

Configuration and operating software for PARATRONIC sensors: Sensors HMI

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1 DESCRIPTION

PARATRONIC's "Sensors HMI" software configures and collects data from the latest generation of **PARATRONIC** sensor.

This software is designed for use with computers equipped with Windows 7™, Windows 8.1™ or Windows 10™.

When used for the first time, it may be necessary to update the Framework of the computer, consequently it is strongly recommended to have an Internet connection and sufficient permissions for this operation.

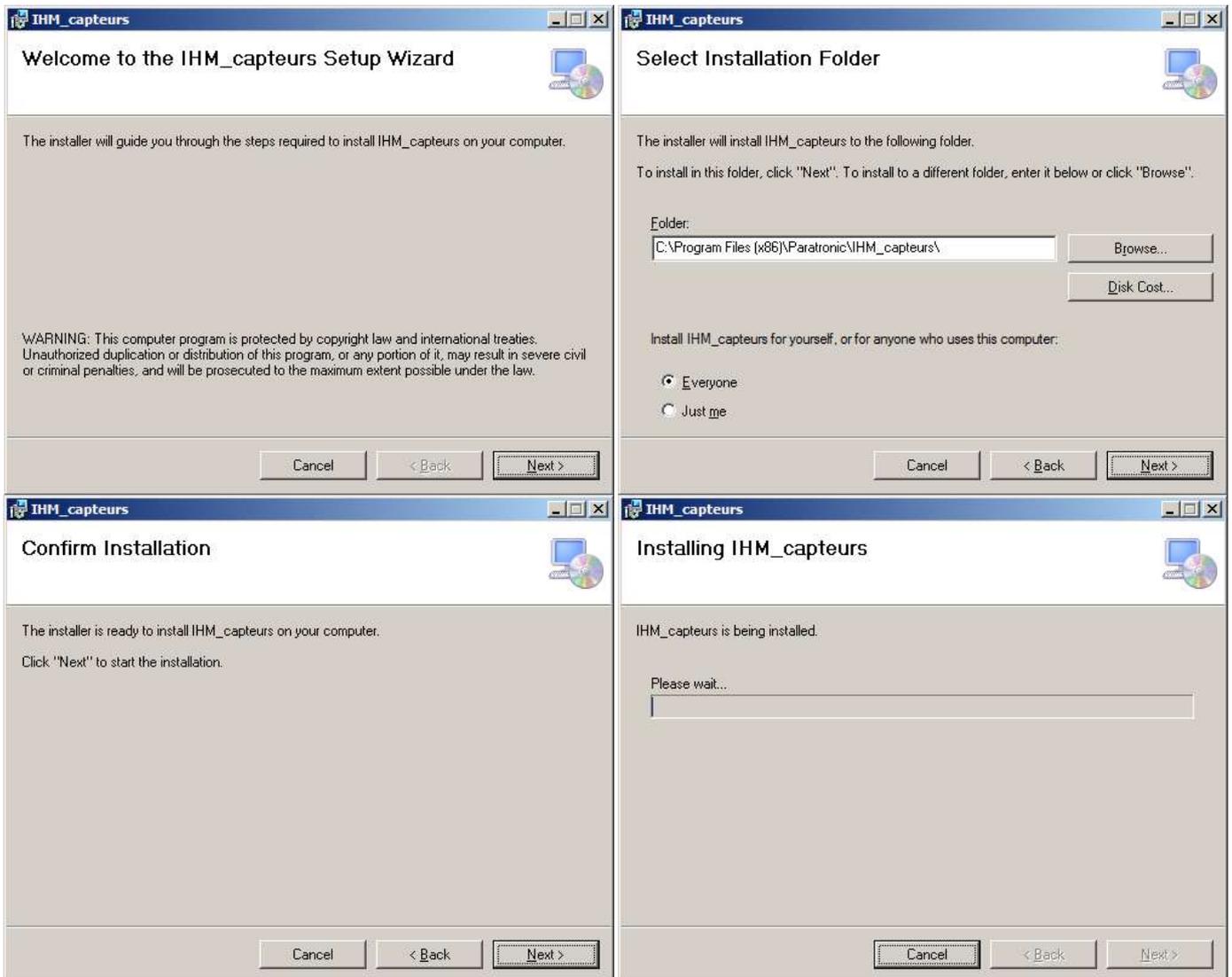
In addition to this documentation, it is recommended to use the **PARATRONIC** manual for the sensor used.

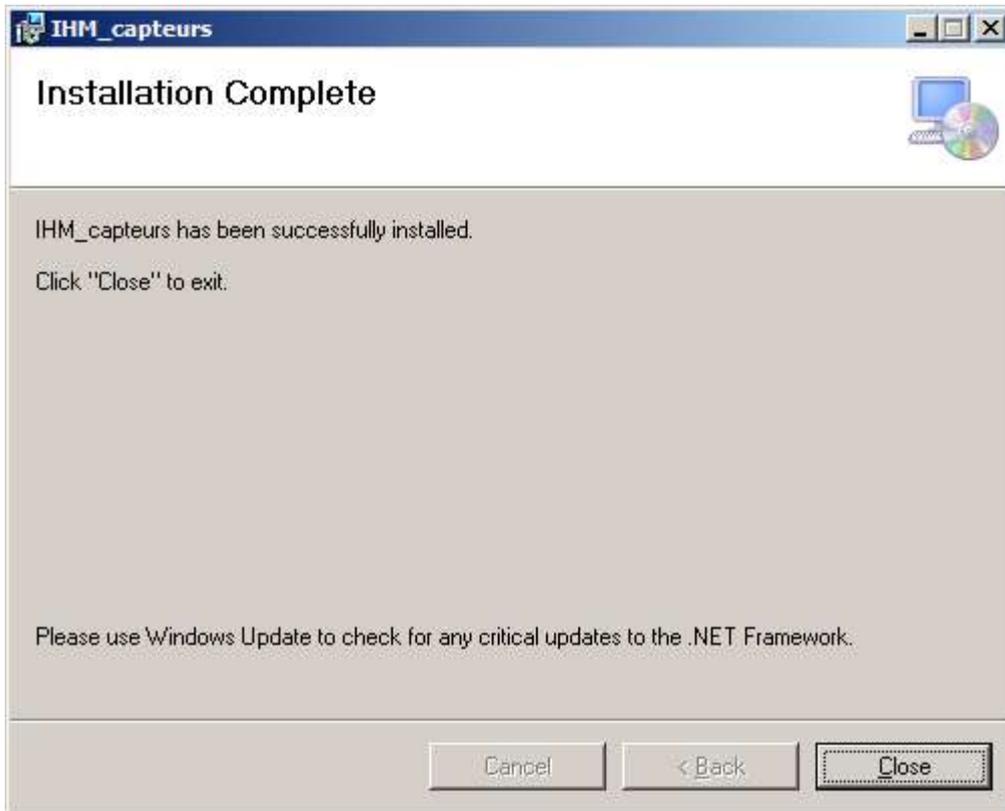
2 INSTALLATION

Installation of the **PARATRONIC** "Sensors HMI" software requires Administrator permissions on the computer.

Download the latest version of the software from [www.pاراتronic.fr/catalogue](http://www.paratronic.fr/catalogue) on the pages for the compatible sensors.

Run "setup.exe" to install the software.





If the user is not the administrator for the workstation, run the installation by right-clicking and selecting "Run as...".

3 **USB DRIVERS**

After having installed "Sensors HMI", you may also need to install the drivers for the USB port. This operation also requires you to be the "Administrator" of the computer. To do this:

- Connect the Paratronic peripheral to a USB port on the computer (Radius, RECD, or ADP_USB).
- Windows may automatically install the driver in which case this step is terminated.
- Otherwise Windows displays "This driver could not be installed"; in this case:
 - o If "Hardware Wizard detected" is displayed, close it.
 - o Log on as administrator and run the executable "driver_usb_Paratronic.exe" in the folder "Sensors HMI" using "Run as administrator".

The executable is on the PC disk in the folder

C:\Program Files x86)\Paratronic\IHM_capteurs or on

C:\Program Files\Paratronic\IHM_capteurs.

- o If the user account check requires confirmation (Windows versions 7,8, and 10), click "Yes":
- o In the "Windows Security" window, click "Install":

Subsequently, it will also be necessary to link these drivers with the hardware and the USB port used every time these differ from the initial configuration.

4 CONNECTION

Before establishing the connection: Start the software,
Connect the product to the computer,

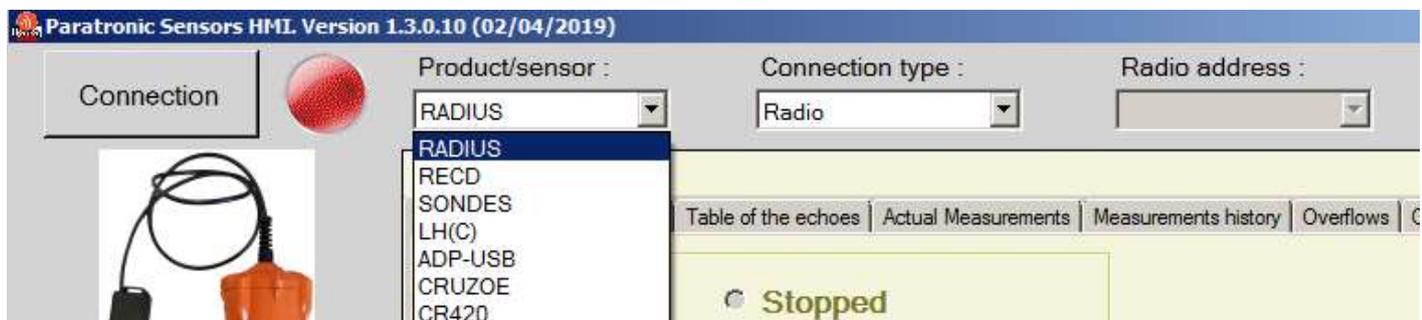
Then select:

The "Product/sensor" connected:

- RADIUS
- BASE RECD
- PROBES
- ADP-USB
- CRUZOE
- CR420
- NRV_RS485
- NRV_420
- LH(C)

- The "Type of connection" used:
- USB
- Radio
- 4-20ma on ADP-USB
- RS485 on ADP-USB

Note: The "Radio address" is only available when selecting the "RADIUS", "Radio" option.
Then select the radio address of the corresponding "RADIUS".



Once the information above has been correctly entered, click "Establish connection". The associated indicator goes green.

Click "Disconnect" to select another product or another connection type or before disconnecting the sensor.



Click "Exit" to close and exit "Sensors HMI".



5 GENERAL SETTINGS

5.1 LANGUAGE CHOICE

Language selection may be changed by clic on “Settings”, then on “language selection” and finally on “English” or “Français”.



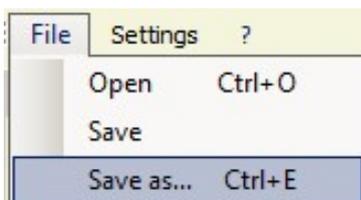
Selection change of language is immediate.

5.2 BACKUP OR LOAD A CONFIGURATION

The backup and restore configuration function is available for all sensors described in this documentation.

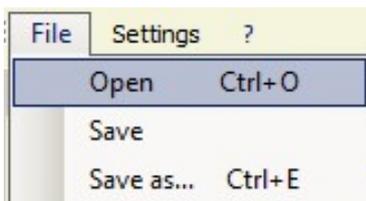
5.2.1 Backup a configuration

It is possible to backup the configuration displayed on the HMI in "XML" format. To do this, click "File" then "Save as" and enter the name of the XML file.



5.2.2 Load a configuration

To reload a configuration in the HMI, clic on « File », then on « Open » and select the file.



Write the settings to the sensor to be taken into account.

6 RADIUS

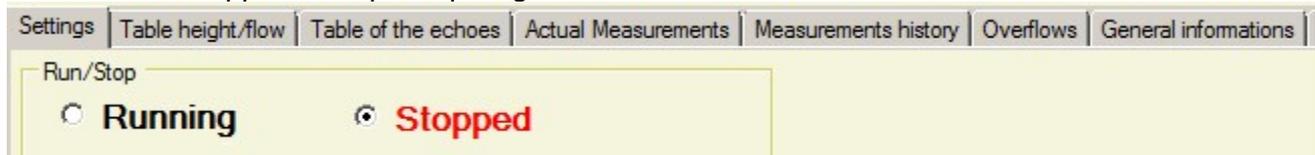
After having established the connection with the "RADIUS" ultrasonic sensor, it is possible to access the various tabs used for configuration, operation or data archiving.

6.1 CONFIGURATION

The "Configuration" tab lets you configure the general operating settings for the "RADIUS".

6.1.1 Run/stop

This group of buttons lets you select the operating mode of the Radius (in a USB connection only); when the Radius is stopped, it stops acquiring data but remains accessible from the HMI.



6.1.2 Measurements in manual mode

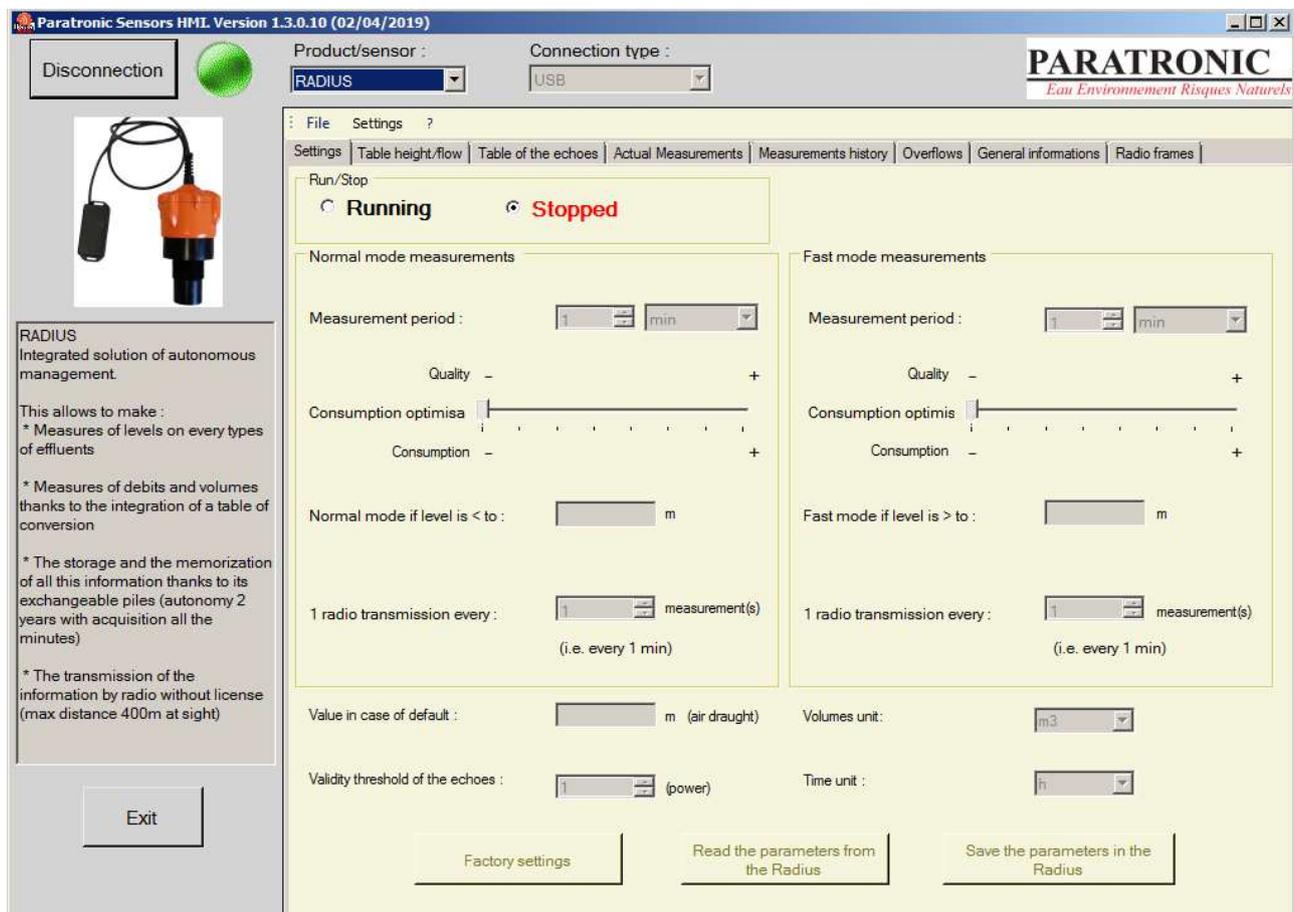
This box contains the settings required for the "Radius" to operate normally.

The measurement period may be configured from "1 to 120" minutes or from 1 to 12 hours,

The "Consumption optimisation" cursor lets you adjust the desired measurement quality and the resulting energy consumption,

"Normal mode if the level is <:" you can enter a level value which will allow "Normal mode measurement" operation for values less than this "threshold",

"1 radio transmission every:" indicates the time step of radio transmissions made by "Radius". This value, configurable from 1 to 65535, is combined with the measurement period in order to determine a time interval shown in parentheses "i.e. every xxx minutes".



6.1.3 Measurements in quick mode

This box contains the settings required for "Radius" to operate in quick mode.

"Quick mode if the level is >:" you can enter a level value which will allow "Quick mode measurement" operation for values greater than this "threshold".

Quick mode is generally used during an overflow. The data recorded following an overflow are processed in the "Overflow" tab.

The other settings in the box may be configured in the same way as for "normal mode".

6.1.4 Fault value

Enter the value to be displayed by "Radius" if it malfunctions here. This value may be between 0 and 16 m vertical clearance.

6.1.5 Echo validity threshold

Enter the minimum threshold value for echoes here; this power may be configured from 1 to 50; 5 by default.

6.1.6 Volume units

Select the unit to be used for volumes, m3 or l (litres)

6.1.7 Flowmetering time unit

Select a time unit: h (hours), mn (minutes, or s (seconds).

6.1.8 Write configuration to the Radius

When configuration has been completed, it has to be written into the "Radius" sensor by clicking "Write configuration to Radius" so it can be registered by the sensor.

6.1.9 Factory configuration

This button restores the default values.

Important: Confirming this action will overwrite all the configurations programmed in the Radius.

6.1.10 Read configuration from the Radius

Clicking this button reads the configuration from a Radius sensor.

6.1.11 Reading a configuration from a file

It is possible to load, in "XML" format, the configuration displayed on the HMI as explained in chapter 5.2 "Backup and load a configuration from a file".

