

Sensor Interface Module

User Guide

To re-order quote part number:	HD0303
Revision:	2.2.0
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The customer in applying the product described in this documentation accepts that the product is a programmable electronic system which is inherently complex and which may not be completely free of errors. In doing so the customer therefore undertakes responsibility to ensure that the product is properly installed commissioned operated and maintained by competent and suitably trained persons and in accordance with any instructions or safety precautions made available or good engineering practice and to thoroughly verify the use of the product in the particular application.

ERRORS IN DOCUMENTATION

The product described in this documentation is subject to continuous development and improvement. All information of a technical nature and particulars of the product and its use including the information and particulars contained in this documentation are given by Hydronix in good faith.

Hydronix welcomes comments and suggestions relating to the product and this documentation

ACKNOWLEDGEMENTS

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1.0.0	Feb 2007	First edition
1.1.0	Apr 2007	Page 13, colour designation for sensor cable corrected.
1.1.1	Feb 2012	User Guide Reformatted & Connection diagram updated with new sensor cable
1.2.0	July 2012	Added Windows 7 checking and Windows 7 manual driver installation.
2.0.0	Mar 2016	Added details for SIM02 Model
2.1.0	July 2016	SIM02 Virtual Com Port Removed
2.2.0	Jan 2020	Address Change

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1 Introduction

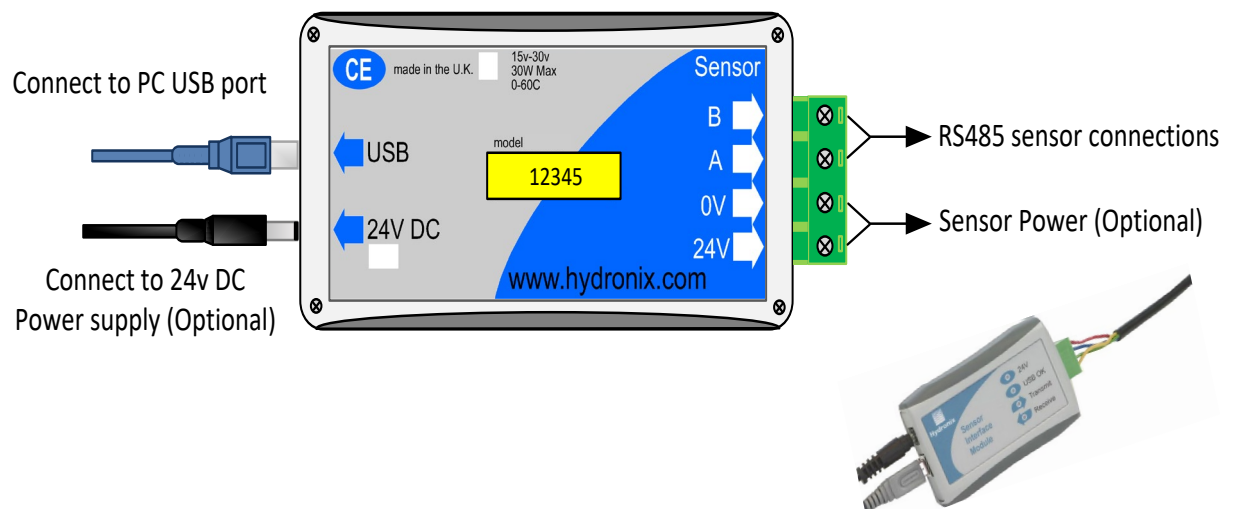
This User Guide covers the operation of both models (SIM01 and SIM02) of the Sensor Interface Module. Any differences in operation are highlighted by the model number, otherwise all information applies to both models.

The Sensor Interface Module provides a simple method of interfacing Hydronix sensors to a PC or laptop without the necessity of using a serial port.

The supplied driver for model SIM01 allows the Sensor Interface Module to appear as a virtual com (serial) port which can then be selected in any Hydronix software application.

The supplied driver for model SIM02 allows the Sensor Interface Module to appear as a USB device for direct connection which can be selected when using Hydro-Com v2.3.0 or later.

The Sensor Interface Module does not require power as it is powered by the USB port. If sensor power is required, for example when testing the sensors in the laboratory or on the bench, then the plug-in DC power supply in the Sensor Interface Module kit can be used. If however the sensor is already powered, then only the RS485 serial communication wires A and B need to be connected. In this case the spare terminal block can be used.



