

# ROBOBUILDER 5720T-FMT (C-YA-A-00231)

The Robot **ROBOBUILDER 5720T-FMT**, from ROBOBUILDER, South Korea, uses 16-DIGITAL SERVO MOTOR to perform well. Formats of joint can be adjusted independently, depending on users' idea because joints of MOTOR is the most prominent feature of this robot model, it can be jointed together easily. The joints of MOTOR are designed better than general robots.

\*\*\* The product **ROBOBUILDER 5720T-FMT** is suitable for users with age of 14 and up \*\*\*



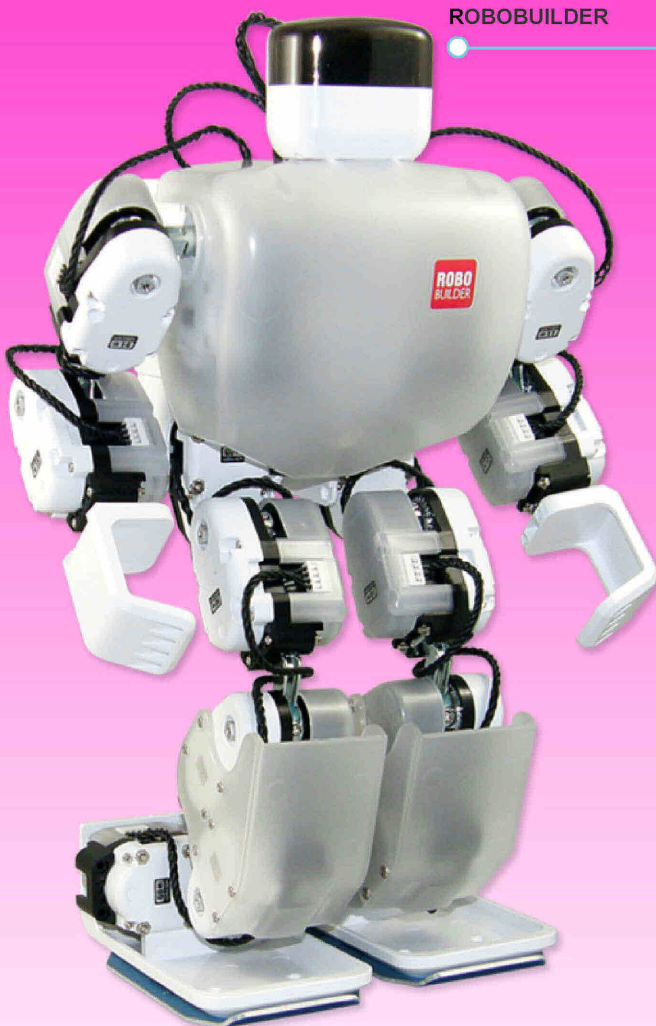
WCK-1108T1



WCK-1111T1



METAL JOINT



## SPECIFICATIONS OF ROBOBUILDER 5720T-FMT

- The robot body is assembled in the format of HUNO with 2-leg; it is 28.5 cm tall and 1.40 kg weight.
- Structure of robot consists of 16-DIGITAL SERVO MOTOR with metal joints; frame of legs and body is made of opaque plastic.
- DIGITAL SERVO is made of strong metal gear, frame of cover is made of transparent and opaque plastic, and 2-colored LED inside SERVO that can be ON-OFF according to user's programming.
- BLOCK CONTROL of ROBOT is MCU No.ATMEGA128 with Switch ON/OFF; there is SOCKET internal BLOCK CONTROL that supports the connection with MODULE BLUETOOTH (MODULE BLUETOOTH is not included in the complete set, \*OPTION\*).
- MODULE SENSOR measures acceleration of gravitation on X, Y, Z axis (GRAVITY DETECTION ACCELERATION SENSOR).
- Have 2 types of IR SENSOR ; one is IR Detector to detect any obstacle in the path and another one is IR Receiver to receive INFARED from REMOTE CONTROL.
- SOUND SENSOR measures the level of loudness.
- BATTERY is NI-MH 8.4V type with ADAPTER for BATTERY CHARGER. REMOTE CONTROL controls and commands robot by INFARED

## Available programs for developing robot

- Program for creating motions – MOTION BUILDER
  - Program for DOWNLOAD MOTION – ROBOBUILDER TOOL
  - Program for creating conditional ACTION upon SENSOR – ACTIONBUILDER
- Other programs such as MSRD (VISUAL PROGRAMMING), C Language of AVR.
- All programs mentioned above supports OS WINDOWS XP, VISTA, 7, 10
  - Download Programs/ Data into ROBOT through PORT RS232 (it can use PORT USB and USB TO RS232 is provided in the complete set).
  - User can download newer version of program for developing robot, including example MOTIONS of ROBOT via internet, please visit website: [www.robobuilder.net](http://www.robobuilder.net) and <http://www.rqworld.com>

## Complete Set of ROBOBUILDER 5720T-FMT includes ...

1. Completed ROBOT is assembled in the format of HUNO
2. REMOTE CONTROL
3. CABLE DOWNLOAD RS232
4. BATTERY NI-MH 8.4 with ADAPTER for BATTERY CHARGER
5. USB TO RS232
6. CD-ROM Program and User Guide Book
7. High-quality black box to keep robot "ET-BOX1"

\*\*\* ETT provides devices and spare parts of SERVO and ROBOBUILDER for customers who purchased the robot from ETT; they can directly return to ETT to check and repair, without sending back to Korea. Provide 1-year guarantee for the product ROBOBUILDER purchased from ETT \*\*\*



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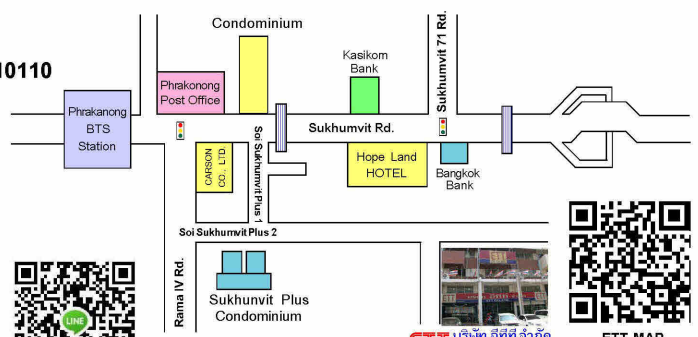
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LINE ID : etteam1



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ETT CO., LTD.