To write the configuration to the Radius, use the write buttons for the configuration, height/flow rate table and the parasitic echoes table.



6.2 HEIGHT/FLOW RATE TABLE

The Radius sensor can calculate a flow rate according to previously-defined heights.

Table de conversion hauteur/débit (32 points max) du Radius 48F987583330

Niveau (m)	Débit (m3/h)
0	0
0,1	0,01
0,2	0,04
0,5	0,25
1	1
2	4
3	9
4	16
*	

Conversion Hauteur-Débit

RAZ Lire la table depuis le Radius Ecrire la table dans le radius Imprimer

In the table on the left, enter the reference levels and the flow rate associated with each. The number of values is limited to 32 points maximum.

The chart on the right shows the corresponding curve deduced from the values entered.

"Write table to the Radius" to confirm the configuration.

It is also possible to "Read table from the Radius".

"Print" allows you to print off the configuration.

"Reset" deletes the contents of the table and the chart.

Note: The "Read table" and "Write table" functions may only be accessed with a USB connection.

6.3 ECHO TABLE

The "echo" table displays the 8 most powerful echoes sorted by increasing distance.

Clicking "Re-read echoes" updates the measurements. The value of the instantaneous vertical clearance is then also updated.

The table of parasitic echoes lists up to 7 values where the echoes should not be taken into account.

Echoes taking place at ± 20 mm of each value entered in this list and with a power less than the entered power +5 will be eliminated.

In the example below (vertical clearance: 1.6m, power: 27) all echoes between 1.58m and 1.62m with a power < 32 will be eliminated.

Select a value and click "Add" to add it to the "Parasitic echo table" so it will be eliminated when processing valid measurements. To add a parasitic echo not present in the table of the most powerful echoes, click the "Enter a parasitic echo" button, a window opens which allows you to enter the vertical clearance and the power of the parasitic echo to be added. The "Parasitic echo table" is limited to 7 values. To delete a value from this table, click the box to the left of the "Vertical clearance" value, the entire row appears with a blue background. Pressing the "Del" key removes the row completely. It is also possible to manually enter a value to be filtered using the "Enter a parasitic echo" button.

The screenshot shows the PARATRONIC software interface. The main window is titled "IHM capteurs, Version 1.2.0.0 (17/01/2017)". The interface includes a navigation menu with options like "Paramétrage", "Table hauteur/débit", "Table échos", "Mesures instantanées", "Mesures historiques", "Surverse", and "Informations générales".

On the left, there is a sidebar with a "Connexion" button and a "RADIUS" section. The "RADIUS" section contains the following text:

RADIUS
Solution intégrée de gestion autonome.

Celle-ci permet d'effectuer :

- * des mesures de niveaux sur tous types d'effluents
- * des mesures de débits et volumes grâce à l'intégration d'une table de conversion
- * le stockage et la mémorisation de toutes ces informations grâce à ses piles interchangeables (autonomie 2 ans avec acquisition toutes les minutes)
- * la transmission des informations par radio sans licence (distance maxi 400m à vue)

At the bottom of the sidebar is a "Quitter" button.

The main area is divided into two tables:

8 échos les plus puissants

Tirant d'air (m)	Puissance
0,179	99
0,199	92
0,255	37
0,373	88
0,444	78
0,569	94
0,633	46
0,759	54

Table des échos parasites (max 7)

Tirant d'air (m)	Puissance
1,6	27

Below the tables, there are several buttons and input fields:

- "Ajouter >" button
- "Saisir un écho parasite" button
- "Lire la table depuis le radius" button
- "Ecrire la table dans le radius" button
- "RAZ" button
- "Relire les échos" button
- Input field for "Tirant d'air instantané:" with the value "0,179" and "m" unit.

Red arrows in the original image point to the selection boxes in the first and second tables.

"Write table to the Radius" to confirm the configuration.

It is also possible to "Read table from the Radius".

"Reset" erases the contents of the "Parasitic echo table".

6.4 ACTUAL MEASUREMENTS

The "Actual measurements" tab shows the latest values from "Radius".

This page also enables the Radius to be "scaled" (**from -16m to + 16m**) according to its location on the site along with its time setting.

To update the values without waiting for the cycle defined in the "Configuration" tab, just click on "Force measurement".

To scale the sensor, click the "Scale" button, the page allowing entry of actual values is displayed. Enter a value (**between -16m and +16m**) or scroll through it using the arrows.

To set the time and date on the sensor, click the "Set time and date" button, the page allowing entry of the current date and time is displayed.

Enter the date and time in the format shown below.

Clicking **the arrow** on the right opens the calendar.

It is also possible to set the Radius to the time on the PC to which it is connected.

The "volume for the current day" is the accumulated volume for the current day calculated from 00:00 to midnight. This volume changes on each new measurement if the flow rate is > 0. It is reset at midnight and/or if Firmware is loaded and/or if the power is cut to the Radius (by disconnecting the batteries and the USB cable).

The "volume for the previous day" is the accumulated volume for the previous day (calculated from 00:00 to midnight). This volume does not change during the day. It is changed at midnight and/or if the Firmware is loaded and/or if the power is cut to the Radius (by disconnecting the batteries and the USB cable).

6.5 MEASUREMENT HISTORY

The "Measurement history" tab allows the measurements contained in the Radius to be downloaded.

Select a depth from "1 to 100" and "time(s), day(s) or month(s)" and click "Read". This operation may take several seconds.

The screenshot shows the 'Mesures historiques' (Measurement History) tab in the IHM capteurs software. The interface includes a menu bar with options like 'Paramétrage', 'Table hauteur/débit', 'Table échos', 'Mesures instantanées', 'Mesures historiques', 'Surveys', and 'Informations générales'. Below the menu, there are buttons for 'Effacer le tableau', 'Enregistrement format xls', and 'Effacer la mémoire'. A 'Profondeur' (Depth) dropdown is set to '7' and a time unit dropdown is set to 'jour(s)'. A 'Lire' (Read) button is visible. A table displays measurement data with columns for Date, Puissance, Température (°C), Tirant d'air (m), Niveau (m), Débit (m3/h), and Tension (V). To the right, a line chart titled 'Mesures historiques' shows temperature data over time. A 'Mesure' dropdown is set to 'température' and a 'Rafraîchir' (Refresh) button is present.

Date	Puissance	Température (°C)	Tirant d'air (m)	Niveau (m)	Débit (m3/h)	Tension (V)
25/04/2017 12:08	62	23,33	0,253	2,947	0	4,541
25/04/2017 12:06	64	23,35	0,254	2,946	0	4,555
25/04/2017 12:06	59	23,35	0,253	2,947	0	4,541
25/04/2017 12:04	61	23,35	0,253	2,947	0	4,56
25/04/2017 12:02	63	23,36	0,253	2,947	0	4,555
25/04/2017 12:00	60	23,36	0,253	2,947	0	4,558
25/04/2017 11:58	62	23,36	0,253	2,947	0	4,55
25/04/2017 11:56	62	23,36	0,253	2,947	0	4,555
25/04/2017 11:54	62	23,36	0,253	2,947	0	4,558
25/04/2017 11:52	63	23,36	0,253	2,947	0	4,558
25/04/2017 11:50	62	23,37	0,253	2,947	0	4,553
25/04/2017 11:48	59	23,37	0,253	2,947	0	4,555
25/04/2017 11:46	61	23,36	0,253	2,947	0	4,555
25/04/2017 11:44	60	23,36	0,253	2,947	0	4,55
25/04/2017 11:42	59	23,36	0,253	2,947	0	4,553
25/04/2017 11:40	62	23,34	0,253	2,947	0	4,562
25/04/2017 11:38	60	23,34	0,253	2,947	0	4,543
25/04/2017 11:36	59	23,35	0,253	2,947	0	4,546
25/04/2017 11:35	54	23,36	0,253	2,947	0	4,531
25/04/2017 11:34	58	23,32	0,253	2,947	0	4,548
25/04/2017 11:32	60	23,33	0,253	2,947	0	4,548

Once the information has been retrieved and displayed, it is possible to select one measurement in particular to be shown on the chart.

Select the measurement from the drop-down list and click "Refresh".

This close-up shows the 'Mesure' dropdown menu with options: 'niveau', 'température', 'tirant d'air', 'niveau', 'débit', and 'tension'. The 'niveau' option is currently selected. To the right is the 'Rafraîchir' button.

The historic data can be saved to your PC in a previously-defined folder. Click "Save in XLS format" to save the data. The file name will consist of the word "mesures" followed by the "Radius number" and the extension "XLS".

✓ Example: mesures_48FE744D3330.xls

"Delete table" deletes the information in the table and the chart. To display it again, click "Read".

"Delete memory" PERMANENTLY deletes the measurements contained in the Radius.

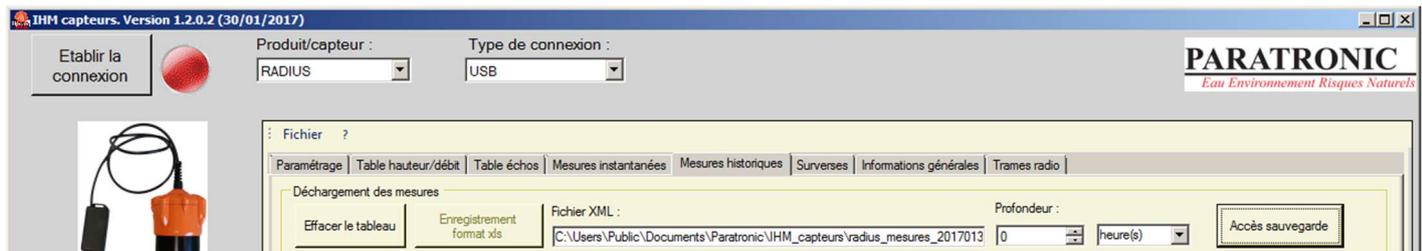
When downloading the data contained in the Radius, a backup file in "XML" format is automatically created. It is saved in a sub-folder of data common to all users of the workstation:

Under Windows 7, 8 and 10: in the folder
"C:\Users\Public\Documents\Paratronic\IHM_capteurs\"

The name of the file relating to the Radius connected consists of "radius_mesures" followed by the date (YYYYMMDD), then the Radius number with the extension "XML".

✓ Example: "radius_mesures_20131211_48FE744D3330.xml"

This backup can be accessed **"OFF-LINE"**.



To do this, select the read depth for this backup and click "Access backup". Select the desired file from the appropriate folder and the measurements will be displayed in the table and the chart.

6.6 OVERFLOW REPORT

The "Overflow" table displays the date and time of the "Start", "Duration" and "Volume" at the end of each overflow event (an ongoing overflow will not be displayed).

Radius can record up to 2500 overflow values.

Select either:

A period by clicking on the "Overflows on:" and select the start and end dates on the calendars using the drop-down lists.

All the overflows recorded by the Radius sensor.

Then click "Read" to display the corresponding values in the table.

The "Overflow total" for overflows which appeared during the selected period is displayed under the table.

The historic data can be saved to your PC in a folder defined previously or by default in:
"C:\Program Files\Paratronic\IHM_capteurs\ surverses_48FE744D3330.xls"

Click "Save in XLS format" to save the data. The file name will consist of the word "surverses" followed by the "Radius number" and the extension "XLS".

✓ Example: surverses_48FE744D3330.xls

	Début	Durée	Volume (m3)
▶	17/01/2017 15:27	00:02:30	1,1775
	17/01/2017 15:01	00:05:30	2,603333
	17/01/2017 14:42	00:02:30	0,03510417
	17/01/2017 11:53	02:20:30	1,651629
*	17/01/2017 11:48	00:02:30	0,03397917

Total surverses : 5

"Delete memory" PERMANENTLY deletes the overflows contained in the Radius.

IMPORTANT: When updating a Radius to version 1.3 or above from version 1.2 or less it is necessary to delete the content of the overflow memory.

6.7 GENERAL INFORMATION

Paramétrage Table hauteur/débit Table échos Mesures instantanées Mesures historiques Surverves Informations générales

Informations produit

Identifiant produit : 3005 **Product type**

Nom fichier associé : 48FE744D3330 **Radius no.**

Version du logiciel : v1.2

Adresse antenne : 0004A38FDC06 **No. of associated RMA aerial**

Mise à jour du logiciel

Lancer la mise à jour ...

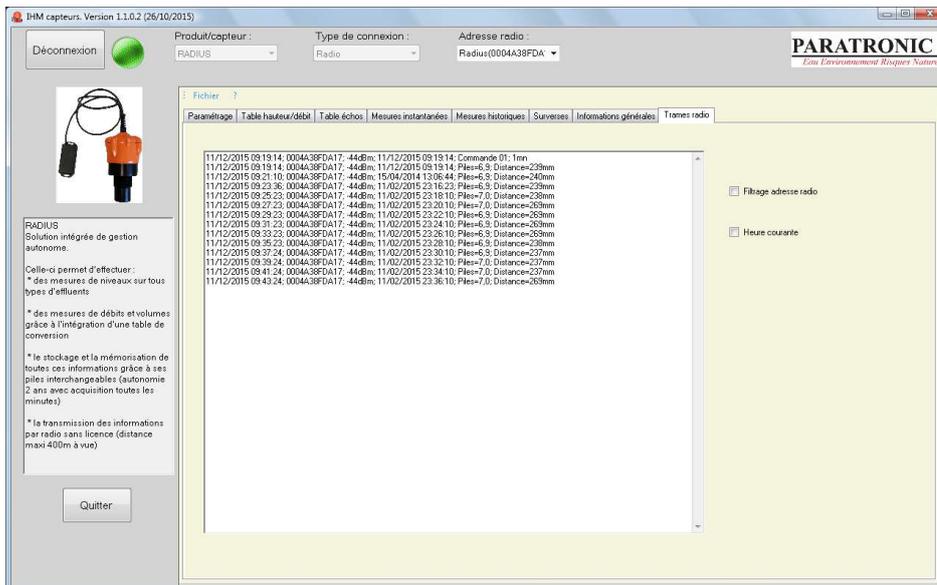
Etat d'avancement de la mise à jour :

The software of a Radius sensor may be directly updated from the "Sensors HMI". Click "Start update", select the appropriate "Radius.bix" file and confirm. The "Update progress" may be viewed in the progress bar.

IMPORTANT: When updating a Radius to version 1.3 or above from version 1.2 or less it is necessary to delete the content of the overflow memory.

"Aerial address" is the number of the aerial connected to the Radius. It is used during detection by the RECD radio base.

6.8 RADIO SIGNALS



This feature is useful for checking the quality of the radio connection between the Radius and its base.

The display options are:

- "radio address filtering" to display only the signals from the selected RMA aerial,
- the current time to show the PC time.

The fields displayed are:

- date-time stamp of the signal reception,
- radio address of the RMA aerial which issued the message,
- receive level of the message,
- time-date stamp of the measurement,
- battery voltage,
- measurement.

The limit of the receive level is of the order of -100 dBm. The difference from the received level gives the reception margin.

6.9 ARCHIVES

Example of presentation of "Measurement history" files in "xls" format

	A	B	C	D	E	F	G
1	Date et Heure	Température(°C)	Tirant d'air(m)	Niveau(m)	Débit	Tension(V)	
2	10/12/2013 11:44	23,27	0,953	2,247	49,88	6,9	
3	10/12/2013 11:42	23,23	0,952	2,248	49,92	6,898	
4	10/12/2013 11:40	23,21	0,952	2,248	49,92	6,9	
5	10/12/2013 11:38	23,17	0,952	2,248	49,92	6,895	
6	10/12/2013 11:36	23,16	0,952	2,248	49,92	6,898	
7	10/12/2013 11:34	23,14	0,953	2,247	49,88	6,898	
8	10/12/2013 11:32	23,12	0,952	2,248	49,92	6,9	

Example of presentation of "Overflow" files in "xls" format

	A	B	C	D	E
1	Début	Durée (s)	Volume		
2	26/11/2013 14:37	124	9936		
3	26/11/2013 14:33	120	3185019		
4	25/11/2013 17:25	700	14596689		
5	25/11/2013 16:37	2734	489201		
6	25/11/2013 16:25	572	0		
7	25/11/2013 16:20	77	6412		

7 **RECD**

After having established the connection with the "RECD" radio base, it is possible to access the various tabs used for configuration, operation or data archiving.

In addition to this documentation, it is recommended to use the **PARATRONIC I159F** manual for the Radius sensor and the "RECD" base.

7.1 **CONFIGURATION**

The "Configuration" tab lets you configure the general operating settings for the "RECD" radio base.

7.1.1 **Radio addresses (and product Ids) detected**

Several "Radius" ultrasound sensors may be detected by the "RECD" radio base. They are displayed in a box which shows a number followed by the sensor type between parentheses.

This information is displayed when a Radius sends its information by radio.

The number relates to the "Aerial address" which is associated with the Radius.

The sensor type is valid when it is fully shown (Radius). If () or (0) is shown, detection has not yet been confirmed. It is therefore necessary to wait for the complete display.

- ✓ Example: 0004A38FDC06 (Radius)

Select the desired Radius sensor (shown on a blue background) and click "Add to the base" so that it can be registered by the RECD base.

The sensor is now present in the "Sensors known by the base" table.

7.1.2 **Base configurations**

The "RECD" radio base includes 2 Jbus communication ports:

- ✓ One, the "Master", is dedicated to communication with the **PARATRONIC** 4-20 mA analogue outputs.
- ✓ The second, the "Slave", is dedicated to communication with a data acquisition system, the communication master.

"Base Jbus address" is the slave number of the "RECD" base. The slave number of the "RECD" radio base is 10 by default but can be configured to between 1 and 255.

"Slave Jbus Speed" is the communication speed used on the "Slave" port of the RECD base. The default speed is 9600 but can be changed using the drop-down list (1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115200).

7.1.2.1 **Sensors known by the base**

"Sensor no." indicates the order of the Radius sensors added to the "RECD" base which can collect up to "3" Radius sensors.

"Radio identifier" relates to the "Aerial address" associated with the Radius which allows detection by the "RECD" radio base.

The "Name" of the default sensor is "Radius". It can be changed by clicking on the appropriate cell to enter a different name of a maximum of 20 characters.

"Slave Jbus addr" gives the "Slave" address allocated to each Radius. This address is used to differentiate Radius sensors when a "master" data acquisition reads information on the "Slave" port of the "RECD" base. The slave Jbus address may be configured from 1 to 255 by clicking on the appropriate cell. By default:

- ✓ address 11 is allocated to sensor 1,
- ✓ address 12 is allocated to sensor 2,
- ✓ address 13 is allocated to sensor 3.

