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HW4 Software version 2

Device Manager
HC2 probe series

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1   ORGANIZATION OF THE HW4 MANUALS

The HW4 manuals are organized in separate books so as to limit the size of the individual documents. A list of the HW4 manuals is provided in document **E-M-HW4v3-DIR**

HW4 Manuals	Contents
HW4 Main Book	General software description Installation, start-up and settings Device connection methods Functions common to all devices used with HW4
Device Specific Functions 1 (separate book for each device type or model)	Legacy devices (original HygroClip technology): o HygroLog NT data logger o HygroFlex 2, HygroFlex 3 and M3 transmitters o HygroLab 2 and HygroLab 3 bench indicators o HygroPalm 2 and HygroPalm 3 portable indicators o HygroClip DI digital interface o HygroClip Alarm programmable logic o HygroStat MB Device Manager (device configuration) and other device specific functions
Probe Adjustment 1	Humidity and temperature adjustment function common to all legacy devices (original HygroClip technology)
Device Specific Functions 2 (separate book for each device type or model)	Devices based on the AirChip 3000 technology: o HygroClip 2 (HC2) probes o HF3 transmitters and thermo-hygrostats o HF4 transmitters o HF5 transmitters o HF6 transmitters o HF7 transmitters o HL20 and HL21 data loggers o HP21, HP22 and HP23 hand-held indicators o Custom designed OEM products Device Manager (device configuration) and AirChip 3000 functions
Probe Adjustment 2	Humidity and temperature adjustment function common to all devices based on the AirChip 3000 technology
Data Recording Function	Data recording function common to all devices based on the AirChip 3000 technology

Both the HW4 manuals (software) and device specific manuals (hardware) are available on the HW4 CD.
The manuals can also be downloaded from several of the ROTRONIC web sites.

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2   OVERVIEW

This section of the HW4 manual covers only the following HW4 module:

HW4 Functional Modules for the HC2	Usage
Device Manager	o HC2 probe user configurable settings o AirChip 3000 user functions: enable and configure

o   The **Data Logging** module is common to all probes and instruments based on the AirChip 3000 technology and is separately described in the HW4 manual **E-M-HW4v3-DR-001**

o   The **Probe Adjustment** module is used calibrate and adjust the probe humidity and temperature signals. This module is common to all probes and instruments based on the AirChip 3000 technology and is separately described in the HW4 manual **E-M-HW4v3-A2-001**

o   HW4 functions that are not device dependent are covered in the HW4 manual **E-IN-HW4v3-Main**.

When HW4 has detected a HC2 probe, the probe appears as an icon in the left pane of the HW4 main screen. Click on the + sign to the left of the probe icon to display a list of the available functional modules.

3   DEVICE MANAGER

Device Manager is used to configure the HC2 probe and to enable, configure and access the AirChip 3000 functions.

To select the Device Manager module, click on it with the left mouse button. HW4 opens the Device Manager form.

Device Manager automatically interrogates the probe and downloads its current configuration.

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The different sub-forms that are available within Device Manager are listed in a tree located on the left pane of the Device Manager form. To select a sub-form, click on it with the left mouse button.

## 3.1   *Device Manager Menu Bar*

The Device Manager menu bar is located at the top of the form.

File

The file menu is used to save to the PC, or to retrieve from the PC, the configuration settings of the HC2 probe. The settings are saved in an XML file with the extension DAT. Saving the configuration settings to a file is useful for several reasons:

- provides a backup when the probe configuration has been changed in error
- provides a means of quickly configuring a replacement probe in the exact same manner as the original probe when the original probe is defective
- provides a means of quickly configuring a number of identical probes

● **Open:** opens the device configuration folder specified in HW4 Global Settings - File Locations Tab - and displays all available probe and device configuration files (extension DAT). Select the appropriate file and click on Open in the explorer form. The contents of the configuration file are loaded to the Device Manager form. Review the contents of the Device Manager sub-forms. Click on the Device Manager OK button to write the configuration settings to the probe or click on the Cancel button to leave the probe unchanged.

