

RELATIVE HUMIDITY MODULE

HM1520

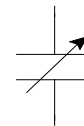
Based on the rugged HS1101 humidity sensor, HM1520 is a dedicated humidity transducer designed for measurements at low humidity. Direct measurement of dew point or water concentration can be easily obtained in really cost effective conditions. Direct interface with a micro-controller is made possible with the module's linear voltage output.

Main features

- Tubular form for through wall mounting.
- Not affected by water condensation
- **Full interchangeability.**
- **Typical 1 to 1.6 Volt DC output for 0 to 20% RH at 5 V DC supply.**
- **Calibrated, linear voltage for easy electronic interface.**
- Controlled temperature dependency
- Ratiometric to voltage supply

Humidity sensor specific features

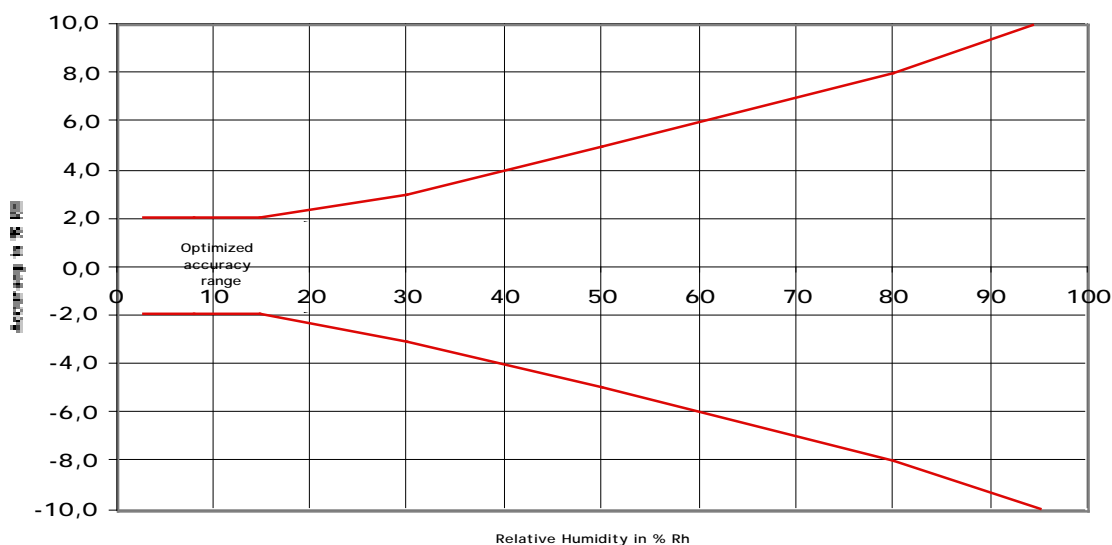
- **No affected by long period at low humidity values.**
- Patented solid polymer structure.
- High resistance to chemicals.
- Fast response time.



Maximum ratings

Ratings	Symbol	Value	Unit
Supply Voltage (Peak)	Vs	12	Vdc
Operating Range (see graph below)	RH	0 to 100	% RH
Operating Range (Dew Point)	Td	-50 to 30	°C
Operating Range in Temperature	Ta	-30 to 60	°C

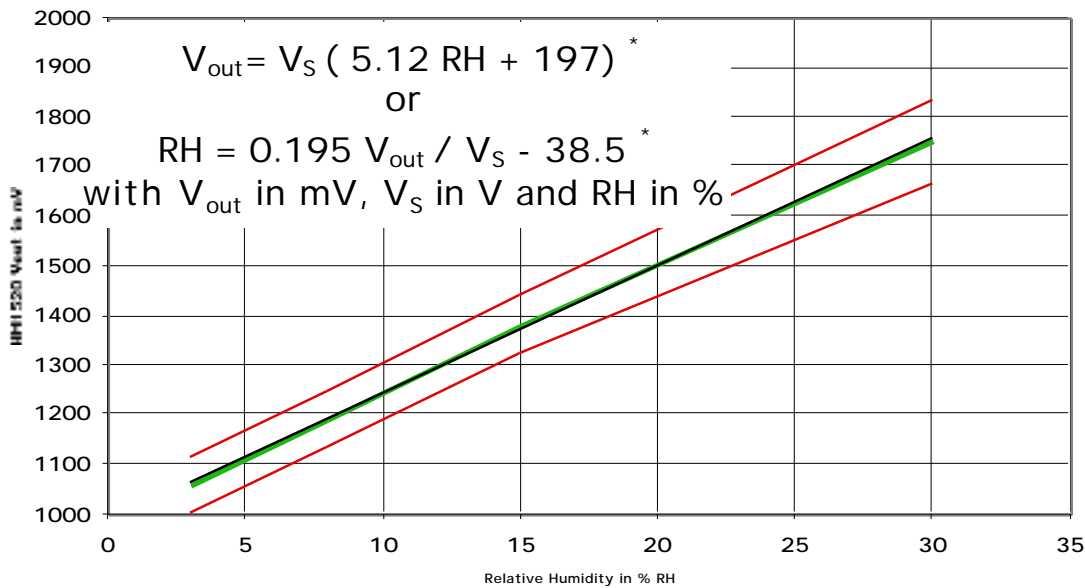
Accuracy of HM1520 when used from 1 to 95% RH