"Timeout (min)" shows, in minutes, the time before a communication fault appears between a Radius and the "RECD" radio base. It may be configured from 1 to 255 minute(s) by clicking on the appropriate cell.

7.1.2.2 List of 4-20 mA modules on the base

In addition to this documentation, it is recommended to use the **PARATRONIC I124F** manual for the "analogue output" extension modules.

The "RECD" radio base may be connected, via the "Master" Jbus port, to **PARATRONIC** 4-20 mA analogue output modules. It is thus possible to "route" measurement information from the Radius ultrasonic sensors in order to use it on the 4-20 mA data acquisitions (display, PLC, etc.).

IHM capteurs, Version 1.0.0.1 (06/12/2013).

Produit/capteur : RECD Type de connexion : USB

PARATRONIC
Eau Environnement Risques Naturels

Fichier ?

Paramétrage Mesures instantanées Mesures historiques Informations générales

Adresses radio (et Id produits) détectés :

0004A38FDC06 (Radius)
0004A38FE060 (Radius)
0004A38FDBF6 (Radius)

Ajouter à la base

Paramétrages de la base :

Adresse JBus de la base : 10 Vitesse JBus esclave : 9600

Capteurs connus de la base :

	N° capteur	Identifiant radio	Nom	Adr JBus esclave	Timeout (min)
▶	1	0004A38FDC06	3092-001	11	60
	2	0004A38FE060	Radius 2	12	60
	3	0004A38FDBF6	Radius 3	13	60

Liste des modules 4-20 mA de la base :

	Adr module	N° sortie	N° capteur	Choix mesure	Valeur 4 mA	Valeur 20 mA
	1	1	1	niveau	0	3.2
	1	1	2	débit	0	3.2
	2	2	2	niveau	0	3.2
	2	1	3	débit	0	3.2
	3	1	1	niveau	0	3.2

Quitter

Configuration usine Lire le paramétrage de la base Ecrire le paramétrage dans la base

Note: Only 3 measurements per Radius sensor may be sent to the 4-20 mA analogue output modules.

"Module addr" is the Jbus address of the corresponding module. It may be changed by clicking on the appropriate cell.

"Output no." lets you enter which module output is to be used for the measurement, output 1 or 2. It may be changed by clicking on the appropriate cell or by using the drop-down list.

"Sensor no." identifies the Radius which will be used for the measurement, Radius 1, 2 or 3. It may be changed by clicking on the appropriate cell or by using the drop-down list.

"Measurement choice" lets you select the measurement you want to "route" to the selected analogue output module. It can be changed using the drop-down list which provides the following options: Vertical clearance, level, flow rate, temperature, voltage.

"4 mA value" lets you enter the measurement value for 4 mA.

"20 mA value" lets you enter the measurement value for 20mA.

7.1.2.3 Write configuration to the base

When configuration has been completed, it has to be written into the "RECD" radio base by clicking "Write configuration to the base" so it can be registered by the "RECD" radio base.

7.1.2.4 Read configuration from the base

While connected, it is possible to read the configuration from an "RECD" base by clicking this button.

7.1.2.5 Factory configuration

This button restores the default values.

Important: Confirming this action will erase all the configurations programmed in the "RECD" radio base.

7.2 ACTUAL MEASUREMENTS

The "Actual measurements" tab shows the latest values received by the RECD radio base from the "Radius" sensors.

Clicking "Delete" deletes all the displayed values.

The values will be updated on the next transmission from the corresponding Radius sensor.

To set the time and date on the RECD base, click the "Set time and date" button, the page allowing entry of the current date and time is displayed.

Enter the date and time in the format shown below.

Clicking the arrow on the right opens the calendar.

It is also possible to set the RECD base to the time on the PC to which it is connected.

7.3 MEASUREMENT HISTORY

The "Measurement history" tab allows the measurements contained in the RECD radio base to be downloaded.

Select: One Radius sensor (from the 3 possible) in the drop-down list.

A depth from "1 to 100" and "time(s), day(s) or month(s)" and click "Read". This operation may take several seconds.

RECD
* Base radio permettant de récupérer à distance (distance maxi 400 m à vue) des informations issues de capteurs Radius (3 maxi)
* Ces informations peuvent être transférées vers un système d'acquisition via une liaison série RS485 Modbus.

Date	Niveau (m)	Tirant d'air (m)	Température (°C)	Débit	Tension (V)
12/12/2013 13:48	3,034	0,597	22	3	6,907
12/12/2013 13:47	2,973	0,658	22	2,973	6,909
12/12/2013 13:46	3,034	0,596	22,1	3	6,912
12/12/2013 13:45	3,035	0,596	22,1	3	6,912
12/12/2013 13:44	3,034	0,597	22,1	3	6,907
12/12/2013 13:43	2,973	0,658	22,1	2,973	6,909
12/12/2013 13:42	2,973	0,658	22,1	2,973	6,907
12/12/2013 13:41	3,034	0,597	22,1	3	6,907
12/12/2013 13:40	3,035	0,596	22,1	3	6,907
12/12/2013 13:39	2,973	0,658	22,1	2,973	6,909
12/12/2013 13:38	3,034	0,597	22,1	3	6,907
12/12/2013 13:37	2,974	0,657	22,1	2,974	6,909
12/12/2013 13:36	2,973	0,658	22,2	2,973	6,912
12/12/2013 13:35	2,973	0,658	22,2	2,973	6,909
12/12/2013 13:34	2,973	0,658	22,2	2,973	6,909
12/12/2013 13:33	3,035	0,596	22,2	3	6,912
12/12/2013 13:32	2,973	0,658	22,2	2,973	6,909
12/12/2013 13:31	3,035	0,596	22,2	3	6,909

Once the information has been retrieved and displayed, it is possible to select one measurement in particular to be shown on the chart.

Select the measurement from the drop-down list and click "Refresh".

The historic data can be saved to your PC in a previously-defined folder.

Click "Save in XLS format" to save the data. The file name will consist of the word "mesures" followed by the "RECD number" and the extension "XLS".

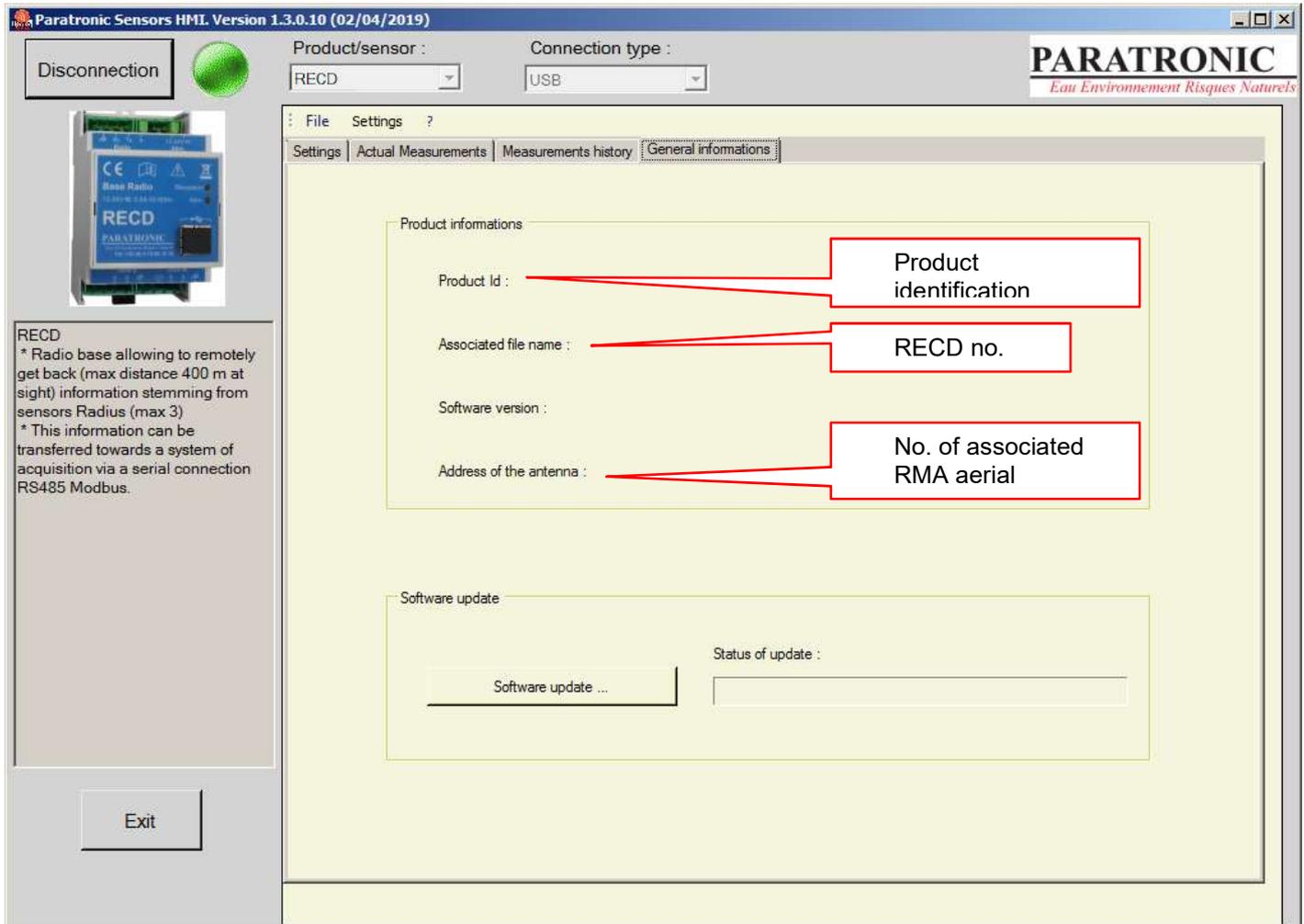
✓ Example: mesures_48FC77593330.xls

"Delete table" deletes the information in the table and the chart. To display it again, click "Read".

"Delete memory" PERMANENTLY deletes the measurements contained in the Radius.

7.4 GENERAL INFORMATION

This page displays the "general information" for the RECD radio base.



The software of an RECD radio base may be directly updated from the "Sensors HMI". Click "Start update", select the appropriate "Base_radio.bix" file and confirm. The "Update progress" may be viewed in the progress bar.

7.5 ARCHIVES

Example of presentation of "Measurement history" files in "xls" format

	A	B	C	D	E	F	G	H	I
1	Date and time	Sensor no	Level (mm)	Air draught (mm)	Flow	Echo amplitude	Temperature (°C/10)	Battery voltage (mV)	Alarm status
2	12/12/2019 18:31	1	2,676	0,955	2,566	117	23,1	6,914	0
3	12/12/2019 18:30	1	2,676	0,955	2,566	122	23,1	6,912	0
4	12/12/2019 18:29	1	2,676	0,955	2,566	125	23,1	6,909	0
5	12/12/2019 18:28	1	2,675	0,956	2,566	125	23,1	6,914	0
6	12/12/2019 18:27	1	2,676	0,955	2,566	121	23,1	6,914	0
7	12/12/2019 18:26	1	2,675	0,956	2,566	121	23,1	6,912	0
8	12/12/2019 18:25	1	2,676	0,955	2,566	142	24,1	6,912	0

8 **PROBES**

After having established the connection with the probe via ADP-USB, it is possible to access the various tabs used for configuration and operation.

8.1 **CONFIGURATION**

The "Configuration" tab lets you configure the general operating settings for the probe. The probe model (SNA, SNAX, SND, SNC, SNCX or SNFX) is detected automatically and displayed on the first row.

8.1.1 **Settings**

The display is adapted so that the configuration relates to the mode chosen (pressure, height or flow rate).

In "**pressure**" mode enter only the pressure values for 4 mA and 20 mA.

The screenshot displays the 'Settings' tab of a software interface. At the top, there are three tabs: 'Settings', 'Actual Measurements', and 'General informations'. The 'Settings' tab is active. Below the tabs, the 'Probe model' is set to 'SNC'. A 'Settings' box contains a 'Mode' dropdown menu set to 'pressure'. Below this, there are two input fields for pressure values: 'Pressure for 4mA' is set to '0,00' mBar, and 'Pressure for 20mA' is set to '1000,00' mBar. At the bottom of the interface, there are two buttons: 'Read the settings from the probe' and 'Write the settings in the probe'.

In "**height**" mode, enter the "density of the liquid" and the height values for 4 mA and 20 mA.

Settings | Actual Measurements | General informations |

Probe model : SNC

Settings :

Mode : height

Density of the liquid : 1000 Kg/m³

Height for 4mA : 0.000 m Height for 20mA : 10.000 m

Read the settings from the probe Write the settings in the probe

In "**Flow rate**" mode, enter the "density of the liquid", the flow rate values for 4 mA and 20 mA, the flow rate unit and the number of decimal places to be displayed for the flow rate values (maximum 3).

Settings | Actual Measurements | General informations | Table height/flow |

Probe model : SND

Settings :

Mode : flow

Density of the liquid : 1000 Kg/m³

Flow for 4mA : 0.00 l/s Flow for 20mA : 10.00 l/s

Flow unit : l/s

Number of flow decimals : 2

Read the settings from the probe Write the settings in the probe

8.1.2 Height/Pressure conversion principle

The SNA submersible level sensor may be used in liquids of different densities.

As part of the process for programming the probe, it may be necessary to calculate the correspondence between pressure in mbar and height of the liquid:

The height of the liquid is the product of the pressure and the factor 10.197 and related to the specific gravity:

PRESSURE (mbar)	X 10.197	/	SPECIFIC GRAVITY*	=	HEIGHT (mm)
0	X 10.197	/		=	0
	X 10.197	/		=	
	X 10.197	/		=	

*: Specific gravity of the liquid to be measured.

8.1.3 Height/Flow rate Table

The SND template provides access to the "Height/Flow rate Table" which lets you enter up to 32 height/flow rate conversion points (QH law). Once the table is recorded in the SND probe, the 4/20 mA signal delivered is proportional to the flow rate.

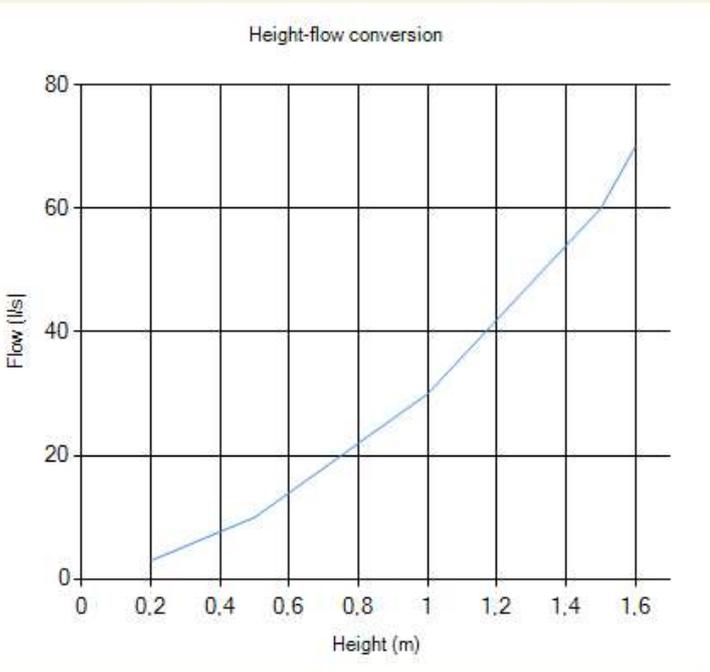
- An empty table equates to a flow rate of 0.
- If the height is less than the lowest height defined in the flow rate table, this will be the lowest height.
- If the height is greater than the greatest height defined in the flow rate table, this will be the greatest height.
- The level offset is subtracted from the height measured by the probe before the flow rate calculation. It allows a table associated with an overflow to be defined independently of the position of the probe.

Settings | Actual Measurements | General informations | **Table height/flow**

Conversion table height/flow (max 32 points)

Height (m)	Flow (l/s)
1	30
0.5	10
0.2	3
1.5	60
1.6	70
▶▶	

Height-flow conversion



Level offset : m

Clear
Read the table from the probe
Write the table in the probe
Print

8.1.4 Write configuration (or the table) to the probe

After having completed the configuration or changes to the height/flow rate table, this needs to be written to the probe by clicking the "Write configuration to the probe" or "Write table to the probe" buttons so they can be registered by the probe.

8.2 ACTUAL MEASUREMENTS

The "Actual measurements" tab shows the latest values from the probe: pressure, height, flow rate (depending on the probe mode) and the temperature.

Important: While reading instantaneous digital measurements with the HMI, there may be current fluctuations on the 4-20 mA analogue output of the probe.

Settings | Actual Measurements | General informations | Table height/flow |

Actual Measurements

Pressure : -0.208 mBar

Height : -0.002 m

Flow : 3.00 l/s

Temperature : 28.1 °C

8.3 GENERAL INFORMATION

This tab lets you both display information on the product (identifier, serial number, software version of the probe) and to update the probe software.

The probe software may be directly updated from the "Sensors HMI". Click "Start update", select the appropriate "****.bix" file and confirm.

Important: if you are updating from a version ≤ 2.3 to a version ≥ 3.0 the following message is displayed: **"Important: the firmware update will require factory recalibration. Do you want to continue?"** It is not recommended to carry out this update as this requires the probe to be recalibrated in the factory which would make it unusable.

The "Update progress" may be viewed in the progress bar.

Settings | Actual Measurements | General informations | Table height/flow |

Product informations

Product Id : C5

Serial number : 630

Software version : 3.0

Software update

Run the update ...