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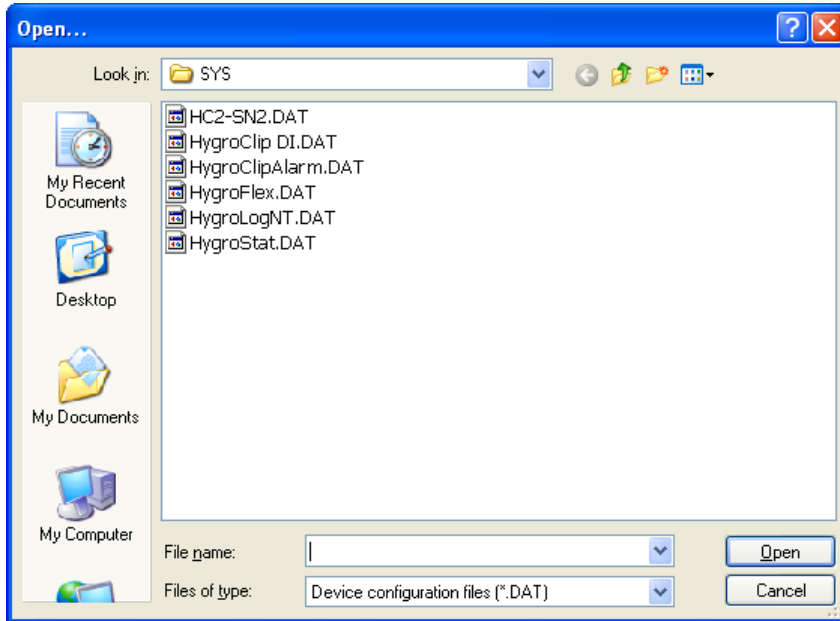
● **Save As:** saves the current configuration to an XML file with the extension DAT) in the device configuration folder specified in HW4 Global Settings - File Locations Tab. If so desired, any directory and any file type may be specified.
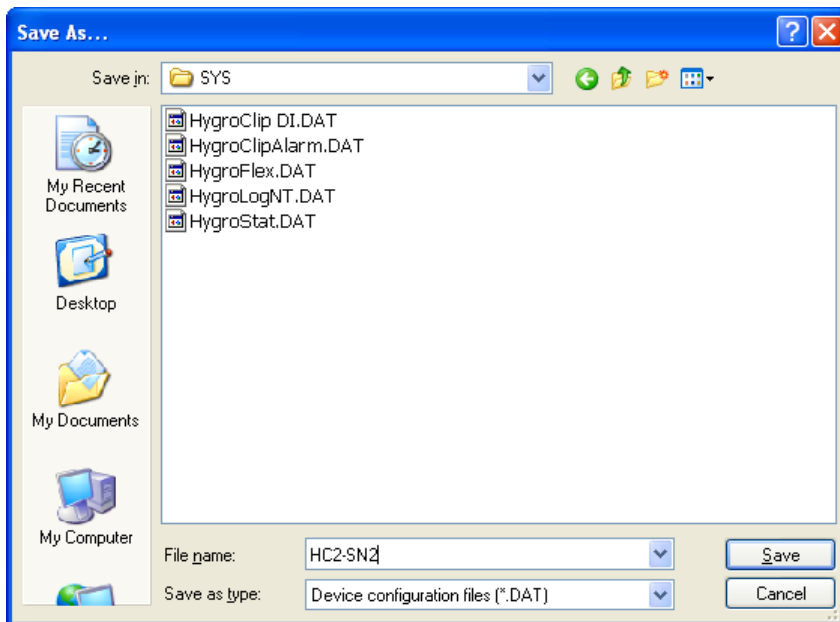

● **Exit:** exits Device Manager

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Tools

● **Firmware Update:** This tool is used to update the firmware of the HC2 probe after downloading a new firmware file from the ROTRONIC website to your PC. Firmware files are given a name that shows both to which device the file applies and the version number of the firmware. All firmware files have the extension HEX. The ROTRONIC website will publish firmware updates as required.

