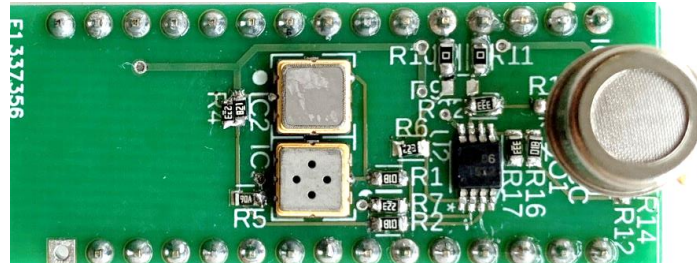


# H2 Gas Sensor Module

## Datasheet



### 1 Features

The H<sub>2</sub> gas sensor module has application for monitoring gas leakage detection in fuel cells and battery thermal runaways

- 2 thermal conductivity sensors on-board TC-1326 and PTC-01
- Analog voltage output 0...3V
- Arduino Nano compatible
- Digital version with 10-bit ADC

### Device Information

Product Name	H2 Gas Sensor Module
Application	Leakage detection in Fuel cells and typical battery thermal runaways
Product MPN	n.a.
Compatible Sensors	PTC-01 TC-1326

<b>Status</b>	Released
<b>Revision</b>	1.0
<b>Date</b>	15.10.2022

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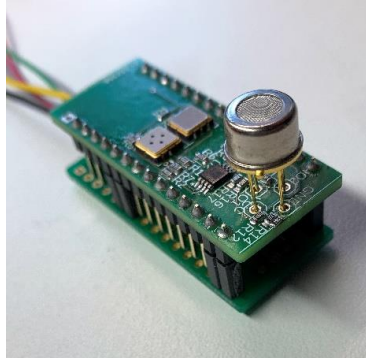
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## References

Ref. No.	Document	Date	Author
1	Datasheet PTC-01		APSP
2	Datasheet TC-1326		APSP

## 2 Description

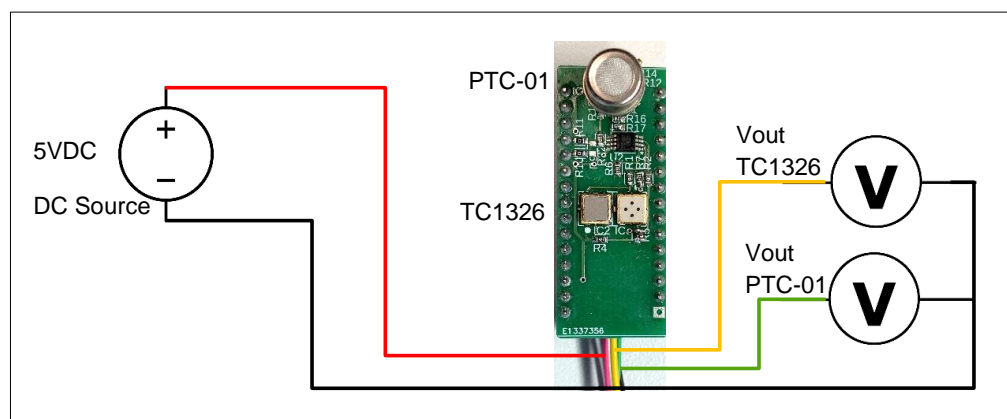
The H<sub>2</sub> gas sensor module is equipped with 2 separated thermal conductivity gas sensors. Both sensors can be evaluated and compared at the same time. Simple design allows sensitivity and offset adjustment in a very user friendly manner.



## 3 Electrical characteristics

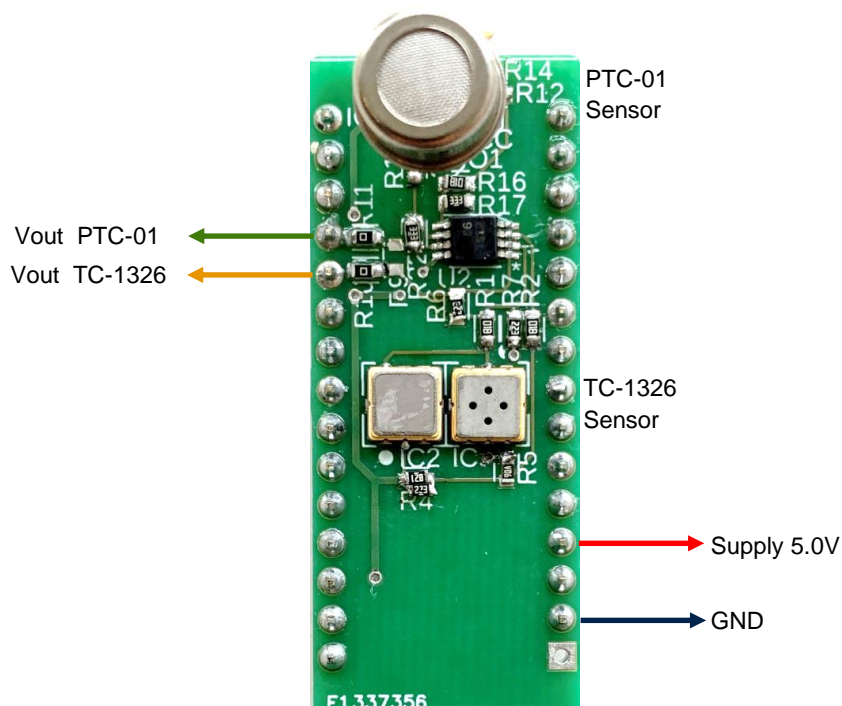
Parameter	Condition	Value	Unit
Supply voltage	T <sub>A</sub> = 25°C	3.3 - 5.5V	VDC
Power dissipation	T <sub>A</sub> = 25°C	300	mW
Current consumption	Supply 5VDC, T <sub>A</sub> = 25°C	60	mA
Output voltage	Supply 5VDC, T <sub>A</sub> = 25°C	0 - 3.0	V
Offset voltage	In the air	Typ. 400	mV
Output impedance	Supply 5VDC, T <sub>A</sub> = 25°C	100	Ohm
Operating temperature	No condensation	-40 - +80	°C
Storage temperature	No condensation	-	°C
ESD Ratings	Human body model (HBM)	±1000	V