Status of update :

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Appropriate "****.bix" file:

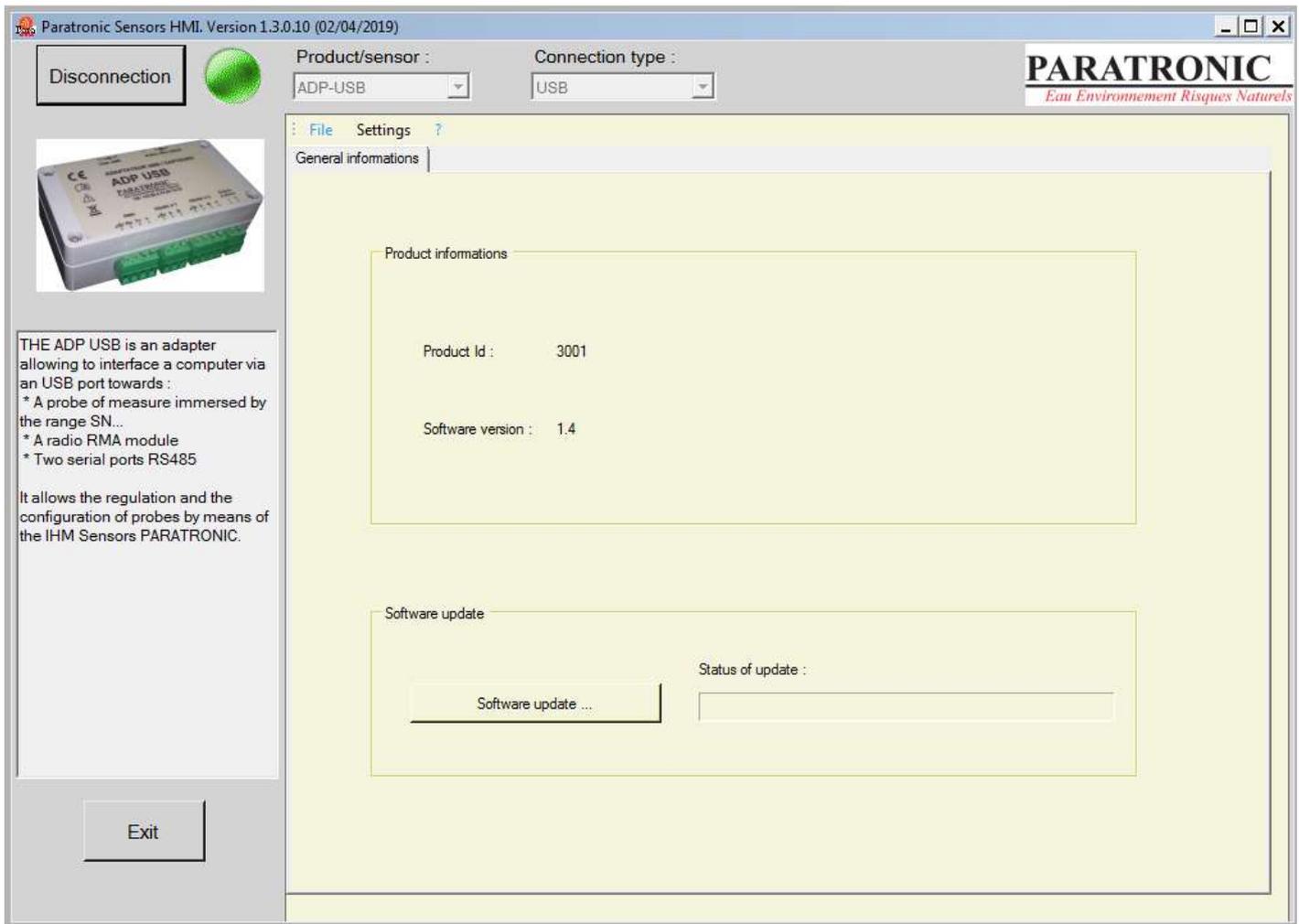
The update files may be obtained on request to info@paratronic.fr

The update files differ according to the versions of the electronics in the sensor, you need to specify whether the sensor to be updated is a 1.xxx or 2.xxx version.

9 ADP-USB

9.1 GENERAL INFORMATION

This tab lets you both display information on the product (identifier, software version) and to update the software for the ADP-USB.



The software may be directly updated from the "Sensors HMI".
Click "Start update", select the appropriate "****.bix" file and confirm.
The "Update progress" may be viewed in the progress bar.

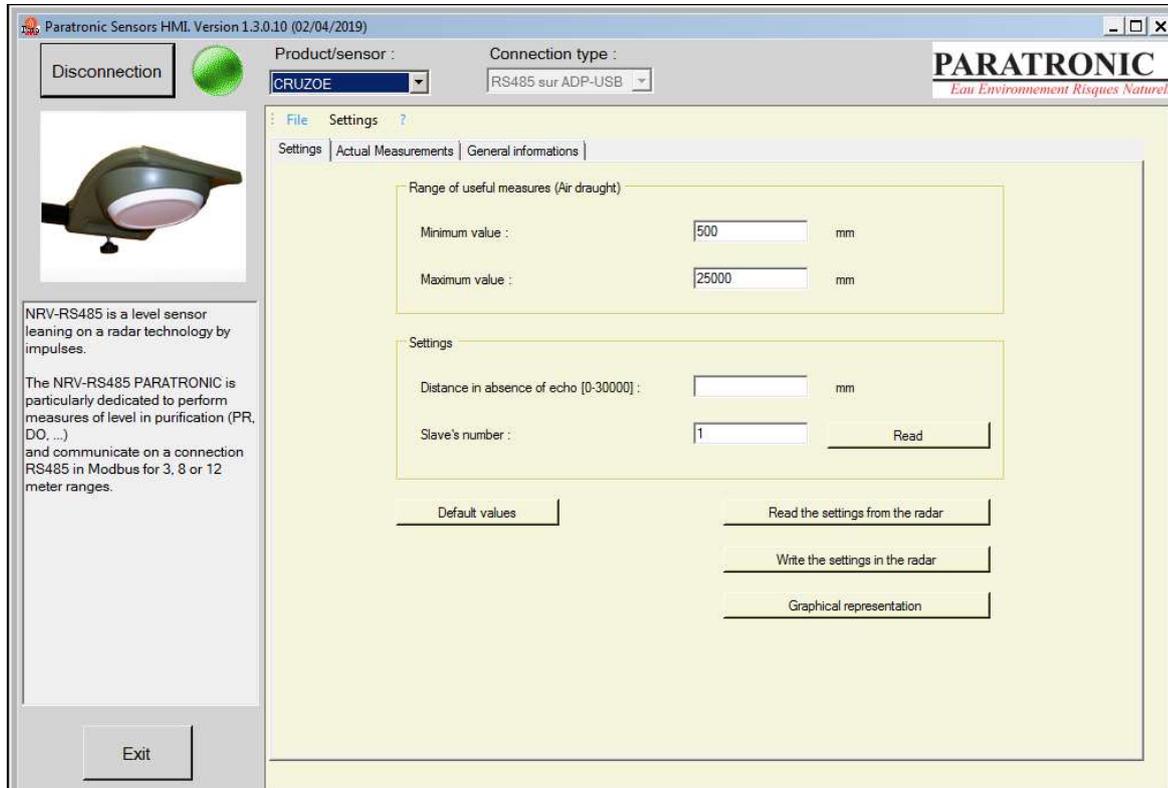
10 CRUZOE AND NRV RS485 RADARS

By default the 3 tabs "Configuration", "Actual measurements" and "General information" are displayed

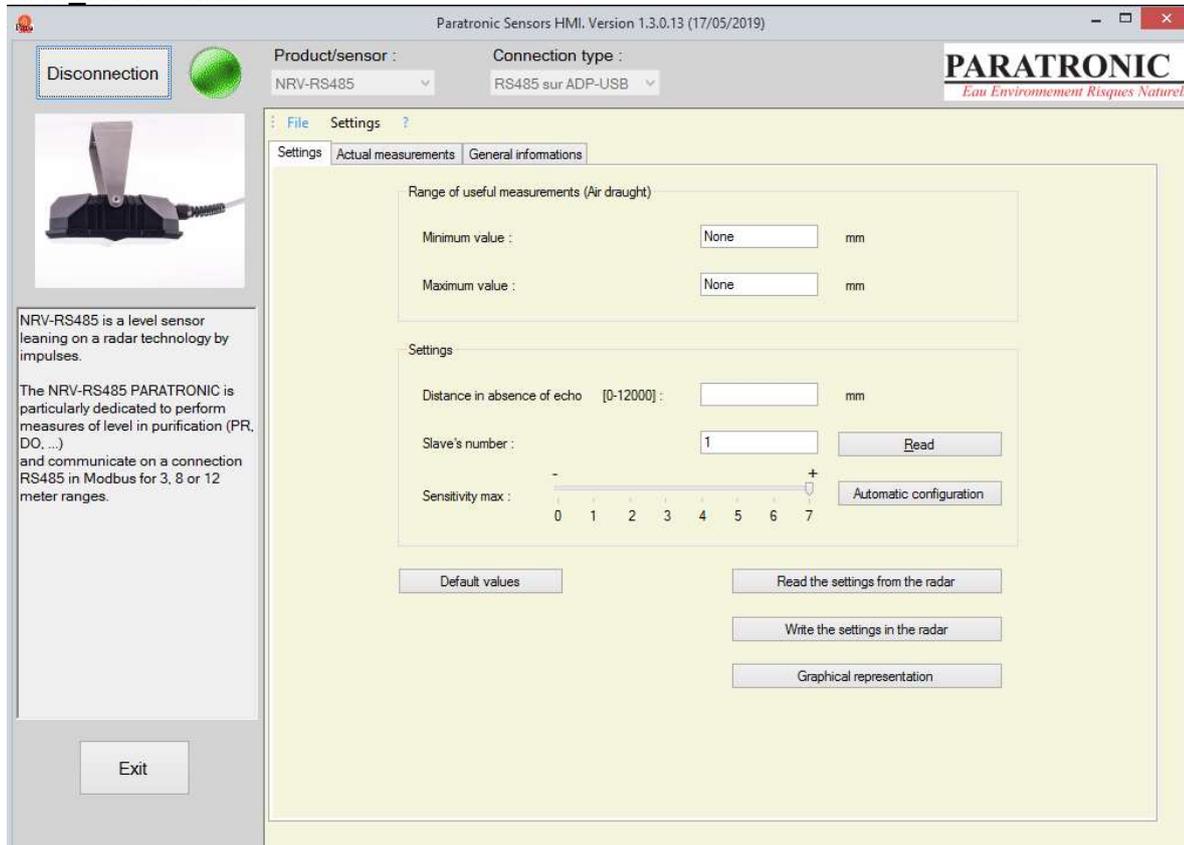
10.1 CONFIGURATION

The "Configuration" tab lets you configure the general operating settings for the radar.

Cruzoe radar



NRV_RS485 radar

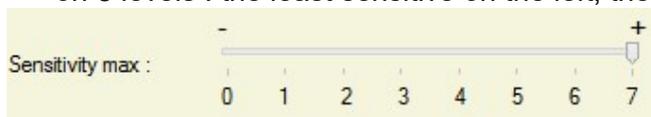


- Range of useful measurements: The minimum and maximum vertical clearance values define the valid measurement interval. To disable one of these limits, enter the value "0" or the word "None".
- Distance in absence of echo: Enter here the value to be delivered by the radar if there is no echo (value between 0 and 30000). The specific value "65533" used by default is the only "off limit" value which can be entered.

Radar model	Distance in absence of echo : values (mm) and between :
Cruzoé	[0 and 30000]
NRV_RS485/3	[0 and 3000]
NRV_RS485/8	[0 and 8000]
NRV_RS485/12	[0 and 12000]

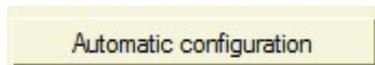
The particular value « 65533 », used as default, is the only value “out of range” that can be entered.

- Slave number: between 1 and 255. The "Read" button reads the slave number of the radar.
- Default values: this button restores the default values.
- "Read configuration in the radar" displays the configuration values saved in the radar.
- "Write configuration to the radar": After the configuration has been changed, it needs to be saved to the radar by clicking this button so it can be registered by the radar.
- For the NRV_RS485 radar only : The sensitivity slider let you adjust the radar reception sensitivity, on 8 levels : the least sensitive on the left, the most sensitive on the right.

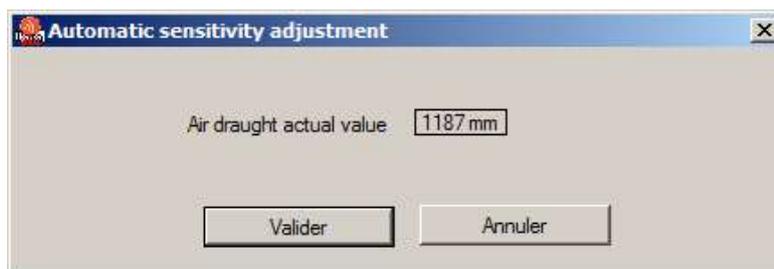


A high sensitivity is well suited to a low reflective surface (presence of foam for example), and to the presence of condensation

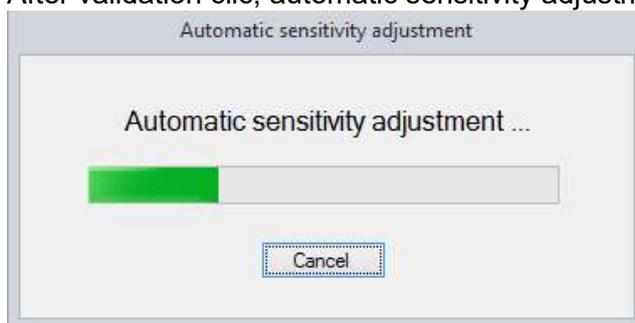
- For the NRV_RS485 only : The “Automatic configuration” button process an automatic adjustment of radar reception sensitivity.



As a first step, the page display air draught actual value, which must be correct for a precise adjustment.

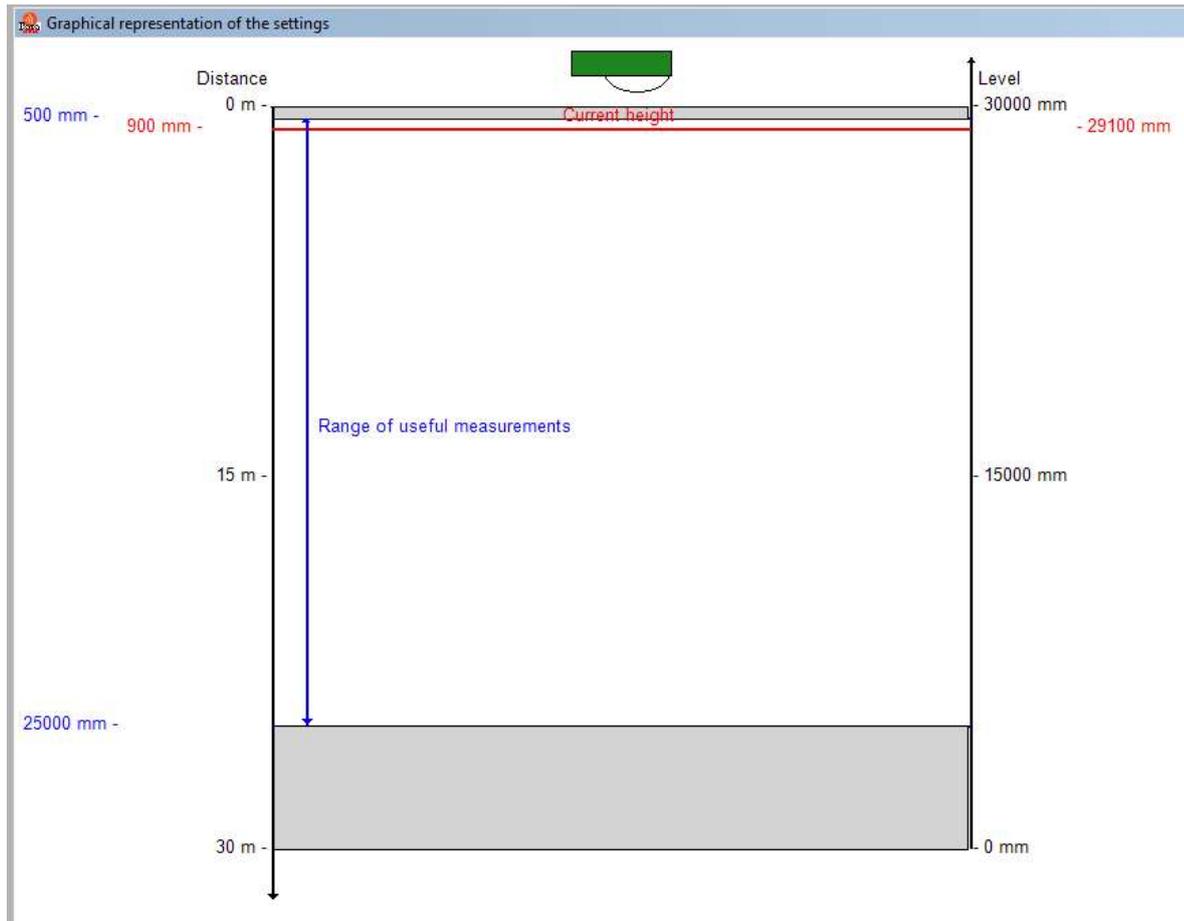


After validation clic, automatic sensitivity adjustment can take about 10 seconds.



Then the sensitivity value is write in the radar, and the sensitivity slider is automatically positioned on this value.

- « Graphic representation » : After a clic on this button, a new form open and display a graphical representation of the settings :



10.2 ACTUAL MEASUREMENTS

The "Actual measurements" tab shows the latest values from the radar. The measurements are refreshed every second.

The radar carries out several measurements per second and averages them over 1 s, 4 s and 16 s. The averaged values are displayed in a table.

