Innovative Sensor Technology

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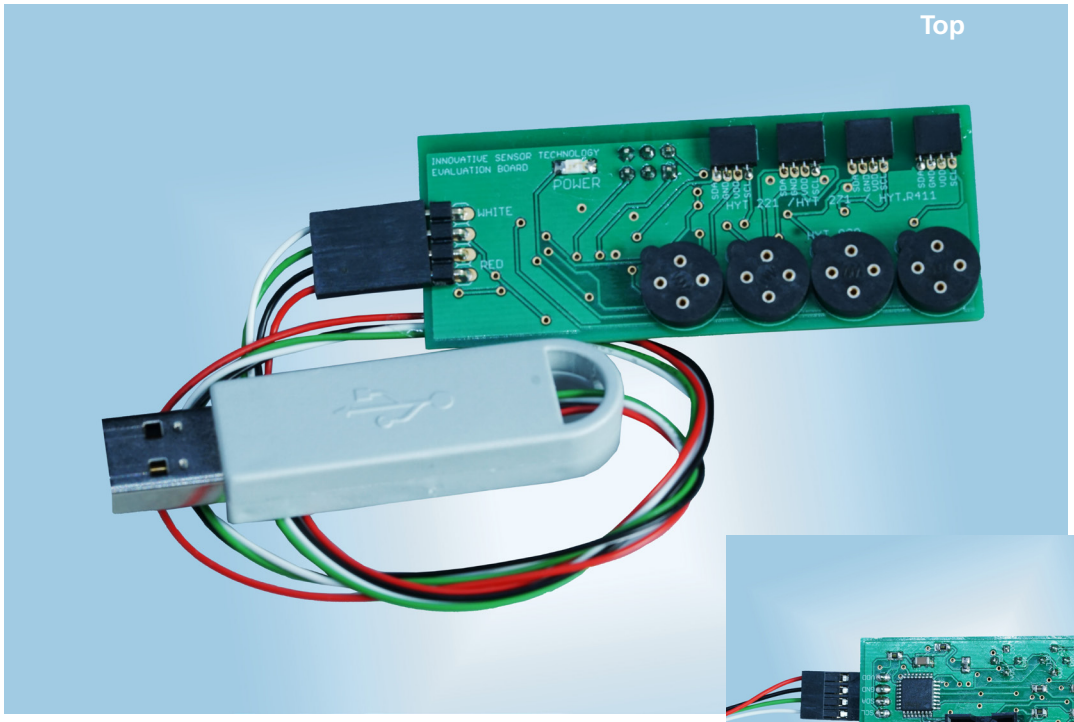
Quick Start Guide

4-Channel Evaluation board for digital humidity modules

HYT 271, HYT 221 and HYT 939



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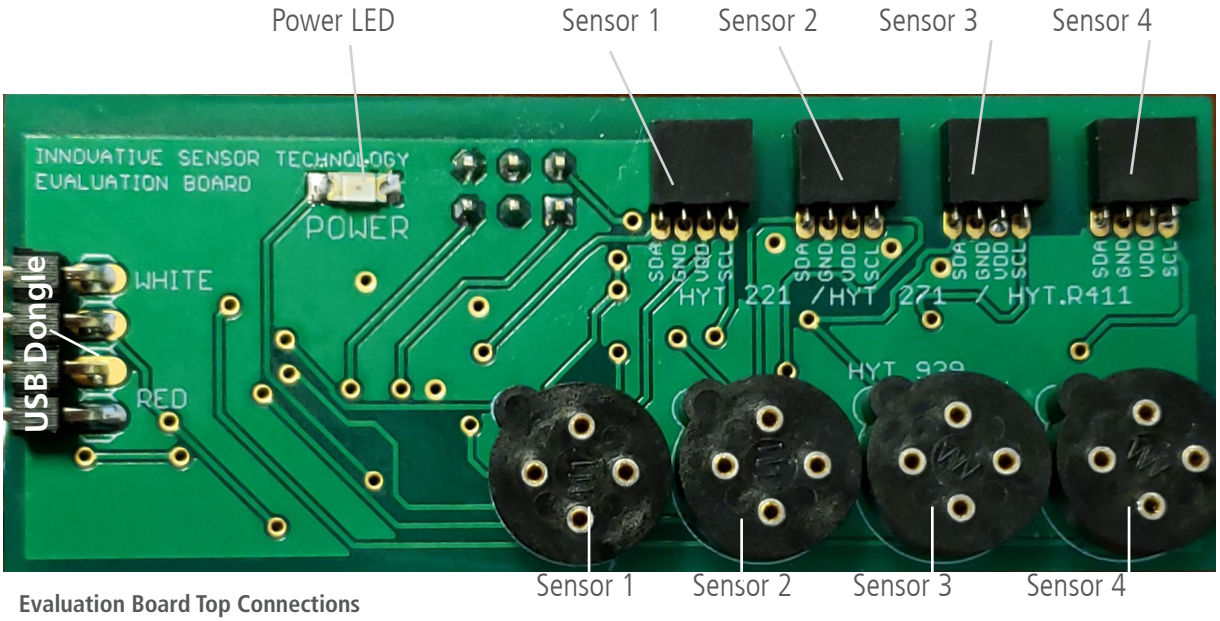
The purpose of this evaluation board is to facilitate the evaluation of HYT sensor modules for humidity and temperature. The evaluation board enables to connect up to 4 HYT modules simultaneously.

