I2C-DAC™ I²C 8-Bit Digital-to-Analog Converter
User Manual

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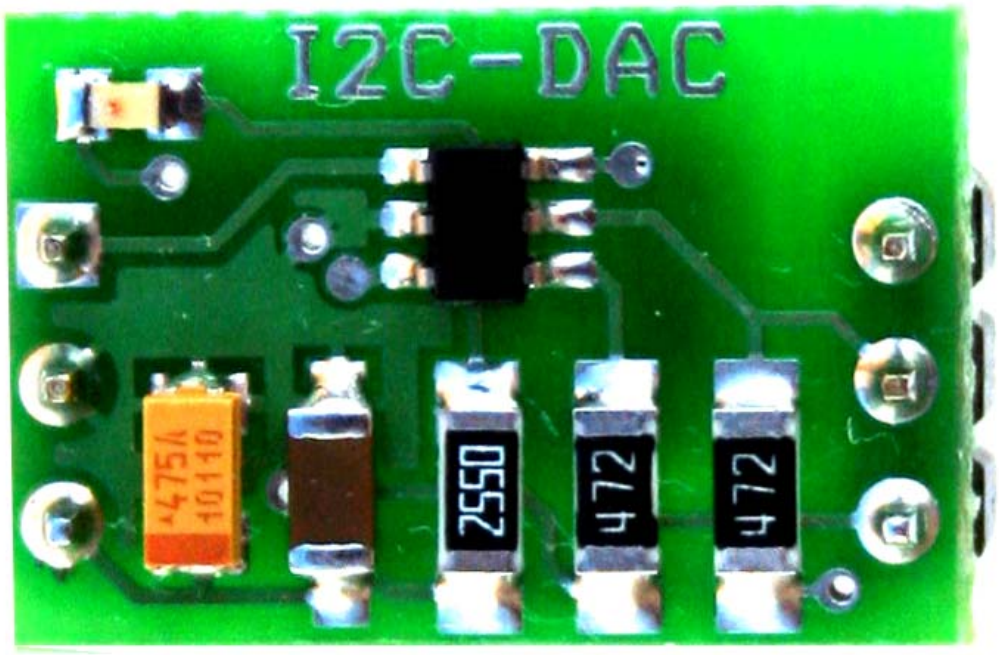

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Description

The I2C-DAC board is a 6-pin CMOS 8-bit digital-to-analog converter device using I²C bus. There are no external components required. Only two signal lines SDA and SCL plus supply voltage and ground are required to be connected. This makes it perfect for embedded systems that require digital-to-analog converter.

This board features innovations that set it apart from other digital-to-analog converter module. Innovations feature like on-board I²C address jumpers, pull-up resistors, and power LED. The module can be quickly connected directly on to the breadboard. The board is small and compact in size 0.70 x 0.47 inches.

The I2C-DAC is designed base on DAC5571 IC. It is a low-power, single-channel, 8-bit buffered voltage output DAC. Its on-chip precision output amplifier allows rail-to-rail output swing to be achieved.

The output voltage range of the DAC is 0V to VCC. The I2C-DAC incorporates a power-on-reset circuit that ensures that the DAC output powers up at zero volts and remains there until a valid write to the device takes place.

A jumper pins vary the fixed I²C address and allow up to two devices to share the same I²C bus.

Features

- Up to 2 devices on the same bus
- Resolution: 8-bit
  Fast Update Rate: 188 KSPS
- I²C Interface up to 3.4 Mbps
- On-Chip Output Buffer Amplifier, Rail-to-Rail Operation
- Stand alone module, no external components required
- On-board I²C address jumpers, pull-up resistors and power LED
- Decoupling supply voltage
- Design easy for breadboard
- High quality double sided PCB
- All SMT components
- Small and compact in size 0.70 x 0.47 inches
- Dual row 0.6” width, 0.1” pitch header pins
- Flexible operating power supply voltage range of +2.7V to +5.5V
- Suitable for 3.3V or 5.0V microcontroller