Kit Contents



- A** USB-RS485 Sensor Interface Module
- B** 1.5m USB cable
- C** 1m sensor cable
- D** Spare terminal block
- E** Sensor power supply (24V DC)
- F** Bag and carry strap

Order Options:

Basic kit:	Part Number: SIM01-B / SIM02-B
Comprises:	A, B and D only, plus CD for USB driver installation
Use:	Onsite connection to sensor.
Full kit (shown above):	Part Number: SIM01-A / SIM02-A
Comprises:	All the above plus CD for USB driver installation
Use:	Laboratory/Bench and onsite connection to sensor

The Sensor Interface Module connects to a USB port on any desktop PC or laptop. The module may also be connected through a powered or unpowered USB hub. As with all USB devices cables should be less than 5m in length. If possible, the USB cable supplied by Hydronix should be used and the Sensor Interface Module connected directly into a USB port on the computer.

Note that only one SIM01 can be connected to a single PC at any one time. Multiple SIM02 devices may be connected.

1 Installing the Drivers for Model SIM01

1.1 Auto-Installing the Drivers

Hydronix Hydro-Com v2.3.0 and later includes pre-installed drivers for the model SIM01. Ensure the SIM01 is not connected to the PC and install Hydro-Com v2.3.0 or later from the Hydronix Documentation CD or website download. Once installation is complete connect the SIM01 and the driver installation will automatically be completed.

1.2 Installing the Drivers

If Hydro-Com is not to be installed, the drivers can be installed manually.

The SIM01 driver files are supplied on the CD that comes with the SIM01, and are also available for download from the Hydronix website www.hydronix.com. The drivers may be installed directly from the supplied CD, or alternatively the files may be copied to an empty folder on the hard disk of the PC.

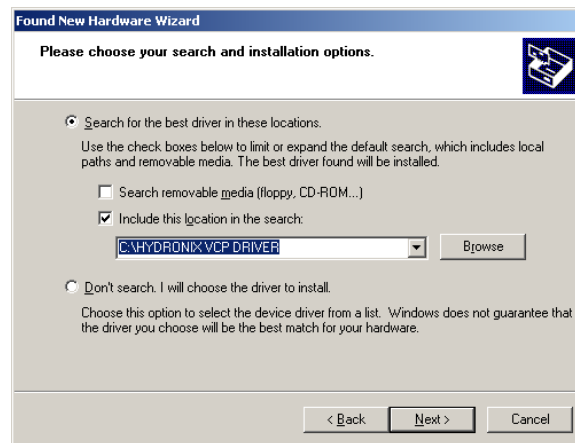
The Add New Hardware wizard will be run twice during the installation. The first wizard will install the USB driver, the second will install the virtual com port driver.

These instructions are based on Windows XP in English, but other operating systems are similar.

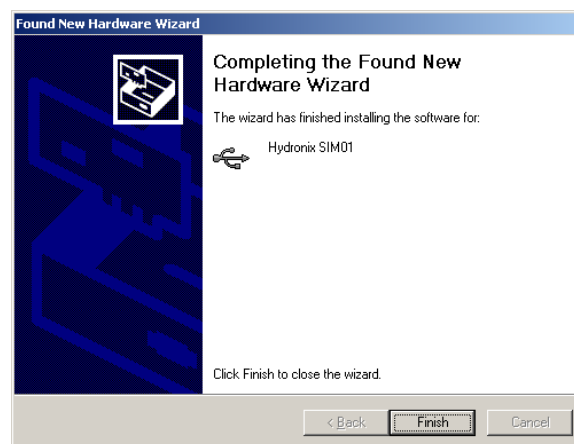
1. Connect the Sensor Interface Module to a free USB port on the computer.
2. The Found New Hardware wizard will appear as shown below.
3. Select the option 'Install from a list or specific location (Advanced)', then click 'Next'.



4. Select the option 'Include this location in the search:'
5. Click the 'Browse' button and select the folder where the driver files are located.
6. Click 'Next'. The 'Installation' window will appear and copy the files.