1. Evaluation board connections

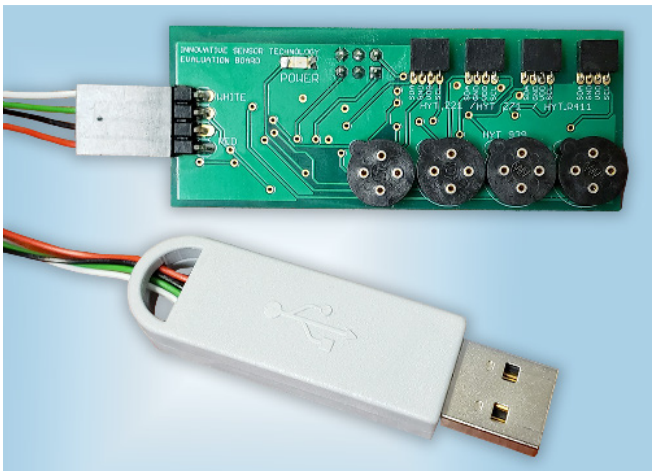
Though the humidity evaluation board has 8 connectors, a maximum 4 sensors can be used at a time (See Section 4 for details).
The square-shaped connectors are for HYT 221, HYT 271, and HYT.R411 modules. The round connectors are for HYT 939 modules. The pinning of each sensor is displayed on the board.

To power the board, connect the USB Dongle to the Evaluation Board according to the "WHITE" and "RED" color markings. Then connect the USB Dongle to your PC.



Evaluation Board Top Connections

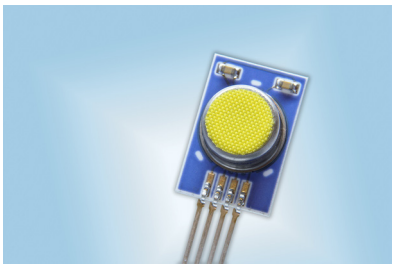
USB dongle connected to the evaluation board



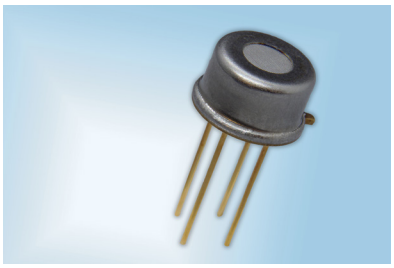
2. Compatibility

The evaluation board is compatible with all IST AG humidity modules of the HYT family.

HYT 271



HYT 221



HYT 939

3. Power supply and outputs

The transmitter can be powered via USB cable from a PC or from a DC power source. Please refer to Schematics (1.1) for the position of the corresponding connectors.

Power supply requirements:	
USB	5 V
DC power source	4 to 15 V DC (ca. 50 to 300 mA)

Pin assignment of J1 connector:	
Uh	Rel. Humidity, analog output 0-10V
GND	Ground
+U	Power supply PCB, input 4-15V DC
Ut	Temperature, analog output 0-10V

4. Signal transmission

4.1 Analog output

The analog voltage signals transmitted are directly proportional to the measured parameters.
The following measuring and signal ranges represent the default HYT calibration:

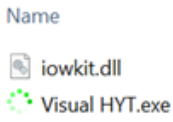
Parameter	Output	Minimum	Maximum
Relative humidity	**Uh**	0% RH .. 0V	100% RH .. 10 V
Temperature	**Ut**	- 40 °C .. 0V	+125 °C .. 10 V

The effectively measured values can be calculated according to the following formula:

5. Software installation

Operating System: Windows, 7, Windows 8/8.1, Windows 10, Windows 11.

