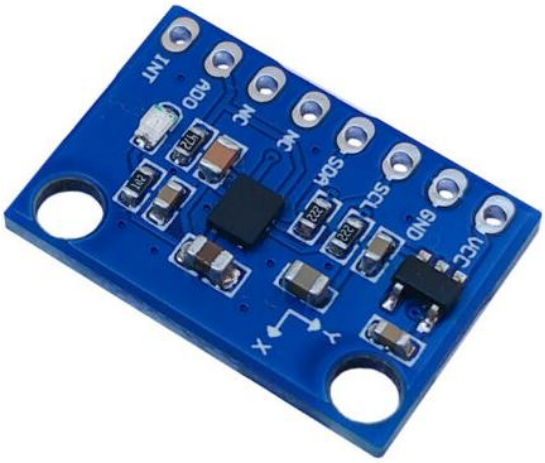
Introduction

The IM-611 module is an accelerometer and gyroscope module based on the ICM42670 from TDK Invesense. The ICM-42670-P is a high performance 6-axis MEMS MotionTracking device that combines a 3-axis gyroscope and a 3-axis accelerometer. It has a configurable host interface that supports I3CSM, I2C, and SPI serial communication, features up to 2.25 Kbytes FIFO and 2 programmable interrupts with ultra-lowpower wake-on-motion support to minimize system power consumption



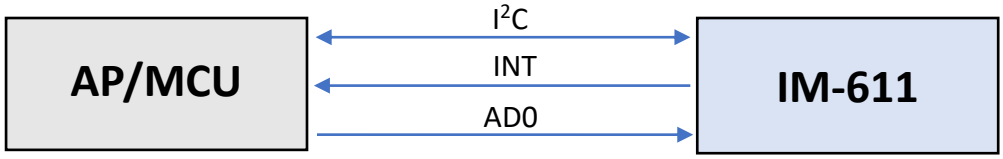
IM-611 FEATURES

- supply voltage: 4.5V to 5V
- Low-Noise mode 6-axis current consumption of 0.55 mA Accelerometer Noise: 70 µg/√Hz
- Low-Power mode support for always-on experience
- User selectable Gyro Full-scale range (dps): ± 250/500/1000/2000
- User selectable Accelerometer Full-scale range (g): ± 2/4/8/16
- User-programmable digital filters for gyro, accel, and temp sensor
- APEX Motion Functions: Pedometer, Tilt Detection, Low-g Detection, Freefall Detection, Wake on Motion, Significant Motion Detection
- Host interface: 1 MHz I2C
- Compact size, 14 x 21 mm

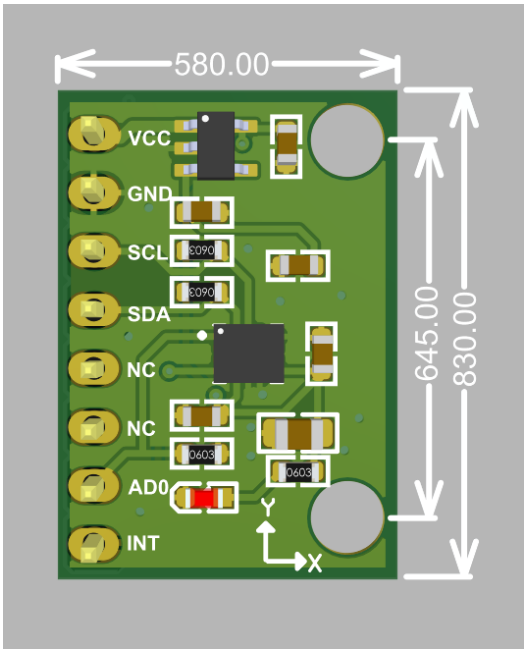
APPLICATIONS

- Wearables (Fitness Bands, SmartWatches, Healthcare wearables)
- Hearables (True Wireless Headsets)
- Gaming Controllers
- Robotics
- IoT Applications
- Smart Home Appliances
- Smart TV remotes
- Drones
- Augmented Reality/Virtual Reality

BLOCK DIAGRAM



Pinout



Pin Number	Pin Name	Pin Description
1	VCC	Power supply voltage
2	GND	Power supply ground
3	SCL	I2C serial clock
4	SDA	I2C serial data
5	AD0	I2C slave address LSB , HIGH Address will be 0x69 , LOW address will be 0x68
6	INT	All interrupts mapped to this pin

INT - This is the interrupt pin. You can setup the IM-611 to pull this low when certain conditions are met such as new measurement data being available. Consult the datasheet and register map for usage.

AD0 - I2C Address pin. Pulling this pin high or bridging the solder jumper on the back will change the I2C address from 0x68 to 0x69.

I2C communication

Data output and settings are available via I2C. The maximum I2C clock frequency can be 1MHZ. It is possible to connect 3.3V or 5V microcontrollers (STM32, Arduino, etc.) directly without using a logic level converter circuit.

