

LamaPLC: MAX4466/MAX9814: Low-noise Microphone Preamplifiers

The MAX4466 and MAX9814 are low-noise microphone preamplifiers typically used with electret microphones to convert sound into electrical signals for microcontrollers like Arduino.

MAX4466: Fixed Gain Amplifier

The MAX4466 is a straightforward operational amplifier optimized for use as a microphone preamp.



- **How it works:** It amplifies incoming audio by a set amount that you can manually tune using a potentiometer (trimmer).
- **Key Advantage:** It provides consistent, predictable gain. If the sound volume stays the same, the output stays the same.
- **Best For:** Audio-reactive projects (like FFT visualizers), precise sound level monitoring, and voice changers where you want full manual control over sensitivity.

MAX9814: Automatic Gain Control (AGC) Amplifier

The MAX9814 is a more sophisticated chip that features Automatic Gain Control (AGC).

- **How it works:** It dynamically adjusts its own gain. It makes quiet sounds louder and prevents loud sounds from “clipping” (distorting) by automatically lowering their volume.
- **Key Advantage:** It handles unpredictable environments where sound levels vary wildly without needing manual adjustment.
- **Best For:** Voice recognition, conferencing systems, portable recorders, and any application where you need a stable output level regardless of how far away the speaker is.


Comparison Table: MAX4466 vs. MAX9814

Feature	MAX4466	MAX9814
		
Gain Control	Manual: Adjusted via an onboard potentiometer.	Automatic (AGC): Automatically adjusts to keep sound levels constant.
Gain Range	Variable from 25x to 125x (~28dB to 42dB).	Selectable base gains of 40dB, 50dB, or 60dB.
Operating Voltage	2.4V to 5.5V	2.7V to 5.5V
Noise Level	Low: Known for excellent power supply rejection (112dB)	Very Low: Features 30nV/rtHz input-referred noise density
Behavior	Predictable and consistent output for fixed sounds	Adaptive; prevents “clipping” from sudden loud noises

Feature	MAX4466	MAX9814
Complexity	Simple op-amp; easy to wire and use	Advanced; allows tuning "Attack" and "Release" ratios
Best For	Audio-reactive LEDs, FFT visualizers, and precise monitoring	Voice recognition, conferencing, and dynamic environments

Key Differences

- **Audio Consistency:** Choose the MAX4466 if you need your electrical signal volume to accurately reflect the room volume. Choose the MAX9814 if you want the signal to stay "loud and clear" even if the speaker moves closer or further away from the mic.
- **Power Efficiency:** The MAX4466 is a micropower device, drawing only about 24 μA, making it slightly better suited to ultra-low-power battery applications than the MAX9814.



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MAX9814 Module Pinout Table

^Pin^Name^Description|

VCC	Power Supply	Input voltage, typically 2.7V to 5.5V
GND	Ground	Common ground for power and signal
OUT	Analog Output	Audio signal output (approx. 2Vpp max) with a 1.25V DC bias
GAIN	Gain Control	Sets the maximum amplification level (see configuration below)
AR	Attack/Release	Adjusts the AGC's attack-to-release time ratio (see configuration below)

Configuration Settings

You can change the behavior of the module by connecting the GAIN and AR pins to VCC, GND, or leaving them "floating" (unconnected).

Gain Settings (Maximum Gain)

- **Unconnected (Floating):** 60dB (Maximum sensitivity).
- **Connected to GND:** 50dB.
- **Connected to VCC:** 40dB (Minimum sensitivity).

AR (Attack/Release Ratio) Settings

This controls how quickly the AGC responds to volume changes.

- **Unconnected (Floating):** 1:4000 ratio (Slowest response; best for most general purposes).
- **Connected to VCC:** 1:2000 ratio.

- **Connected to GND:** 1:500 ratio (Fastest response).

Pro-Tip: For the cleanest signal on an Arduino, connect VCC to 3.3V rather than 5V to minimize electrical noise from the power rail.