The executable file is dependent on the iowkit.dll file. To run the software, it is important that the iowkit.dll file is in the same directory as the executable file.

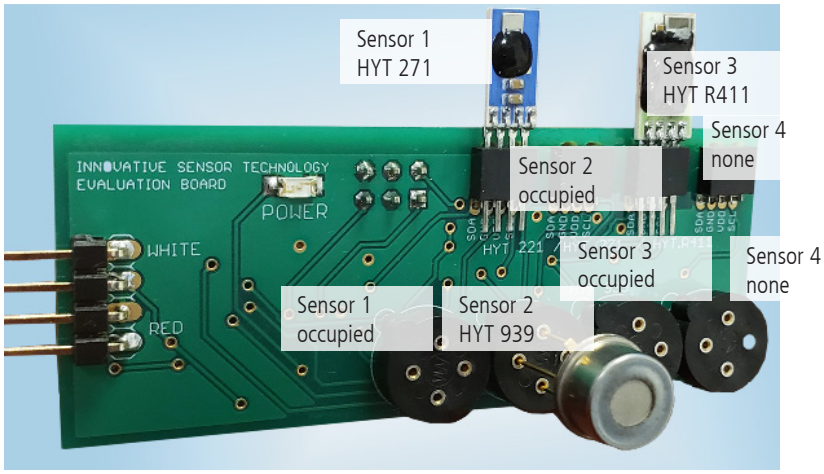


DLL file and executable file in the same directory.

6. Assembly of sensors

Only one sensor can occupy a shared sensor slot (Ex: Square connector of "Sensor 1" has a HYT271 connected, so the round connector of "Sensor 1" is considered occupied). When assembling the HYT 939, make sure the shape of the sensor housing nose also matches the shape of the circle shaped connector. Assemble the flat chip sensors into the square connectors facing up.

See example of assembling the sensors on the Evaluation Board below.



Assembled sensors on the Evaluation Board. Occupied slots cannot be used.

7. Using the software

Steps to read sensor data:

1. Click "Scan I2C Bus" under the Interface section to ensure that the Evaluation Board can be found by the software.
2. On the settings section, select the appropriate sensor settings that correspond to how you have assembled the sensors on the Evaluation Board. Change the cycle time if needed. To apply the settings, click "Write". To read the previously applied settings, click "Read".

   Note: When using HYT 221/271/R411, select sensor type "HYT271".

3. To begin reading the sensor data, click "Read" located under the Interface section. To stop the reading, click "Stop Read".

Changing Address Module:

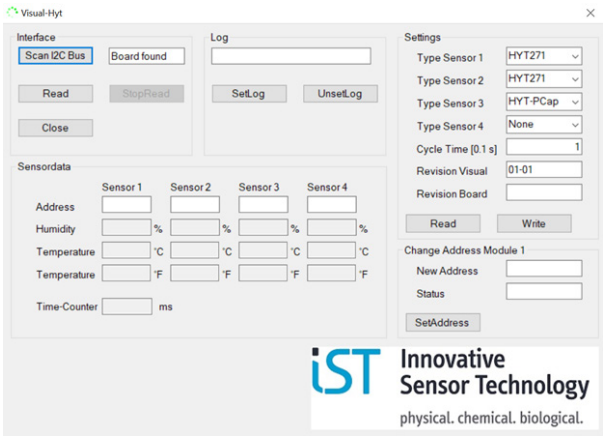
1. Assemble the sensor that you desire to change the address in Sensor slot #1.
2. Under the "Change Address" section, type the new decimal address in the "New Address" box.
3. Finally, click "Set Address" to set the new desired address.

