



Raspberry Pi 3

RASPBERRY PI3-MOD B + SD8G

(C-YA-A-00214) ***

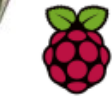
This is the latest **RASPBERRY PI3-MOD B** that has already been added more Circuit WIFI and Circuit BLUETOOTH; it increases more speed of CPU than PI2. Moreover, it is provided with SD CARD 8G that has already been installed the Operation System: OS.

• This RASPBERRY PI3 is 32Bit minicomputer with 1GB Memory that can be connected with Computer monitor or TV monitor (HDMI) and KEY BOARD and MOUSE. Actually, it can run as a computer, it can enter WEB BROWSER and play file multimedia as well. It can choose the operating systems via SD CARD such as LINUX and WINDOWS 10.

• This RASPBERRY PI3 has the same board size, connectors as the RASPBERRY PI2 model; so, it can use the same accessories and box as the previous model. Except POWER SUPPLY, it requires 5V at least 2.4A.



new



Raspberry Pi 3

- CPU uses BROADCOM BCM2837 64 BIT QUAD CORE 1.2GHZ that is more speed than the old PI model approx. 50-60%, RAM 1 GB
- 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 17 mm.
- POWER SUPPLY from Connector MICRO USB SOCKET 5V/2.4A

CONNECTORS

GPIO CONNECTOR : 40PIN HEADER 2.54mm.MALE (GPIO, UART, I2C and etc.)

USB : 4 PORT USB 2.0 for KEYBOARD, MOUSE

ETHERNET : 10/100 BASE RJ45

VIDEO OUTPUT : HDMI and COMPOSITE VIDEO(PAL/NTSC) 3.5mm. 4-POLE JACK

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

CAMERA CONNECTOR : 15 PIN MIPI CAMERA SERIAL INTERFACE (CSI-2)

MEMORY CARD SLOT : MICRO SD

If connecting monitor via Connector HDMI, it requires

- Monitor with Connector HDMI
- Cable HDMI (CABLE HDMI/HDMI 2.0)
- KEY BOARD USB
- MOUSE USB
- POWER SUPPLY 5V with CONNECTOR MICRO USB (ET-SWITCHING ADAPTER 5V 3A TYPE U)

If connecting monitor via RJ45 LAN, it requires

- COMPUTER
- ROUTER (DHCP SERVER)
- Cable LAN DIRECT 2M
- POWER SUPPLY 5V with CONNECTOR MICRO USB (ET-SWITCHING ADAPTER 5V 3A TYPE U)

RASPBERRY PI3-MOD B

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



Raspberry Pi 3

ET-SWITCHING ADAPTER 5V 3A TYPE U

(A-AP-A-00107)

It is DC POWER SUPPLY as SWITCHING type under standard of TIS and UL.



INPUT : AC INPUT 100-240VAC

Connector 3PIN MALE

(if customer does not have any Cable AC, please buy)

OUTPUT : 5V 3A CONNECTOR

MICRO USB TYPE B MALE

สายไฟ POWER 3 P AC 1.8M

(A-CB-A-00002)



• **ET-CONV 40D** (P-ET-A-00198)



• **SD CARD 8 GB-B3** (A-CM-A-00047)



This 8G MICRO SD CARD has already been installed the operating System and it is compatible with Raspberry Pi 3-MOD B.

• **สาย LAN DIRECT 2 M** (P-CB-A-00028)



• **CABLE HDMI/HDMI 1.8M** (A-CB-A-00046)



• **PI-CONV 40T** (A-CO-A-00292)



Board PI-CONV 40T is Board CONVERT, it converts Connector 40PIN I/O on Board RASPBERRY PI such as PI MODEL A+, PI MODEL B+, PI2 MODEL B to Connector 40PIN HEADER MALE; moreover, it types name of I/O PIN on PCB to connect with PROJECT BOARD and test conveniently (when it is connected from Board RASPBERRY PI 40 PIN, it requires PAIR CABLE 40 PIN (OPTION: it is not included in the package)).

• **CASE RASPBERRY-MOD B+** (A-CV-D-00018)



• This CASE is made for RASPBERRY PI2 MOD B, RASPBERRY-MOD B+ -512M. It is made from transparent acrylic 3mm. in thickness. It is easier to assembly to be a box.

• Provide HEATSINK to ventilate heat and 2 pcs of glue to stick IC (convey heat)

***This board is imported product; its circuit is SMD type that is irreparable. Please note that ETT checked and approved all parts of circuit before sale and we confirmed the product is available.