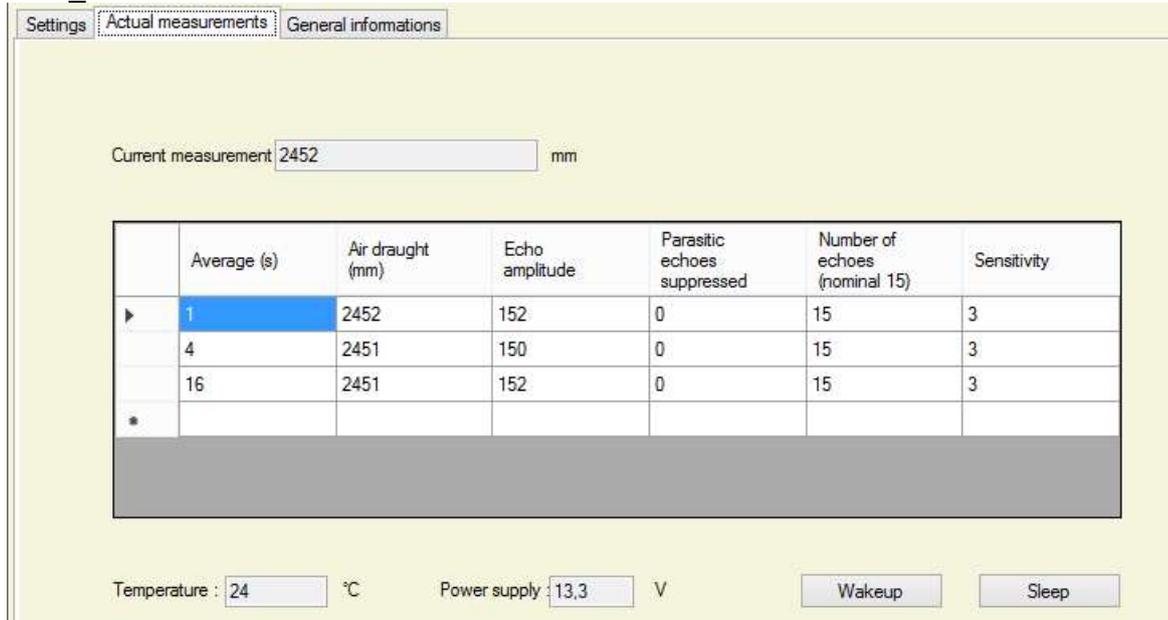
Cruzoe radar

Settings Actual measurements General informations

Current measurement mm

	Average (s)	Air draught (mm)	Echo amplitude	Parasitic echoes suppressed	Number of echoes (nominal 15)
▶	1	2490	63	0	15
	4	2490	63	0	15
	16	2489	63	0	14
*					

Temperature : °C Power supply : V



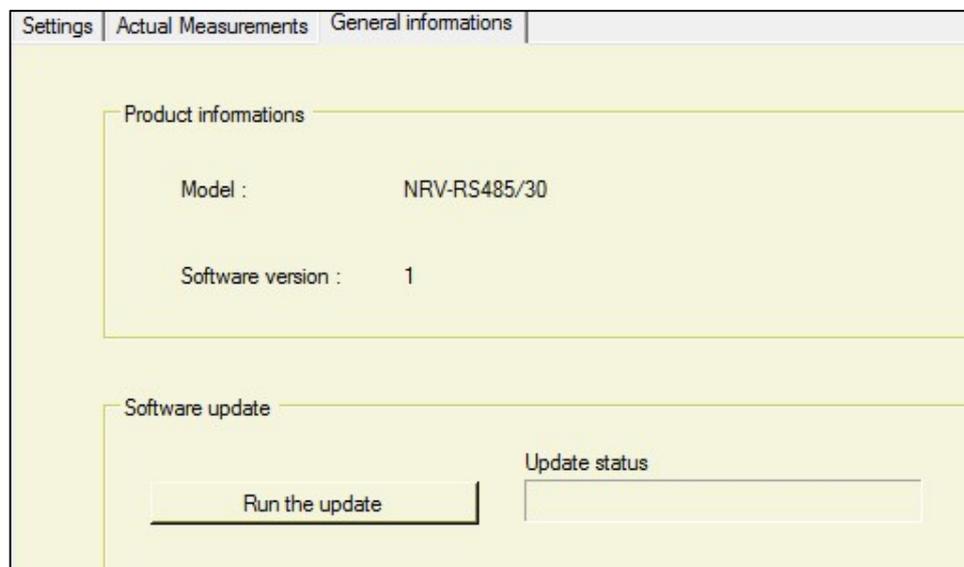
- Mean: Measurement averaged over 1 s, 4 s and 16 s (non-configurable)
- Distance: Distance (vertical clearance) between the radar sensor and what it is measuring.
- Echo amplitude: Amplitude of the echo at a number of points. It depends directly on the reflection conditions on the surface being measured (under difficult conditions, the amplitude must not be less than 100 points).
- Parasitic echoes removed: Number of echoes non-compliant with the gradient.
- Number of echoes: Number of valid echoes.
- For NRV_RS485 only : 'Boost' value represents additional gain apply on measurement.

Temperature and battery voltage measurements of radar are displayed at bottom of the page.

This page also allows the radar to be put on standby or to wake it up. When the radar is put on standby, communication between the software and the radar is stopped. Information from the radar is therefore no longer refreshed.

10.3 GENERAL INFORMATION

This page displays the general information on the radar and allows the software in the radar to be updated.



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The model may have 1 value for Cruzoé and 3 values for NRV_RS485 :

- Cruzoé : 30m
- NRV_RS485/3 : 3m
- NRV_RS485/8 : 8m
- NRV_RS485/12 : 12m

The software of a radar may be directly updated from the "Sensors HMI".
Click "Start update", select the appropriate "****.bix" file and confirm.

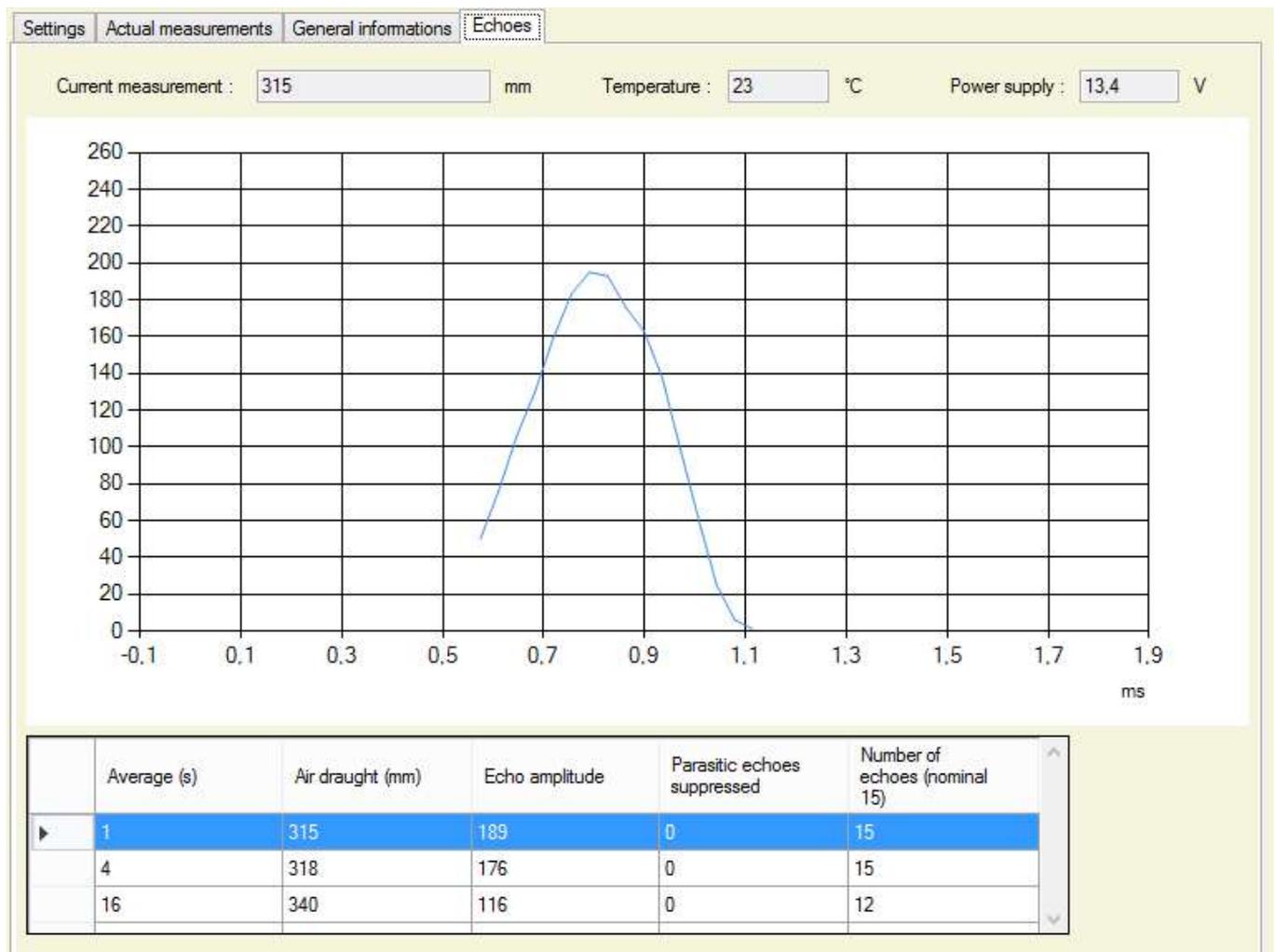
Important: if you are updating a Cruzoe radar from a version ≤ 8 to a version ≥ 9 the following message is displayed:

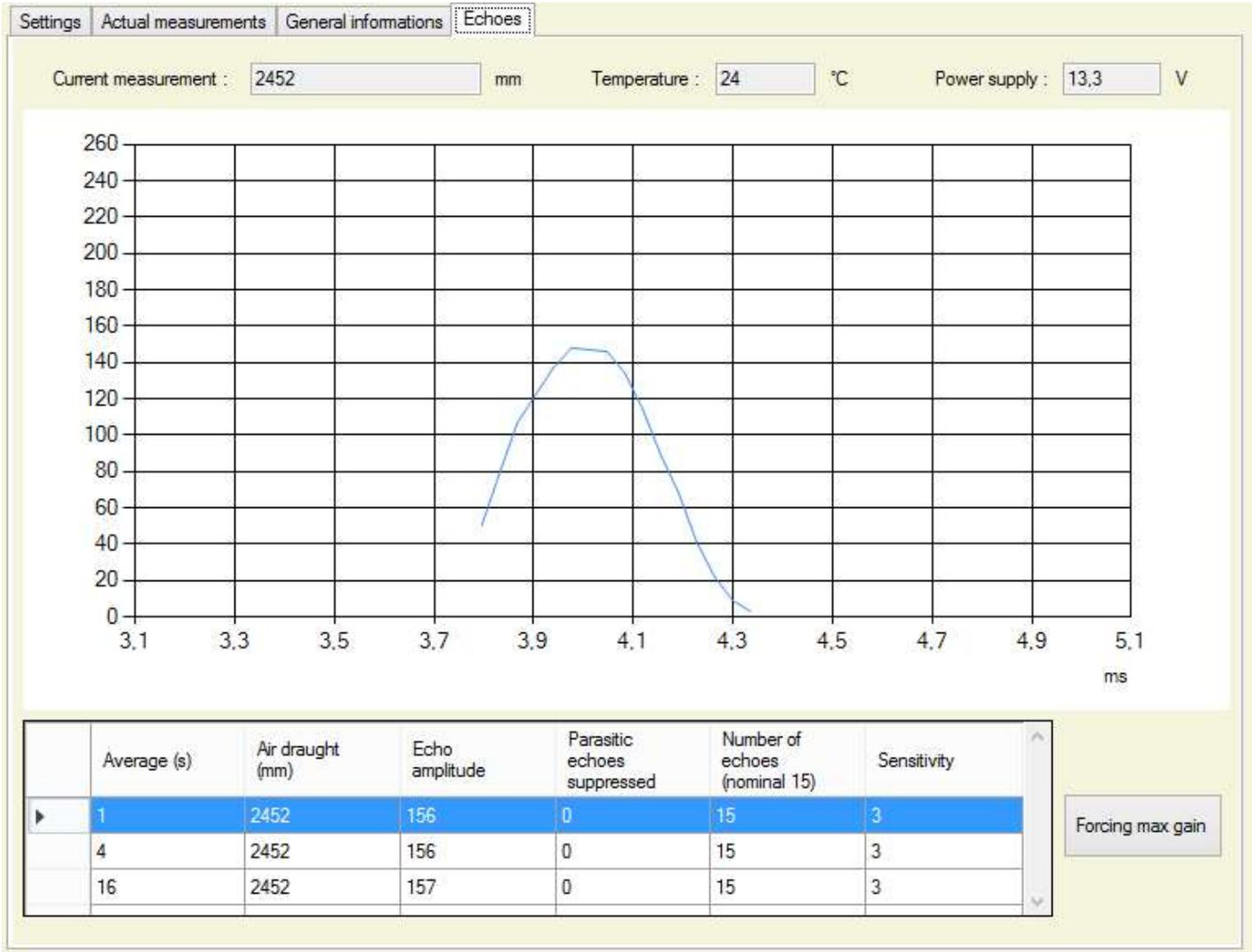
"Important: the firmware update will require factory recalibration. Do you want to continue?"

It is not recommended to carry out this update as this requires the radar to be recalibrated in the factory which would make it unusable.

10.4 ECHOES

The 4th "Echo" tab is only displayed if the program was launched with the /echo option. Its use is limited to the analysis of malfunctions and the curve drawn depends directly on the measurement conditions (water surface, sensor installation conditions, etc.).





- For NRV_RS485 only :
 - The table has a 'Boost' column as for 'actual measurements'
 - A clic on "Force max gain" button forces radar to use maximal value for additional gain. The button text change to "Forcing stop". An other clic on this button stop this mode.

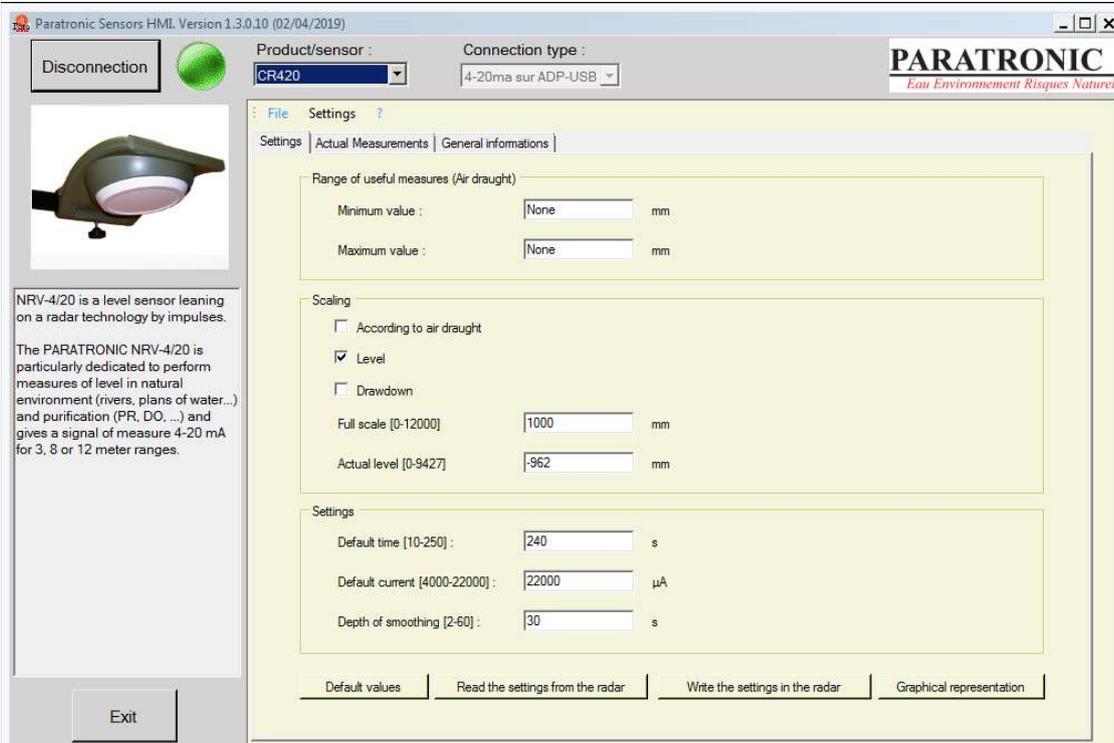
11 CR420 AND NRV 4/20 RADARS

By default the 3 tabs "Configuration", "Actual measurements" and "General information" are displayed.

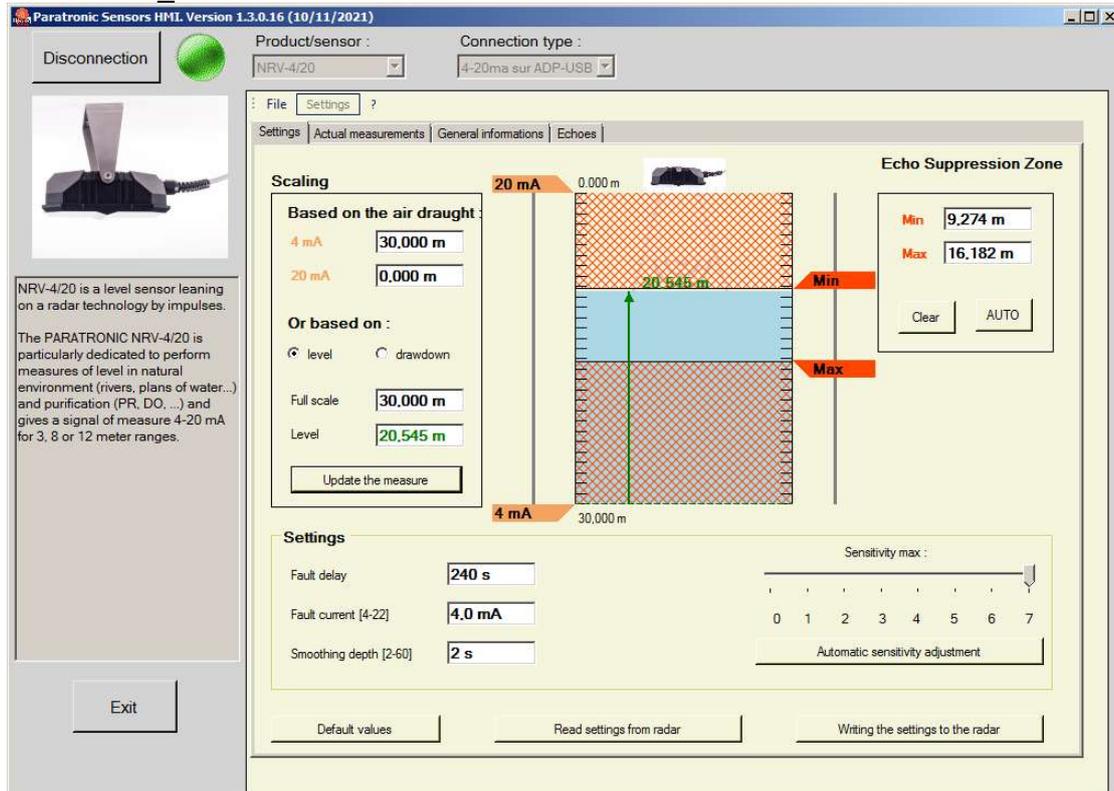
11.1 CONFIGURATION

The "Settings" window of the CR420 radar sensor or NRV_4/20 radar sensor provides access to the "Settings" and "Scaling" adjustments for the radar sensor.

Radar CR420



Radar NRV 4/20



11.1.1 Range of useful measurements:

- The minimum and maximum air draught values define the valid measurement interval. To disable one of these limits, enter the value "0" or the word "None".

