FU.SEN.RSV.011 Low Power Heterodyne Contact Sensor IP65
S/N 564YYXXXX

General description:

RSV are standalone ultrasound heterodyned voltage output sensors designed to be used with IOT applications.

RSV uses a resonant contact Sensor designed for ultrasound driven lubrication, steam systems inspection and valve inspection. Sensitive to friction, impact and turbulence, RSV delivers an analog signal indicative of the machine or accessories condition.
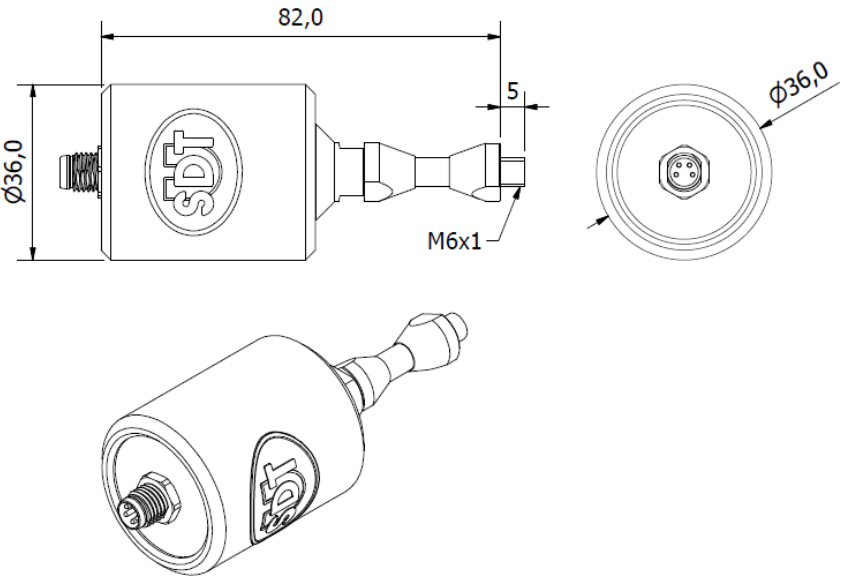
Features:

- Static or dynamic output;
- On board amplification stages;
- Hardware calibration;
- On board ambient T° measurement (through serial communication);
- Non-volatile memory (used to save configuration and recover sensor state/mode upon power outage);
- Unique ID;
- Digital I/O communication for simple use;
- Serial communication for advanced use.

### Top view pinout (IEC 60947-5-2 compliant):
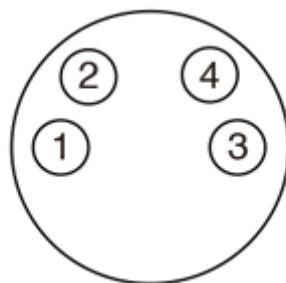
1 = POWER SUPPLY (BN)
2 = OUTPUT VOLTAGE (WH)
3 = GROUND (BU)
4 = COMMUNICATION LINE - should be left floating if not used – (BK)

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Technical data:

General specifications	
Dimensions [mm]	
Weight	126 Gram / 4.44 Oz
IP rating	IP65
Installation	
Power supply	3.6 [V] +/- 10%
Operating temperature	-20 [°C] to +85 [°C]
Pinout voltage	GROUND to VDD
Recommended maximum cable length	30 [m] / 100 [feet]
Recommended mounting torque	2 N.m
Sensor signal (Typical)	
Resonant frequency	37 [kHz] +/- 1 [kHz]
Gain range	0 [dB] to 60 [dB]
Gain step	12 [dB]
Connector size	M8 - 4 pin
Heterodyne signal (Typical)	
Heterodyne frequency	38.5 [kHz] +/- 10%
Bandwidth	[0.25 – 4] [kHz]
RMS Time Period in static mode	1 [s]