ETT MAP

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**ET-RASPBERRY HAT EXP BOX (P-ET-A-00557)**

**ET-RASPBERRY MINI EXP BOX (P-ET-A-00558)**

This training kit is used together with Textbook “เรียนรู้ เข้าใจ ใช้งาน Raspberry Pi3 (Learning, Understand & Use Raspberry Pi3)” (Thai only). It is divided into 2 sets; firstly, **ET-RASPBERRY HAT EXP BOX** is used with Board RASPBERRY to connect and test in **Chapter 1-11 (it is recommended user to buy this box set first and then buy Board ET-RASPBERRY MINI EXP BOX later)**. Secondly, ET-RASPBERRY MINI EXP BOX is used to connect & test in **Chapter 12-16**.

Both sets do not include Board CPU RASPBERRY PI3; so, customer needs to buy it (OPTION). Or, if customer has already had Board RASPBERRY PI3 and wire cables, POWER SUPPLY, it only buys ET-RASPBERRY HAT or MINI.



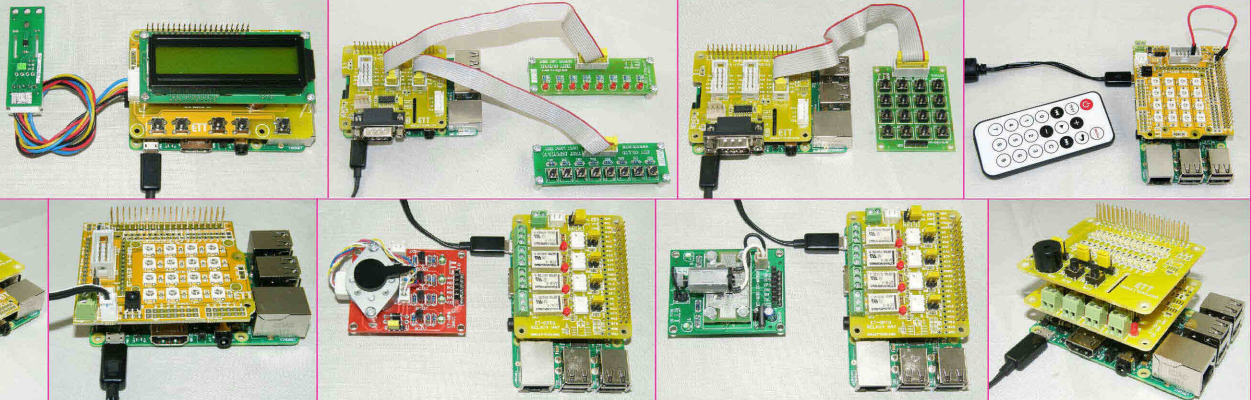
Training Kit **ET-RASPBERRY HAT EXP BOX** includes in the high quality box, it is more convenient to use and protect all devices well. The training kit consists of...

- SD CARD 16GB-EXP3 provided OS and LAB for testing
- ET-LCD SW HAT
- ET-ILED 4x4 RGB (HEADER 40PIN)
- ET-SWITCHING 5V 2A TYPE B
- ET-OPTO DC IN4 HAT
- ET-CONV 10/RS232 HAT
- ET-MINI SMCC V2
- ET-TEST 10P/OUT
- Wire Cables
- DVD provided Example Programs and Programs of RASPBERRY PI3
- Textbook “เรียนรู้ เข้าใจ ใช้งาน Raspberry Pi3 (Learning, Understand & Use Raspberry Pi3)” (Thai only)
- High quality plastic box to keep and protect Training Kit “ ET-BOX1 ”
- ET-SENSOR SHT31
- ET-IR REMOTE KEY
- ET-OPTO RELAY4 HAT
- ET-TEST HAT
- ET-MINI DC MOTOR
- ET-MINI KEY 4X4
- ET-TEST 10P/INP
- Pair Cable 10PIN

Board **RASPBERRY PI3**, **POWER SUPPLY**, **wire cables**, **LAN Cable** are not included in the Box Set.



Example illustrates how to connect **ET-RASPBERRY HAT EXP BOX** with Board **Raspberry Pi3**.



**ET-RASPBERRY HAT EXP BOX** can be used with Textbook “เรียนรู้ เข้าใจ ใช้งาน Raspberry Pi3 (Learning, Understand & Use Raspberry Pi3)” (Thai only) for testing in **Chapter 1-11**. For **Chapter 12-16**, it must be used with **RASPBERRY MINI EXP BOX**.

This Training kit can be used to test, use, and learn

- how to develop RASPBERRY
- how to test LED, SW
- how to test OUTPUT RELAY
- how to test KEY 4X4
- how to test RTC
- how to create SD CARD
- how to test LED RGB
- how to test OPTO DC IN
- how to test LCD
- how to test SENSOR HUMIDITY
- how to write Program by Python
- how to test receiving IR REMOTE
- how to test RS232 PORT
- how to test BUZZER

\*It is recommended user to have the **Training Kit RASPBERRY HAT EXP BOX** first and then use or buy **ET-RASPBERRY MINI EXP BOX** later.

Training Kit **RASPBERRY MINI EXP BOX** is contained in high quality plastic box, it is divided in small section that is more convenient to keep and protect all devices.

The box set consists of...

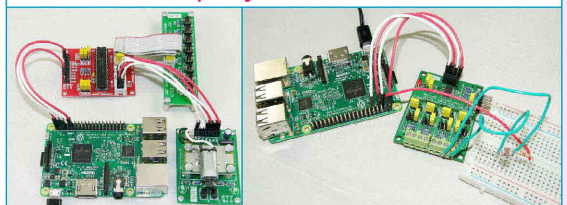
The box set consists of...

- ET-MINI MCP3424 ADC
- LDR, THERMISTER, R, LED
- test A TO D, measure pressure, LDR, THERMISTER
- test INPUT, OUTPUT, I/O via PORT I<sup>2</sup>C
- ET-MINI MCP23017
- PROJECT BOARD 400 HOLES

It can be used with Textbook “เรียนรู้ เข้าใจ ใช้งาน Raspberry Pi3 (Learning, Understand & Use Raspberry Pi3)” (Thai only) for testing in Chapter 12-16; it can



Example illustrates how to connect **ET-RASPBERRY MINI EXP BOX** with Board **Raspberry Pi3**.





