FU.SEN.RSV.012 Low Power Heterodyne Airborne Sensor IP65 S/N 567YYXXXX

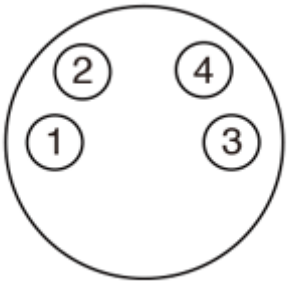
General description:

RSV are standalone ultrasound heterodyned voltage output sensors designed to be used with IOT application.
RSV uses a resonant Airborne Sensor designed for electrical application. Sensitive to friction, impact and turbulence, RSV delivers an analog signal indicative of the machine or accessories condition.

Features:

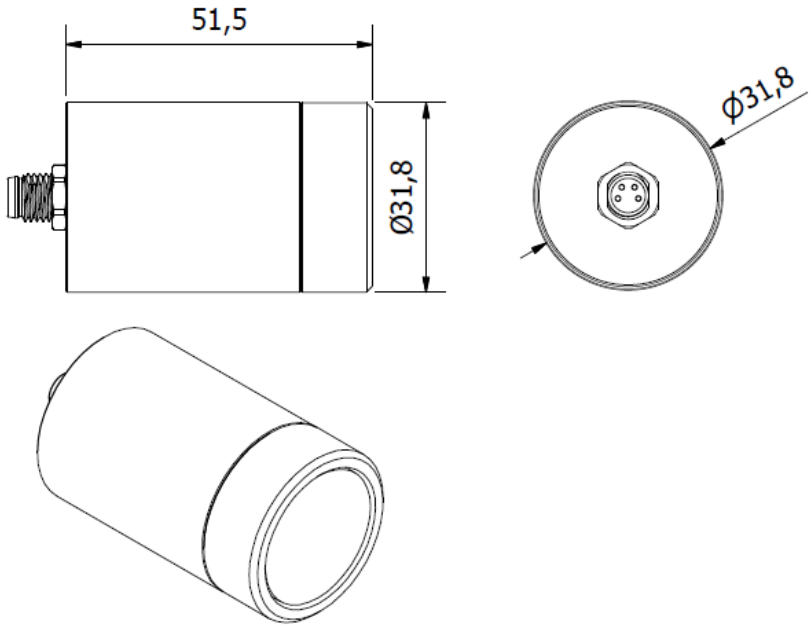
- Static or dynamic output;
- On board amplification stages;
- Hardware calibration;
- On board ambient T° measurement (through serial communication);
- Non-volatile memory (used to save configuration and recover sensor state/mode upon power outage);
- Unique ID;
- Digital I/O communication for simple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

Top view pinout (IEC 60947-5-2 compliant):

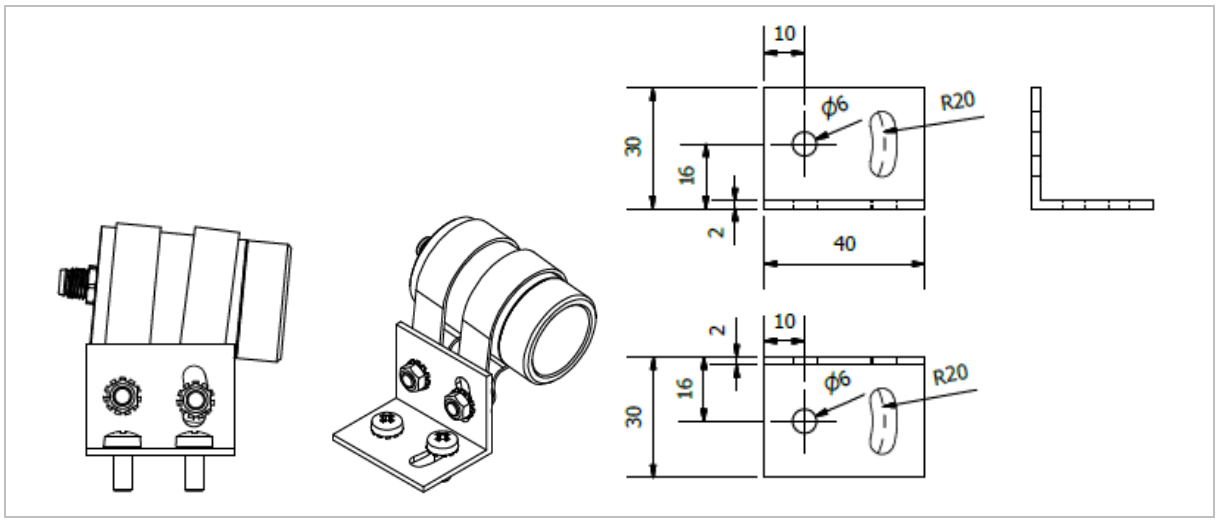


1 = POWER SUPPLY (BN)
2 = OUTPUT VOLTAGE (WH)
3 = GROUND (BU)
4 = COMMUNICATION LINE - should be left floating if not used – (BK)

