The sensor is designed to measure temperature and humidity with 1-wire bus communication. Thanks to its narrow design, it is suitable for use in narrow spaces such as risers, shafts or RACK cabinets and therefore it can be used, for example, for measurements in data centers or server rooms. The 4-core PVC "telephone" cable is terminated with an RJ11 connector as standard, but the sensor can also be supplied without a cable terminated with a connector.

he information about measured values is transmitted using the DS2438 circuit on a 1-wire communication bus. Each sensor has its own unique address, which must be found via the bus using a Master device - e.g. a 1 wire extension from Loxone. If more accurate temperature measurement is required, a DS18B20/DS18S20 temperature sensor can be added to all types, in which case the device will communicate at two addresses. The sensors must be protected from dirt, excessive dust or direct exposure to water!

Basic technical parameters

Supply voltage (Ucc) [1]	5 VDC
Current consumption	max. 2 mA
Type of used temperature sensor	DS2438 / SHT40I / DS18B20
Accuracy of temperature measurement [1]	DS2438 ± 2°C / SHT40I ± 0,5°C / DS18B20 ± 0,5°C
Type of used humidity sensor	SHT40I
Measurement range of humidity	0 ÷ 100%
Humidity resolution	0,25%
Accuracy of RH (+25°C) [1]	± 3% (20 ÷ 80 %RH)
Communication	1- wire
HW Communication interface	DS2438 (+DS18B20)
Galvanic separation input - output - 1wire	no
Range of working temperature and humidity [2]	-10 ÷ 40°C / 0 ÷ 100 %RH without condensation
Range of recommended storage temp. / RH	10 ÷ 50 °C / 20 ÷ 60 % RH
Protection level	IP40 (EN 60529)
Connector type	RJ11
Connector of 1W-HT-S, 1W-HT+DB-S	Terminal block, conductors max. 1mm^2
Cable	4-core PVC „telephone"
Dimensions	65 x 9 x 5 mm

[1] The accuracy of temperature and RH measurement depends on the stability of the supply voltage Ucc (pin 4 of the RJ11 connector), as the STH40I sensor is directly powered from it, see. *Formulas for calculating the value of measured quantities*

[2] The sensor operates stably within the recommended measuring range, which is 5 ÷ 60 °C and 20 ÷ 80 %RH. Long-term exposure to high humidity, especially >80%RH, results in a gradually increasing deviation of the RH reading (+3%RH after 60 hours >80%RH). After returning to the normal range, the RH measurement slowly returns to the calibrated values. Long-term exposure to extreme conditions can accelerate the aging of the sensor.

Connector connection RJ11 (1W-HT)
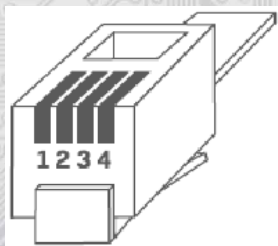
Terminal 1......... Not used
Terminal 2......... 1-wire (data)
Terminal 3......... GND
Terminal 4......... + 5V (Ucc)

Wirring diagram   (1W-HT-S, 1W-HT+DB-S)

Terminal 1......... 1-wire (data)
Terminal 2......... GND
Terminal 3......... + 5V (Ucc)

2025/01

 List of types :

1W-HT-y

Types with temperature sensor DS18B20

1W-HT+DB-y   y = cable length in meters (standard length is 3m)

Types without cable terminated with terminal block
 1W-HT-S or   1W-HT+DB-S

Description of measured quantities:

T (temperature)
All types have a temperature sensor, which is part of the DS2438 circuit and temperature sensor SHT40I.
Type 1W-HT+DB... a DS18B20/DS18S20 temperature sensor is added; the device will communicate at two addresses.

RH (relative humidity)
To measure RH, an SHT40I sensor is used; the output of which is processed by one of the A/D converters
of the DS2438 circuit.

Formulas for calculating the value of measured quantities:

1. Calculation from bit values of registers:

rVDD   = register value VDD (supply voltage to DS2438) [b]
rVAD   = register value VAD [b]
rVsens = register value Vsens [b]

T(SHT40I) [°C] = -66,875+218,75*((0,00390625*rVsens)/(rVDD*0,01))
RH [%]   = -12,5+125*((rVAD*0,01)/(rVDD*0,01))

2. Calculation from voltage values:

VDD   = voltage value (supply voltage to DS2438) [V]
VAD   = voltage value [V]
Vsens = voltage value [V]

T(SHT40I) [°C] = -66,875+218,75*(16*Vsens/VDD)
RH [%]   = -12,5+125*(VAD/VDD)