## ส่วนของ RASPBERRY PI3 ที่เลือกซื้อตรงกับความต้องการ

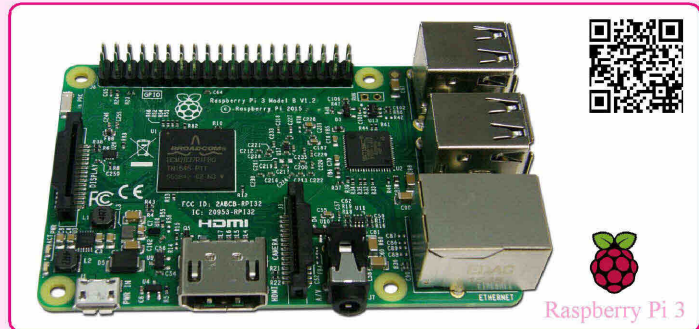
### RASPBERRY PI3-MOD B

(C-YA-A-00213) \*\*\*

This **RASPBERRY PI3-MOD B** is the newest product that adds **WIFI** and **BLUETOOTH** and speed of CPU is higher than PI2.

?This RASPBERRY PI3 is 32BIT minicomputer with 1GB Memory, it can connect with computer monitor or TV monitor (HDMI) with key board and mouse. It acts like a computer that can access WEB, play multimedia files. Run the operating System through SD CARD such as LINUX, WINDOWS 10.

• Size and Connectors of RASPBERRY PI3 are the same as RASPBERRY PI2; it can be used with all devices and box of the previous version (except POWER SUPPLY, it requires 5V at least 2.4A).



- CPU uses BROADCOM BCM2837 64 BIT QUAD CORE 1.2GHz, speed is higher than PI model about 50-60%, RAM 1GB
- use BCM43143 WIFI and BLUETOOTH LOW ENERGY (BLE) ON BOARD
- 400 MHz VIDEO CORD IV GPU
- OPERATING SYSTEM BOOTS FROM MICRO SD CARD
- DIMENSION: 85 X 56 X 17mm
- POWER SUPPLY FROM CONNECTOR MICRO USB SOCKET 5V/2.4A

#### CONNECTORS

- GPIO CONNECTOR** : 40 PIN HEADER 2.54mm. MALE (GPIO, UART, I2C, etc)
- USB** : 4 PORT USB 2.0 for KEY BOARD, MOUSE
- ETHERNET** : 10/100 BASE RJ45
- VIDEO OUTPUT** : HDMI and COMPOSITE VIDEO (PAL/NTSC) 3.5mm. 4-POLE JACK

**AUDIO OUTPUT** : HDMI and 3.5mm. 4-POLE JACK

**CAMERA CONNECTION** : 15 PIN MIPI CAMERA SERIAL INTERFACE (CSI-2)  
**MEMORY CARD SLOT** : MICRO SD

\*\*\*This board is imported from abroad; Circuit is SMD type that is irreparable. ETT checks all circuit and guarantee all boards is available before sale.

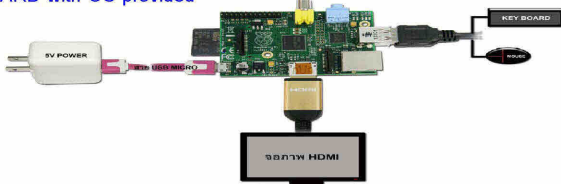
\*\*\*This product, especially this model, has not any warranty. If customer does not accept the condition of product, please do not unseal the package and return the product to ETT to refund.\*\*\*

#### \*\*\* How to connect Board RASPBERRY PI3 \*\*\*

1. If connecting through screen HDMI, it requires following devices...

- Board RASPBERRY PI3
- CABLE HDMI/HDMI
- ET-SWITCHING ADAPTER 5V 3A TYPE U and CABLE POWER 3 P
- SCREEN with HDMI
- KEY BOARD PC and MOUSE

SD CARD with OS provided



2. If connecting through LAN Cable, it required following devices...

- Board RASPBERRY PI3
- CABLE LAN DIRECT 2M
- ET-SWITCHING ADAPTER 5V 3A TYPE U and CABLE POWER 3 P
- ROUTER (DHCP SERVER) and COMPUTER PC
- SD CARD with OS provided

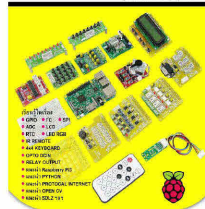


TEXTBOOK “เรียนรู้ เข้าใจ ใช้งาน Raspberry PI3 (LEARNING UNDERSTAND & USE Raspberry Pi3)” (THAI ONLY)

(A-BK-P-00151)



เรียนรู้ เข้าใจ ใช้งาน  
**Raspberry Pi3**



ETT ผลิต และ กระจาย

It describes how to write program and use Board RASPBERRY PI3, including GPIO, I2C, SPI, ADC, LCD, LED RGB, IR REMOTE, 4X4 KEY BOARD, DC INPUT, RELAY, WEB CAM.

It suggests Board RASPBERRY PI3, PYTHON Language for writing program on Board RASPBERRY, PROTOCOL, INTERNET, OPEN CV, SDL2. Moreover, it suggests how to connect this board with Board HAT and Board ET-MINI I/O from ETT. This textbook is published by fine printing paper, 352 Pages.

### SD CARD 16GB-EXP3 (A-CM-A-00049)



This is MICRO SD CARD 16GB CLASS10 that is provided with OS, it is ready to be used with BOARD RASPBERRY PI3. Example Programs, Library for testing program are provided.

\*\*\* This SD CARD is already included in the box set of ET-RASPBERRY HAT EXP BOX. \*\*\*

### ET-SWITCHING ADAPTER 5V 3A TYPE U (A-AP-A-00107)

It is SWITCHING DC POWER SUPPLY under TISI and UL Standards.



