

SUPPORTED ACCESSARIES FOR ET-ROBOTICS SYSTEM FROM ETT

### ET-MMA7455L (P-ET-A-00437)



**ET-MMA7455L** is a board to measure acceleration (AC-CELEROMETER) while material is shaking or moving; in this case, it measures a change of G value (GRAVITATION). The board fastens with the device that user requires measuring the value and it gives 8BIT DIGITAL OUTPUT or 10BIT DIGITAL OUTPUT (only RANGE  $\pm 8G$ ). It supports the measurement on 3 axes; X, Y, Z. User can apply this device to measure banging material while shipment, to detect falling device from upright position, to detect moving material, to detect driving and stopping car.

#### Specifications of Board ET-MMA7455L

- Use IC No.MMA7455L LGA-14 PIN TYPE from FREESCALE
- Have 2 types of DIGITAL OUTPUT; I2C and SPI. Both types use 4MHz CLOCK at the maximum
- Run with 2.4V-3.6V Power Supply, LOW CURRENT (not be higher than 3.6V)
- Have FUNCTION SELF-TEST for Z-axis
- Measure acceleration or G value on 3 axes; X, Y, Z
- Has 3 sensitivity ranges to measure G value;  $\pm 2G$ ,  $\pm 4G$ , and  $\pm 8G$
- Choose to read data as 8BIT OUTPUT (for  $\pm 2G$ ,  $\pm 4G$ ) or 10BIT OUTPUT (for  $\pm 8G$  only)
- Has 2 BANDWIDTHS to measure value; 62.5Hz (OUTPUT SAMPLE RATE as 125Hz) and 125Hz (OUTPUT SAMPLE RATE as 250Hz)
- Board is designed to place on PIN HEADER; 5PIN for each side, so there are 10PIN intotal with 2.54mm. pin pitch. The pitch on 5PIN side is 1.52cm. and it can be placed on PROJECT BOARD.
- PCB size: 1.50 X 2.00 cm.
- ET-MMA7455L consists of ...

1. Board
2. CD-ROM User's Manual and Example Programs

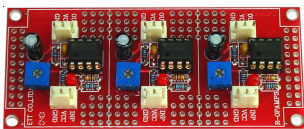
\*\*\* If using the board, it has to interface with MCU that only uses 2.4V-3.6V Power Supply such as ARM7, STM8. In this case, we don't recommend user to use MCU that uses 5V Power Supply because it has to interface through BUFFER, so it has got problem in reading the value.\*\*\*

### R-OPA 1 (P-ET-A-00124)



● **R-TRACKER 1** It is line detected sensor with infrared. It uses 1 sensor with IC OP AMP, be able to detect for 3 cm. distance with VR for Output into TTL HI/LO and wire connector.

### R-OPA 3 (P-ET-A-00165)



**R-OPA 3** are signal expansion with OPAMP 3 channel. There's R to transform signal of ANALOG into OUTPUT TTL with wire connector into system 3 PIN ROBOT from ETT.

### R-SW (P-ET-A-00129)



● **R-SW** It is detected buffer 1 ch with wire connector.

### ET-MMA7331L

(P-ET-A-00436)



**ET-MMA7331L** is the same as Board ET-MMA7455L, it measures different acceleration (ACCELEROMETER); in this case, it gives ANALOG OUTPUT on 3-axes; X, Y, Z.

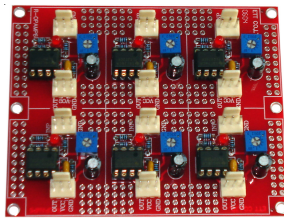
#### Specifications of Board ET-MMA7331L