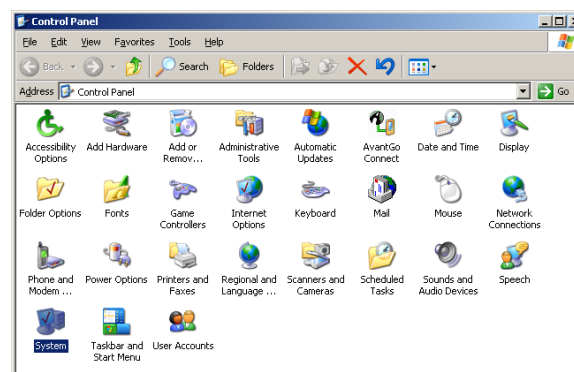
7. When the 'Completed' window appears, click on 'Finish'



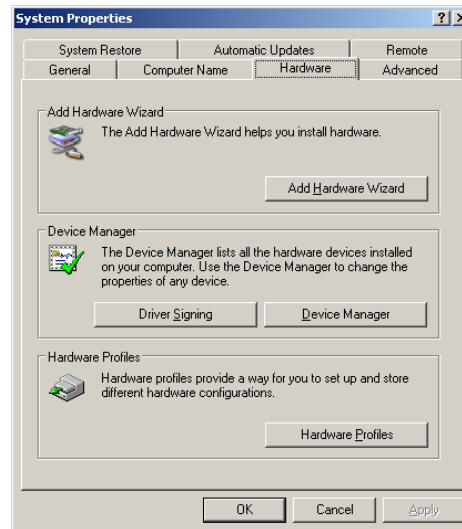
8. The 'Add new hardware' wizard will appear again. To install the virtual com. port driver, the procedure is exactly the same as above.

1.3 Checking Installation and Virtual Com Port Number in Windows XP

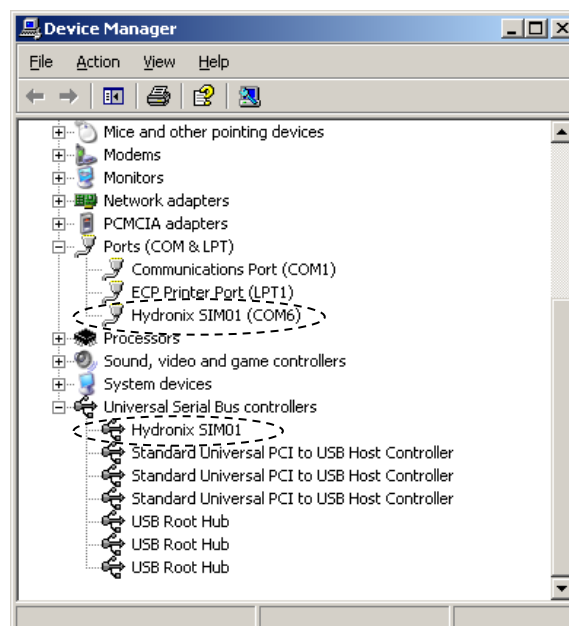
1. To check that the installation has worked correctly, click on 'Control Panel' in the 'Start' menu.
2. Double click the 'System' icon.



- Click on the 'Hardware' tab and the 'Device Manager' button.



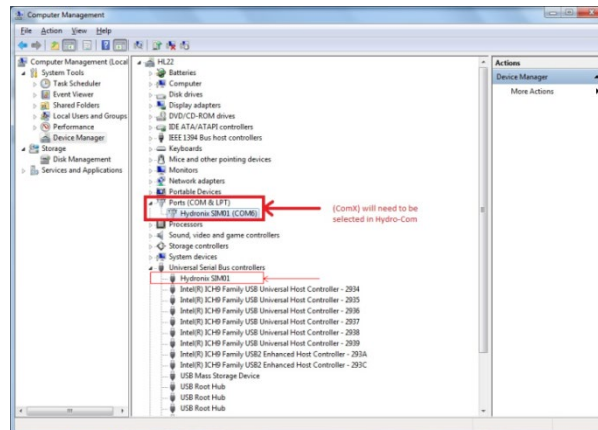
- In Device Manager, select 'Universal Serial Bus controllers'.
- Check that 'Hydronix SIM01' is listed without any error or warning icons.
- If Hydronix SIM01 is not listed then it is likely that the first stage of the installation failed.
- Select 'Ports (COM & LPT)'.
- Check that 'Hydronix SIM01' is listed without any error or warning icons. The COM port number created is listed here.
- If Hydronix SIM01 is not listed then it is likely that the second stage of the installation failed.
- Make a note of the COM number listed as this is the COM port to select when using Hydronix utilities such as Hydro-Com software.
- If the installation failed, the drivers can be removed by right clicking the entry in the 'Device Manager' and selecting 'Uninstall'. Alternatively, from the 'Control Panel', select 'Add/Remove Programs'. Find the Hydronix SIM01 drivers and click on 'Change/Remove'.