11.1.2 Scaling

Allows the output current from the radar to be adjusted according to the distance to be measured. The display in the box differs according to the "Selection".

- "According to air draught":
 - o Enter the air draught for 20 mA
 - o Enter the air draught for 4mA

These two values are in mm, their limits are shown in the table below based on the radar model.

- "Level" or "Drawdown":

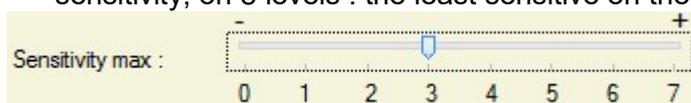
For these modes, the radar sensor must already be positioned. The actual rating is automatically entered by the software with the current measurement. You must then enter the desired full scale and change the actual dimension if necessary. The value is in mm, its limits are shown in the table below based on the radar model:

Radar model	Air draught for 20mA Air draught for 4mA Full scale Actual rating mm values and values between :
CR420/6	[0 and 6000]
CR420/10	[0 and 10000]
CR420/20	[0 and 20000]
NRV_420/3	[0 and 3000]
NRV_420/8	[0 and 8000]
NRV_420/12	[0 and 12000]

The scaling and echo suppression area can also be set up by using the sliders on either side of the diagram.

11.1.3 Settings

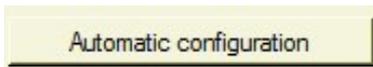
- Fault time delay: Time in seconds, configurable from [0 to 250], following which the radar sensor changes to fault mode if the measurement is invalid.
- Fault current: Value of the output current in μA , given by the radar sensor if there is a measurement fault (Configurable from [4000 to 22000]).
- Smoothing depth: Time in seconds, configurable from [2 to 60] during which the measurement is averaged before being displayed.
- For the NRV_4/20 radar only : The sensitivity slider allows you to adjust the radar reception sensitivity, on 8 levels : the least sensitive on the left, the most sensitive on the right.



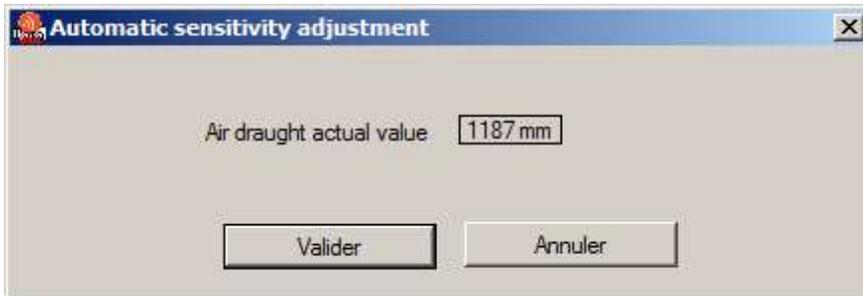
A high sensitivity is well suited to a low reflective surface (presence of foam for example), and to the presence of condensation

- The buttons:

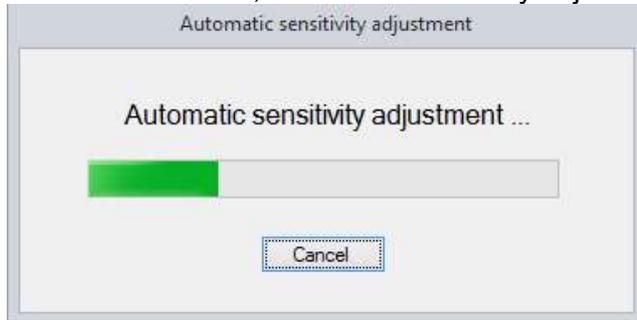
For the NRV_4/20 only : The “Automatic configuration” button process an automatic adjustment of radar reception sensitivity.



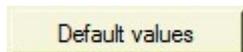
As a first step, the page display air draught actual value, which must be correct for a precise adjustment.



After validation clic, automatic sensitivity adjustment can take about 10 seconds.



At the end of the adjustment, the calculated value is stored in the radar, and the sensitivity slider is automatically positioned.



This button lets you restore the factory settings.



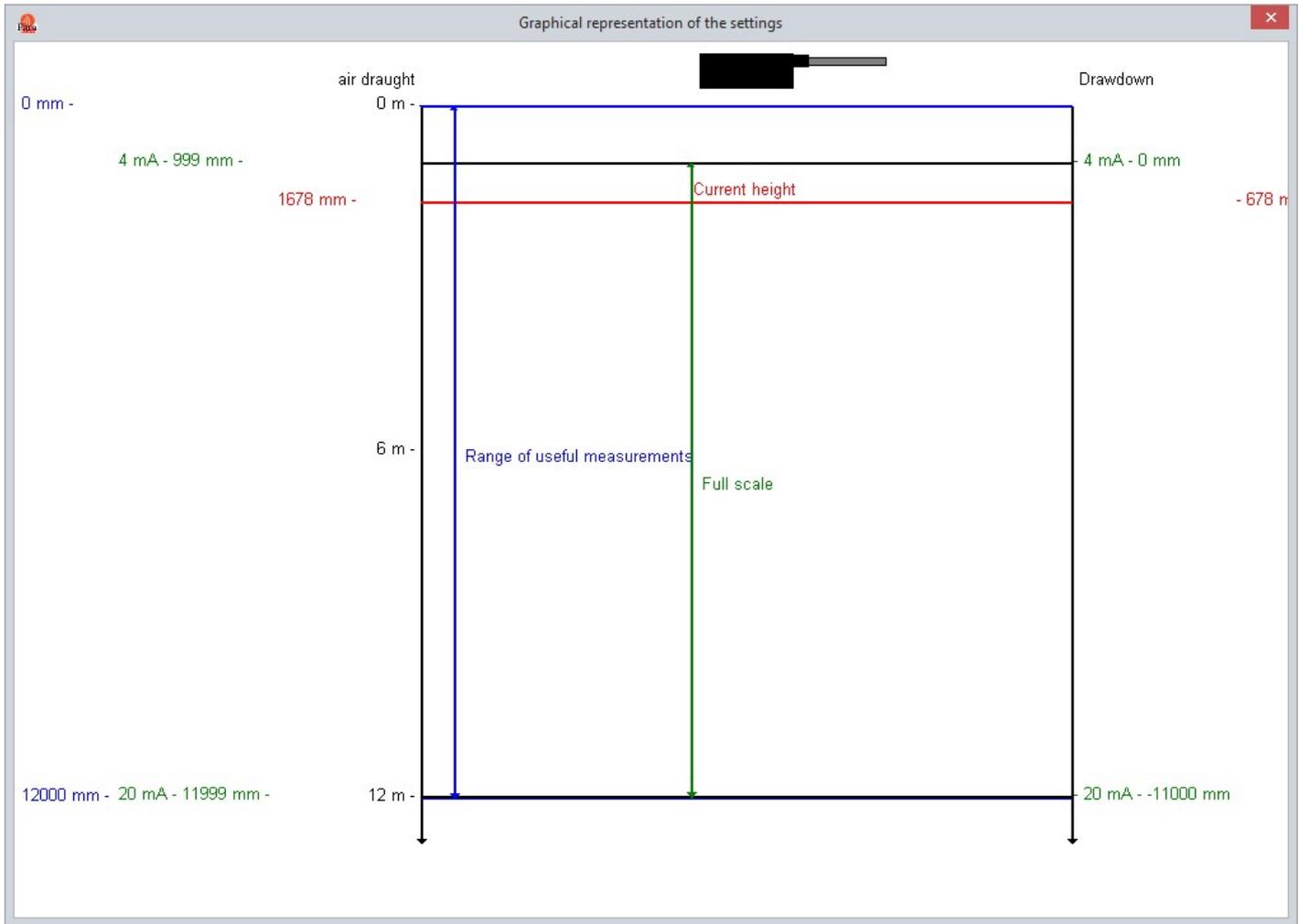
Enter the boxes with the settings recorded in the sensor



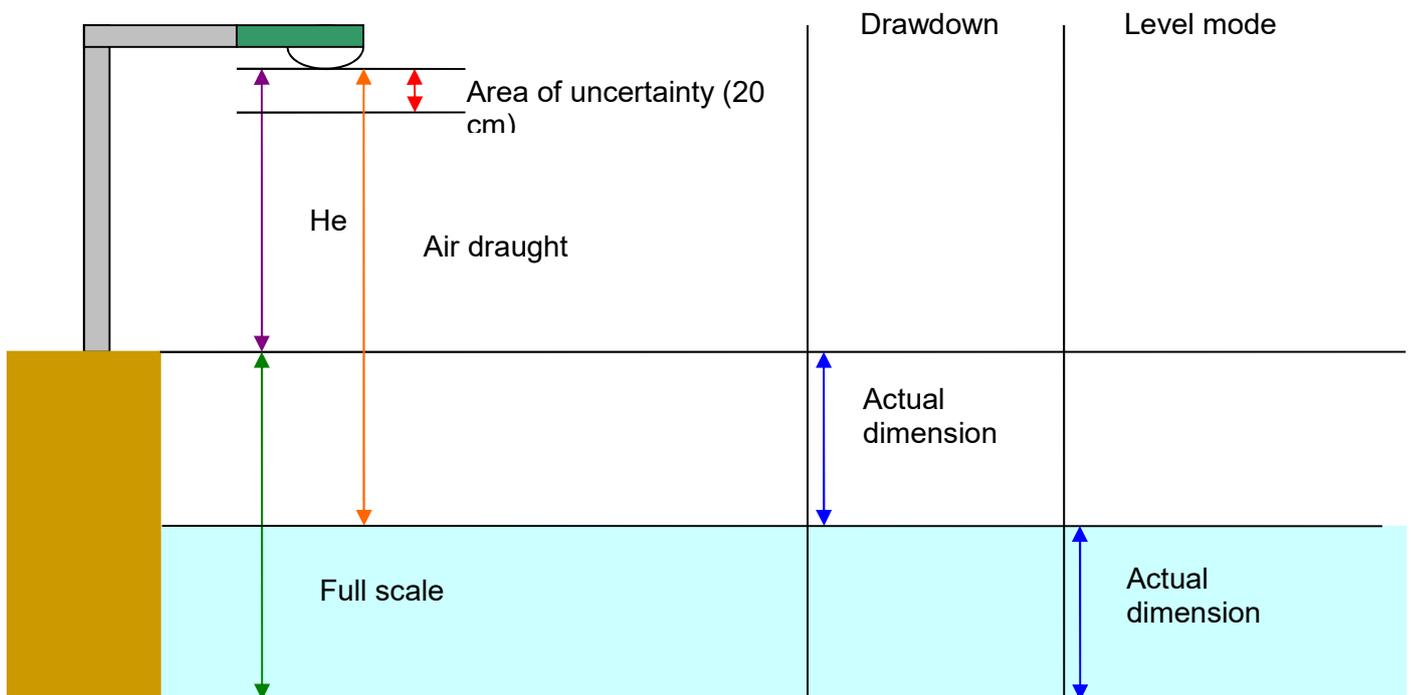
Allows the sensor to be configured with the values entered in the boxes.

Graphical representation

A new form is opened that display a graphical representation of the settings:



11.1.4 Distance diagram



11.2 ACTUAL MEASUREMENTS

The “instantaneous measurements” tab allows you to view the latest measurements of the radar. The measurements are refreshed every seconds. The radar takes several measurements per second and averages them over 2s and 30s. The averaged values are displayed in a table.

Radar CR420

Settings **Actual measurements** General informations Echoes

Current measurement: mm

	Average (s)	Air draught (mm)	Echo amplitude	Parasitic echoes suppressed	Number of echoes (nominal 15)
▶	2	1679	82	0	15
	2	1679	82	0	15
*					

Temperature : °C

Radar NRV_4/20

Settings **Actual measurements** General informations Echoes

Current measurement: mm

	Average (s)	Air draught (mm)	Echo amplitude	Parasitic echoes suppressed	Number of echoes (nominal 15)	Sensitivity
▶	2	1678	137	0	9	3
	30	1677	136	0	9	3
*						

Temperature : °C

List of columns:

- Average: Measurement averaged over 2 s (fixed) or 30 s (configurable from 2 s to 60 s via the "Configuration" tab, setting "Smoothing depth").
- Distance: Distance (air draught) between the radar sensor and what it is measuring.
- Echo range: Amplitude of the echo at a number of points. It depends directly on the reflection conditions on the surface being measured (under difficult conditions, the amplitude must not be less than 100 points).
- Parasitic echoes removed: Number of echoes non-compliant with the gradient.
- Number of echoes: Number of valid echoes.
- For the NRV_4/20 radar only : 'Sensitivity' value represents additional gain apply on measurement.

Current level or drawdown is displayed at top of the page.

Temperature measurement of radar is displayed at bottom of the page.

11.3 GENERAL INFORMATION

This tab lets you both display information on the product (identifier, software version) and to update the software for the radar.

The product model can take 3 values for the CR420 and 3 values for the NRV_4/20:

- CR420/6 : 6m
- CR420/10 : 10m
- CR420/20 : 20m
- NRV_420/3 : 3m
- NRV_420/8 : 8m
- NRV_420/12 : 12m

The software of a radar may be directly updated from the "Sensors HMI".
Click "Start update", select the appropriate "****.bix" file and confirm.

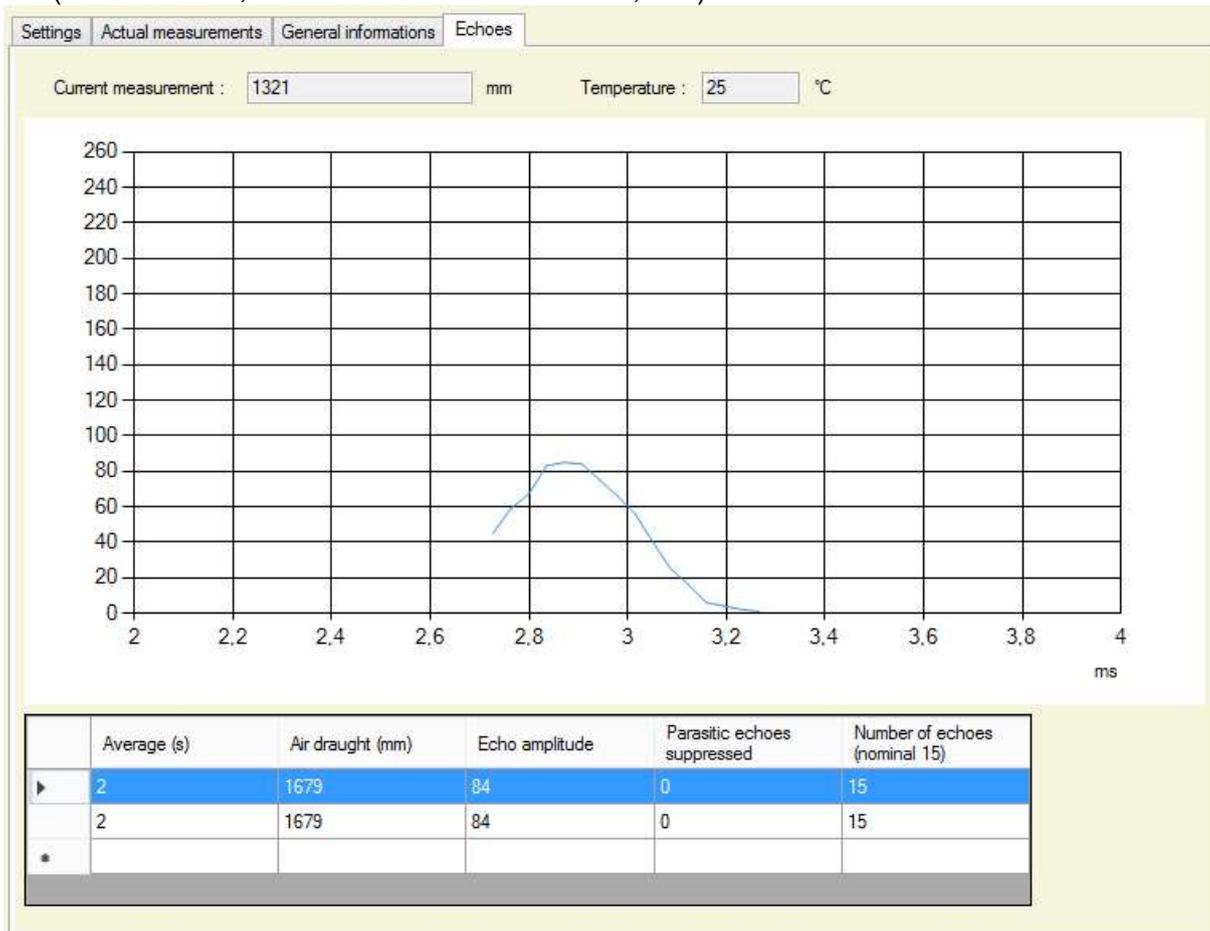
Important: if you are updating a CR420 radar from a version ≤ 4 to a version ≥ 5 the following message is displayed:

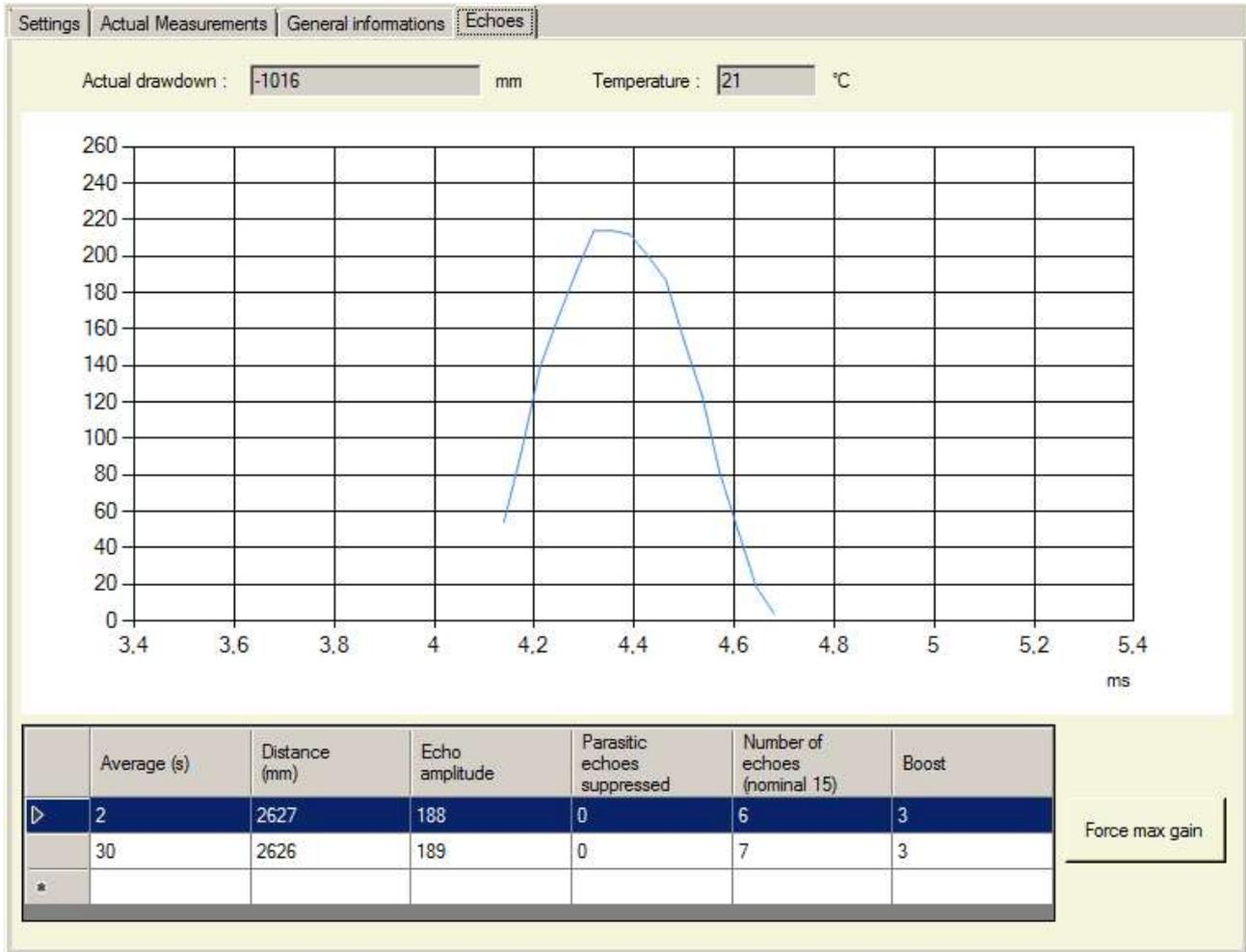
"Important: the firmware update will require factory recalibration. Do you want to continue?"

