MOHO AIR

Infrasonic sensor

Key features

✅ Compact design
✅ Switchable gain
✅ Easy and rapid deployment
✅ Working modes: DataStreamer, Seedlink, Win2SDR, EwExport.

Applications

✅ Disaster warning
✅ Detect industrial explosions
✅ Study atmospheric and geophysical processes

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QUAKELOGIC

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1. General specifications

Performance

Analog input channels:	1 (CH1)
ADC:	Delta-Sigma, 24 bits, Cirrus Logic CS5532
Sample rate:	■ 50 ■ 100 ■ 200
Resolution (effective bits):	21 @ 100 SPS
Clip level:	±8,388,608 counts @ 24 Bits
Adjustable gain:	Yes
Selectable gain:	2, 4, 8, 16, 32, 64
Selectable digital filters:	■ Low-pass filter ■ High-pass filter ■ Inverse filter
Polarity correction:	Yes
Sensor included:	Differential Pressure Sensor

Single Board Computer (SBC)

SBC full compatibility:	■ Raspberry Pi Zero 2W ■ Raspberry Pi Zero W
SD card support:	MicroSD 8 GB (included) for operating system and data storage

Communications

Timing:	NTP (Network Timing Protocol, default)
Data transmission:	■ TCP ■ UDP
Connectivity:	■ 802.11 b/g/n LAN wireless (Wi-Fi 4) ■ Ethernet 10/100 BaseT (on request)

Software

Operating System:	Linux BBshark 5.10.63+ (based on Raspberry Pi OS)
Software:	■ Earthworm ■ WindSDR
Continuous seismic data:	miniSEED format
Web-interface (HTML):	■ Network and system settings ■ Helicorder and waveform plot generator ■ System status and logs.
System Requirements:	■ Windows ■ Linux ■ Mac OS

Physical

Dimensions:	■ 100x100x107 mm (without feet)
Weight:	■ 410 g
Enclosure rating:	IP54, standard 3D printed enclosure
Environment[1]:	Operating temperature, 0°C to +45 °C

[1] Limited by the PETG case, the Raspberry Pi, the digitizer board and the geophone themself can go from -20°C to +70°C)

Power

Input power:

- 12 V/2.1 A DC via wall plug AC-DC power adapter supply
- 5 V via GPIO header
- 1.752 W power consumption (run-time, 5 V × 350 mA)

1.1. Recommended operating conditions

Minimum and maximum specifications apply from T_A = –20°C to +70°C. Typical specifications are at T_A = 25°C.

PARAMETER		MIN	NOM	MAX	UNITS
Input power supply					
V_{A+}	Power supply voltage:	4.75	5.0	5.25	V
Analog input (note 1, note 2)					
V_{IN}	Differential input voltage, eq. (1):	-0.3		V_{A+}+0.3	V
V_{CM}+V_{AINx}	Common-mode + Signal on AIN1+ or AIN1-:	0.7		V_{A+}-1.7	V
	Absolute input voltage (+IN, -IN):	See the Analog interface pinout section			