Applications

- Process Control
- Data Acquisition Systems
- Closed-Loop Servo Control
- Thermostat controls
- Audio and Video
- Peripherals
- And much more…

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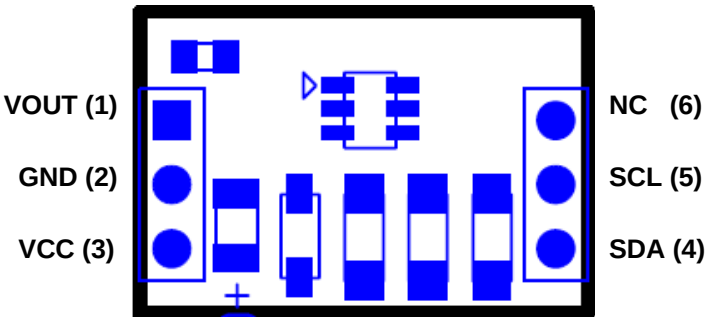
Pin Configuration



Pin No.	Name	Type	Description
1	VOUT	Output	Analog output voltage from DAC
2	GND	PWR	Supply ground
3	VCC	PWR	Supply voltage
4	SDA	I/O	Serial data line
5	SCL	Input	Serial clock line
6	NC	NC	No connect

Interfaces

Power:

The I2C-DAC board needs an external +2.7VDC – +5.5VDC supply.

- **VCC:** is an input power +2.7VDC – +5.5VDC to I2C-DAC board.
- **GND:** is a common ground for every pin. This pin MUST be connected to ground of the external power supply.

I²C pins:

The I2C-DAC operates as a slave on the I²C bus. Only two signal lines SDA and SCL are required for I²C bus. Please refer to I²C specification for more information.

VOUT pin:

This is an analog output voltage from the I2C-DAC. The output is contains the buffer amplifier. The output buffer amplifier is a gain-of-2 amplifier, capable of generating rail-to-rail voltages on its

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output, which gives an output range of 0 V to VCC. It is capable of driving a load of 2 kΩ in parallel with 1000 pF to GND. The source and sink capabilities of the output amplifier can be seen in the typical characteristics curves. The slew rate is 1 V/µs with a half-scale settling time of 7 µs with the output unloaded.

Module Configuration

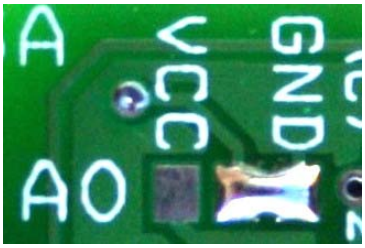
I²C address:

Default address shipped from the manufacture is 0x98 for write and 0x99 for read.

A0 = GND

MSB							LSB
1	0	0	1	1	0	A0	0

The address can be easily change by solder the bridge between the A0 pin to VCC or GND at the bottom of the module. This is allows up to two devices to share the same I²C bus.



Power-on LED:

The green LED on the module is illuminating when the power applied. The power-on LED is enabled from the manufacture. It can be disabling for light sensitive or low current requirement application by remove the solder bridge on “PW” at the bottom of the module.

I²C pull-up resistors:

I²C bus specification required to have pull-up resistors on SDA and SCL pin. I2C-DAC come with these two pull-up resistors enabled from the manufacture. It can be disabling when connect to I²C bus that already have pull-up resistors by remove the solder bridge on the “PU” at the bottom of the module.

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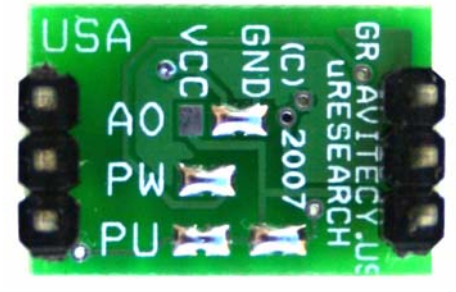
Below are the default settings from the manufacture.



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