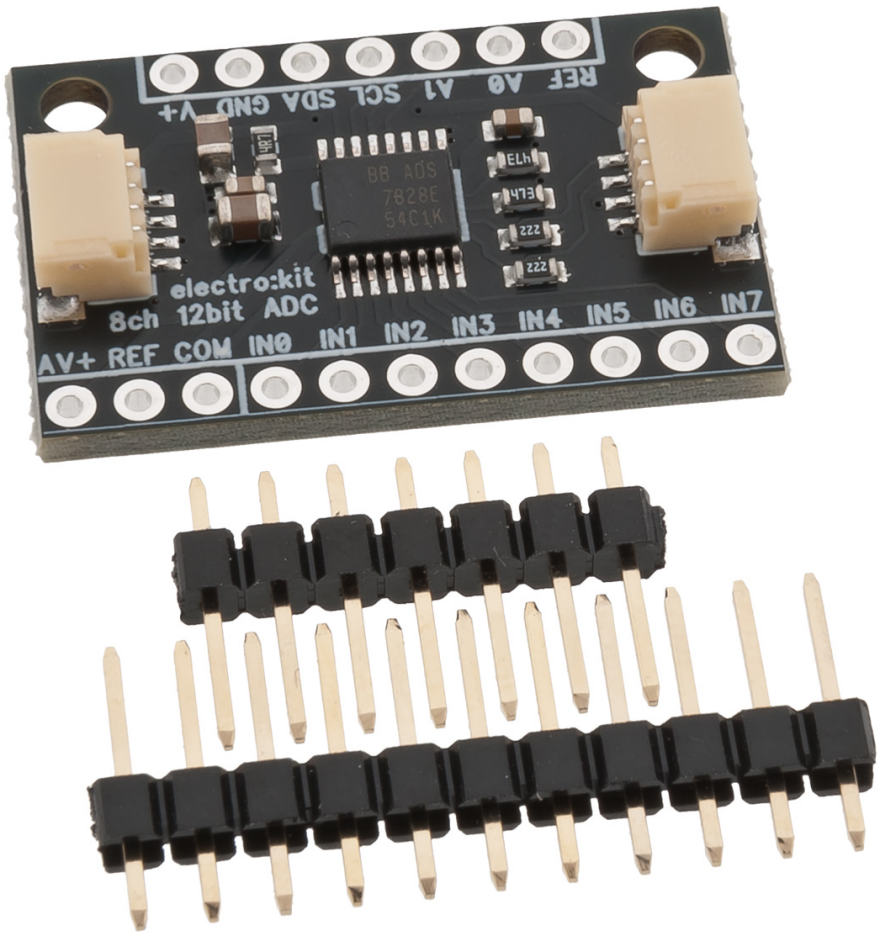
AD Converter 8-ch 12-bit QWIIC ADS7828

Part.no: 41036181 ↗



ADC Module based around Texas Instruments ADS7828. The converter has 8 separate channels (or 4 pseudo-differential channels) with 12-bit resolution.

The module breaks out all pins and contains all neccesary supporting components. The module also features two QWIIC connectors for simple, solder-free hookup to a compatible I2C host.

ADS7828 can use either the internal voltage reference of 2.5V or an external reference (0.05V to V+). On this module, the REF pin is connected to AV+ by default, which enables the full range from 0V to V+ to be sensed.

The analog inputs can be configured either as 8x single-ended or 4x pseudo-differential signals. Single-ended signals are simple ground referenced voltages, while pseudo-differential signals each use two inputs (IN0+1, IN2+3, IN4+5, IN6+7), where one input is the signal (+) and the other is a locally sourced ground reference (-). This is useful for precise measurements where the remote ground reference could be slightly different from the

local ground. Please note that the inputs are not fully differential and the negative input (-) range is only 0V - 0.2V! Higher voltages on the negative input pin (when the converter is set to differential mode) can damage the converter!

Functions

- 8 high speed, high precision analog inputs
- Internal 2.5V reference or external
- Supports standard, fast and high-speed I2C
- Two address bits allow up to four modules per I2C bus
- QWIIC connectors for easy wiring
- LED indicators for relay status

Specifications

- Voltage supply: 2.7 - 5V (3.3V using QWIIC)
- Internal reference: 2.5V
- Analog voltage range: 0V - VREF
- Input capacitance: 25pF
- Sampling rate: 2kHz (standard mode, 100kHz) / 8kHz (fast mode, 400kHz) / 50kHz (high speed mode, 3.4MHz)
- Dimensions: 28 x 18 mm
- Mounting holes: ø2.5mm / c-c 23mm

