Intellijel MEMS Mic

Micro Electro Mechanical System Microphone Module

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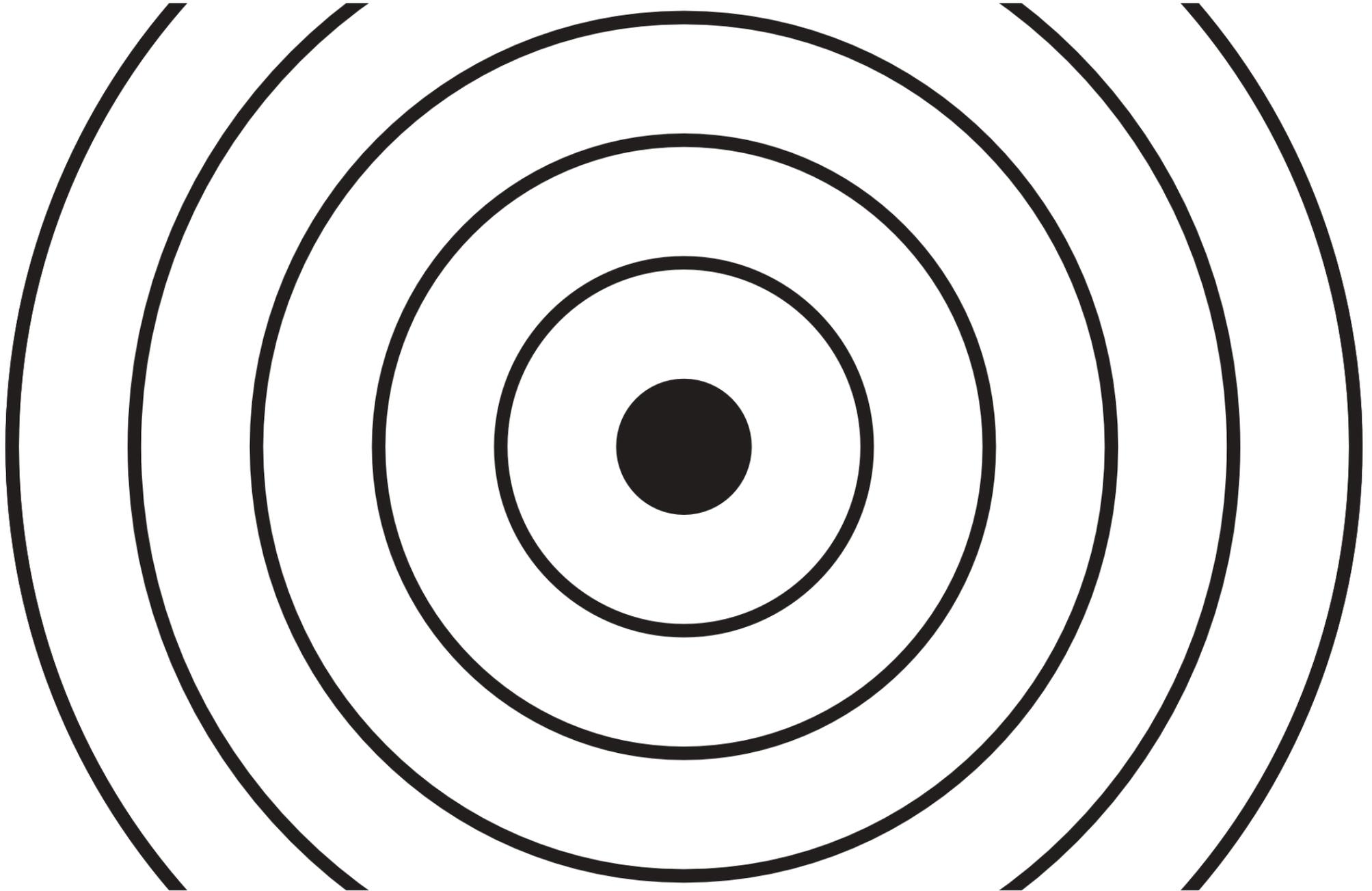
Compliance

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by Intellijel Designs, Inc. could void the user's authority to operate the equipment. Any digital equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

This device meets the requirements of the following standards and directives:
EMC: 2014/30/EU
EN55032:2015 ; EN55103-2:2009 (EN55024) ; EN61000-3-2 ; EN61000-3-3
Low Voltage: 2014/35/EU
EN 60065:2002+A1:2006+A11:2008+A2:2010+A12:2011
RoHS2: 2011/65/EU
WEEE: 2012/19/EU

Installation

Installation 〉 Before you Install

MEMS Mic is designed to be used with a Eurorack-compatible case and power supply. We recommend our Intellijel Cases and Power Supplies.