It is not recommended to carry out this update as this requires the radar to be recalibrated in the factory which would make it unusable.

11.4 ECHOES

The 4th "Echo" tab is only displayed if the program was launched with the /echo option. Its use is limited to the analysis of malfunctions and the curve drawn depends directly on the measurement conditions (water surface, sensor installation conditions, etc.).





- For the NRV_4/20 radar only :
 - The table has a 'Boost' column as for 'actual measurements'
 - A click on "Force max gain" button forces radar to use maximal value for additional gain. The button text change to "Forcing stop". Another click on this button stop this mode.

12 LH(C)

After having established the USB connection, it is possible to access the various tabs used for configuration, operation or data archiving, depending of logger model : communicating recorder (LHC) or non-communicating recorder (LH).

- LHC : tabs displayed are : “Configuration measures”, “Transmission parameters”, “Alarms”, “Actual measurements”, “Measurements history”, “Transmission log” and “General informations”.
- LH : tabs displayed are : “Configuration measures”, “Actual measurements”, “Measurements history” and “General informations”.

12.1 MEASUREMENTS CONFIGURATION

The « Configuration measures » tab is used for parameters configuration of measurements.

The screenshot shows the Paratronic Sensors HMI software interface. The title bar indicates the version is 1.3.0.10 (02/04/2019). The interface is divided into several sections:

- Top Left:** A 'Disconnection' button and a green status indicator.
- Top Center:** 'Product/sensor' dropdown set to 'LH(C)' and 'Connection type' dropdown set to 'USB'.
- Top Right:** The Paratronic logo with the tagline 'Eau Environnement Risques Naturels'.
- Navigation Tabs:** 'Configuration measures', 'Transmission parameters', 'Alarms', 'Actual Measurements', 'Measurements history', 'Transmission log', and 'General informations'.
- Recorder status:** Radio buttons for 'Running' (selected) and 'Stopped'.
- Identification:** Text input fields for 'Recorder name' (value: id_julien), 'Hydrau. code' (value: hydro_julien), and 'Customer code'.
- Measure:**
 - 'Acquisition period' input field with value 10750 and unit 'minutes(s)'.
 - 'Liquid Density' input field with value 1000 and unit 'kg/m3'.
 - 'Measure type' radio buttons for 'Level' and 'Drawdown' (selected).
- Positioning of the sensor:**
 - 'Vertical distance between the recorder and the sensor (cable length)' input field with value 0.000 and unit 'm', with a 'Help' button.
 - 'Distance between the recorder and the water surface (air draught)' input field with a placeholder 'Enter the current air draught ...'.
- Bottom:** Two buttons: 'Read the parameters from the recorder' and 'Write the parameters in the recorder'.

12.1.1 Run/Stop

Those radio buttons are used for running mode of LH(C); When the recorder is stopped, there are neither acquisitions nor transmissions.

This close-up shows the 'Recorder status' section. It contains two radio buttons: 'Running' (which is selected and highlighted in green) and 'Stopped'.

12.1.2 Identification

The 3 inputs allow to write recorder name, hydrological code and customer code.

- Recorder name is optional.
- Hydrological code is required for transmissions, it's written into exported files.
- Customer code is optional, it's required for "FTP supervisor WEB Paratronic" transmission and is provided by Paratronic.
- Recorder name and hydrological code may be used for transmissions :
 - FTP : For file name.
 - MQTT : For topics name.

See chapter "12.2.2 Transmission parameters", "12.2.4.2 FTP protocol", and "12.2.4.3 MQTT protocol" for more details.

12.1.3 Measure

Information concerning acquisition of measurements are presented in this part :

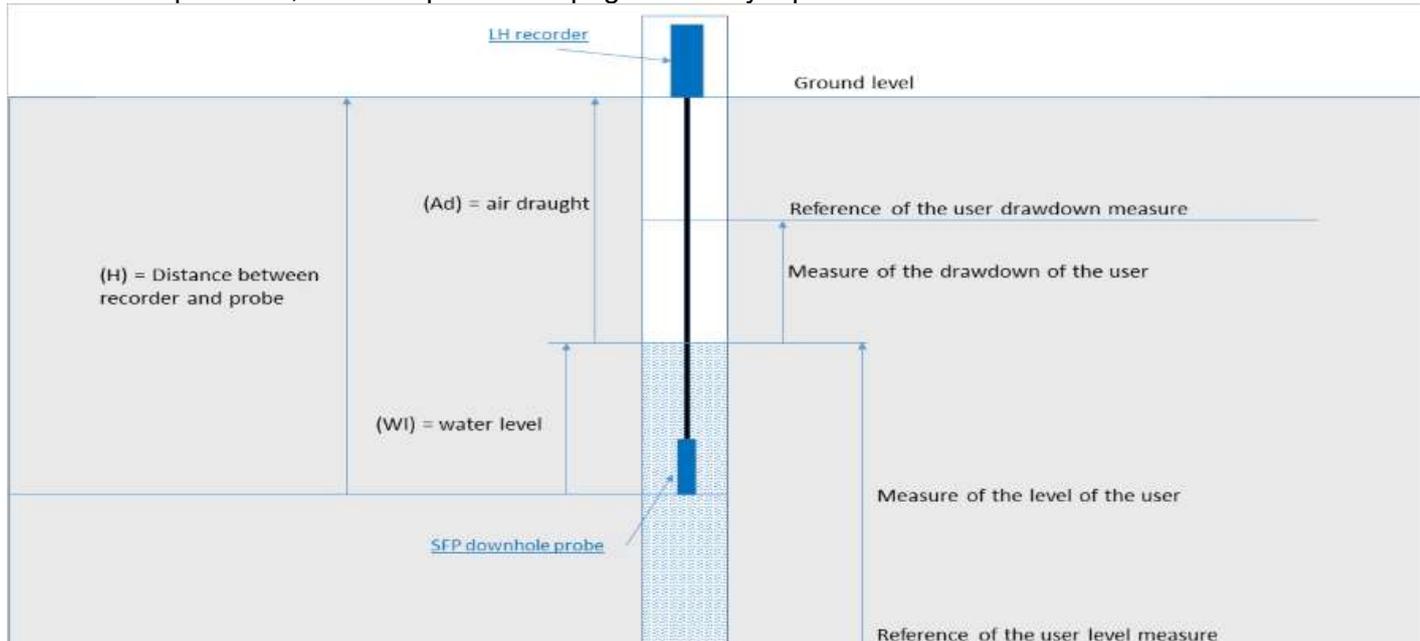
- Acquisition period : between 1 minute and 24 hours.
- Liquid density (1000kg/m³ for water).
- Measure type : "Level" or "Drawdown".

12.1.4 Sensor positioning

Sensor positioning may be configured either :

- By indicating vertical distance between recorder and sensor
- Or by indicating air draught (vertical distance between recorder and water surface) :
 - Click on "Enter the current air draught ..." button and type the current value.

Click on "Help" button, this will open a new page with a synoptic of distances:



Click on "Write the parameters in the recorder" for modifications validation. For read and displaying recorder parameters, click on "Read the parameters from the recorder" button.

12.2 TRANSMISSIONS CONFIGURATION

The “Transmission parameters” tab is only shown for communicating recorder.

Some parameters are common to all transmissions protocols and other are specific.

12.2.1 Modem configuration

In this frame there are provider parameters for network acces, for all transmission protocols except “SMS”.

- APN (Access Point Name)
- Login
- Password

These information are given by SIM card provider.

12.2.2 Transmission parameters

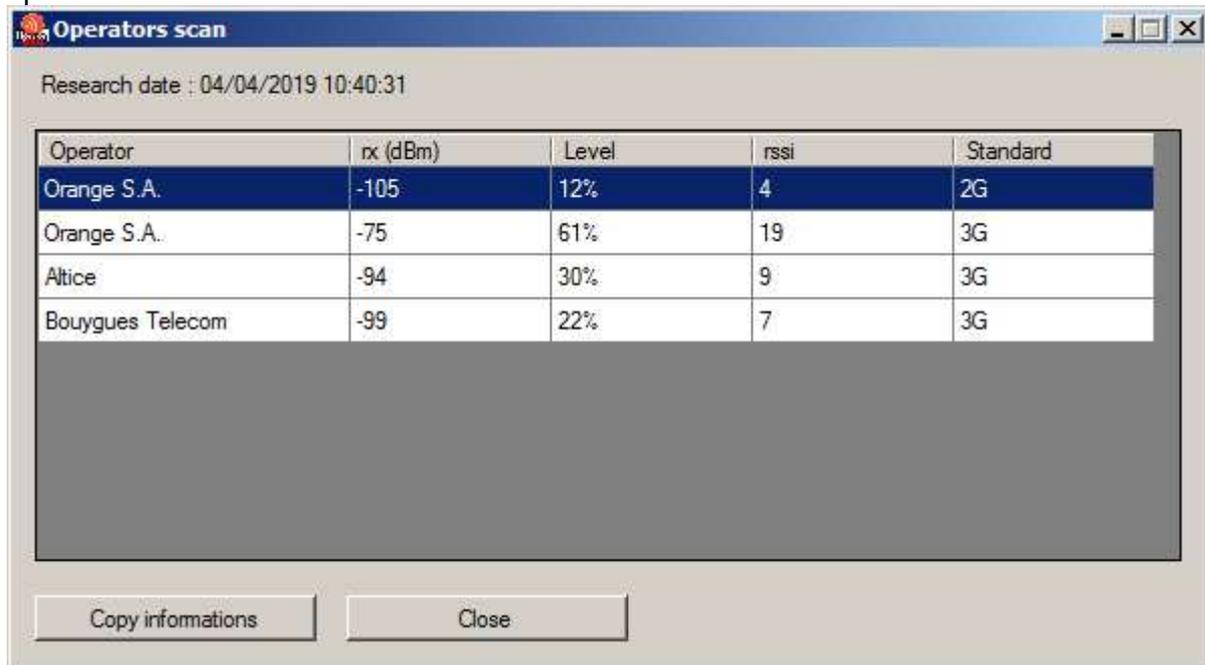
“Transmission parameters” frame allow configuration of protocols and transmission parameters :

- Protocol choice : NONE, FTP, MQTT, SMS, Automatic MQTT, FTP supervisor WEB Paratronic.
- Common parameters :
 - Transfer period : between 1 hour and 180 days
 - Day and time reference for transfer. Transfers are set on this day and time.
 - Maximum depth transfer : this parameter give the depth of measurements in the transfer, in number of periods. The input “total” indicate the correspondance in days and hours.
 - Transfer content : 6 checkbox allow selection of measurements type send in transfer ; At least 1 checkbox must be checked.
 - Measurement (level or drawdown)
 - Water temperature
 - Water pressure
 - Air pressure
 - Air temperature
 - Battery voltage
- “Force transmission of measurements” button : when a protocol is selected, a clic on this button make a transmission as it’s configured in recorder. The recorder must be running otherwise a warning message display : “The recorder is stopped : start it to send the command”.

- "Operators scan" : this button allow search of accessible operators. After clic on this button a confirm message display : "Launch of the operator search carried out", the search can take few minutes ; during the search a dialog display :



The search can be abort by user by click on "Cancel" button. After end of scan, a page display a list of operators found.



The date of search is display at top of the page. The table contain this columns :

- 'Operator' : Name of operator
- 'rx (dBm), 'Level', 'rssi' : these columns indicate reception level in units :
 - o 'rx' : value in dBm
 - o 'Level' : value in %
 - o 'rssi' : measurement between 0 and 31 ; possible values :
 - o

Rssi value	Explanation
0	-113 dBm or less
1	-111 dBm
2...30	From -109dBm to -53 dBm
31	-51 dBm or more
99	Unkown value
255	Error of read

A high value for 'rx', 'Level' or 'rssi' means good reception.

- 'Standard' column : indicate supported network '2G' or '3G'.

The “Copy informations” button allow copy into windows clipboard.

Notes :

- If there is no result, a messagebox display “No operator found”.
- If there is an error, a messagebox display “Operator search failed. Please try again later”

At bottom of the page :

- A click on “Read parameters from recorder” button process a read of parameters in recorder ; modifications not saved will be lost.
- A click on “Write parameters in recorder” button save all parameters in recorder.

12.2.3 Special characters

Special characters may be used into FTP file name or into MQTT topics names, or into Input “Text” in alarms tab ; list of special characters available :

Character	
%@S	Serial number
%@H	Recorder ident. code
%@C	Customer code
%H	Current or sending hour (00-23)
%M	Current or sending minute (00-59)
%S	Current or sending second (00-60)
%Y	Current or sending year (4 digits ex 2019)
%m	Current or sending month number (00-12)
%d	Current or sending day number (01-31)

Example : Name of FTP file when input name is [%@H_meas_%Y%m%d_%H%M%S.xml](#) the name of file send will be for example : “001_meas_20190402_120000.xml

12.2.4 Protocols

For all protocols “Customer code” and “Ident. Code” are used for measurements exports ; see chapter “12.1.2 Identification”.

12.2.4.1 None protocol

The screenshot shows a configuration window with several tabs: Configuration measures, Transmission parameters, Alarms, Actual Measurements, Measurements history, Transmission log, and General informations. The 'Transmission parameters' tab is active. It contains fields for Modem APN, Login, and Password. Under 'Transmission', the Protocol is set to 'NONE'. The 'Transfer period' is 7 days. The 'Maximum depth of the transfer' is 8, with a total transfer period of 56 days. The 'Contents of the transfer' section has several checked options: Measure, Air pressure, Water temperature, Air temperature, Water pressure, and Voltage of the battery. There is a 'Transfer reference day and time' section set to Thursday 1:00. At the bottom, there are buttons for 'Read the parameters from the recorder', 'Write the parameters in the recorder', and 'Automatic MQTT information'.

In this configuration, no transmission is made.

Note : In this configuration alarms by SMS are available.

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Configuration measures	Transmission parameters	Alarms	Actual Measurements	Measurements history	Transmission log	General informations
Modem						
APN	SFR	Login	admin	Password	1234	
Transmission				Transfer reference day and time		
Protocol	FTP			Day	Hour	Minute
Transfert period	7	days(s)	Thursday	1	0	
Maximum depth of the transfer	8	period(s) of transfer : total	56 days(s) 0 hours			
Contents of the transfer				Force the transmission of the measurements		
<input checked="" type="checkbox"/> Measure	<input checked="" type="checkbox"/> Water temperature	<input checked="" type="checkbox"/> Water pressure	Operators scan			
<input checked="" type="checkbox"/> Air pressure	<input checked="" type="checkbox"/> Air temperature	<input checked="" type="checkbox"/> Voltage of the battery				
FTP protocol						
IP address of server or host Name	ftp.lhc.fr					
Port No.	21					
Destination folder	/					
File name		File format	XML			
Login	adm	Password	1234			
<input type="checkbox"/> LZO compression	<input checked="" type="checkbox"/> Passive mode					
Read the parameters from the recorder		Write the parameters in the recorder			Automatic MQTT information	

This frame allows FTP transmission configuration :

- IP address of server or host name
- FTP port number
- Destination folder of FTP server. Set "/" to send at root server
- File name of the file transferred. If blank, the file name will be [%@H mesures %Y%m%d %H%M%S.xml](#) (see chapter "12.2.3" for special characters).
- File format : XML or CSV column. File extension will be automatically added by recorder.
- Login and Password for FTP connection.
- "LZO compression" checkbox : if checked the file will be compressed before transfer and file name will have a ".lzo" extension.
- "Passive mode" checkbox : if checked, transfer will be in passive mode, otherwise in active mode (Some servers accept only passive mode).

To save modifications click on "Write parameters in recorder" button.