The tool opens a form that allows you to specify the folder where the firmware update file is located and to select the file. Click on OPEN to start the update process.
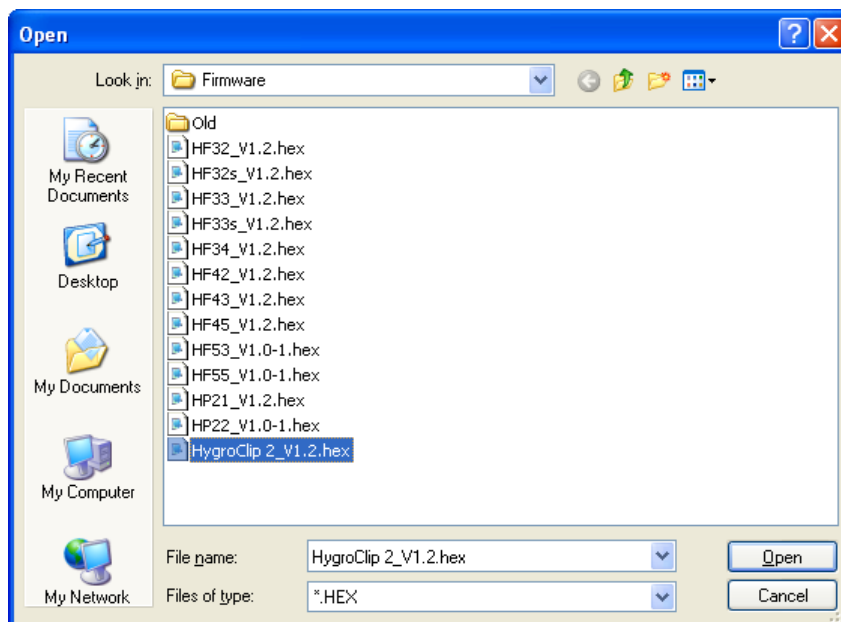

IMPORTANT: the probe must be powered during the entire process. Loss of power when the probe is being updated may have unexpected results and prevent future operation of the probe.

● **Generate Protocol:** generates a Device Configuration Protocol. This text file is automatically saved in the folder specified in HW4 Global Settings - File Locations Tab. If so desired, any directory and any file type may be specified. This action is not recorded in the User Event file.

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● **Communication Protocol:** This tool is provided for users who want to digitally communicate with the HC2 probe digital interface without relying on the HW4 software and is used to select and configure one of the available communication protocol options.