1.5 Checking Installation and Virtual Com Port Number in Windows 7

In order to check the installation of the drivers the SIM01 module must be plugged in. To check that the installation has worked correctly use the following procedure:

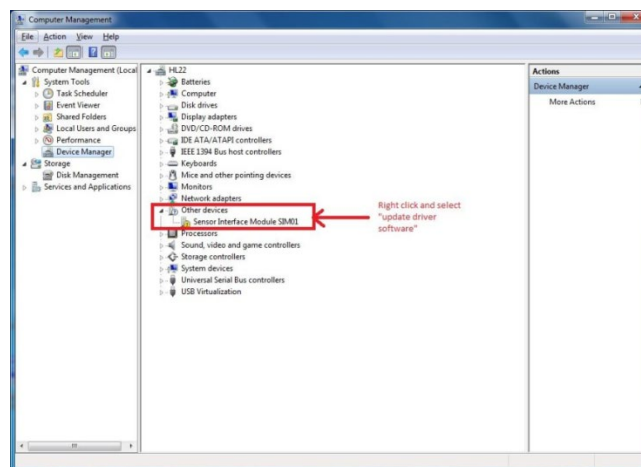
1. Click the Windows button at the bottom left hand corner of the screen.
2. Right click "Computer" and left click "Manage" from the dialog box
3. Click "Device Manager"
4. If installed correctly "Hydronix SIM01" will appear in both the "Universal serial bus controllers" and "Ports (COM & LPT)" sections



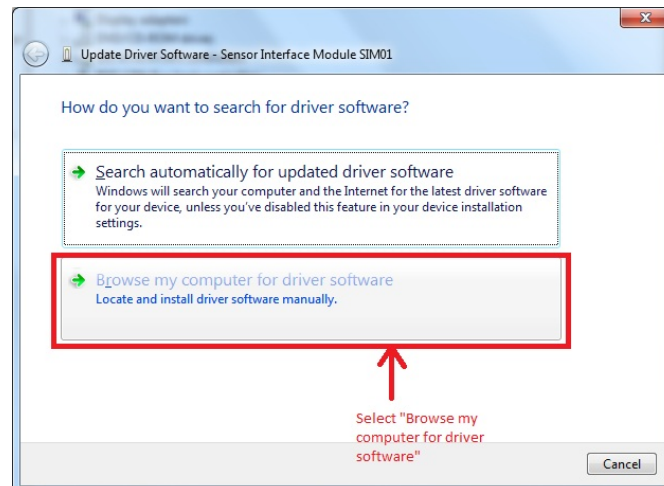
1.6 Manually Installing the SIM01 Drivers in Windows 7

If the add/remove hardware wizard is not configured to run automatically or the automatic installation of the SIM01 drivers is interrupted it may be necessary to install the drivers manually. To do this first plug in the SIM01 module and follow this procedure:

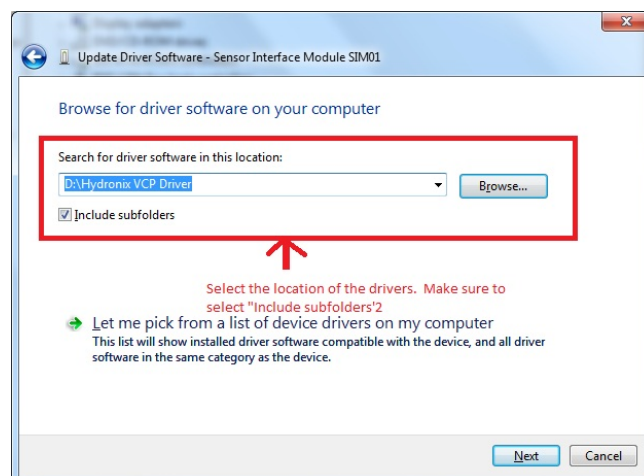
1. Click the Windows button at the bottom left hand corner of the screen.
2. Right click "Computer" and left click "Manage" from the dialog box
3. Click "Device Manager"
4. If the "other devices" heading is not expanded double click it to expand it