Factory configuration	
Signal mode	Dynamic
Gain	60 dB
Optional accessories offered by SDT	
Cables with Straight M8 Connector	
FU.RSC.CABL.01.015-1	SENSOR-/ACTOR CABLE M8 4PF <> FREE END 1.5m - STRAIGHT SHIELDED
FU.RSC.CABL.01.030-1	SENSOR-/ACTOR CABLE M8 4PF <> FREE END 3.0m - STRAIGHT SHIELDED
FU.RSC.CABL.01.050-1	SENSOR-/ACTOR CABLE M8 4PF <> FREE END 5.0m - STRAIGHT SHIELDED
FU.RSC.CABL.01.100-1	SENSOR-/ACTOR CABLE M8 4PF <> FREE END 10.0m - STRAIGHT SHIELDED
Cables with 90° M8 Connector	
FU.RSC.CABL.02.015-1	SENSOR-/ACTOR CABLE M8 4PF <> FREE END 1.5m - 90° SHIELDED
FU.RSC.CABL.02.030-1	SENSOR-/ACTOR CABLE M8 4PF <> FREE END 3.0m - 90° SHIELDED
FU.RSC.CABL.02.050-1	SENSOR-/ACTOR CABLE M8 4PF <> FREE END 5.0m - 90° SHIELDED
FU.RSC.CABL.02.100-1	SENSOR-/ACTOR CABLE M8 4PF <> FREE END 10.0m - 90° SHIELDED
FA.RSC.ACC.002-01	CONMONSense - HEAT SINK - AISI303 Ø30,0 (M6) x74,5mm

Normalized heterodyned response curve (typical)
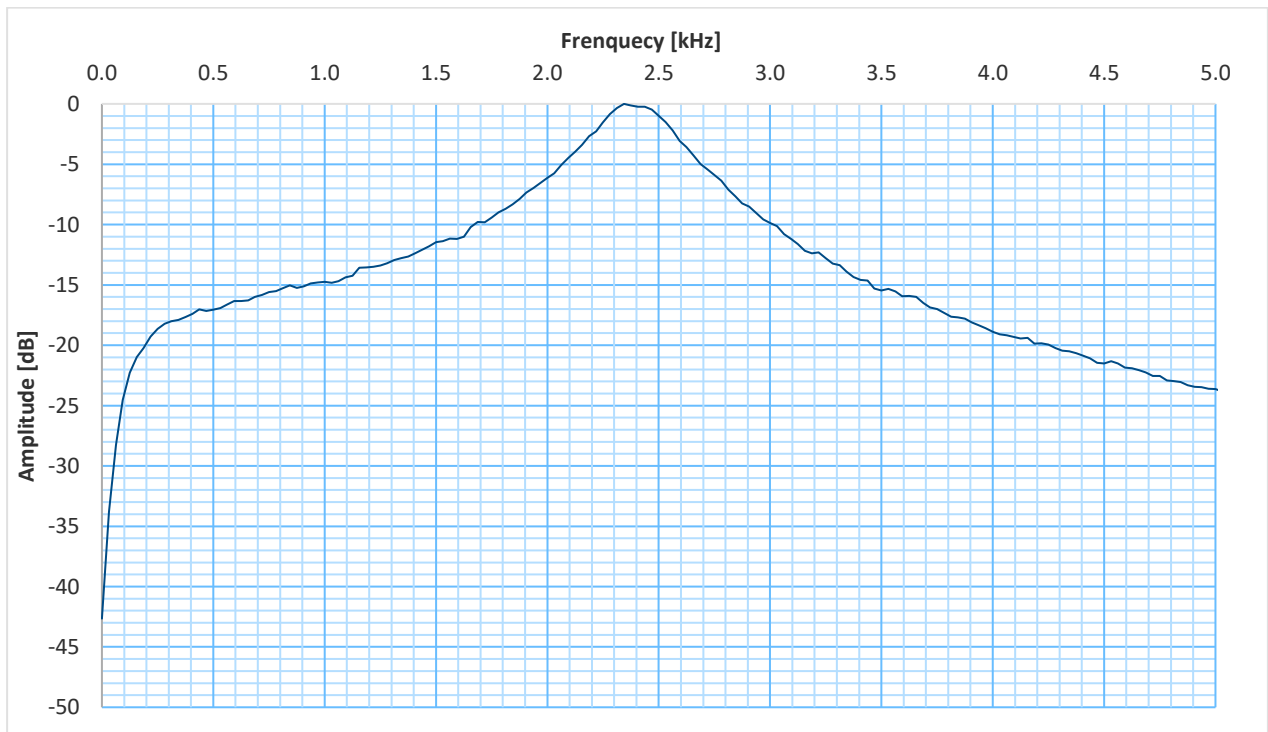
Communication:

Digital output mode

Gain and mode can be selected by generating pulses on the communication line.

The default state of the line is +VDD (pulled up internally with a 10 [kΩ] resistor) and a pulse consists of pulling the line down for at least 1 [ms] then releasing the line.

After the first pulse is initiated a 5 [s] internal timer is started. When the 5 [s] timeout occurs, the sensor counts how many pulses it received during this time-lapse:

- 1 pulse: increase the gain by 12 [dB] (has no effect if the gain is already at 60 [dB]);
- 2 pulses: decrease the gain by 12 [dB] (has no effect if the gain is already at 0 [dB]);
- 3 pulses: change the mode (switch between static and dynamic mode);
- 4 pulses: initialize the sensor in dynamic mode with a gain of 60 [dB] (factory reset);

After any modification, data are saved inside a non-volatile memory and are restored on sensor power on.

Example

- Change the output mode (generate 3 pulses under 5 [s]).
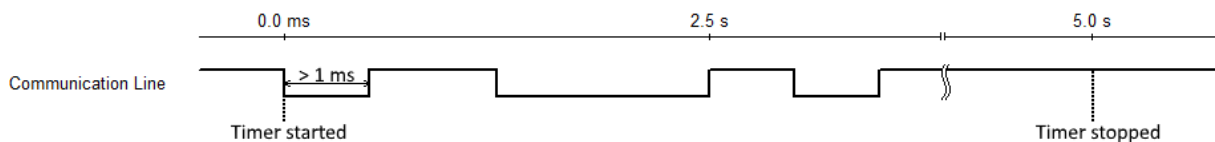
Serial mode

The communication line can also be used for a serial communication allowing advanced features. The protocol used is UART 9600-8-E-1 (9600 bauds, 8 data bits, 1 even parity bit, 1 stop bit). The user can write data to the sensor:

1) The serial communication is initialized by the user by sending the header byte <AAh>;
2) The second byte is the device address or the generic address (<00h>). The sensor will only answer to its specific address or to the generic address;
3) The third byte is the memory address (see below) that the user wants to write or to read;
4) The fourth byte is the operation: <00h> for a write operation;
5) During a write, the fifth byte is sent by the user with the data that needs to be written;
6) During a write, the sixth byte is sent by the user and contain the one-byte checksum.

The one-byte checksum is the LSB (least signification byte) from the addition of all bytes sent.

After any modification, data are saved inside a non-volatile memory and are restored on sensor power on.

Memory address

00	Sensor specific address (R/W)	range 0 to 255
01	Sensor gain (R/W)	range 0 to 60 with a step of 12
02	Sensor mode (R/W)	1 for static mode; 2 for dynamic mode

Example

a) write a new specific device address, <11h> to the sensor:

User: <AAh 00h 00h 00h 11h BBh>

(Checksum is AAh + 11h = BBh)

Revision	Writer	Nature of modification	Approved
04	CMA 20/04/2021	Max cable length	RGO
03	CMA 05/11/2020	New info in table + factory reset	RGO
02	CGI 29/10/2020	No commas but dots	RGO
01	RGO 27/10/2020	Original version	CGI
Revision	**Writer**	**Nature of modification**	**Approved**

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