Arduino & MAX9814

Here's an example sketch to read audio signals from the MAX9814 and display the amplitude on the Serial Monitor:

```
const int microphonePin = A0; // Connect MAX9814 OUT to A0

void setup() {
  Serial.begin(9600);
  Serial.println("MAX9814 Microphone Test");
}

void loop() {
  int audioValue = analogRead(microphonePin); // Read audio signal
  Serial.print("Audio Amplitude: ");

  // use the Arduino Serial Print -> Tools > Serial Monitor
  // use the Arduino Serial Plotter -> Tools > Serial Plotter
  Serial.println(audioValue);

  delay(10); // Small delay for smooth readings
}
```

Sensor topics on lamaPLC

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• lamaPLC project: Arduino - OLED SH1106 with AHT20/BMP280 Sensor	2026/04/23 21:51	bmp280 , aht20 , temperature , humidity , pressure , sensor , arduino , oled , sh1106 , arduino code
• lamaPLC project: Arduino - Vibration sensors	2026/04/15 17:21	vibration , sensor , piezoelectric , mems , eddy-current , electrodynamic , gxfm0459 , ldtm-028k , arduino , arduino code
• lamaPLC project: Digitales Potentiometer Board Moduls	2026/04/11 18:29	sensor , module , arduino code , renesas , x9c series , x9c102 , x9c103 , x9c104 , x9c503 , xdcp , digitally controlled potentiometer
• lamaPLC project: Sension SCD CO² measurement module	2026/04/15 19:34	scd30 , scd40 , scd41 , iaq , ndir , sensor , i2c , arduino code
• lamaPLC: A0221AU / A02YYUW Waterproof Ultrasonic Distance Sensor with UART communication	2026/04/23 21:52	a0221au , a02yyuw , waterproof , ultrasonic , distance , sensor , uart , ip67 , serial , sen0311 , dfrobot

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- [LamaPLC: Allegro ACS758 Hall-effect linear current sensors](#) 2026/04/23 21:52 [cjmcu, cjmcu-758, acs758, acs758lcb-050b, acs758lcb-100b, acs758kcb-150b, acs758ecb-200b, hall-effect, current, sensor, analog, arduino, code](#)
- [LamaPLC: APDS - Avago ALS and proximity detection sensors with I²C communication](#) 2026/04/23 21:52 [avago, apds-9900, apds-9930, apds-9960, als, proximity, detection, gesture recognition, gesture, i2c, communication, sensor, arduino, code](#)
- [lamaPLC: Arduino Modul: BME680](#) 2026/05/12 18:40 [code, c, 2026, arduino, bme680, sensor, i2c, comunication](#)
- [lamaPLC: AS5600 Magnetic Induction Angle Measurement Sensor Module](#) 2026/05/13 00:06 [communication, i2c, as5600, as-5600, magnetic, induction, angle, sensor](#)
- [LamaPLC: BMP/BME Bosch Temperature/Humidity/Pressure sensors with I²C communication](#) 2026/04/23 21:52 [bme280, bme680, bme688, bmp180, bmp280, hw-611, hw611, bosch, temperature, humidity, pressure, sensor, arduino, i2c, communication, ai, cjmcu, volatile organic compounds, vocs, volatile sulfur compounds, vscs, iaq](#)
- [LamaPLC: BQ25570 / CJMCU-2557 - Texas Instruments nano-power management IC and module](#) 2026/04/23 21:52 [bq25570, sensor, texas instruments, nano-power management, dc-dc boost charger, mppt, solar, thermoelectric, piezoelectric, energy harvesting, eh](#)
- [LamaPLC: CJMCU-219/INA-219 breakout board/IC with I²C communication](#) 2026/04/23 21:52 [cjmcu-219, ina-219, ina219, breakout board, i2c, communication, sensor, voltage, current, arduino, code, cjmcu](#)
- [LamaPLC: CJMCU-3216 / AP-3216 integrated digital ambient light and proximity sensor module/IC with I²C communication](#) 2026/04/23 21:52 [cjmcu-3216, cjmcu, ap-3216, ap3216, ambient light, proximity, sensor, arduino, code, i2c, communication](#)
- [LamaPLC: CJMCU-3901/PMW-3901 compact optical flow sensor module/IC by PixArt with SPI communication](#) 2026/04/23 21:52 [cjmcu-3901, cjmcu, pmw3901, pmw-3901, optical flow, sensor, pixart, spi, communication, arduino, code, pmw3901mb-txqt](#)
- [LamaPLC: CJMCU-6701: Biosensor for measuring Galvanic Skin Response \(GSR\) with SPI communication](#) 2026/04/23 21:52 [cjmcu, cjmcu-6701, acs758, acs-758, galvanic skin response, gsr, electrodermal activity, eda, spi, communication, arduino, code, sensor, healthcare](#)
- [LamaPLC: CJMCU-6814 combined gas sensor module for CO, NO₂, NH₃](#) 2026/04/23 21:52 [analog, cjmcu, cjmcu-6814, mics6814, mics-6814, sensor, arduino, code, carbon monoxide, co, ammonia, nh₃, nitrogen dioxide, no₂](#)