**INPUT:** AC INPUT 100-240VAC 3PIN MALE

(If customer has not any Cable AC 3PIN, it requires buying Cable POWER 3P AC 1.8M, its costs \*35.-)

**OUTPUT:** 5V 3A HEADER USB MICRO TYPE B MALE

• สาย LAN DIRECT 2 M (P-CB-A-00028)

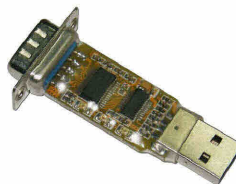


• CABLE HDMI/HDMI 1.8M (A-CB-A-00046)



### ET-USB/RS232 MINI R1 (P-ET-A-00502)

Board converts signal from RS232 PORT to mini USB Port, it is inexpensive and it can be connected to Connector USB 2.0 of computer PC directly.



- Use IC No.FT231XS from FTDI , don't worry about newer Driver version of OS in the future
- Connector RS232 DB9 Pin MALE and Connector USB TYPE A
- Run on OS WINDOWS 98/ SE/ ME/ 2000/ XP/ 7/ 8/ LINUX/ MAC OS

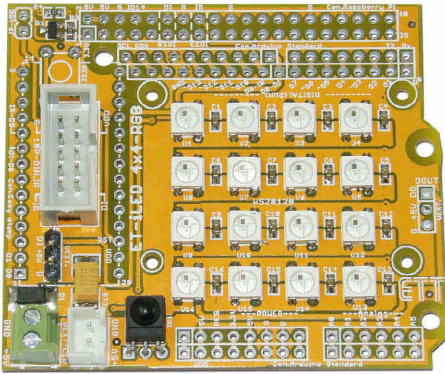
### WEB CAM USB (C-YA-A-00230)

This WEB CAM USB connects with Connector USB of Board RASPBERRY. It is used to test in the Chapter 15. It is more convenient to connect and use.



- IMAGE SENSOR CMOS
- MAXIMUM DYNAMIC PIXEL: 5.0M pixels
- FRAME RATE: 30 fps
- COMPATIBLE WITH USB2.0/1.1

## ET-iLED 4x4-RGB (P-ET-A-00548)



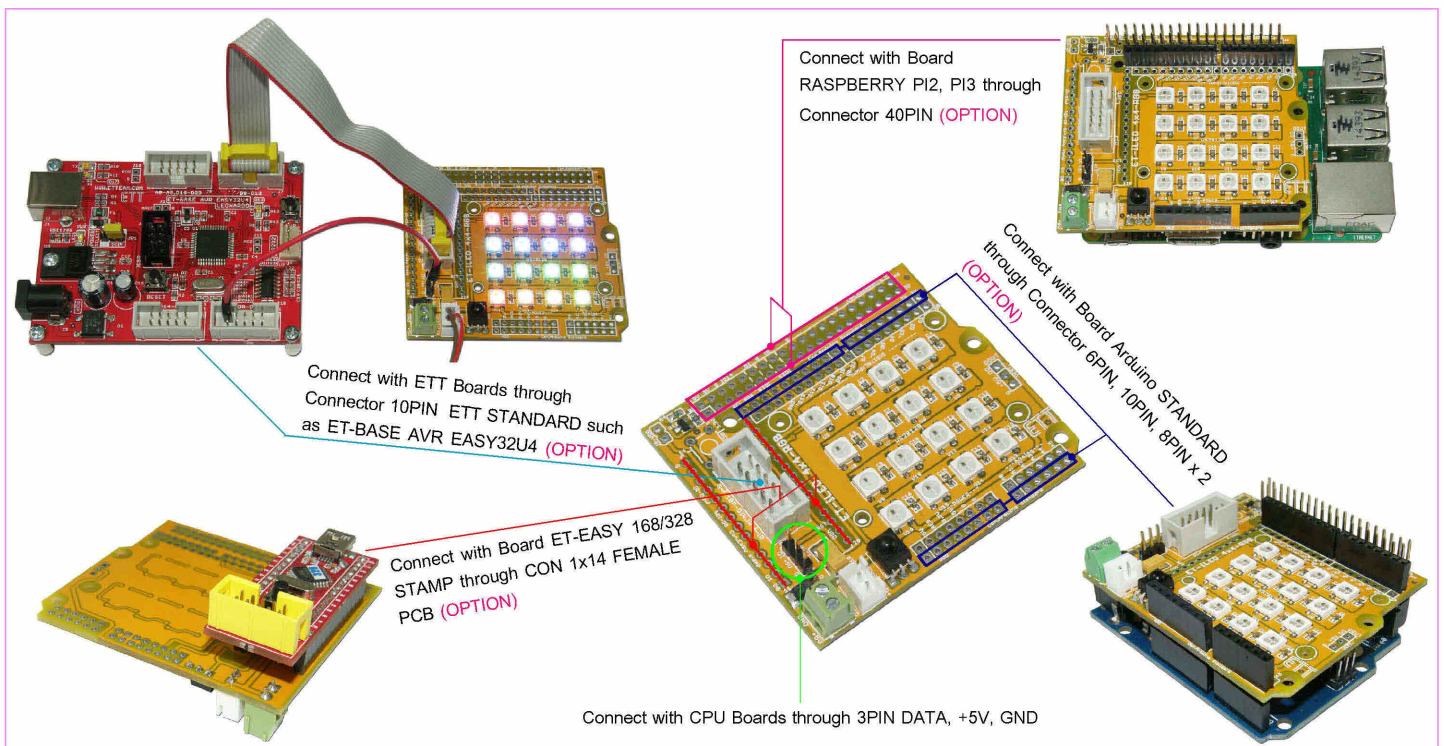
ET-iLED 4x4-RGB is RGB LED Display Board; it is inexpensive board that is designed to connect with various types of Board Controller such as Board RASPBERRY PI, Arduino Boards, and ETT Boards. This Board 4x4-RGB consists of 16-LED RGB No.WS2812B that are connected in the format of 4x4 DOT, it can display high resolution of RGB up to 24 BIT COLOR or 16 million colors and user can setup the contrast of this LED up to 256 levels.

**SPECIFICATIONS of ET-iLED 4x4-RGB**

- Separately use 5VDC Power Supply (1 AMP Current)
- Only use single Cable CONTROL or 1 BIT to control all 16-LED in order to control the Circuit to display result as SERIAL NZR
- INPUT connects with Signal TTL 5V with Circuit BUFFER 3.3V TO 5V to connect with Board RASPBERRY
- Circuit IR receives data from IR REMOTE KEY; it uses IC No.TSOP4838, so it can write program to command the operation of LED RGB from IR REMOTE KEY.