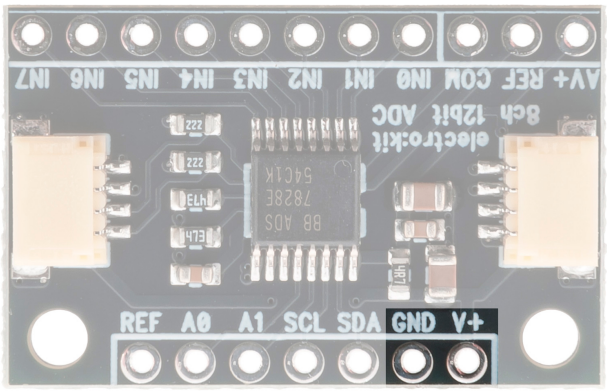
Connections

Voltage supply

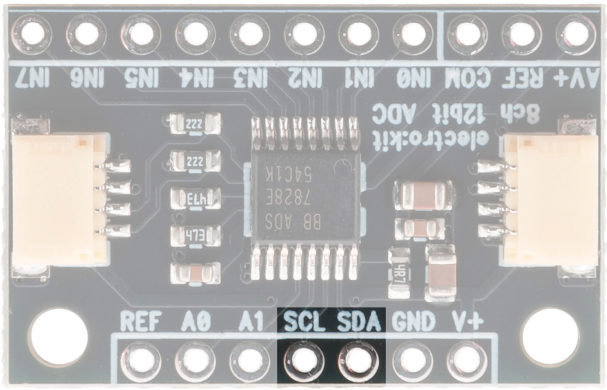
The module should be supplied with a voltage between 2.7 and 5VDC on these pins.

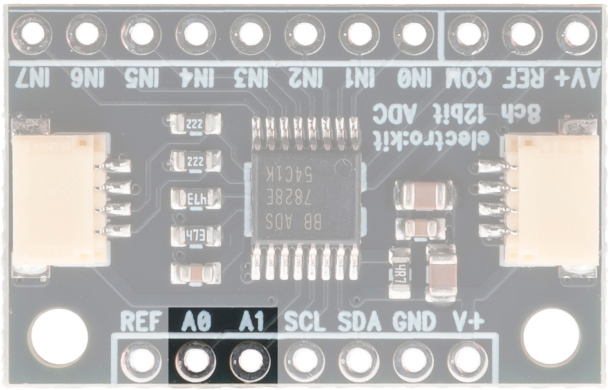
When using the QWIIC connectors, these pins can instead be used as an auxillary 3.3V output.

Do NOT supply power to both V+ pins and QWIIC connectors at the same time.



I2C pins



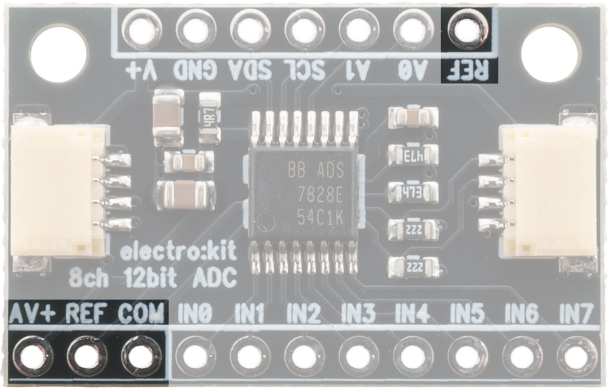


SCL and SDA are the clock and data pins for I2C communication. Both pins have pullup resistors onboard. The resistors can be disabled by severing the I2C Pullup solder bridge on the back side.

A0 and A1 are address pins and can be wired upp in different combinations to change the I2C address.

A0	A1	Address
0	0	0×48 (default)
1	0	0×49
0	1	0×4A
1	1	0×4B

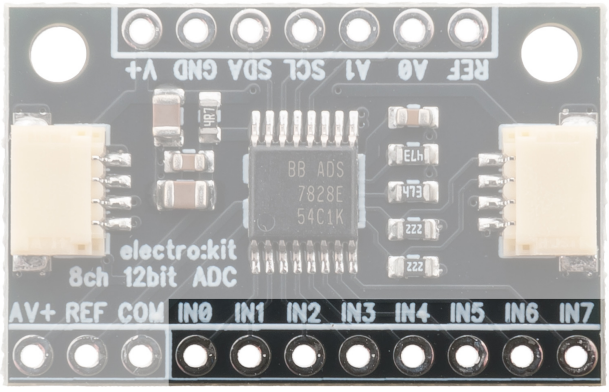
Voltage reference



AV+, REF and COM are voltage references for the analog inputs and can be used for wiring up potentiometers and other sensors.

