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I2C-7SEG™ I²C 4-DIGIT 7-SEGMENT DISPLAY
User Manual

Description

The I2C-7SEG board is a 5-pin CMOS device that provides 4-digit of 7-segment display 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 LED display.

This board features innovations that set it apart from other 7-segment 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 1.50 x 2.05 inches.

The I2C-7SEG is designed base on SAA1064 IC. The circuit is especially designed to drive four 7-segment LED displays with decimal point by means of multiplexing between two pairs of digits. It features an I²C bus slave transceiver interface with the possibility to program four different SLAVE ADDRESSES, a POWER RESET flag, 16 current sink OUTPUTS, controllable by software up to 21 mA, two multiplex drive outputs for common anode segments, an on-chip multiplex oscillator, control bits to select static, dynamic and blank mode, and one bit for segment test.

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

Features

- Five colors to choose from (green, red, orange, orange/red and yellow)
- Flicker free multiplexed 7-segment display
- Total control of individual segment
- Display brightness controllable by software
- Automatically refreshes and updates each display digit
- Free up host controller for continuous display updates and refresh loops
- 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 1.50 x 2.05 inches
- Single row 0.4" width, 0.1" pitch header pins
- Flexible operating power supply voltage range of 4.5V to 15V
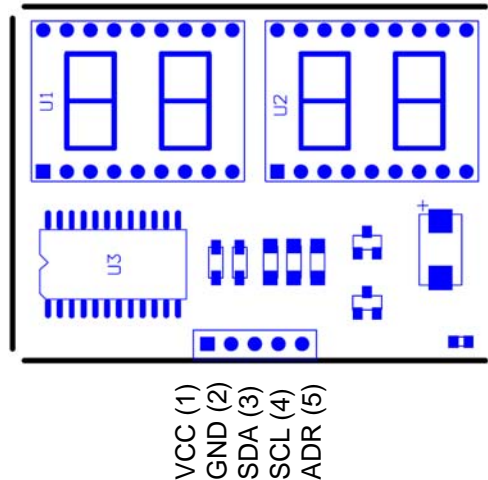- Suitable for 5.0V microcontroller

Applications

- Any display applications

* I²C is a trademark of Philips Semiconductors Corporation.

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Pin Configuration

VCC (1)
GND (2)
SDA (3)
SCL (4)
ADR (5)

Pin No.	Name	Type	Description
1	VCC	PWR	Supply voltage
2	GND	PWR	Supply ground
3	SDA	I/O	Serial data line
4	SCL	Input	Serial clock line
5	ADR	Input	Address selection input **(DO NOT connect this pin when using internal address mode)**

Interfaces

Power:

The I2C-7SEG board needs an external 4.5VDC – 15.0VDC supply.

- **VCC:** is an input power 4.5VDC – 15.0VDC to I2C-7SEG 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-7SEG 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.

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Module Configuration

I^{2}C address:

Default address shipped from the manufacture is 0x70 for write and 0x71 for read.

ADR = GND

0	1	1	1	0	A1	A0	1

Internal addressing mode: The address can be easily change by solder the bridge between the middle pad of "ADR" to VCC or GND at the bottom of the module. These two options allow up to two devices to share the same I^{2}C bus.


However, if you wish to connect more than two modules on the bus, the external address can be use to connect up to four modules. That is total of 16-digit. To use external address selection, remove all of the solder bridge from ADR pads. Connect voltage to the ADR pin 5 according to the table below.

ADR Voltage	Read Address	Write Address
GND	70	71
3/8 VCC	72	73
5/8 VCC	74	75
VCC	76	77

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 "LED" at the bottom of the module.
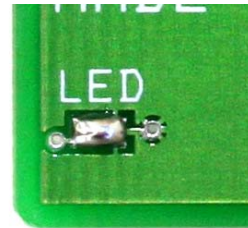
DISABLE this option when VCC is higher than 8.0VDC.

I^{2}C pull-up resistors:

I^{2}C bus specification required to have pull-up resistors on SDA and SCL pin. I2C-7SEG come with these two pull-up resistors enabled from the manufacture. It can be disabling when connect to I^{2}C bus that already have pull-up resistors by remove the solder bridge on "I2CPU" at the bottom of the module.
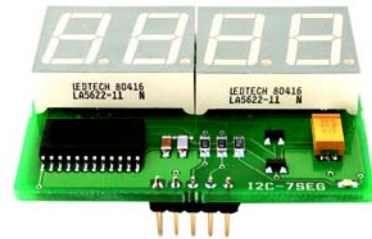
Below are the default settings from the manufacture.
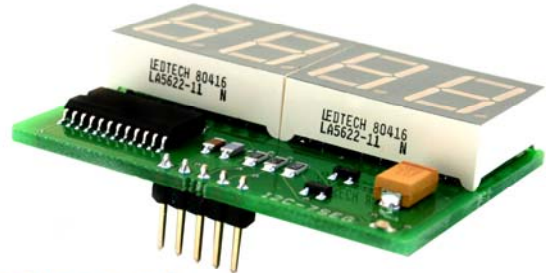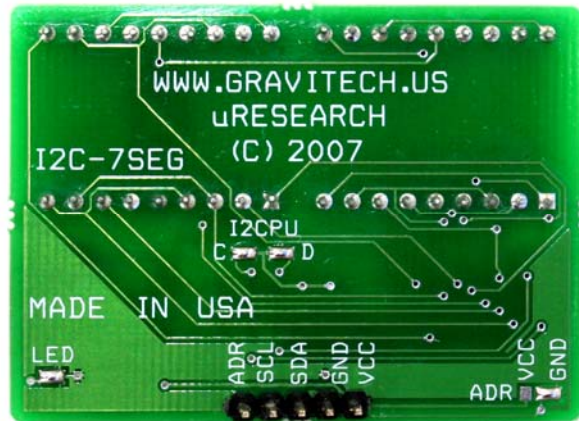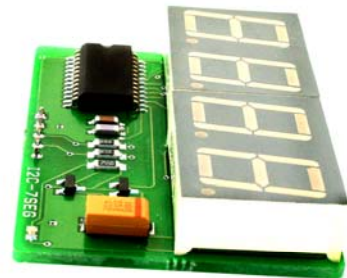
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