• Board ET-iLED 4x4-RGB has various types of Connector, so it can be connected with various boards. It can be connected through...

1. Connector 10PIN ETT is connected through Pair Cable 10PIN (**\*OPTION\* Pair Cable 10PIN CON2 10CM (P-CB-A-00033)**). It can connect with ETT Boards such as ET-BASE AVR EASY32U4, ET-BASE AVR EASY88/168/328.
2. Connector 2x20 PIN is connected with Connector 2x20 PIN of Board RASPBERRY PI2, PI3 by soldering Connector 2x20PIN (**\*OPTION\* 2 x 20 PIN STACKABLE 25.5 mm. (A-CO-A-00289)**)
3. Connector Arduino STANDARD solders additional Connector 6PIN, 10PIN and 8PIN x 2 (**\*OPTION\* 1 x 6 PIN STACKABLE 21mm (A-CO-A-00299), 1 x 8 PIN STACKABLE 21mm (A-CO-A-00300), 1 x 10 PIN STACKABLE 21mm (A-CO-A-00301)**)
4. Connector 14x2 PIN HEADER is connected with Board ET-EASY 168 or 328 STAMP by soldering additional Connector 14x2 PIN HEADER (**\*OPTION\* It uses 2pcs of CON 1x14 FEMALE PCB (A-CO-A-00302)**)
5. Connector 3PIN HEADER is connected with CONTROL Boards through Connector 3PIN DATA, +5V, GND



- Can connect Board ET-iLED 4x4-RGB together up to 64 (NOTE: It requires high speed CPU such as AVR, ARM, and etc. For CPU MCS51 and general PIC, it cannot be used with this Board ET-iLED 4x4-RGB)
- Use POWER SUPPLY +5VDC and at least 1A Current that is connected through 2PIN TERMINAL or 2PIN HEADER 2.50mm. (**\*OPTION\* It can be used with ET-SWITCHING ADAPTER 5V 2A TYPE B (A-AP-A-00095)**)
- PCB size: 5.96 x 6.85cm.
- Set of Board ET-iLED 4x4-RGB includes... 1. Board ET-iLED 4x4-RGB 2. CD-ROM Manual and Example Program

## ET-IR REMOTE KEY (P-ET-A-00546)



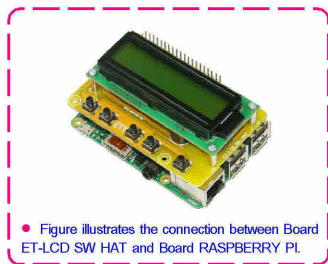
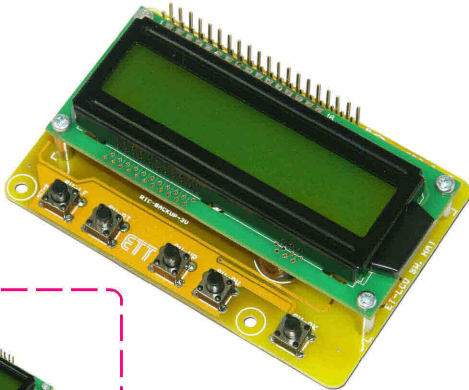
This is mini KEY IR REMOTE with Frequency 38 KHz; there are 20 Keys with BATTERY 3V.

- ET-IR REMOTE KEY size: 8.65 x 4.10 x 0.75 cm.



**ET-LCD SW HAT (P-ET-A-00550)**

**ET-LCD SW HAT** is an I/O Board of ETT that is designed to connect with BOARD RASPBERRY PI that has Connector I/O 40PIN. Board includes LCD Display 16x2, SW, BUZZER, RTC, and Connector I2C I/O. User can connect this Board ET-LCD SW HAT with Board RASPBERRY PI though Connector 40PIN directly. Next, user can practice writing program to control devices or can create new project easily. This complete set provides example programs in CD-ROM that illustrates how to use all devices, it is written by PYTHON Language.

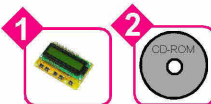


• Figure illustrates the connection between Board ET-LCD SW HAT and Board RASPBERRY PI



**SPECIFICATIONS of BOARD ET-LCD SW HAT**

- Be compatible with Board RASPBERRY PI MODEL B+, PI2 MOEL B, PI3 that has Connector 40PIN
- LCD 16x2 BACKLIGHT is connected as 4BIT LCD with VR to adjust contrast 5 of PUSH BUTTON SW
- REAL TIME CLOCK RTC No.DS3231 with BATTERY 3V BACKUP
- BUZZER MINI generates sound that is activated at LOGIC 1
- Connector I2C BOX 5PIN can be connected with devices; for example, it connects with SENSOR to measure HUMIDITY and TEMPERATURE "ET-SENSOR SHT31"; it provides example program for using with this SHT31 (\*OPTION\* ET-SENSOR SHT31 (P-ET-A-00539)). Moreover, it provides Circuit Clamper to adjust voltage that can be used with Voltage 5V.
- Board uses POWER SUPPLY 5V and 3.3V that is connected from Board RASPBERRY PI.
- PCB Size: 8.49 x 5.6 cm
- Complete set of Board **ET-LCD SW HAT** includes...
  1. Board ET-LCD SW HAT
  2. CD-ROM Manual and Example Program



**LCD 16x2 I2C (A-LC-C-00026)**



It is LCD with 16-Character 2-Line, blue BACKLIGHT and white font (STN NEGATIVE BLUE). The display is I2C Interface that saves amount of I/O of CPU when connecting with this LCD. It provides program for using with Board Arduino.