• lamaPLC: CJMCU-811 CCS811 Gas Sensor (VOCs TVOC CO2)	2026/04/23 21:52	cjmcu-811, ccs811, gas, sensor, vocs, tvoc, eco2, co2, arduino, air quality metal oxide, mox, i2c, micropython, rp2040-eth
• LamaPLC: CJMCU-8221 Analog Devices Precision instrumentation amplifier module	2026/04/23 21:52	cjmcu-8221, ad8221ar, analog devices, amplifier, sensor, cjmcu
• LamaPLC: D6T Omron Non-Contact Thermal Sensors with I ² C communication	2026/04/23 21:52	d6t, d6t-32l, d6t-44l, d6t-8l, d6t-1a, omron, non-contact, thermal, sensor, i2c, arduino, code
• LamaPLC: DHT Temperature /Humidity sensors with 1-wire / I ² C communication	2026/04/23 21:52	dht11, dht20, dht22, temperature, humidity, pressure, sensor, 1-wire, arduino, code
• LamaPLC: DPS Infineon Temperature/Pressure sensors with I2C communication	2026/04/23 21:52	dps310, infineon, temperature, pressure, sensor, arduino, i2c, communication, code
• lamaPLC: DS18B20 1-Wire Digital Thermometer	2026/04/23 21:52	ds18b20, sensor, 1-wire, communication, arduino, thermometer, parasitic mode
• lamaPLC: Energy, power, current, and voltage	2025/05/31 23:32	i2c, i c, communication, arduino, energy, power, current, sensor, ina226
• LamaPLC: ENS ScioSense Multi-gas sensors with I ² C communication	2026/04/23 21:52	ens160, sciotsense, gas-quality, i2c, communication, sensor, arduino, code, eco2, tvoc, aqi, indoor air quality, iaq, co2, voc
• lamaPLC: ENS160 + AHT21 Air Quality Sensor - CO, ECO, TVOC, Temp & Humidity Module	2026/04/23 21:52	arduino, ens160, aht21, air quality, sensor, co, eco, tvoc, module, aqi
• LamaPLC: Gas sensors	2023/07/01 17:29	gas, sensor, i2c, onewire, communication, mq-3, mq-4, mq-5, mq-6, mq-7, mq-8, mq-9, mq-135, gm-102b, gm-302b, gm-502b, gm-702b, alcohol, ch4, natural gas, smoke, lng, co, co2, lpg, h2, iso-butane, nox, nh3, benzene, town gas, formaldehyde, propane, humidity, temperature, voc, grv gas sens v2
• LamaPLC: GM MEMS Gas-sensors	2026/04/23 21:52	gm-102b, gm-302b, gm-502b, gm-702b, mems, gas-quality, sensor, arduino, code, nitrogen dioxide, no2, volatile organic compounds, voc, carbon monoxide, co, ethyl alcohol, c2h5ch, formaldehyde, ch2o, alcohol, c2h5oh
• lamaPLC: GY-511 6DOF sensor module	2026/04/23 21:52	stmicroelectronics, lsm303dlhc, i2c, lsm303, sensor, gy-511, 6dof, pololu, module, arduino
• LamaPLC: HC-SR04 Ultrasonic Sensor Module	2026/04/23 21:52	hc-sr04, ultrasonic, sensor, arduino, code
• LamaPLC: HDC Texas Instruments Temperature/humidity sensors with I ² C communication	2026/04/23 21:52	sht21, htu21, si7021, gy-21, gy-213v, hdc1080, gy-213v-hdc1080, cjmcu, cjmcu-1080, texas instruments, temperature, humidity, sensor, i2c, communication, arduino, code