## 4 Connection diagram



Red	supply 5.0V
Black	GND
Green	Voltage output PTC-01
Yellow	Voltage output TC-1326

## 5 Application and Implementation



### 5.1 Analog variant

In the analog set there is included piggyback board with loose-end cables which can be connected directly to power supply and voltmeter

Signal name	Condition	Value	Unit
Vout PTC-01	Ref. to GND	0...3	V
Vout TC-1326	Ref. to GND	0...3	V
Supply		3.1 ... 5.5	V
GND		GND	

## 5.2 Digital variant - Arduino Nano Shield

The Digital StarterKit includes pre-programmed Arduino Nano board. The signals from sensors can be gathered using serial interface terminal.

- Connect StarterKit to the USB port,
- run your favorite serial interface tool with 9600 baudrate
- get the sensor data direct on your PC screen.



Sensor board pin	Arduino signal	Pin No.
Vout PTC-01	ADC0	19
Vout TC-1326	ADC1	20
Supply	+5V	27
GND	GND2	29

### 5.2.1 Serial interface settings

Sensors signals can be gathered from Arduino board using any serial interface terminal with following settings

Baud rate: 9600  
 Data 8 bit  
 Stop bit: 1  
 Parity: None

### 5.2.2 Data structure

Measurement data are sent automatically every 500ms to the serial port in following structure

```
TC1326: 352 Counts; 1639mV PTC01: 348 Counts; 1621mV
```

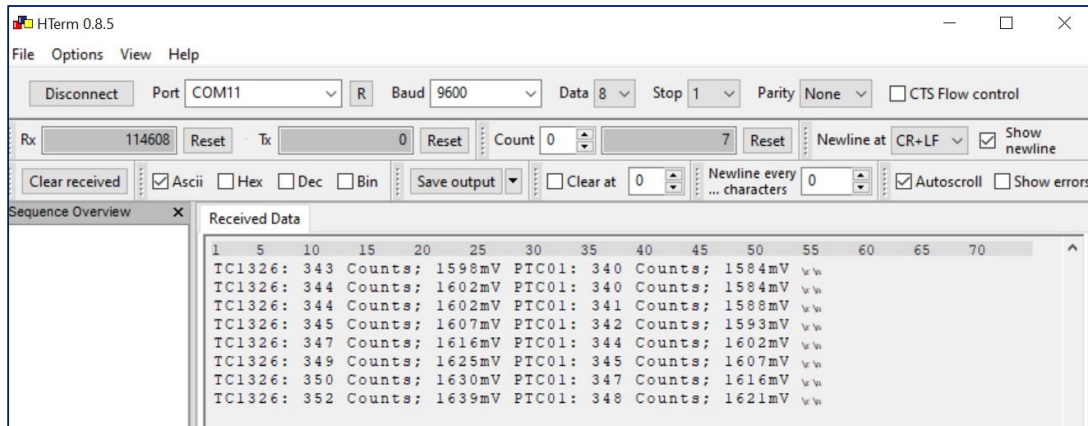
**Counts value** represents raw ADC counts