- Use IC No.MMA7331L LGA-14PIN TYPE from FREESCALE
  - Give ANALOG OUTPUT (2.2V-3.6V) at Pin X, Y, Z
  - Run by 2.2V-3.6V Power Supply, LOW CURRENT (not be higher than 3.6V)
  - Has FUNCTION SELF TEST for FREE FALL DETECTION (it measures the value while material is falling from the upright position)
  - Has 2 sensitivity ranges to measure G value;  $\pm 4G$ ,  $\pm 12G$
  - Use BANDWIDTH to measure X, Y = 400Hz and Z = 300Hz
  - Board is designed to place on PIN HEADER; 4PIN for each side, so there are 8PIN in total with 2.54mm. pin pitch. The pitch on 4PIN side is 1.52cm. and it can be placed on PROJECT BOARD.
  - PCB size 1.25 X 2.00 cm.
  - ET-MMA7331L consists of...
1. Board
  2. CD-ROM User's Manual and Example Program

\*\*\*\* If using the board, it has to interface with MCU that uses 2.4V-3.6V Power Supply such as ARM7, STM8. If it has to use MCU that uses 5V Power Supply; in the part of OUTPUT ANALOG X, Y, Z of MMA7331L can be interfaced with INPUT of A TO D of MCU, but Pin CONTROL of MM7331L must be interfaced through BUFFER to reduce voltage internal Pin CONTROL not higher than 3.6V. If it does not use Pin CONTROL of board, user can set Pin CONTROL to be fixed LOGIC 0 or LOGIC 1 as required. However, if it set as LOGIC 1, it is not higher than 3.6V or should be equal to Power Supply of Board ET-MMA7331L.\*\*\*\*

### R-OPA 6

(P-ET-A-00164)



**R-OPA 6** are signal expansion with OPAMP 6 channel. There's R to transform signal of ANALOG into OUTPUT TTL with wire connector into system 3 PIN ROBOT from ETT.

### R-REFLEX

(P-ET-A-00166)



● **R - REFLEX** It is buffer sensor 1 channel with 1-3 cm distance by SENSOR RPR - 359F and use with board R-OPA 1, R-OPA 3 or, R-OPA 6.

### R-SW2

(P-ET-A-00150)



● **R-SW2** It is buffer sensor by MICRO SW with LED Display and wire connector into ET-ROBOT 3 PIN from ETT.

### ET-TCS230

(P-ET-A-00290)



High-Resolution Conversion of Light Intensity to Frequency  
Programmable Color and Full Scale Output Frequency  
Communicates Directly with a Microcontroller  
Single-Supply Operation (2.7V to 5.5V)

It is Board Color-Light-To-Frequency Converter of RED, BLUE and GREEN color by using signal FREQUENCY OUTPUT and it uses IC No.TCS230 from TAOS.

- IC No.TCS230 to be Color-Light-To-Frequency Converter that consists of Photo-Diode 8x8 and it is divided into 4 groups; RED, BLUE, GREEN and CLEAR (NO FILTER).
- Give signal OUTPUT of each color to be Frequency that is variable with each color-light.
- Voltage 2.7V-5.5V Low Power
- Inconsistency 0.2% at Frequency 50KHz
- Whit LED on board to reflect color of material in case of less light or it is not variable during test
- PCB size 4.4 x 5.6 cm.
- Connector 8 PIN can be applied for testing LED's color, robotics, fruit's color
- ET-TCS230 consists of ET-TCS230, CD-ROM User's Manual

### R-TRACKER 3

(P-ET-A-00121)



● **R-TRACKER 3** It is line detected sensor with infrared. It uses 3 sensors with IC OP AMP, be able to detect for 3 cm. distance with VR for Output into TTL HI/LO and wire connector.

### R-TRACKER 1

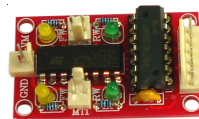
(P-ET-A-00122)



● **R-TRACKER 1** It is line detected sensor with infrared. It uses 1 sensor with IC OP AMP, be able to detect for 3 cm. distance with VR for Output into TTL HI/LO and wire connector.

### R-MOTOR

(P-ET-A-00125)



● **R-MOTOR** It is 2-DC MOTOR by using IC No. L293D with wire connector.

### R-LIGHT

(P-ET-A-00127)



● **R-LIGHT** It is detected infrared sensor 1 channel with wire connector.