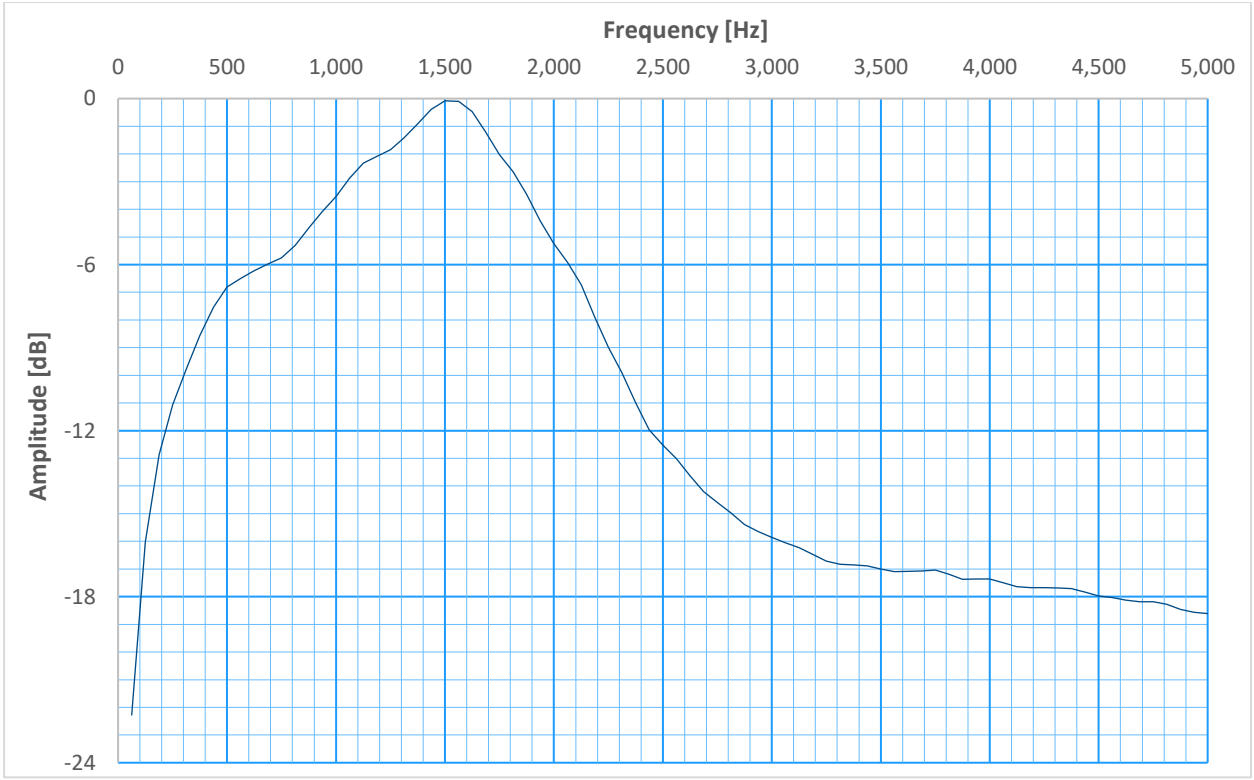
Technical data:

General specifications	
Dimensions [mm]	
Weight	82 Gram / 2.9 Oz
IP rating	IP65
Installation	
Power supply	3.6 [V] +/- 10%
Operating temperature	-20 [°C] to +70 [°C]
Pinout voltage	GROUND to VDD
Recommended maximum cable length	30 [m] / 100 [feet]

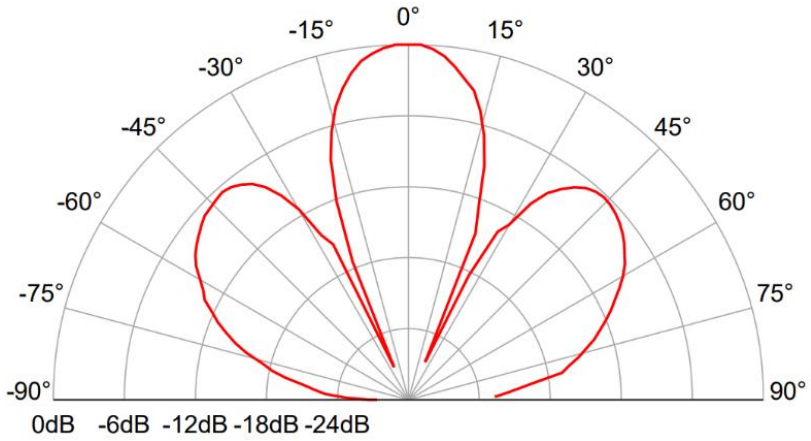
Sensor signal (Typical)	
Resonant frequency	40 [kHz] +/- 1 [kHz]
Gain range	0 [dB] to 60 [dB]
Gain step	12 [dB]
Connector size	M8 - 4 pin
Heterodyne signal (Typical)	
Heterodyne frequency	38.5 [kHz] +/- 10%
Bandwidth	[0.25 – 4] [kHz]
RMS Time Period in static mode	1 [s]
Factory configuration	
Signal 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
Mounting bracket	
FA.RSC.ACC.001-01	4-20mA Heterodyne Mounting Accessories



Normalized heterodyned response curve (typical)



Beam angle



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.

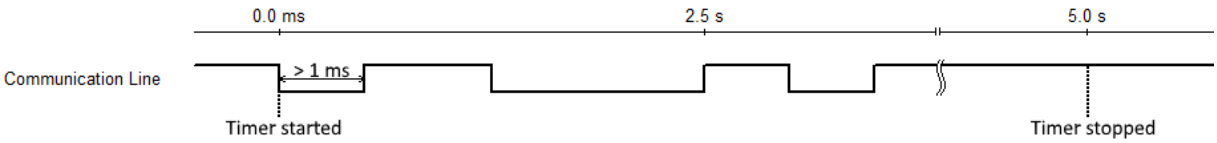
After the first pulse is initiated a 5 [s] internal timer is started. When the 5 [s] timeout occurs, the sensor counts how many pulses it received during this time-lapse:

- 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:

- The serial communication is initialized by the user by sending the header byte <AAh>;
- 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;
- The third byte is the memory address (see below) that the user wants to write or to read;
- The fourth byte is the operation: <00h> for a write operation;
- During a write, the fifth byte is sent by the user with the data that needs to be written;

- 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