**SPECIFICATIONS of LCD 16x2 I2C**

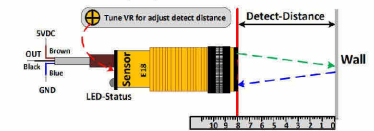
- LCD 16-Character 2-Line and blue BACKLIGHT (STN NEGATIVE BLUE)
- Only use 4 Cables for I2C-BUS Interface; GND, +5VDC, SDA, SCL. Moreover, it can connect 8 LCD together in the same I2C BUS (Must set different ADDRESS)
- IC extends PORT to connect LCD by PCF8574A or PCF8574
- PCB Size: 80 x 36mm.; Display Size: 64 x 14mm.
- Use Power Supply 5VDC, 25mA Current
- Complete set includes Board LCD, CD-ROM Manual and Example Program for using on Arduino



**E18-D80NK (A-LE-N-00117)**



INFRARED SENSOR detects distance that uses reflection of INFRARED when light is reflected from a surface of object. It can adjust the range of detection from 6 cm to 80cm. OUTPUT is released as LOGIC TTL 0 and 1 (5V)



**SPECIFICATIONS of E18-D80NK**

- Distance of detection can be adjusted by R to be in the range of 6cm-80cm; there is LED to show state of distance detection.
- Use opaque material for SENSING; black is the best because SENSOR works well when using INFRARED reflection
- OPEN COLLECTION OUTPUT must be connected R 10K PULL UP at OUTPUT
- Only use 3 Cables; 5VDC, GND, OUTPUT
- Release Signal OUTPUT as LOGIC 0 and 1
- Use POWER SUPPLY 5VDC with 100mA



**HK1100C SENSOR (A-LE-N-00120)**

5V 0-1.2 MPa Pressure Transducer Sensor Oil Fuel Diesel Gas Water Air Sensor



**Specifications :**

Working Voltage	DC 5.0V
Output Voltage	DC 0.5-4.5 V
Sensor material	Carbon steel alloy
Working Current	≤ 10 mA
Working Pressure Range	0-1.2 MPa (0-12 bar, 0-174 PSI)
The Biggest Pressure	2.4 MPa
Cable length	19 cm.
Destroy Pressure	3.0 MPa
Working TEMP. Range	0-85 °C
Storage Temperature Range	0-100 °C
Measuring Error	± 1.5 %FSO
Temperature Range Error	± 3.5 %FSO
Responses Time	≤ 2.0 ms
Cycle Life	500,000 pcs
Application	non-corrosive gas liquid measurement

**LJ12A3-4-Z/BX (A-RF-C-00014)**



INDUCTIVE PROXIMITY SENSOR LJ12A3-4-Z/BX NPN, 3 WIRE ON, DIAMETER 12mm., PROXIMITY SW (NOTE: Can be used with metal for detection only)

4 mm. distance detection

Red LED shows state of detection



MODEL	LJ12A3-4-Z/BX
OUTPUT	NPN, 3 WIRE, NO (NORMAL OPEN)
WORK VOLTAGE	6VDC - 36VDC
OUTPUT CURRENT	300mA. (SINK)
SIZE	DIA. 12 mm. L : 64 mm.(BODY)
CABLE LENGTH	100 cm.
DETECTION RANGE	4 mm.
DETECTION OF OBJECT	METAL (COPPER, IRON, ALUMINIUM ETC.)

# ET-BASE NodeMCU (P-ET-A-00549)

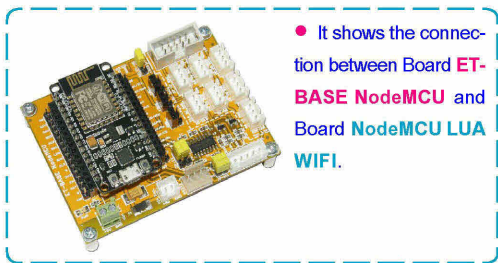


ET-BASE NodeMCU ... supports installation of Board NodeMCU, I/O Pins of NodeMCU are externally pulled; so, it is more convenient to use.

**SPECIFICATIONS OF BOARD ET-BASE NodeMCU**

- Connector RS232 as 4 PIN ETT Type is connected through IC LINE DRIVER ST3232; so, it can be connected with other devices that have PORT RS232 instantly.
- Circuit REGULATOR LM1117 changes 5V to 3.3V on board.
- Connector POWER as 2 PIN TERMINAL Type and BLOCK 2 PIN Type receives 5V to supply board.
- Connector I/O D0-D7 as BLOCK 10 PIN ETT Type connects with ETT Boards that support voltage not higher than 3.3V.
- Connector I/O D5-D10 and A0 as BLOCK 3 PIN Type for use.
- Connector I2C as BLOCK 5 PIN Type is connected through Circuit Voltage Converter, it is compatible with LOGIC 5V.
- Connector PIN HEADER 30PIN MALE and FEMALE connects Pin from MODULE NodeMCU.
- Board Size: 81.28 x 60.96 mm.
- External POWER SUPPLY 5VDC can be ET-SWITCHING ADAPTER 5V 2A TYPE B (A-AP-A-00095) (OPTION)
- BOARD ET-BASE NodeMCU ... includes

1. BOARD ET-BASE NodeMCU
2. Document and Circuit



• It shows the connection between Board ET-BASE NodeMCU and Board NodeMCU LUA WIFI.

**OPTION CONNECTOR ET-BASE NodeMCU**



CON 2P HOUSING 2.50 mm.  
(A-CO-A-00162)



CON 5P HOUSING 2.50 mm.  
(A-CO-A-00268)



CON 3P HOUSING 2.50 mm.  
(A-CO-A-00169)



CRIMP TERMINAL 2.50 mm.  
(A-CO-T-00002)

ET-CABLE RS232 9 PIN F  
(P-CB-A-00002)



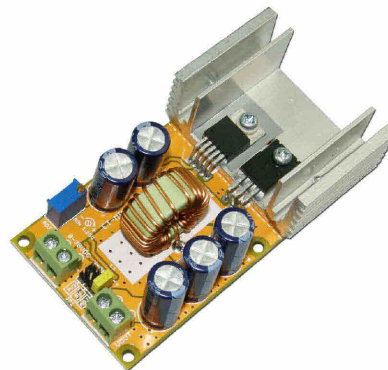
Cable RS232 DB9 PIN Female and one terminal is 4 pins Female.

**ET-SWITCHING ADAPTER 5V 2A TYPE B (A-AP-A-00095)**



THIS IS DC POWER SUPPLYSWITCHING.  
**INPUT : AC INPUT 220VAC 50/60Hz 0.5A**  
**OUTPUT : DC 5V/2.0A (10W)**  
TYPE B HOUSING 2.50 mm. 2 PIN HEADER

**ET-MINI PWR ADJ-6A (P-ET-A-00556)**



ET-MINI PWR ADJ-6A is SWITCHING REGULATOR POWER SUPPLY as STEP-DOWN that can choose Voltage of OUTPUT to be 3.3VDC or 5.0VDC by manual adjustment or JUMPER. It can provide the maximum Current at 6A.