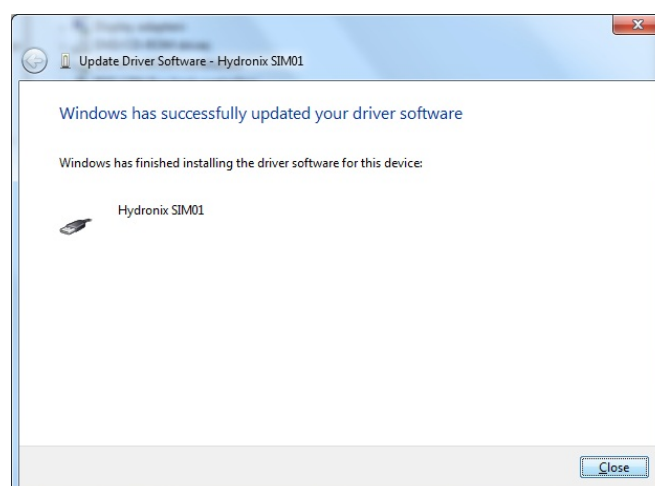
5. Right click "Sensor Interface Module SIM01"
6. Click "Update driver software..."
7. Click "Browse my computer for driver software"



8. Click the browse button and navigate to the folder containing the Hydronix VCP drivers. There is a copy of this folder on the CD supplied with the SIM01 module



9. Make sure the "Include subfolders" option is selected and click the "Next" button
10. When the driver has been installed left click close



11. In device manager listed under "other devices", right click "USB Serial Port" and select "update driver software" and follow steps 7-10.

2 Installing the Drivers for Model SIM02

2.1 Auto-Installing the Drivers

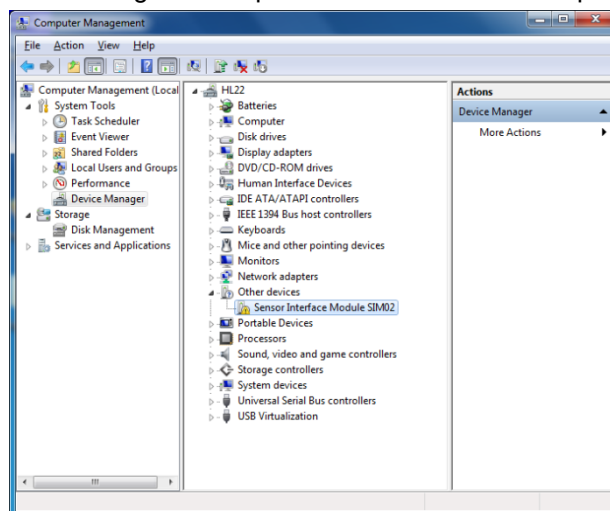
Hydronix Hydro-Com v2.3.0 and later includes pre-installed drivers for the model SIM02. Ensure the SIM02 is not connected to the PC and install Hydro-Com v2.3.0 or later from the Hydronix Documentation CD or website download. Once installation is complete connect the SIM02 and the driver installation will automatically be completed.

2.2 Manually Installing the Drivers

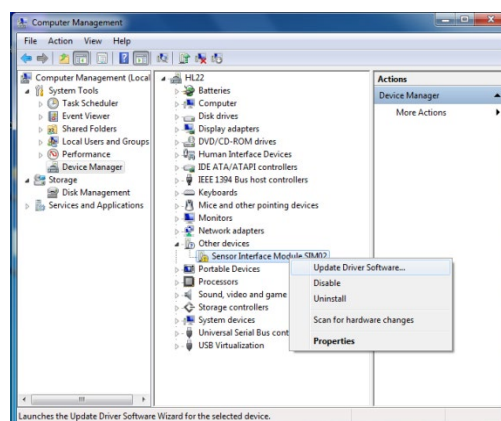
If Hydro-Com is not to be installed, the drivers can be installed manually.

These instructions are based on Windows 7 in English, but other operating systems are similar.

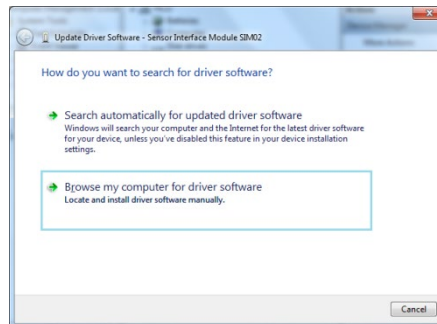
1. Connect the Sensor Interface Module to a free USB port on the computer.
2. A warning bubble will appear stating that the drivers could not be found. Click on the bubble to start Device Manager.
3. Alternatively start Device Manager as follows:
 - a. Click the Windows button at the bottom left hand corner of the screen.
 - b. Right click “Computer” and left click “Manage” from the dialog box
 - c. Click “Device Manager”
4. If the “other devices” heading is not expanded double click it to expand it