The tool opens the form shown below:
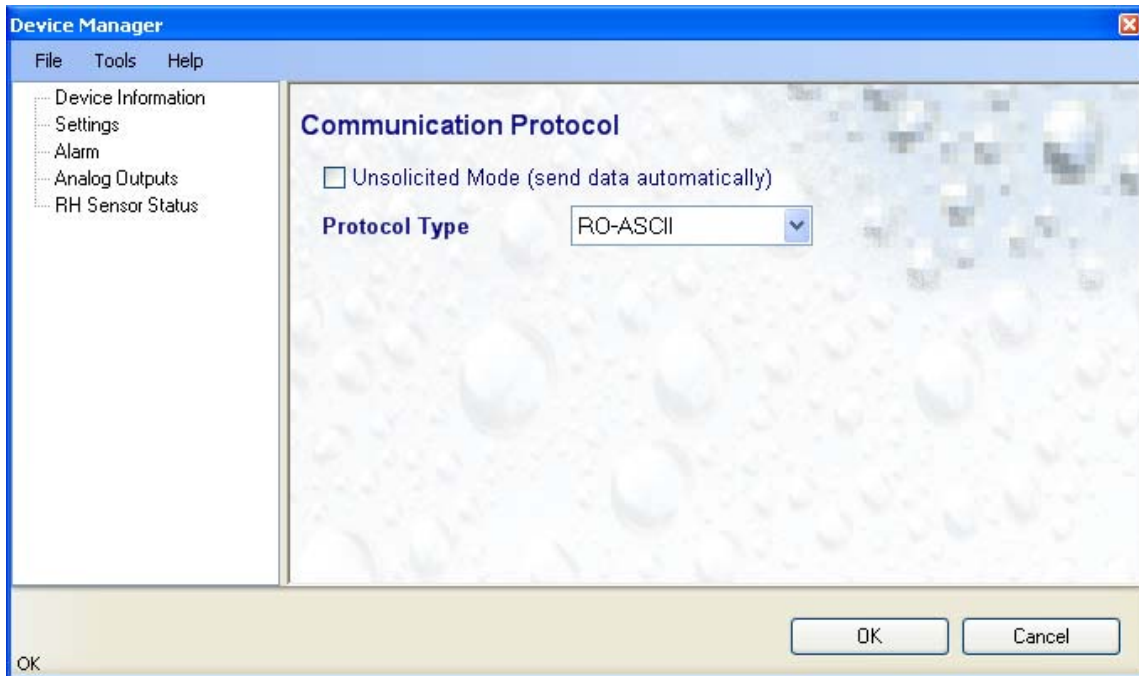
Protocol Type:

Select from one of the following options:

RO-ASCII: This is the standard (default) communication protocol used by the HC2 probe and by the HW4 software.

Custom: This communication protocol can be used to provide compatibility of the HC2 probe with an existing communication system. The Custom communication protocol is limited to reading measurement data from the probe. Functions such as device configuration, humidity and temperature adjustment, etc. are not supported. The Custom protocol allows RS-485 networking (when the probe is connected to the appropriate digital interface cable)

Modbus: Use of the Modbus protocol is limited to devices with a RS-485 interface. The AirChip 3000 Modbus protocol is limited to reading measurement data from the AirChip 3000 device. Functions such as device configuration, humidity and temperature adjustment, etc. are not supported by the AirChip 3000 Modbus protocol.

I2C: Use of the I2C protocol is limited to HC2 probes and to some OEM products. The I2C protocol available with the AirChip 3000 is limited to reading measurement data. Functions such as device configuration, humidity and temperature adjustment, etc. are not supported by the I2C protocol

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Unsolicited Mode:

Selecting this mode causes the HC2 probe to send data automatically after each refresh cycle without requiring a data request. This is the only mode available with the I2C protocol.

NOTES:

o The Custom, Modbus and I2C protocols can be used only with AirChip 3000 devices with firmware version 1.3 or higher.

o For detailed instructions, see document **E-M-AC3000-CP**

Help:

● **HW4 Help:** Opens HW4 Help
● **About HW4:** Displays the version number and ID number of HW4

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3.2 *Device Information*

- ● **RS485 Address**: click on the underlined blue link to change the HC2 probe address to be used in conjunction with an RS-485 network (multi-drop). Each network address should be unique and within the values of 1 to 64. Note: the default factory RS-485 address is 0. Click on the Device Manager OK button to write the new address to the probe.

- ● **Device Protection**: This function is used to prevent unauthorized access to critical functions such as probe configuration changes, probe adjustment, etc. For a description, see document E-IN-HW4v2.1-Main