Hexadicimal	Decimal
0x23	35
0x24	36
0x25	37
0x26	38
0x27	39
0x28	40
0x29	41
0x2A	42
0x2B	43
0x2C	44
0x2D	45

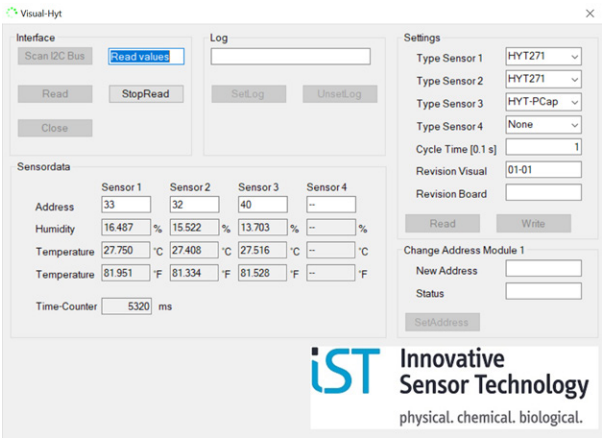
Simple Hexadecimal to Decimal conversion chart for quick reference.

Data Acquisition / Logging:

1. Under the Log section, click "Set Log".
2. Browse the directory in which the log file is to be saved.
3. Logging should begin upon reading the sensor data. To stop the software from logging further data, click "Unset Log".



Sensor settings that correspond with Fig 4. sensor assembly configuration



Reading the sensor's data (address, humidity, temperature)

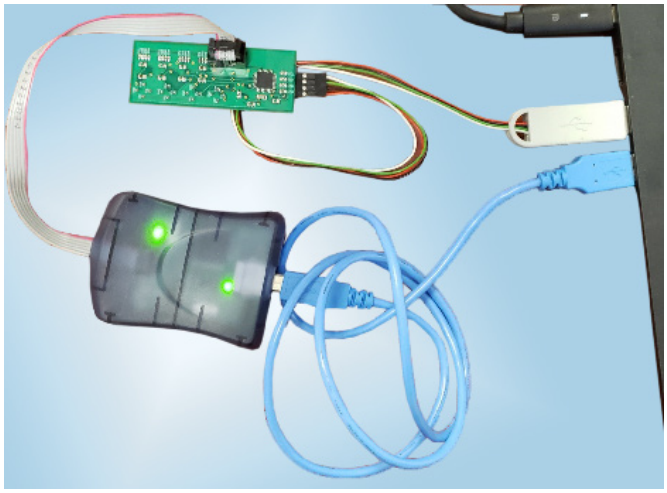
3. Flashing the firmware

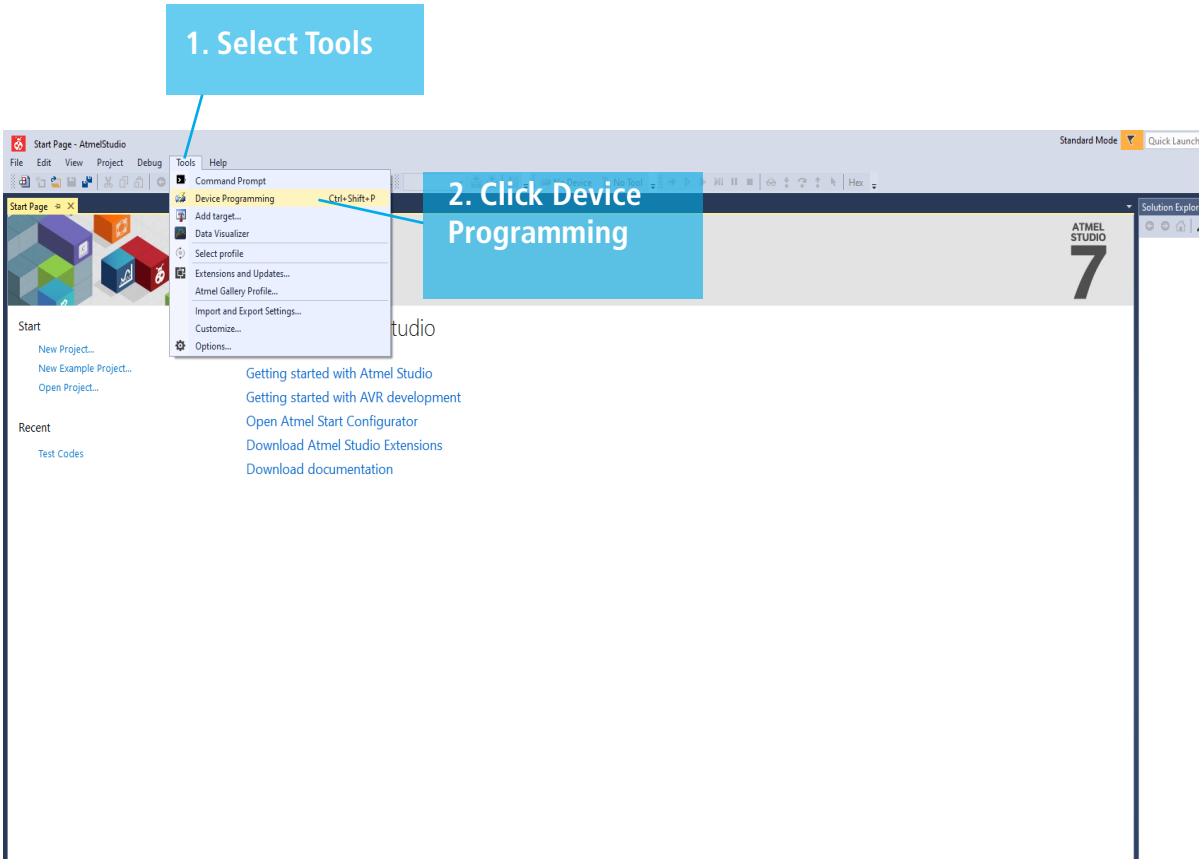
Software «Microchip Studio»: https://www.microchip.com/en-us/tools-resources/develop/microchip-studio