Characteristics ($V_s = 5.0V_{dc}$, $R_L > 1 M$ otherwise stated)

Characteristics	Symbol	Min	Typ	Max	Unit
Humidity measuring range / Ta -30 to 60°C	RH	1		99	%RH
Relative Humidity accuracy(1-20%RH) at 23°C	RH		+/-2	+/- 3	%RH
Relative Humidity accuracy at 55% RH at 23°C	RH		+/-5		%RH
Voltage supply	V_s	4.75	5.00	5.25	V
Nominal output @ RH = 10 % / Ta 25°C	V_{out}	1.17	1.24	1.31	V
Current consumption	I_c		0.4	0.8	mA
Temperature coefficient(10 to 50 °C and 1 to 20% RH)	T_{cc}		< 0.1		%RH / °C
Averaged Sensitivity from 5% to 10 % RH	mV/%RH		+26		mV/%RH
Output Impedance	Z		70		Ohms
Sink current capability ($R_L = 15 kohm$)	I_s			300	μA
Humidity Hysteresis			+/-1.5		% RH
Long term stability			0.5		%RH/yr
Response time (5 to 10% RH, static, @63%)			5		s

HM1520 Preliminary Specification when used from 1 to 30% RH



- Those equations can be used above 30% RH and allow to obtain an over all accuracy as described in page one of this document in all the humidity measuring range
- Temperature (in the range 0 to 50°C) does not affect HM1520 measurement when used from 1 to 30% RH. No temperature compensation is required.

Signal output from 1 to 20% RH at 23°C :

RH (%)	0	1	2	3	4	5	6	7	8	9	10
Vout (mV)		1013	1038	1064	1089	1115	1141	1166	1192	1217	1243
RH (%)	11	12	13	14	15	16	17	18	19	20	
Vout (mV)	1269	1294	1320	1346	1371	1397	1422	1448	1474	1499	

With $V_s = 5.0$ Volts DC

Calibration data are **traceable to NIST** standards through CETIAT laboratory.

IMPORTANT NOTICE : HM1520 is based on HS1101 capacitive sensor and thus is fully useable on a large range of relative humidity (1 to 99% RH). In that range, HM1520 presents a typical accuracy of +/-5% RH at 55% RH.)

However HM1520 is a dedicated module for humidity measurements at low Relative Humidity levels.

Thus, HM1520 is also well adapted to measure water concentrations (ppm) or low dew points when associated with an ambient temperature probe.

HM1520 features an optimized accuracy for **water concentration below 6000ppm water or 0°C dew point at 23°C** (equivalent to 20% RH) .

TYPICAL OUTPUT of HM1520 when measuring water concentration at ambient temperature of 23°C :

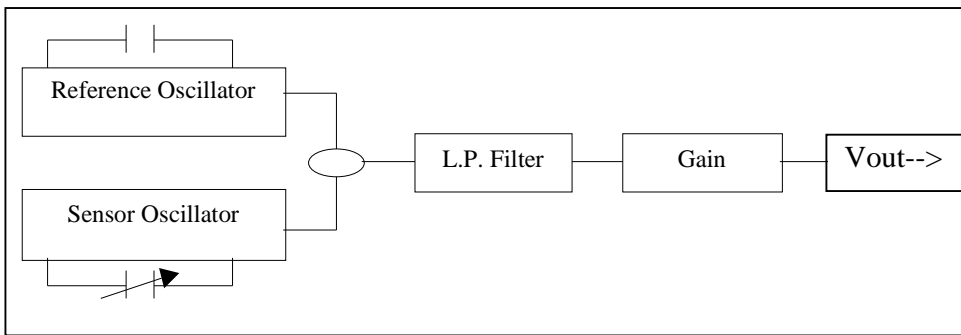
ppm	0	275	550	825	1100	1375	1650	1925	2200	2470	2750
Vout (mV)		1013	1038	1064	1089	1115	1141	1166	1192	1217	1243
ppm	3025	3300	3570	3850	4120	4395	4670	4945	5220	5495	
Vout (mV)	1269	1294	1320	1346	1371	1397	1422	1448	1474	1499	

$$\text{ppm}_{\text{water}} = 10.75 V_{\text{out}} - 10615 \quad \text{with } V_{\text{out}} \text{ in mVolts}$$

TYPICAL OUTPUT of HM1520 when measuring dew point at ambient temperature of 23°C :

°C		-36	-29	-24	-21	-18.5	-16	-14.5	-13	-11.5	-10
Vout (mV)		1013	1038	1064	1089	1115	1141	1166	1192	1217	1243
°C	-9	-7.8	-6.8	-5.8	-4.9	-4.1	-3.2	-2.5	-1.6	-1.1	
Vout (mV)	1269	1294	1320	1346	1371	1397	1422	1448	1474	1499	

Internal Block Diagram



Package outline HM1520