  To protect the probe, click on the underlined link next to Device Protection. HW4 opens the following form where a password can be entered (maximum 8 characters):
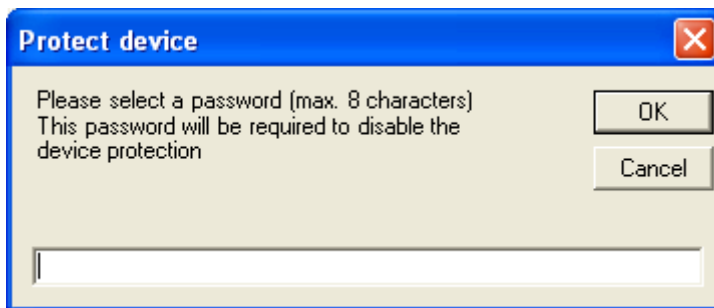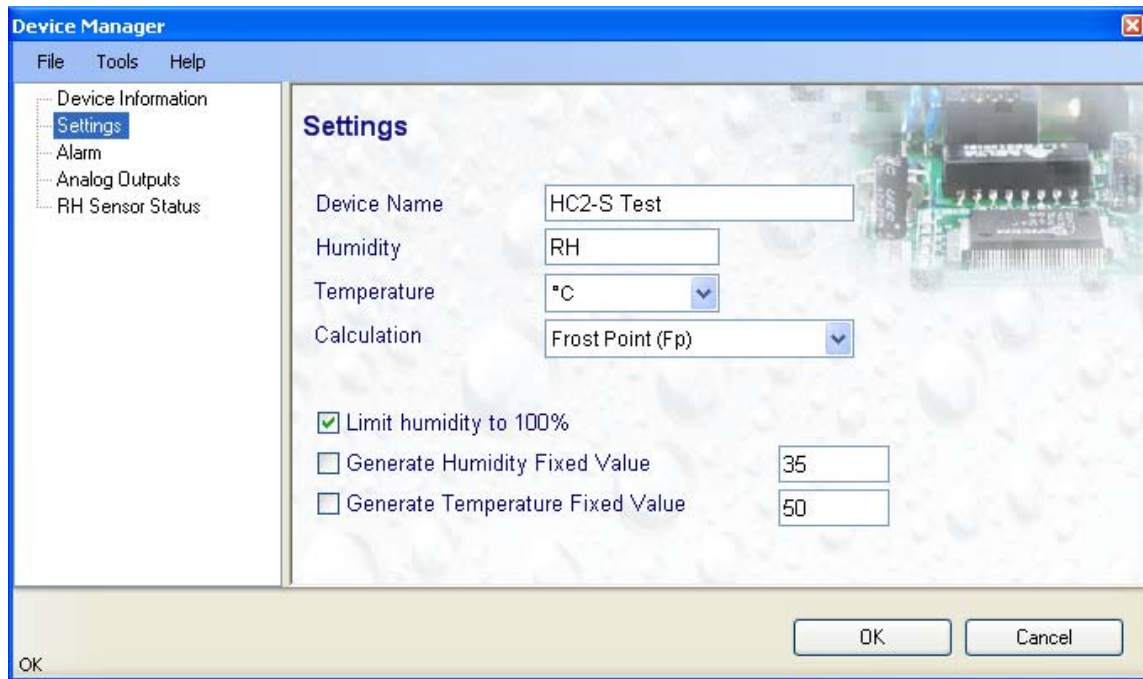

Click on the Device Manager OK button to write the new protection settings to the probe.

FORGOT THE PASSWORD? - Power down the probe. After powering up the probe, you have about one minute to use the default password **!resume!** (include the exclamation marks). After one minute the default password is no longer accepted.

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3.3 *Settings*

- **Device Name**: As far as possible use a unique device name (maximum 12 characters)

- **Humidity**: enter here the letters to be used after the "%" symbol used for relative humidity

- **Temperature**: Left click on the arrow to the right of the text box and select the temperature engineering unit (˚C or ˚F).

- **Calculation**: Left click on the arrow to the right of the text box and select from the following: No calculation, Dew Point or Frost Point

- **Limit humidity to 100%**: typically, the humidity sensor gives a reading slightly above 100 %RH when condensation occurs at the surface of the sensor. Check this box to limit the maximum value of humidity to 100 %RH.

- **Generate Humidity Fixed Value / Generate Temperature Fixed Value**: place a check mark in these boxes to make the HC2 probe generate fixed humidity and temperature values instead of the actual measurements.