<ul style="list-style-type: none"> • LamaPLC: HTU TE Connectivity temperature/humidity sensors with I²C communication 	2026/04/23 21:52	htu , htu31d , htu21d , htu20d , sht20 , htu20 , sht21 , htu21 , si7021 , gy-21 , gy-213v , hdc1080 , si702 , gy-20 , sht31 , htu31 , si7031 , gy-31 , te connectivity , temperature , humidity , i2c , communication , sensor , arduino , code
<ul style="list-style-type: none"> • LamaPLC: HX711 24-bit analog-to-digital converter (ADC) 	2026/04/11 18:28	hx711 , hx-711 , analog-to-digital , adc , converter , load cell , wheatstone bridge , weight , sensor , communication , arduino , code
<ul style="list-style-type: none"> • lamaPLC: INA modules with Arduino libraries 	2026/04/23 21:52	i2c , i c , communication , arduino , energy , power , current , monitor , sensor , ina219 , gy-219 , ina226 , gy-216 , ina228 , gy-228 , ina237 , ina238 , ina260 , ina3221 , ina
<ul style="list-style-type: none"> • lamaPLC: INA226 - current/voltage/power monitor with I²C communication 	2026/04/23 21:52	i2c , i c , communication , arduino , energy , power , current , monitor , sensor , ina226 , ina219 , ina
<ul style="list-style-type: none"> • lamaPLC: LTC3588 - Nanopower energy harvesting power supply IC 	2026/04/23 21:52	communication , arduino , sensor , energy harvesting , eh , energy , ambient power
<ul style="list-style-type: none"> • LamaPLC: M01 - V0.4 Laser ranging sensor with UART communication 	2026/04/23 21:52	distance measurement , laser , distance , sensor , m01
<ul style="list-style-type: none"> • LamaPLC: MAX30100/MAX30102 Heart Rate Click Sensor Module 	2026/04/23 21:52	max30102 , max30100 , heart rate click , sensor , communication , i2c , arduino , code
<ul style="list-style-type: none"> • lamaPLC: Max31865 RTD to Digital Converter - PT100/PT1000 Platine 	2026/04/23 21:52	max31865 , rtd , pt 100 , pt 1000 , temperature , spi , platinum , arduino , code , sensor , adafruit
<ul style="list-style-type: none"> • LamaPLC: MAX4466/MAX9814: Low-noise Microphone Preamplifiers 	2026/04/23 21:52	audio , microphone , analogue audio , max4466 , max9814 , max 4466 , max 9814 , agc , preamplifiers , sensor , arduino , code
<ul style="list-style-type: none"> • LamaPLC: MH-Z19 series of NDIR CO₂ sensors 	2026/04/23 21:52	mh-z19 , mh-z19d , mh-z19c , mh-z19b , mh-z19e , ndir , co₂ , sensor , winsen , uart , pwm , communication , non-dispersive infrared , infrared , ir , temperature , arduino , code , tasmota
<ul style="list-style-type: none"> • lamaPLC: MPU-6050 (HW-123, GY-521) 6-axis MotionTracking device 	2026/04/23 21:52	mpu-6050 , hw-123 , gy-521 , 6-axis motiontracking , dmp , temperature , sensor , mems , arduino code , arduino , accelerometer , gyroscope , tilt
<ul style="list-style-type: none"> • LamaPLC: MQ Winsen Gas-sensors 	2026/04/23 21:52	mq , mq-2 , mq-3 , mq-4 , mq-5 , mq-6 , mq-7 , mq-8 , mq-9 , mq-131 , mq-135 , mq-137 , winsen , gas-sensor , sensor , arduino , code , alcohol , c₂h₅oh , benzine gas , smoke , lpg , propane , C₃H₈ , hydrogen , h₂ , methane , ch₄ , iso-butane , town gas , ammonia , nh₃
<ul style="list-style-type: none"> • LamaPLC: PIR sensors 	2026/04/23 21:52	hc-sr501 , hc-sr505 , am-312 , ekmb , ekmc , pir , motion , sensor , arduino , code