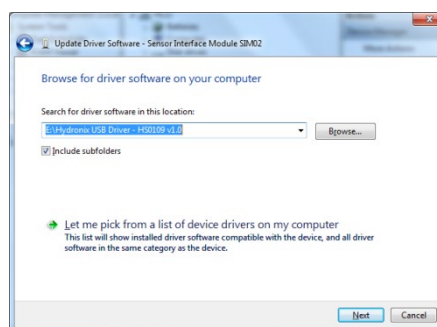
5. Right click on the “Sensor Interface Module SIM02” and select “Update Driver Software”:



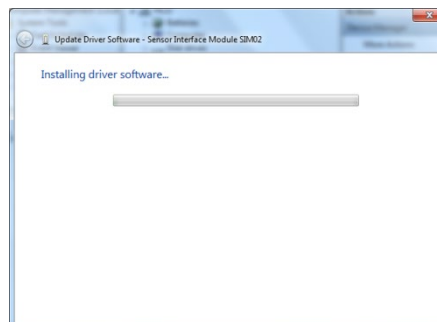
- Click on “Browse my computer for driver software”:



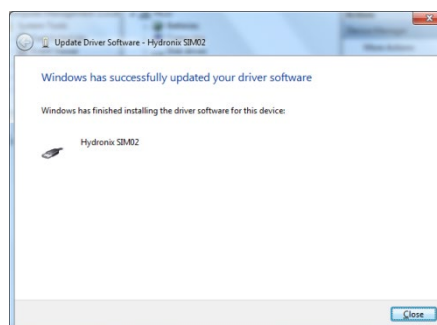
- Browse to the folder where the drivers are located. Ensure that “Include subfolders” is ticked:



- Windows will install the SIM02 driver:



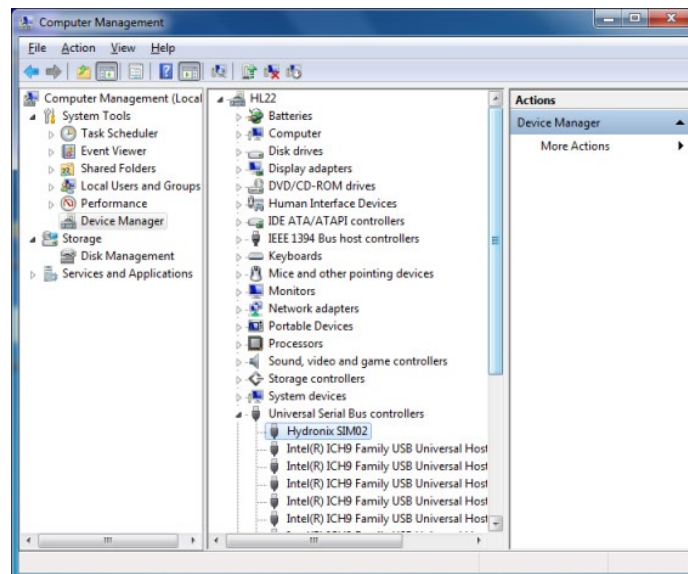
- When installation completes, click on “Finish”:



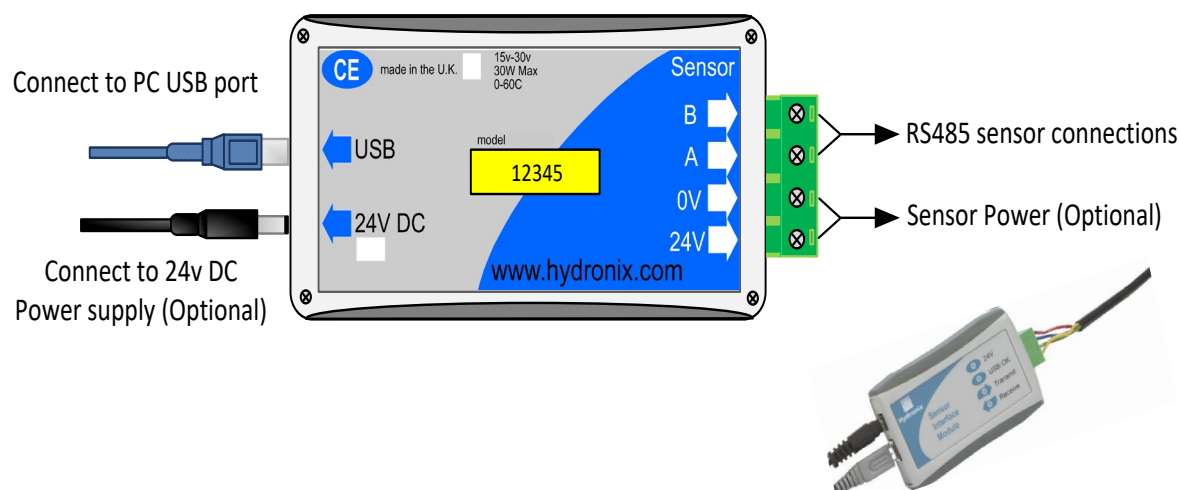
2.3 Checking the Driver Installation

These instructions are based on Windows 7 in English, but other operating systems are similar.

1. Start Device Manager as follows:
 - a. Click the Windows button at the bottom left hand corner of the screen.
 - b. Right click “Computer” and left click “Manage” from the dialog box
 - c. Click “Device Manager”
2. Expand the “Universal Serial Bus Controllers” section and verify that “Hydronix SIM02” is listed:



To communicate with the PC only two wires are required from the sensor, the RS485 A and B signals.



1 Sensor Cable Connections


The sensor cable supplied with the kit is wired as follows:

SIM01 / SIM02	Colour	Corresponding pin on MIL-Spec connector
B	Yellow	G
A	Green	F
0V	Blue	B
24V	Red	A



2 Indicators

The Sensor Interface Module has four indicators to show that it is working correctly.

	24V	Red	This light will be on if power is detected, either using the external power supply in the kit or from plant power assuming that the power connections are made.
	USB OK	Orange	Indicates that the Sensor Interface Module is correctly connected to a host PC and that the driver is installed and running
	Transmit	Green	Indicates that data is being sent from the host PC to the sensors
	Receive	Green	Indicates that data is being sent from the sensors to the host PC

3 External Power Supply

The external power supply in the kit can be used worldwide simply by changing the mains plug head to one of the supplied variants. The power supply input is rated 100V – 240VAC, 50/60Hz.

Note that the external power supply should only be used to power up to a maximum of 3 sensors.

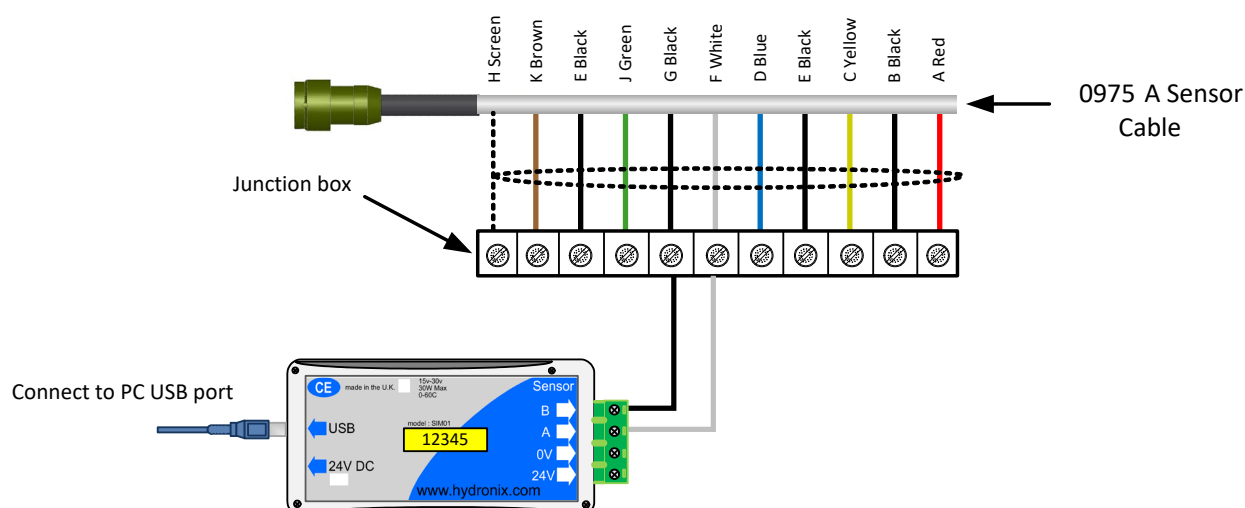
4 Connecting to a Sensor on the Bench

With use of the supplied power supply and sensor cable, it is easy to connect to a single sensor for basic bench tests or for configuration purposes.