 The fixed values must be with the following limits: -999.99 and 9999.99

  Note: if using the probe analog outputs, verify that the fixed values fall within the range specified for the analog outputs

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Use of the HC2 probe as a simulator serves the purpose of verifying both the digital and analog signal transmission (loop validation) after completing an installation. Whenever the humidity and/or temperature signal is set to a fixed value, this is reported on the HW4 main screen (current Values tab) as shown below. The fixed value is shown in red when the probe is not selected.
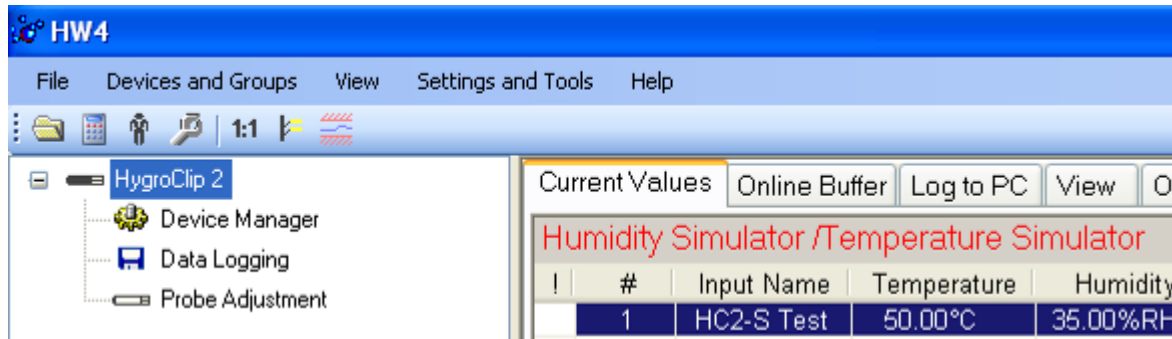

3.4   *Alarm*
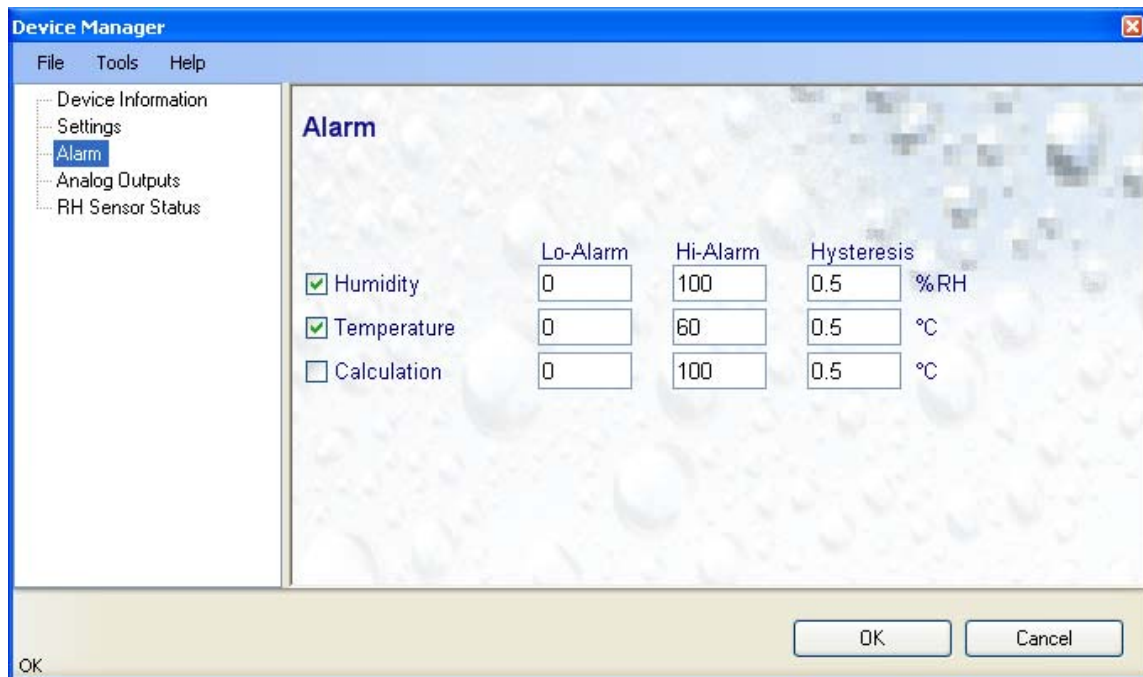
Note: this function applies only to the HC2 probe digital signal (digital alarm flag) and has no effect on the analog outputs.