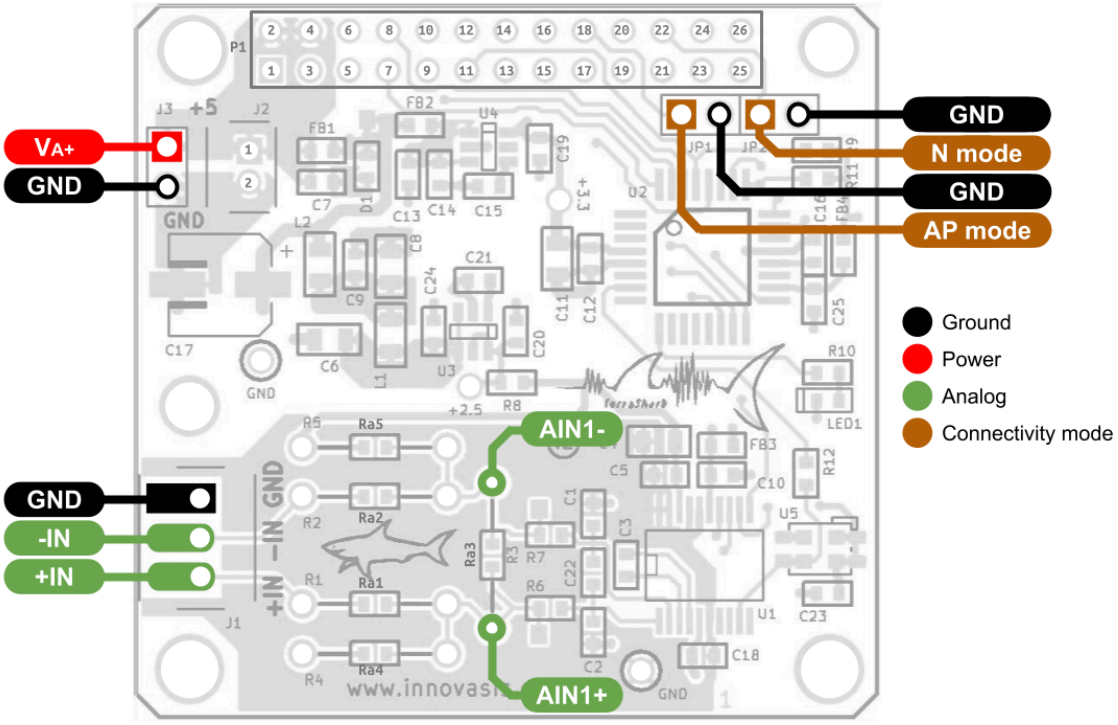
Notes:
1. For accurate measurements, in the gain ranges from 2 to 64, the input signals AIN+ and AIN- (voltages in R3 and Ra3, Fig. 1) must remain between the given voltages values (MIN and MAX).
2. Voltage on the BIS-M1DAQ analog inputs

The differential input voltage is denoted by V_{IN}, and it is calculated using eq. (1):

$$V_{IN} = V_{AIN+} - V_{AIN-} \quad (1)$$

The common-mode voltage is calculated using eq. (2):