• LamaPLC: Pixart PAJ7620U2 Gesture recognition sensors/module with I ² C communication	2026/04/23 21:52	paj7620u2, gy-paj7620, pixart, gesture recognition, i2c, communication, sensor, arduino, code
• lamaPLC: PT100 / PT1000	2025/09/23 18:59	pt100, pt1000, temperature, sensor, platine, rtd
• lamaPLC: PTA8C04 4-channel PT100 Modbus Modul	2026/02/14 18:42	pta8c04, sensor, modbus, rtu, rs-485, communication, platine, um72
• LamaPLC: RCWL - Microwave radar sensor	2026/04/23 21:52	rcwl-0516, rcwl, microwave, radar, sensor, arduino, code
• lamaPLC: RD-xx - Ai-Thinker Radar Module with UART communication	2026/04/23 21:52	radar, s3km1110, fmcw, rd-01, rd-03, rd-03d, ai-thinker, k-band, 24 ghz, sensor, distance, micro-movements
• lamaPLC: RP2040_ETH_Modul: Read BME 680/688 sensor data	2026/05/12 21:06	code, micropython, 2026, rp2040 eth, bme680, i2c, sensor, communication
• lamaPLC: RP2040_ETH_Modul: Read BME 680/688 sensor data and store in Modbus input registers	2026/05/12 18:58	code, micropython, 2026, rp2040 eth, bme680, i2c, sensor, communication
• LamaPLC: SGP Sensirion TVOC/VOC sensors with I ² C communication	2026/04/15 19:41	sgp30, sgp40, sgp41, sensirion, gas-sensor, i2c, communication, sensor, arduino, code, eco2, voc, tvoc, indoor air quality, iaq, nox, hydrogen
• LamaPLC: SHT Sensirion Temperature/humidity sensor with I ² C communication	2026/04/23 21:52	sht20, sht21, sht25, sht30, sht31, sht35, sht40, gy21, temperature, humidity, i2c, communication, sensor, arduino, code
• LamaPLC: Texas Instruments ADCs: Delta-sigma multi-channel Analog Converters with SPI communication	2026/04/23 21:52	ads111x, ads12xx, delta-sigma, converter, texas instruments, adc, spi, communication, sensor, arduino, code, ads1110, ads1112, ads1113, ads1114, ads1115, ads1118, ads1119, ads1220, ads1232, ads1234, ads1256, ads1261, ads1263, multi channel
• LamaPLC: TOFnnnC STMicroelectronics Time-of-Flight (ToF) sensors with I ² C communication	2026/04/23 21:52	tof050c, vl6180, tof200c, vl53l0x, tof400c, vl53l1x, stmicroelectronics, time-of-flight, tof, i2c, communication, sensor, arduino, code
• LamaPLC: UICPAL Temp.humi.sensor	2023/06/25 00:43	simatic, s7, modbus, communication, temperature, humidity, sensor
• LamaPLC: VL53Lnn STMicroelectronics time-of-flight (ToF) laser-ranging sensors with I ² C communication	2026/04/23 21:52	vl53l0x, vl53l1x, vl53l0 1xv2, gy-530, time-of-flight, tof, laser-ranging, i2c, communication, sensor, arduino, code
• LamaPLC: VL6180X STMicroelectronics Time-of-Flight (ToF) sensor with I ² C communication	2026/04/23 21:52	vl6180x, stmicroelectronics, time-of-flight, tof, i2c, communication, sensor, arduino, code
• LamaPLC: Waveshare TOF Laser Range Sensor with UART / I ² C communication	2026/04/23 21:52	distance measurement, laser, range, sensor, tof, waveshare
• lamaPLC: XGZP68xx: Silicon Pressure Sensors/Module	2026/05/15 15:17	communication, i2c, sensor, modul, pressure, cfsensor, xgzp68xx, xgzp6810d, xgzp6857d, xgzp6859d, xgzp6887d, xgzp6897d, xgzp6899a, piezoresistive, capacitive

- [lamaPLC: YR-3180 - Weight sensor module with UART or Modbus communication](#) 2026/02/15 00:00 [communication, modbus, rtu, sensor, weight, yr-3180, hx710b, arduino, ttl, rs-485](#)
- [LM393: Dual differential comparator \(flame, light, sound sensors\)](#) 2026/05/12 22:18 [communication, analog, lm393, lm-393, flame, ir, sound, hall, sensor, ky-026, hw-484, ky-037, ky-038, fc-03, hc-89, ky-024, modul](#)
[magnetic angle sensor, magnetic flux, sensor, spi, i2c, pwm, communication, modul, as5047p, as5600, mt6701, mt6816, mt6835, tle5012b, amr, gmr, tmr, anisotropic magnetoresistive](#)
- [Magnetic angle sensors](#) 2026/03/05 21:19 [nt18b07, sensor, modbus, rtu, rs-485, communication, platine](#)
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