Alarm conditions can be defined for humidity, temperature and the calculated parameter. Values that are below the low alarm value or above the high alarm value will trigger an alarm. The value specified for the alarm function hysteresis is used for both the low and the high alarm.

All versions of HW4 will show an out-of-limits value alarm in red on the monitor screen. In addition, HW4 Professional can be configured (HW4 global settings - Alarm settings tab) to display an alarm table and generate a report whenever an out-of-limits condition occurs.

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3.5 *Analog Outputs*
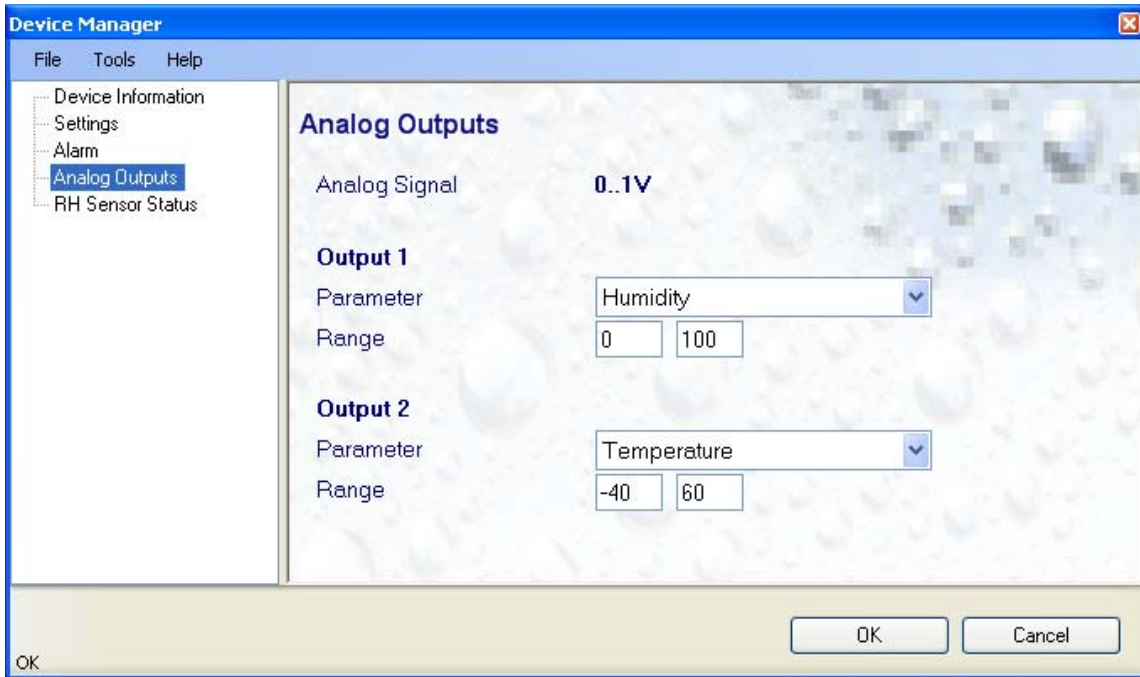
- **Analog signal**: the type of signal cannot be changed and is always 0…1V

- **Output 1 and Output 2:** select the parameter corresponding to each analog output and the range to be used.
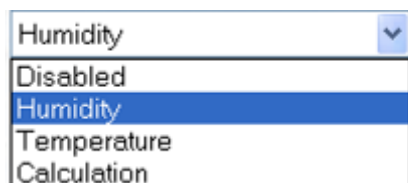
Each output can be made to correspond to the parameters shown on the list. Any output can also be disabled.