- AV+: Filtered positive analog supply.
- REF: Positive voltage reference. Tied to AV+ by default. When using AV+ as a positive reference, the measurable range is 0V to AV+. If the internal reference is to be used, the solder jumper on the back must first be severed. With the internal reference, the measurable range is 0V to 2.5V.
- COM: Common negative reference. Tied to GND by default. Connects to the negative terminal of analog inputs. Can also be wired to a remote GND for more accurate readings. Please note that this voltage must stay within 0.2V relative to local GND. When using this pin as an input, sever the solder jumper on the back.

Analog inputs

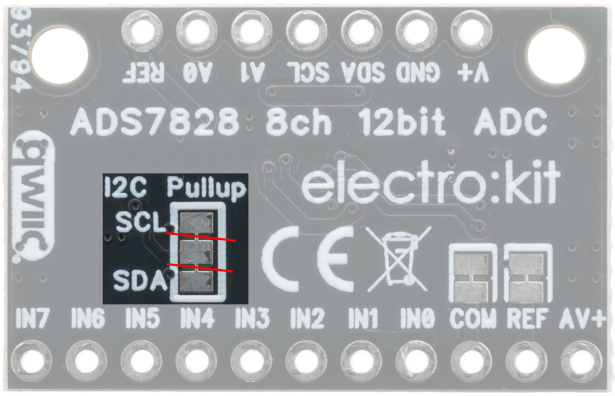


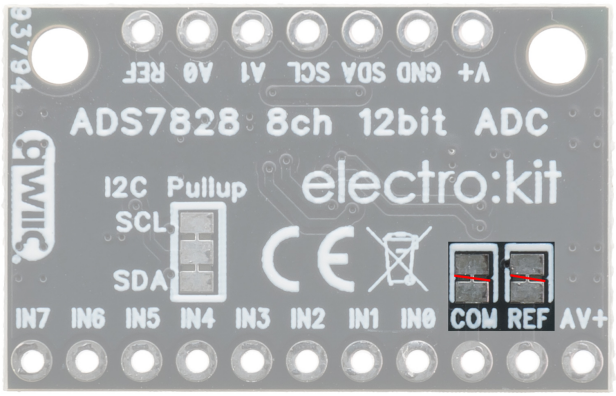
The converter has 8 multiplexed analog inputs in single-ended mode or 4 inputs in pseudo-differential mode.

The most common use case is to use the converter in single-ended mode. In this mode, each input pin simply reads an analog voltage ranging from GND (0V) to REF (AV+ or 2.5V). Take care not to exceed the voltages on these pins or damage could occur.

If the measured analog signals are located away from the module, with a ground reference that could be slightly lower or higher than the local ground, readings can instead be made using two pins per input. One input becomes the positive signal and the other the negative. Please note that the negative input must never be more than 0.2V lower or higher than local GND.

Solder jumpers





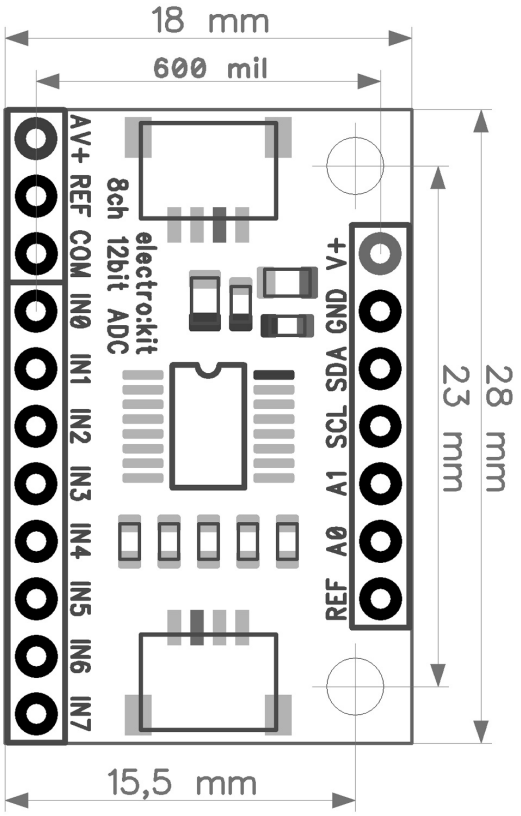
Four solder jumpers are available on the back side to control I2C pullup resistors and analog reference outputs.

- I2C Pullup: Sever both solder jumpers to disable the board mounted 4.7k resistors.
- COM, REF: Sever one or both jumpers to disable internal voltages to be sent to these pins. Please read the relevant parts of the guide and the ADS7828 datasheet for more information.

Arduino library

Electrokit ADS7828 Arduino Library

Mechanical dimensions


18 mm
600 mil
AV+ REF COM IN0 IN1 IN2 IN3 IN4 IN5 IN6 IN7
electro:kit
8ch 12bit ADC
REF A0 A1 SCL SDA GND V+
28 mm
23 mm
15,5 mm