$$V_{CM} = \frac{V_{AIN+} + V_{AIN-}}{2} \quad (2)$$



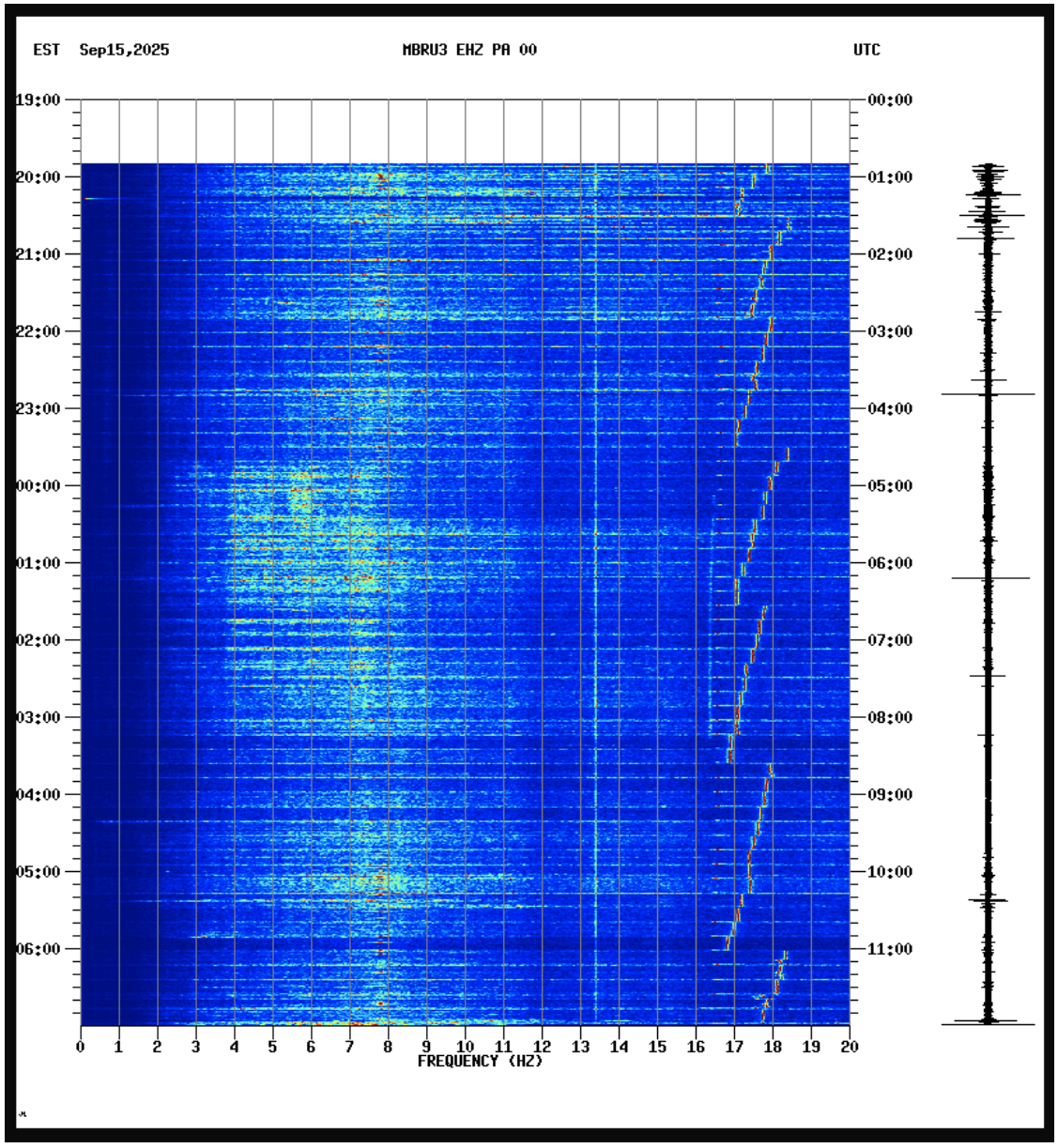
1.2. Typical characteristics

PARAMETER		MIN	NOM	MAX	UNITS
Power supply					
V_D	ADC digital power supply:		3.3		V
Voltage reference					
V_{REF}	Reference voltage:	2.498	2.5	2.502	V
	Output voltage temperature drift:		2.0	8	ppm/°C
	V_{REF} long-term stability (1000 hours T_A=25°C):		40		ppm
Internal clock source					
f_{CLK}	Internal frequency clock:		4.9152		MHz
f_{stab}	Internal frequency clock stability:	-20		20	ppm
DC	Duty cycle:	45		55	%

2. Sensor specifications

Quakelogic AIR personal infrasound sensor is a scientific-grade instrument designed to monitor infrasound. It is WiFi-connected and includes an internal web interface that allows you to view, in real time, both the device status and the data your AIR is recording.

The AIR also features a built-in data server compatible with any standard software that accepts MiniSEED input, such as Jamaseis, WinSDR, WinQuake, Swarm, ObsPy, and many others. In addition, AIR provides direct access to spectrogram data from the past week, displayed in 12-hour segments, making it easy to review recent infrasound activity at a glance.



3. Interface

3.1. Software-selectable parameters

VARIABLE	DESCRIPTION	MIN	NOM	MAX	UNITS
Sample rate					
ChanRate	Sampling rate (Samples/s):	50	100	200	SPS
Digital filter					
LP	Low-pass filter:	0.01	15	24	Hz
HP	High-pass filter:	0.02	0.1	49	Hz
INV	Inverse filter filter:		0.5		Hz
ADC channel characteristics					
Gain	ADC channel gain (2, 4, 8, 16, 32, 64):	2	2	64	
Bits	Set the usable ADC bits:		24		Bits
DcOffset	Offset to the incoming data in ADC counts:	0	0	$(2^{Bits}/2)-1$	Counts
VARIABLE	DESCRIPTION		NOM	OPTIONS	
ADC channel characteristics					
Invert	Polarization correction of the ADC signal:		N	Y, 1	N, 0
SendToEW	Send ADC data to Earthworm ring:		Y	Y, 1	N, 0
SendToWinSDR	Send ADC data to WinSDR using the TCP Server:		Y	Y, 1	N, 0

Notes: Y=Yes, 1=Yes, N=No, 0=No