The output range must be within the numerical limits of -999.99 and 9999.99

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3.6 *RH Sensor Status*

For a description of the RH sensor test function see document **E-T-AC3000-DF-V1**

The sensor test function uses the settings entered in the form shown below.

After each test, the sensor status is reported as Good, SQ-Tuned or Bad.

- **Automatic Sensor Test**: place a check mark in this box to enable the automatic RH sensor test.

Sensor Test Interval	Enter the desired time interval for the automatic sensor test (minutes). Recommended value: **60**
Test sensor only above	The RH sensor will be tested only when the measured humidity value is equal to or higher than the value entered in this text box. **Default value: 60** (may be changed by factory) Note: a different test is used to detect major sensor problems such as an open circuit or a short circuit. This test is not affected by the settings entered in this form.

Depending on the test result, the RH sensor status is reported as follows:

Not available	The sensor has not been tested. Verify the RH sensor test settings (Device Manager menu bar > Tools). The sensor will not be tested as long as the current value of %RH is below the value entered in the box labeled "Test above [%RH}"

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Good	The sensor error is less than the correction threshold value. The correction offset (SQ) for sensor drift correction is automatically set to zero
SQ-Tuned	The sensor error is equal or larger than the correction threshold value but less than the defective threshold. A correction (SQ) is automatically added to the value measured by the sensor. The correction (SQ) is calculated based on the %RH currently measured by the sensor and on the coefficients A, B and C (RH sensor test settings).
Bad	The sensor error is equal or larger than the defective threshold value

The probe issues a digital alarm only when both of the following conditions are met: (a) the %RH measured prior to the test is at least equal to the value entered in Tools > RH Sensor Test Settings > Test above [%RH] box and (b) the humidity sensor test returns the result "Bad". When using HW4 to communicate with the HC2 probe, the text "Bad Sensor Alarm" appears in red on the monitor screen. HW4 Professional can be configured (HW4 global settings - Alarm settings tab) to display an alarm table and generate a report whenever a device alarm condition occurs.

- **Correction Threshold:** place a check mark in this box to enable the automatic RH sensor drift compensation function.

Correction Threshold	Enter the sensor error (%RH) that will trigger a correction. Recommended value: **2** (may be changed by factory)
Defective Threshold	Enter the sensor error (%RH) above which the sensor will be considered to be defective. Recommended value: **5** (may be changed by factory)

- **Fail Safe Mode**: In the event of a sensor failure, this function makes the HC2 probe generate predetermined humidity and temperature values so as to prevent undesirable action by a humidity or temperature control device that relies on the analog or digital signals of the probe. Place a check mark in this box to have the HC2 probe generate a fixed humidity or temperature value (both digital and analog) when any of the following occurs:

  - RH sensor test returns the result "Bad"
  - Major failure of either the humidity or temperature sensor (shorted or open sensor)

  The fixed values must be with the numerical limits of -999.99 and 9999.99 and should also be within the range specified for the analog outputs.

  Note: The calculated dew or frost point takes a fixed value whenever the value of both temperature and humidity is fixed.

- **Check Humidity Sensor Now**: this link works only when the probe is configured with the automatic RH sensor test function enabled and when the measured value of humidity is above the limit entered in the RH Sensor Test Settings form. When both conditions are met, click on this link to manually run a humidity sensor test and eventually have the probe apply a correction to the humidity output signal

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4 DOCUMENT RELEASES

Release	Software Ver.	Date	Notes
_10	3.0.0	Jun. 18, 2010	Original release