- Use IC STEP-DOWN VOLTAGE REGULATOR No.SL4016 (INOUT 8V TO 40V, 8A OUTPUT, 180KHz SWITCHING FREQUENCY)
- Continuously provide the maximum Current at 6A
- Pin INPUT can receive Voltage in the range of 8-38 VDC
- Voltage on Pin Output side can be adjusted in the range of 1.25-36 VDC by Trim pot 25-Circle. Moreover, it can choose fixed Voltage on Pin Output side to be 3.3 VDC or 5.0 VDC by JUMPER.
- Connector 2PIN on the side of Pin INPUT and Connector 2 PIN on the side of Pin OUTPUT is TERMINAL SCREW TYPE
- Only PCB size: 4.6 X 7.6cm.; Board size including HEAT SINK (W x L x D) 4.9 x 9.1 x 2.5 cm.

**ET-ADAPTER ROUND PLUG 5V 2A TYPE J (A-AP-A-00119)**  
**ET-ADAPTER ROUND PLUG 12V 1A TYPE J (A-AP-A-00120)**



It is SWITCHING DC POWER SUPPLY under standards of TIS.  
**INPUT : AC INPUT 220VAC 50/60 Hz 300mA for Model 5V 2A and 500 mA. for Model 12V 1A**  
**OUTPUT : 5VDC 2A (10W) for Model 5V 2A ; 12VDC 1A (12W) for Model 12V 1A**  
ADAPTER is 2 PIN WALL MOUNT ROUND  
Connector DC TYPE J: It is FEMALE JACK ROUND 2.5mm.; anode is outer and cathode is inner.

**ET-RS422/485 ISOLATION DIN**  
(P-ET-A-00553)

- 2500 V OPTICALLY ISOLATED
- EXTEND DATA UP TO 1.2 KM
- SET AUTOMATIC SEND DATA CONTROL
- JUMPER SELECT 120 OHM



ET-RS422/485 ISOLATION DIN converts Signal sending /receiving data from RS232 to RS422 or RS485. The format of sending/receiving data is DIGITAL ISOLATION iCOUPLER that can ISOLATION up to 2500V RMS. It uses IC No.ADM2587 that reduces problems about unusual electric system, lightning, or overloaded current into the system; it prevents all electric system from damaged.

**SIGNAL CONVERTER :** RS232 (DB9PIN FEMALE) to RS422 (FULL DUPLEX) and RS485 (HALF DUPLEX)

**BAUD RATE :** 300 BPS to 115.2 KBPS

**ISOLATION :** ISOLATION DATA INTERFACE 2500V RMS (1 MINUTE)  
IC DADM2587E from ANALOG DEVICES

**CONNECTOR :** RS232 PORT is DB9PIN FEMALE  
: RS422/485 is 4 PIN PLUG TYPE TERMINAL BLOCK  
: DC IN POWER is 2 PIN PLUG TYPE TERMINAL BLOCK

**SW DIP MODE :** 4 Modes can be setup as follows;

- : RS422 (FULL)
- : RS485-RTS OFF
- : RS485-RTS ON
- : RS485-AUTO



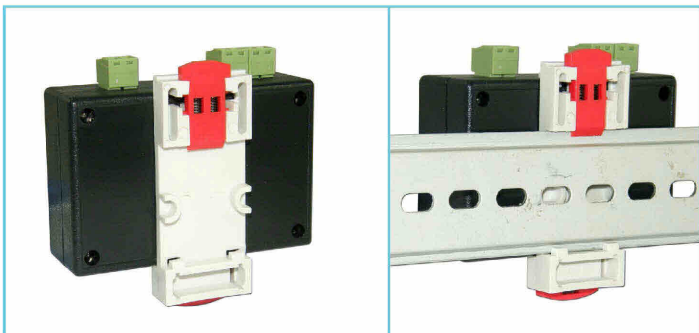
**LED STATUS :** TX, RX, 485, PWR

**POWER SUPPLY :** 9-24 VDC (MAX 100mA at 24 VDC)

**DISTANCE :** RS422/485 can be connected up to 4,000 feet or 1.2 km.

**INSTALLATION :** Interface with DIN 35mm.

**BOX SIZE :** 7.5 x 2.5 x 5 cm (Only Box)



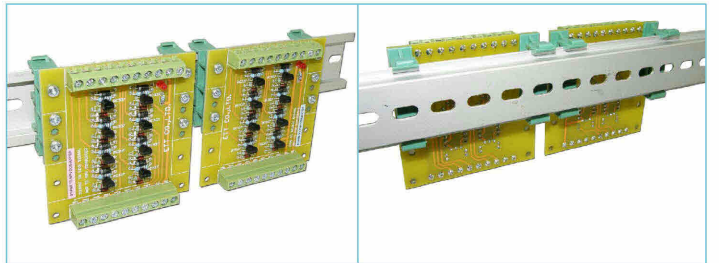
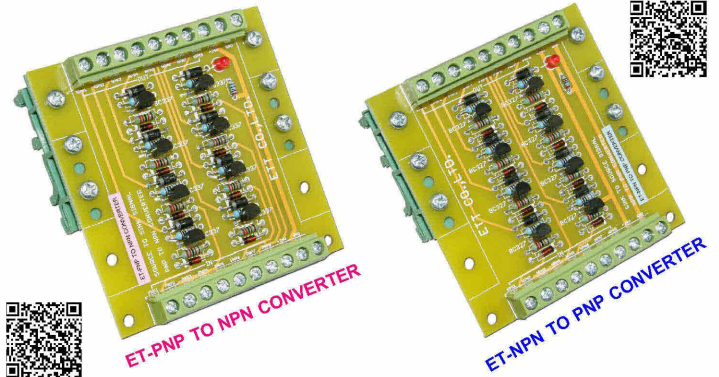
Complete set of ET-RS422/485 ISOLATION DIN includes...