**mV value** – recalculated ADC counts to voltage

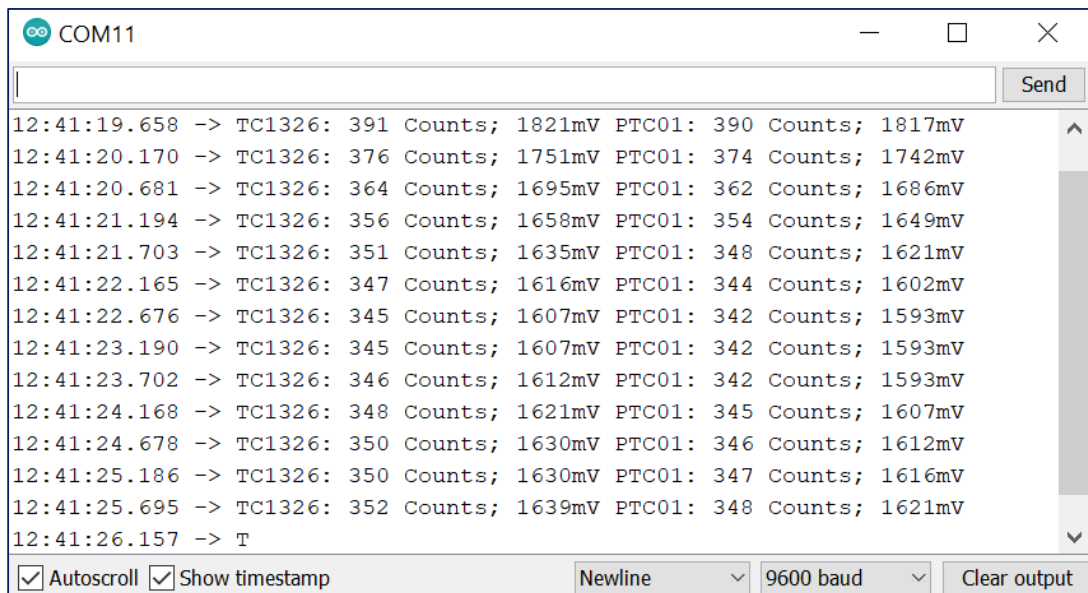
ADC properties:

- resolution 10-bit
- Reference voltage:4.77V

### Communication example using Hterm:



### Communication example Arduino IDE Serial monitor:



## 5.3 Application notes

### 5.3.1 Adjusting sensitivity and measurement range of the StarterKit

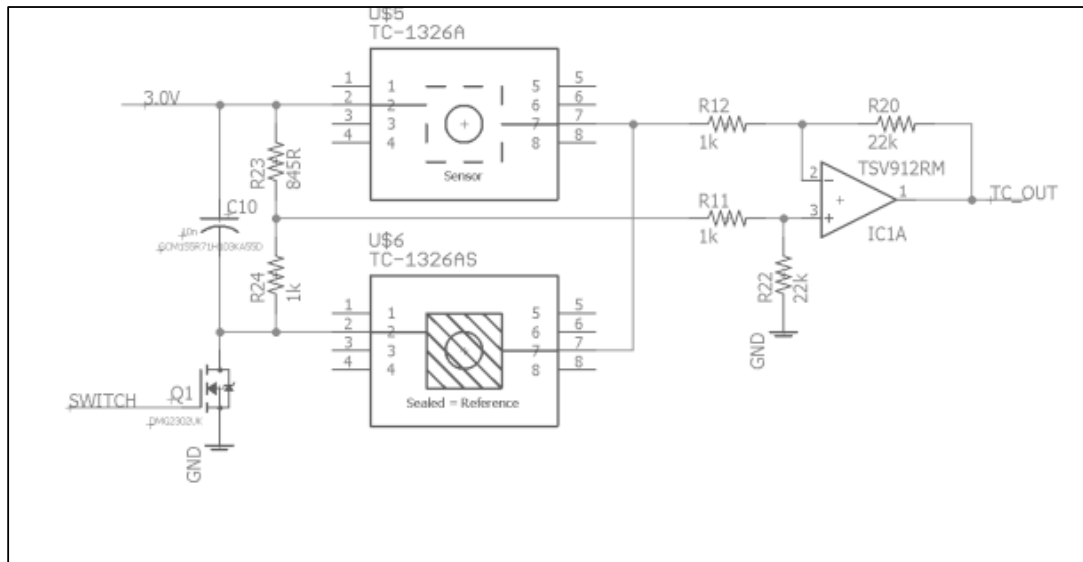


Figure 1 Sensor board schematics

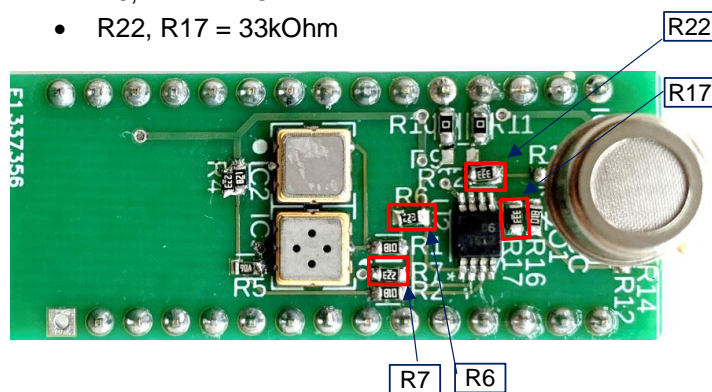
To change the sensitivity the feedback loop resistors needs be adjusted:

- For TC-1326 Sensor the resistor R6 & R7
- For PTC-01 Sensor the resistor R22 & R17

The bigger resistor value the more sensitive sensors are (opamp gain increased).

Currently on the board are assembled

- R6, R7 = 22kOhm
- R22, R17 = 33kOhm



## We are here for you. Addresses and Contacts.

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