You will need…

- Ribbon power cable (included)
- Rack screws (included) and a screwdriver (not included).
- 2HP of 3U rack space.
- One free power header on your Power Bus Board.
- Enough current draw from your Case Power Supply.

Check your PSU has enough juice (aka current)

1. For every module connected to the power supply board (inc. MEMS Mic), record the current draw at each voltage: +12V, -12V and +5V. This info is commonly found in the manual. See **Technical Stuff** for Mic Specs.
2. Sum together all current values with matching voltages - giving you three separate current values.
3. Compare these to the current values stated in the specifications of your Case Power Supply. If the current value at each voltage for all modules is less than the Power Supply's current values, MEMS Mic can be installed.

⚠️ **Failure to adequately power your modules may result in damage to your modules or power supply.**

We would strongly recommend against:

- Leaving gaps between modules – dirt and debris can fall in and cause issues such as electrical shorts.
- Using open frames or enclosures that expose the backside of the module or power supply.

You can use a tool like **ModularGrid** to assist in your planning. If you are unsure about anything relating to installation, please **contact us** before proceeding.

Installation 〉 Install your Mic

1. Switch off and disconnect the power supply from your eurorack case.

⚠️ **Failure to do so may result in serious injury or equipment damage.**

2. Connect the 10-pin end of the included ribbon cable to the power header on MEMS Mic. The header is shrouded to help with orientation. This cable may already be connected to the module. If so, ensure it is seated correctly. The red stripe on the ribbon cable should be aligned with the side of the connector marked "-12V."


Power Bus Board

MEMS Mic
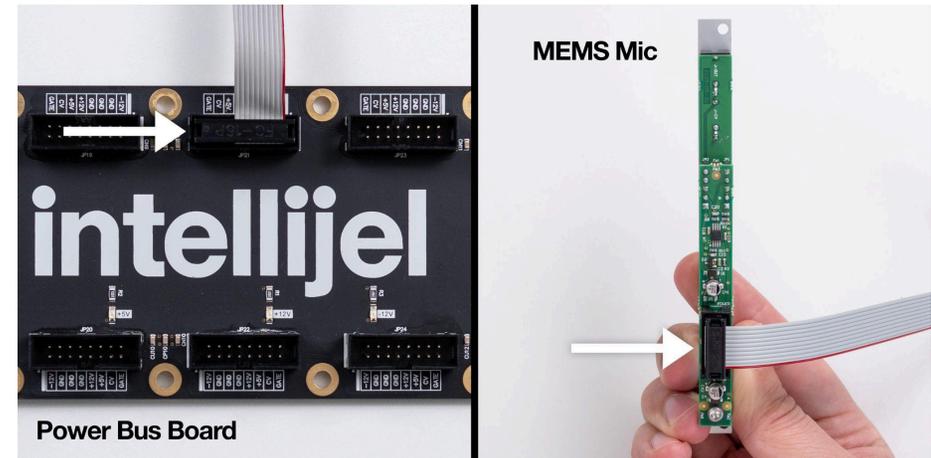
3. Connect the 16-pin end of the ribbon cable to an available header on your case's power bus board. Ensure the red stripe on the ribbon cable aligns with the side of the power header labelled "-12V" or similar. Current Intellijel cases use shrouded headers to help with orientation. If you're unsure, please check the manual for your power supply or case.

⚠️ **Misalignment or a backwards ribbon cable can potentially damage the module. Double check alignment and that the headers are fully seated before continuing.**

4. Reconnect the power supply and switch on. Immediately check that all modules are switched on and operating correctly. If you notice a problem, power off your system immediately and check for mistakes.