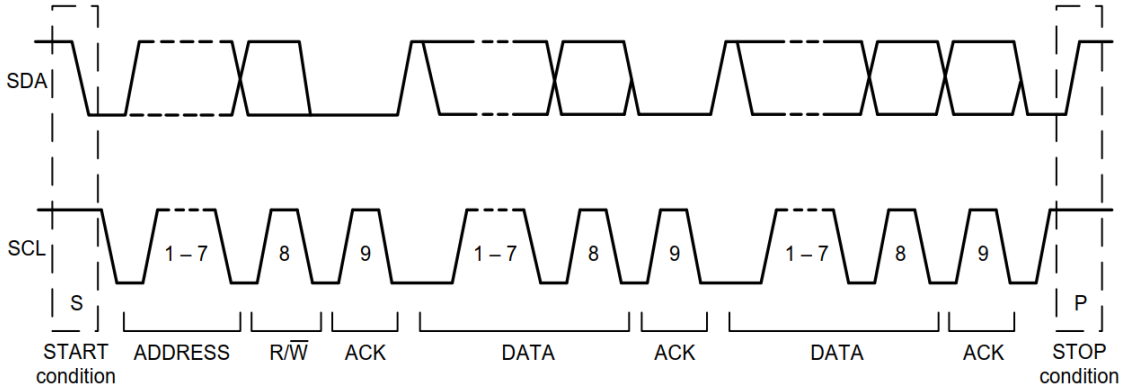
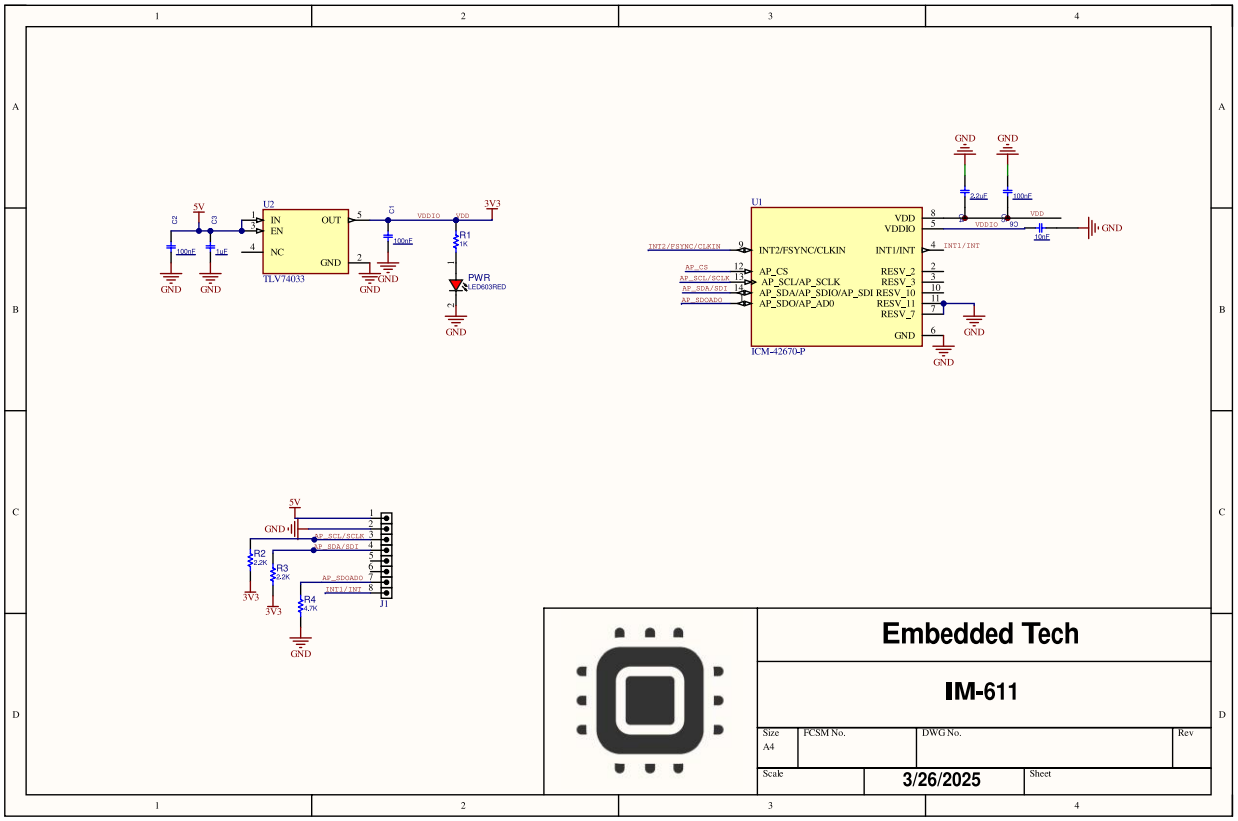


Figure 14. Complete I²C Data Transfer

Schematic


U2
TLV74033
IN
EN
NC
OUT
GND
5V
3V3
VDDIO
100nF
1uF
R1
1K
PWR
LED603RED
U1
ICM-42670-P
VDD
VDDIO
INT2/FSYNC/CLKIN
INT1/INT
AP_CS
AP_SCL/AP_SCLK
AP_SDA/AP_SDIO/AP_SDI
AP_SDO/AP_AD0
RESV_2
RESV_3
RESV_10
RESV_11
RESV_7
2.2uF
10nF
J1
R2
2.2K
R3
2.2K
R4
4.7K
Embedded Tech
IM-611
Size
A4
FCSM No.
DWG No.
Rev
Scale
3/26/2025
Sheet