- Power the sensor by connecting the supplied 24V power supply.
- Connect the sensor cable from the SIM01 to the sensor.
- Connect the USB cable from the PC to the Sensor Interface Module. With SIM01 a virtual com port should now be created which can be used in the software or with SIM02 a USB device driver will be activated.
- Open up Hydronix software such as Hydro-Com to monitor, configure, test diagnostics or calibrate the sensor. Ensure the correct com port or USB device is selected from the menu.

5 Connecting to a Sensor on Site

It is also easy to connect to a sensor or network of sensors that are already installed and powered on site. Up to 16 sensors can be connected on the network and used with the Sensor Interface Module. For this only the RS485 A and B wires need to be connected to the Module, which may be available in the junction box. Use the spare terminal block supplied in the kit for this connection.



For trouble shooting with any Hydronix sensor or software, please refer to their respective user guides or contact Hydronix technical support on support@hydronix.com.

For problems with the Sensor Interface Module, please check the following:

Symptom: 'USB OK' light not on

Possible explanation	Check	Required result	Action required on failure
No virtual com port for SIM01	Device Manager as described in chapter 2.	'Hydronix SIM01 (COM x)' should be shown in the Port (COM & LPT) section. 'Hydronix SIM01' should be shown in the 'Universal serial bus controllers' section.	Reinstall the driver as described in chapter 2.
USB Driver not correctly installed for SIM02	Device Manager as described in chapter 2.	'Hydronix SIM02' should be shown in the 'Universal serial bus controllers' section.	Reinstall the driver as described in chapter 2.
USB not connected correctly	USB cable connected from spare USB port to SIM01/SIM02		

Symptom: Computer does not communicate with the sensor

Possible explanation	Check	Required result	Action required on failure
No power to sensor when connected to site power	DC power at junction box.	+15Vdc to +30Vdc	Locate fault in power supply/wiring.
No power to sensor when using supplied power supply	Power supply connected to mains supply and into the SIM01/SIM02	Red light on SIM01	Locate fault in power supply.
Incorrect serial Com Port selected on Hydro-Com for SIM01	Com Port menu on Hydro-Com. All available Com Ports are highlighted on the pull down menu.	Switch to the correct Com Port	Hydro-Com 1.8.0 and earlier uses com1-10. If assigned com port number is higher than 10 then it should be forced to a lower number using device manager.

Incorrect USB device selected on Hydro-Com (v2.3.0 and later only) for SIM02	Selected options in main Navigator	Expand the correct device	
With SIM01 and Hydro-Com 1.8.0 or earlier, Com port number is higher than 10 and is not available to use in Hydro-Com	The Com Port assignments in the PC's Device Manager window.	Renumber the Com Port used for communication with the sensor, to an unused port number between 1 and 10.	Check sensor addresses.
More than one sensor has the same address number	Connect to each sensor individually.	Sensor is found at an address. Renumber this sensor and repeat for all the sensors on the network.	Try an alternative Sensor Interface Module if available.

Symptom: Only transmit light works during sensor search

Possible explanation	Check	Required result	Action required on failure
Sensor RS485 A and B are not connected correctly	RS485 A and B wires are connected correctly.	Correct polarity.	Connect the two wires correctly.
No power to sensor when connected to site power	DC power at junction box.	+15Vdc to +30Vdc	Locate fault in power supply/wiring.
No power to sensor when using supplied power supply	Power supply connected to mains supply and into the SIM01/SIM02	Red light on SIM01	Locate fault in power supply.
More than one sensor has the same address number	Connect to each sensor individually.	Sensor is found at an address. Renumber this sensor and repeat for all the sensors on the network.	Try an alternative Sensor Interface Module if available.

PC Interface:	USB compatible, requires less than 100mA
System requirements:	Pentium PC or 100% compatible with the following: USB port Windows 98SE (SIM01 only), ME 2000 (SIM01 only), XP, Windows 7 or Windows 10 Hard disk with 1MB free CD Drive 32 MB RAM
Optional external power supply:	24V, 1A max. Hydronix recommend only using the power supply supplied in the kit. This can power a maximum of 3 Hydronix sensors
RS485 interface:	Can connect to a maximum of 16 Hydronix sensors. Maximum input voltage range : 0 – 5 V
Operating temperature:	0 - 60°C; 91% relative humidity, non-condensing
Storage temperature:	- 10° C to 70°C
Environment:	The Sensor Interface Module should be used indoors in dry environments only. The enclosure is sealed to IP31
Dimensions:	95mm x 60mm x 28mm
Weight	75g

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