1. ET-RS422/485 ISOLATION DIN with fastener
2. Cable DB9PIN, Both TERMINALS SERIAL CABLE DB-9 M/F
3. Document



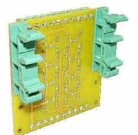
**ET-NPN TO PNP CONVERTER**  
(P-ET-A-00554)

**ET-PNP TO NPN CONVERTER**  
(P-ET-A-00555)



One Board converts Signal from NPN to PNP and another one converts Signal from PNP to NPN. It is used for Signal OUTPUT of SENSOR that is NPN or PNP, it is different from the INPUT System of PLC; or, Signal INPUT is different from SENSOR. Moreover, it can be used with different PLC System; its INPUT or OUTPUT has different NPN or PNP.

- **ET-NPN TO PNP CONVERTER** has 8-CH that can independently receive Signal INPUT NPN(SINK) and convert to PNP(SOURCE).
- **ET-PNP TO NPN CONVERTER** has 8-CH that can independently receive Signal INPUT PNP(SOURCE) and convert to NPN(SINK).
- INPUT of ET-NPN TO PNP runs at -2V and stops running at -1V (ON > -2V, OFF < -1V)
- INPUT of ET-PNP TO NPN runs at 2V and stops running at 1V (ON > 2V, OFF < 1V)
- Drive the maximum Current NPN(SINK) or PNP(SOURCE) at 800mA
- Can be used with the maximum Signal at 25 KHz
- Have Circuit Protection for both INPUT/OUTPUT against reverse of signal connection
- Receive Signal INPUT in the range of 10V-40V (recommended 24V)
- Have Base to mount on DIN Rail 35mm.
- Board size: 7 X 7.30cm.
- **ET-NPN TO PNP** and **ET-PNP TO NPN** includes...
  1. Board and 2 Bases for DIN Rail 35mm. (excluding rail)
  2. Document



**ADAPTER RAIL DIN 35 (A-BX-E-00044)**



- Holes provided for fastening screws with work-piece



This plastic fastener can be connected with PCB or boxes; after fastened, it can be mounted on the DIN Rail 35mm. It easily mounts and removes from the DIN Rail 35mm.

- Dimensions: 19.5mm (H) x 43.25mm (L) x 10mm (W)
- Complete Set includes...

1. 1 of ADAPTER RAIL DIM 35 mm
2. 2 of SCREWS



**ET-CONV DB9 FM-DIN (P-ET-A-00551)**

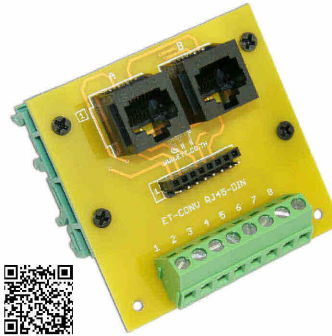
PCB kit with device for converting Connector DB9 PIN MALE and FEMALE that is parallel connected along PIN 1 to PIN 9 converts to Connector 10 PIN TERMINAL; it is easier to connect Cables in the format of SCREW. Moreover, there is Base on board to mount on DIN Rail 35mm.



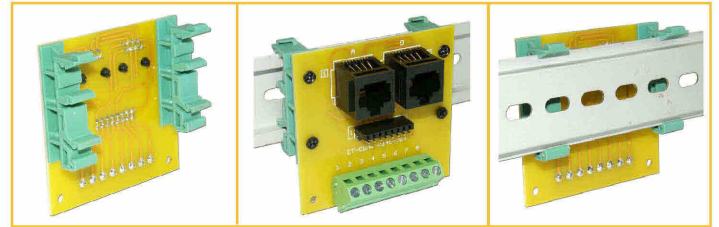
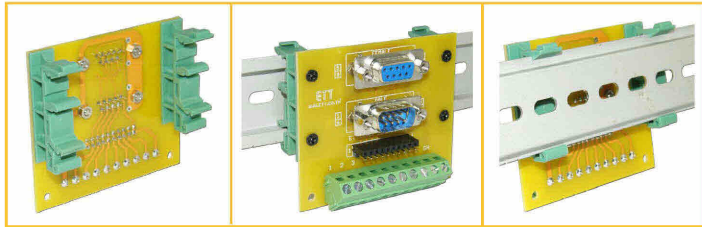
- 2 of Connector DB9 PIN; DB9 PIN MALE and DB9 PIN FEMALE
- Connector 10 PIN TERMINAL SCREW PITCH 5.00mm.; it is inclined type that is easier to connect CABLE
- PIN HEADER 10 PIN 2.54mm. MALE and FEMALE is parallel connected along Connector 10PIN TERMINAL; it is more convenient to connect
- 2 of DIN 35mm. can be mounted on Base Rail 35mm.
- PCB size: 7.1 x 6.3 cm.

**ET-CONV RJ45-DIN (P-ET-A-00552)**

PCB kit with device for converting 2 of Connector RJ45 MODULAR JACK 8P8C that are parallel connected along PIN 1 to PIN 6 converts to Connector 8 PIN TERMINAL; it is easier to connect Cables in the format of SCREW. Moreover, there is Base on board to mount on DIN Rail 35mm.



- 2 of Connector RJ45 MODULAR JACK 8P8C is parallel connected along PIN 1 to PIN 8
- Connector 8 PIN TERMINAL SCREW PITCH 5.0 mm.; it is inclined type that is easier to connect Cable
- PIN HEADER 8 PIN 2.54mm. MALE and FEMALE
- 2 of DIN 35mm. can be mounted on Base Rail 35mm.
- PCB size: 6.5 x 6.3 cm.



**MG996R SERVO MOTOR (A-MO-M-00145)**



**MG996R HIGHTORQUE METAL GEAR  
DUAL BALL BEARING SERVO MOTOR**

- WEIGHT : 55 g
- STALL TORQUE : 9.4 kg/cm (4.8V), 11 kg/cm (6V)
- OPERATING VOLTAGE : 4.8V TO 7.2V
- STALL CURRENT : 2.5A (6V)

- DIMENSION : 40.7 x 19.7 x 42.5 mm.
- OPERATING SPEED : 0.17 s/60° (4.8V), 0.14 s/60° (6V)
- RUNNING CURRENT : 500 mA - 900 mA (6V)
- SERVO PLUG : JR  
ORANGE COLOR = PWM  
RED COLOR = VCC  
BROWN COLOR = GND



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