12.2.4.3 MQTT protocol

Configuration measures	Transmission parameters	Alarms	Actual Measurements	Measurements history	Transmission log	General informations
Modem						
APN	SFR	Login	admin	Password	1234	
Transmission						
Protocol	MQTT			Transfer reference day and time		
Transfert period	7	days(s)	Thursday	1	0	
Maximum depth of the transfer	8	period(s) of transfer : total		56 days(s) 0 hours		
Contents of the transfer				Force the transmission of the measurements		
<input checked="" type="checkbox"/> Measure	<input checked="" type="checkbox"/> Water temperature	<input checked="" type="checkbox"/> Water pressure		Operators scan		
<input checked="" type="checkbox"/> Air pressure	<input checked="" type="checkbox"/> Air temperature	<input checked="" type="checkbox"/> Voltage of the battery				
MQTT protocol						
IP address of server or host Name	mqtt.lhc.com					
Port	1883	Login	adm	Password		
<input checked="" type="checkbox"/> Retain mode	<input type="checkbox"/> JSON mode					
Topics						
Air pressure measurement						
Battery voltage measurement	lhc/battery_voltage					
Air temperature measurement						
Water temperature measurement						
Water pressure measurement						
Level measurement	lhc/water_level					
Drawdown measurement						
Identification of the relay antenna	lhc/cell_info					
Read the parameters from the recorder		Write the parameters in the recorder			Automatic MQTT information	

The MQTT protocol is explained at : <http://mqtt.org>

“MQTT protocol” section allows configuration of :

- IP address of server or host name
- MQTT port number
- Login and Password for MQTT server connection
- “Retain mode” checkbox : if checked, connected users will automatically receive the last measurement
- “JSON mode” checkbox : if checked, MQTT message will be in a JSON format
- Topics list : Each topic allow organisation of messages on MQTT server ; customers subscribe to topic for receive measurements of this topic. Enter the value of the topic in input field which type of measurement has been checked for MQTT transmission.

Note : other parameters are required, except password. Save the modifications by a click on “Write parameters in recorder” button.

12.2.4.4 SMS protocol

“SMS protocol” frame allow configuration of SMS send, for example for site where there is neither 3G nor GPRS.

Destination phone numbers must be separated by space.

12.2.4.5 Automatic MQTT protocol

Transmissions destination is MQTT paratronic server; a click on “Automatic MQTT information” open a window with Parameters for subscription to topics:

Parameter	Value
hostname	mqtt.paratronic.com
port	1883
login	lhc10000103
password	de3815df64142eada54c1c5bc411063fe4c8b9a530845bc2f70a873785f2584
topic_atmospheric_pressure	lhc/10000103/atmospheric_pressure
topic_battery_voltage	lhc/10000103/battery_voltage
topic_air_temperature	lhc/10000103/air_temperature
topic_water_temperature	lhc/10000103/water_temperature
topic_water_pressure	lhc/10000103/water_pressure
topic_water_level	lhc/10000103/water_level
topic_dewatering	lhc/10000103/dewatering
topic_cell_info	lhc/10000103/cell_info

Buttons: Copy informations, Close

A click on “Copy informations” make a copy of the table into windows clipboard.

12.2.4.6 “FTP supervisor WEB paratronic” protocol

Configuration measures	Transmission parameters	Alarms	Actual Measurements	Measurements history	Transmission log	General informations
Modem						
APN	<input type="text"/>	Login	<input type="text"/>	Password	<input type="text"/>	
Transmission						
Protocol	FTP supervisor WEB Paratronic			Transfer reference day and time		
Transfert period	7	days(s)	Thursday	1	0	Hour Minute
Maximum depth of the transfer	8	period(s) of transfer : total	56 days(s) 0 hours			
Contents of the transfer			Force the transmission of the measurements			
<input checked="" type="checkbox"/> Level	<input checked="" type="checkbox"/> Water temperature	<input checked="" type="checkbox"/> Water pressure	Operators scan			
<input checked="" type="checkbox"/> Air pressure	<input checked="" type="checkbox"/> Air temperature	<input checked="" type="checkbox"/> Voltage of the battery				
Read the parameters from the recorder		Write the parameters in the recorder		Automatic MQTT information		

Transmissions destination is the Paratronic Web Supervisor. For an access to this supervisor please contact Paratronic.

12.3 ALARMS

Configuration measures	Transmission parameters	Alarms	Actual Measurements	Measurements history	Transmission log	General informations
Alarm No. 1						
Passing down		Threshold	10.000	m	Hysteresis	100 mm
<input type="checkbox"/> Forcing a transmission of measurements when the threshold is exceeded						
SMS phone numbers separated by a space	060504030201 070605040302					
Text	Alert!					
Alarm No. 2						
Inactive		Threshold	0.000	m	Hysteresis	0 mm
<input type="checkbox"/> Forcing a transmission of measurements when the threshold is exceeded						
SMS phone numbers separated by a space	<input type="text"/>					
Text	<input type="text"/>					
Read the parameters from the recorder		Write the parameters in the recorder				

For de communicating recorder (LHC) only.
The “Alarms” tabs allow configuration of 2 alarms into recorder.

For each alarm enter this parameters :

- Select type of alarm :
 - Inactive
 - Passing down
 - Passing up
- Value of the threshold :
 - Alarm will be active when the measurement is less than threshold if type is “Passing down”
 - Alarm will be active when the measurement is more than threshold if type is “Passing up”

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- Enter hysteresis value ; a other alarm send is make only if measurement variation is more than hysteresis and measurement exceed threshold.
- If “Forcing a transmission of measurements when the threshold is exceeded” checkbox is checked, a transmission will automatically be send after alarm triggering.
- Enter phone numbers in the input
- Enter the text of alarm SMS.

12.4 ACTUAL MEASUREMENTS

« Actual measurements » tab display lastest measurements of recorder.

The screenshot shows the 'Actual Measurements' tab in a software interface. The tab is active, and the 'Latest measurements' section is displayed. The section contains several input fields and buttons:

- Date and time: 01/01/2000 07:31 (with a 'Time setting' button)
- Level: 0 m (with a 'Scaling' button)
- Water temperature: 0 °C
- Water pressure: 0 mbar
- Air pressure: 0 mbar
- Air temperature: 0 °C
- Voltage of the battery: 0 V

At the bottom of the section, there is a button labeled 'Force the acquisition of the measurements'.

- Values displayed : Date/time of recorder, level measurement or drawdown (according to wath is configured in “Configuration measures” tab, water temperature, water pressure, air pressure, air temperature and battery voltage. If no measurement is available, the text “No measure” is displayed.
- “Time setting” button set date and time of the recorder : A click on this button open a dialog for “Entering time”.

The screenshot shows the 'Entering time' dialog box. The dialog has a title bar with the text 'Entering time' and a close button. The main area contains the text 'Enter time :' followed by a dropdown menu showing '04/04/2019 17:49'. Below the dropdown are three buttons: 'PC time', 'Save', and 'Cancel'.

- “PC time” button set date/time of PC in the recorder
- “Save” button : set date/time of input field in the recorder ; to change date and time in the input field, click on the right of the input field and a calendar will appear
- “Cancel” button close this dialog and abort the modification
- “Scaling” button allow setting the right measurement for the actual value.

The screenshot shows the 'Entering the actual value' dialog box. The dialog has a title bar with the text 'Entering the actual value' and a close button. The main area contains the text 'Enter the actual value :' followed by a spin box showing '0,000' and the text '(between -500 m and 500 m)'. Below the spin box are two buttons: 'Save' and 'Cancel'.

The “Force acquisition of measurements” button allow make an acquisition and refresh input fields of this tab. The recorder must be running otherwise a warning dialog will appear.

12.5 MEASUREMENTS HISTORY

The « Measurements history » tab allows the measurements contained in the recorder to be downloaded.

Date	Level (m)	Water temperature (°C)	Air temperature (°C)	Air pressure (mbar)	Water pressure (mbar)	Battery voltage (V)
05/04/2019 13:45:00	-0,255	23,2	24,9	974,12	949,05	5,5
05/04/2019 13:44:00	-0,256	23,1	24,8	974,13	949,05	5,5
05/04/2019 13:43:00	-0,249	23,1	24,8	974,15	949,73	5,5
05/04/2019 13:42:00	-0,249	23,1	24,8	974,19	949,73	5,5
05/04/2019 13:41:00	-0,253	23,1	24,8	974,2	949,39	5,5
05/04/2019 13:40:00	-0,264	23,1	24,8	974,24	948,37	5,5
05/04/2019 13:39:00	-0,25	23,1	24,8	974,26	949,73	5,5
05/04/2019 13:38:00	-0,26	23,1	24,8	974,26	948,71	5,5
05/04/2019 13:37:00	-0,254	23,1	24,8	974,28	949,39	5,5
05/04/2019 13:36:00	-0,254	23,1	24,8	974,28	949,39	5,5
05/04/2019 13:35:00	-0,257	23,1	24,7	974,3	949,05	5,5
05/04/2019 13:34:00	-0,254	23	24,7	974,33	949,39	5,5
05/04/2019 13:33:00	-0,261	23	24,7	974,34	948,71	5,5
05/04/2019 13:32:00	-0,265	23	24,7	974,35	948,37	5,5

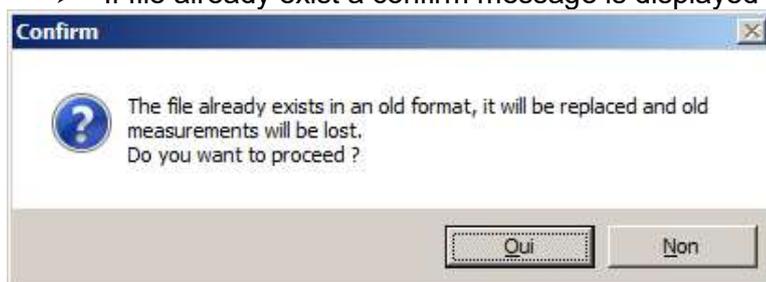
12.5.1 To display measurements into grid

- Select a depth from 1 to 100 and time(s), day(s) or month(s)
 - Click on “Update the chart” button
 - After the download of measurements the table will fill in. There is 1 column by type of measure.
- Note : if there is no measurement, the case keep blank.

12.5.2 Export measurements of grid

To save measurements in CSV or XML format do this :

- Click on “Save in CSV format” or “Save in XML format” button
- A dialogbox allow to select name and path of the file. By default the file name is :
 - mesures_”serial number”.csv for CSV format
 - mesure_”serial number”.xml for XML format.
- If file already exist a confirm message is displayed :

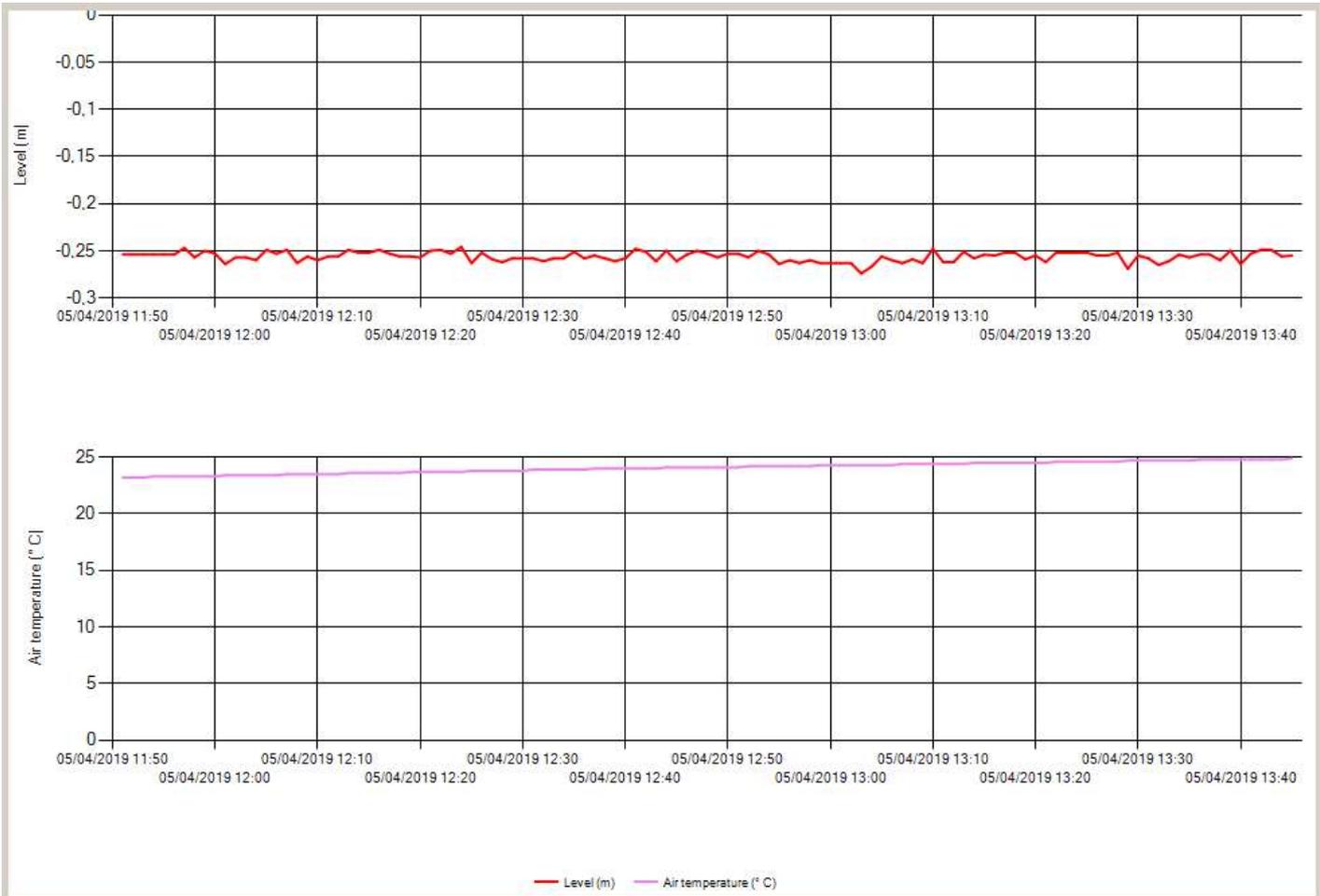


12.5.3 Draw graph of measurements

Graphic

<input type="checkbox"/> Level	<input type="checkbox"/> Water temperature	<input type="checkbox"/> Water pressure	<input type="button" value="Draw the graph"/>
<input type="checkbox"/> Air pressure	<input type="checkbox"/> Air temperature	<input type="checkbox"/> Voltage of the battery	

- Check the checkbox of the measure to display
- Click on “Draw the graph” button ; this open a window with graph.
- To close this window, click on cross at top right or press the “Echap” key.
-



12.6 TRANSMISSION LOG

For the communicating recorder (LHC) only.

The “Transmission log” tab display transmissions history of recorder.

Date	Connection duration in seconds	RSSI (0-31)	BER (0-7)	Battery voltage	Protocol	Alarm 1	Alarm 2	Error
05/04/2019 14:16:00	25	16	2	5	sms	no	no	
05/04/2019 14:12:00	26	15	2	5	sms	no	no	
05/04/2019 14:02:00	24	16	2	5	sms	no	no	
05/04/2019 14:00:00	27	16	0	5	sms	no	no	
05/04/2019 13:46:00	46	16	2	5	sms	no	no	
05/04/2019 13:00:00	54	15	3	5	sms	no	no	
05/04/2019 12:00:00	25	15	2	5	sms	no	no	
05/04/2019 11:54:00	24	14	3	5	sms	no	no	
05/04/2019 11:53:00	23	14	3	5	sms	no	no	
05/04/2019 11:52:00	24	14	2	5	sms	no	no	

12.6.1 Display transmission log

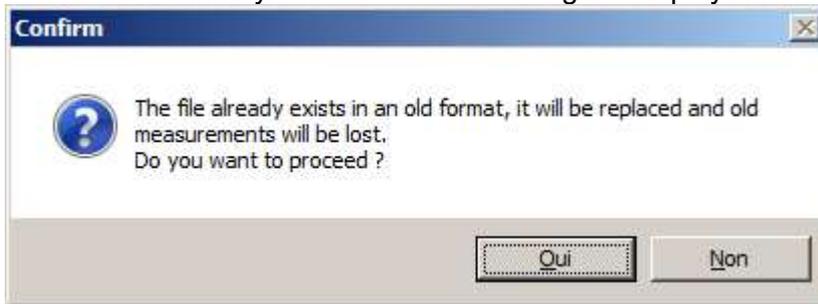
- Select a depth from 1 to 100 and time(s), day(s) or month(s)
- Click on “Update the chart” button
- After the download of log the table will fill in. The different columns are :
 - RSSI (“Received Signal Strength Indication”) is a measurement of reception signal power. See chapter “12.2.2 Transmissions configuration” for list of available values.
 - BER (“Bit Error Rate”) is total of errors bit divide by total of correct bits. A low value corresponds to best signal quality. The available values are :

Value	Explanation
0	Less than 0.2%
1	From 0.2% to 0.4%
2	From 0.4% to 0.8%
3	From 0.8% to 1.6%
4	From 1.6% to 3.2%
5	From 3.2% to 6.4%
6	From 6.4% to 12.8
7	More than 12.8%
99	Unkown value
255	Read error

12.6.2 Export transmission log

To save transmission log in CSV or XML format do this :

- Click on “Save in CSV format” or “Save in XML format” button
- A dialogbox allow to select name and path of the file. By default the file name is :
 - journal_transmission_”serial number”.csv for CSV format
 - journal_transmission_”serial number”.xml for XML format.
- If file already exist a confirm message is displayed :



12.7 GENERAL INFORMATIONS

This tab display informations about the recorder and allow firmware update of recorder and sensor ; Recorder measurements may be clear.

Configuration measures | Transmission parameters | Alarms | Actual Measurements | Measurements history | Transmission log | **General informations**

Product informations

Recorder		Modem	
Model	LHC	Manufacturer	Telit
Hardware version	0	Model	UE910-EU
Software version	1.1	Version	12.00.438
Serial No.	100-000006	IMEI No.	353463070297901
Production date	2019-03-04 08:34:30	Sensor <input type="button" value="Product informations ..."/>	

Software update

Recorder	Sensor
Update status :	Update status :
<input type="button" value="Run the update ..."/>	<input type="button" value="Run the update ..."/>

Recorder initialization

12.7.1 Product information

- Information about recorder (model, hardware version, software version, serial number, production date)
- Information about sensor by a click on “Product information” button (only for the communicating recorder (LHC) only).

12.7.2 Update software of recorder

In section "Recorder", click on "Run the update", select the .bix file and valid.

12.7.3 Update software of sensor

In section "Sensor", click on "Run the update", select the .bix file and valid.

12.7.4 Clear measurements and log

- Click on "Clear the measurements" to delete PERMANENTLY ALL measurements of recorder.
- Click on "Erase the transmission log" to delete PERMANENTLY ALL log of recorder.

12.7.5 Return to factory settings

- Click on "Return to factory settings" button to set default parameters in recorder but this not clear neither measurements nor transmission log.

The specifications described in this document may be changed by the manufacturer without notice.