Features
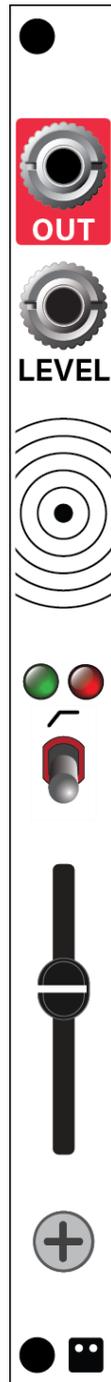
OUT

Microphone audio output.

LEVEL

Linear CV input for level control, attenuated by **LEVEL Slider**.
Normalled to +5V. Range = 0-10V (5V = Unity Gain).

MEMS Microphone

MEMS Microphone component behind panel, covered by a thin protective membrane. **Do not** insert anything into the hole, or you risk damaging both the membrane and the microphone itself.

LED Indicators

GREEN LED (left) indicates level, *RED* LED (right) indicates overload.

Highpass Filter Switch

Low frequency roll-off switch at 180Hz, 6dB/oct.

LEVEL Slider

Attenuates **LEVEL**.

⚠️ Caution - Feedback Warning

MEMS Mic can cause loud feedback under certain conditions. Loud sounds can cause hearing damage / loss. Please observe the following precautions:

1. Before patching **OUT** to the audio path of your system, ensure the **LEVEL Slider** is all the way down - its lowest setting.
2. When using speakers or studio monitors, start by setting them to low level or off. Carefully raise the volume, listen for feedback and be prepared to mute the speakers if feedback runs away.
3. When using headphones only, it is unlikely that feedback will occur. Exercise caution when using both headphones and speakers simultaneously.

What is a MEMS Mic?

MEMS Mic is constructed with a Micro-Electro-Mechanical System (aka MEMS) component, placed on a printed circuit board and protected by a mechanical cover. MEMS Microphones are extremely small, and can be found in a lot of modern electronic devices e.g. phones, tablets, cameras etc. Despite their compact size, they have a very flat response across a large frequency range (~ 6hz to 20kHz.) which makes them excellent for musical applications.

Patch Tips

In addition to using the MEMS Mic as a conventional microphone, eg. recording your voice, instruments, and/or your environment, there are plenty of other inventive ways to incorporate microphone audio into a patch. Here are some tips to help get you started.

Microphone Output as CV

This might be one of the most important tips for MEMS Mic - you don't have to use the audio as *audio*. Try using it as a CV source instead.

You can patch directly from **OUT** for audio rate modulation. To slow things down, try patching through a slew limiter, envelope follower, or sample & hold module first - **Flurry** or **Noise Tools 1U** both have all of these tools built in.

Experimenting with Feedback

Whilst adhering to the precautions on the previous page, experimenting with audio feedback can be a great way to create tones, drones, and noise using the space that you're in.

If you want to play with feedback: start with the **LEVEL Slider** at its lowest setting, turn up your speakers, then *carefully* raise the **LEVEL Slider** - but be ready to bring it back down if it gets too loud.

Instead of relying on the **LEVEL Slider**, why not try a momentary gate / cv source such as our **FSR 1U** module. This allows you to build up feedback by pressing the pad, and then you can release it to instantly mute the mic.

Case Contact Mic

The MEMS Microphone in this module is not fully isolated, meaning that you can pick up physical sounds and resonances from your Eurorack case.

Different materials, such as wood, metal, plastic, will all create different tones that MEMS Mic can pick up. You can sample these sounds or process them through effects - **Multigrain** is a great partner module for this use case.

Stereo MEMS Mics (Two Modules)

Why not get two MEMS Mics and place them on either side of a row - now you're working in stereo!

Gain Booster

Need more gain? Patch up to +10V into **LEVEL** to boost the output. +10V will give you +6dB above Unity Gain (5V).

Technical Stuff

Specifications

Module Width:	2HP
Depth:	35mm
Current:	19mA @ +12V
	19mA @ -12V
Mic Specs:	Type: MEMS
	Pattern: Omni
	Freq: 6Hz ~ 20kHz
	SNR: 63dBA
	Sensitivity: -45dB ±2dB @ 94dB SPL
	130 dB SPL Acoustic Overload Point
Highpass Filter:	1-Pole (6dB/oct) @ 180Hz