Programmer «USB AVRISP XPII»: https://www.waveshare.com/usb-avrisp-xpii.htm

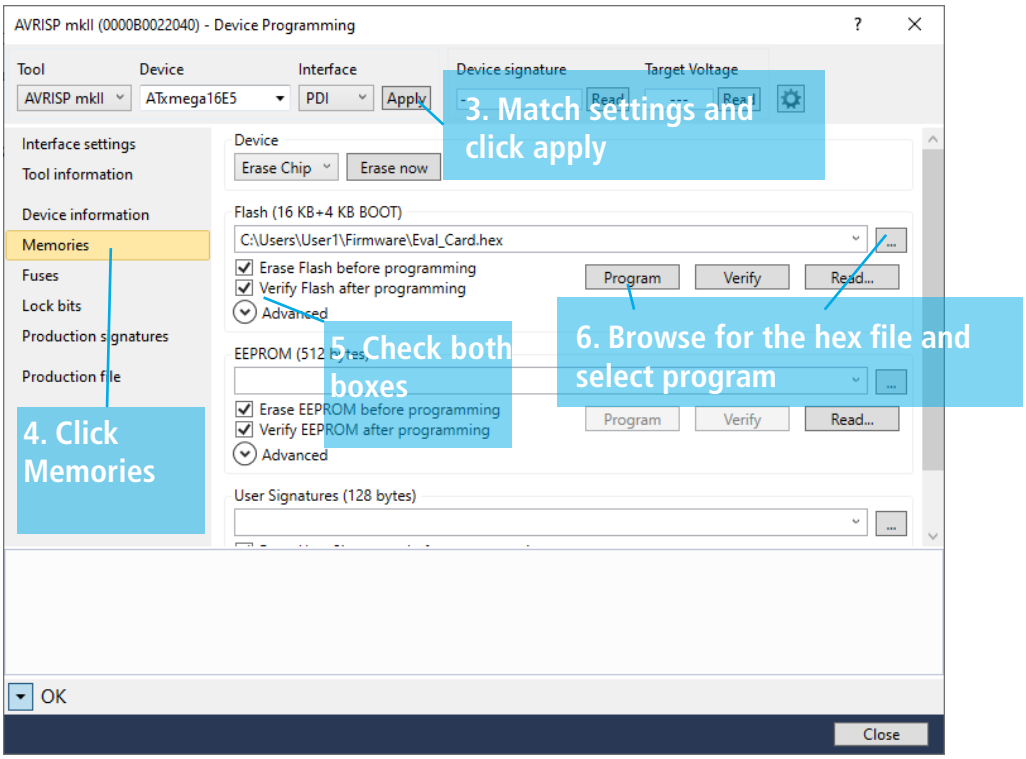
To successfully flash the firmware, the Evaluation Board must be powered on and have a connection to the programmer.

Power the Evaluation Board on by connecting it to the PC via the USB Dongle.





Please see pin assignment above. The recommended maximum length of the extension cable is 30 cm.



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