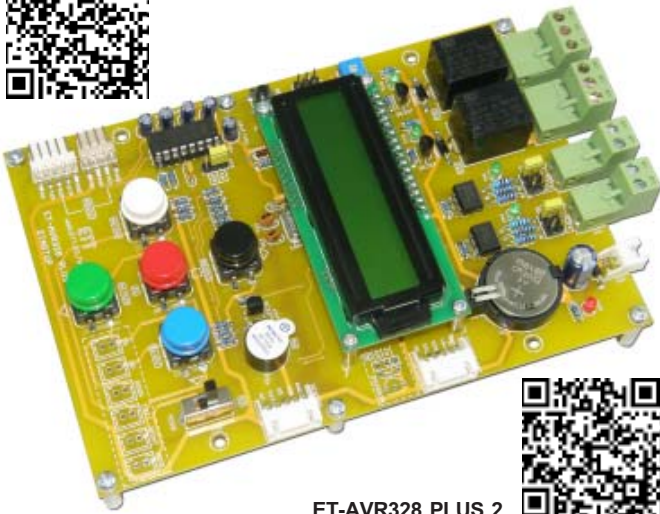
ETT does not warrant the product, especially this model. If customer cannot accept any condition, please not open or unseal the package. Please return this product to refund

ET-AVR328 PLUS 1 (P-ET-A-00541)

ET-AVR328 PLUS 2 (P-ET-A-00542)



ET-AVR328 PLUS 1



ET-AVR328 PLUS 2



This semi-finished Board Microcontroller uses CPU AVR No.ATMEGA328; write program C Language of Arduino. Write and DOWNLOAD program simultaneously to CPU directly through PORT RS232. There is LCD Display, 2-CH OUTPUT RELAY, 2-CH INPUT DC, RTC with BAT 3V, RS232 PORT, 5 KEY, and others on board.

SPECIFICATIONS of ET-AVR328 PLUS 1 and ET-AVR328 PLUS 2

- LCD Display of both boards is only different but other devices in the circuit are the same.

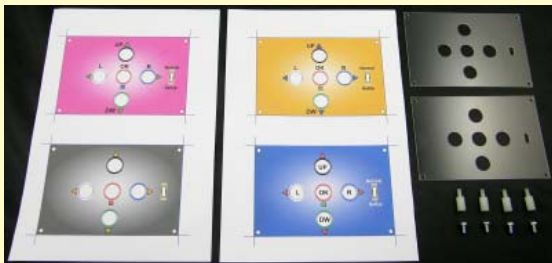
- ET-AVR328 PLUS 1 uses LCD as 16-Character 1-Line.
- ET-AVR328 PLUS 2 uses LCD as 16-Character 2-Line with LED BACKLIGHT.
- Use CPU ATMEGA328 28-PIN DIP TYPE, 32 I/O, 32K BYTE FLASH, 2K BYTE RAM, 1K BYTE Internal EEPROM, Frequency 16 MHz, and BOOTLOADER.
- Write and develop program by C Language of Arduino; it can DOWNLOAD program from PC through PORT RS232.
- 2-CH OUTPUT as TERMINAL NO, NC, COM to be 2 of RELAY 10A.
- 2-CH INPUT as TERMINAL 2 PIN as DC INPUT OPTO ISOLATE 5/12/24V.
- RTC No.DS3231 with BATTERY BACKUP 3V, BUZZER to generate sound.
- 5 of PUSH BUTTON SW. with Cover, and 1 of SLIDE SW.
- RS232 4 PIN for connecting to boards, and RS232 5 PIN for DOWNLOAD.
- 2 of 5 PIN CONNECTOR connects to ET-SENSOR No.AM2302, SHT15, SHT31 to measure temperature and humidity (OPTION).

- Circuit ON BOARD of DS18B20 (OPTION)
 - Connector 6 PIN ICSP for programming by external Programmer such as ET-AVR ISP MKII
 - Provide Programs in CD to support devices on board such as LCD, SW. and other that are written by Arduino; it will be guideline for customer to write and include these programs for their own projects conveniently and easily.
 - POWER SUPPLY 5VDC with Connector as BLOCK 2 PIN and the maximum Current is not higher than 250mA; it can use POWER SUPPLY 5V of ETT "ET-SWITCHING ADAPTER 5V 2A TYPE B" (A-AP-A-00095) (OPTION) - PCB Size: 15.74 x 10.66 cm.
 - Package of ET-AVR328 PLUS 1/2 includes ...
1. Board and LCD 2. CABLE ET-DOWNLOAD RD2 3. CD-ROM Example Programs and Manual



OPTION

ET-COVER KEY AVR328 PLUS (P-ET-A-00543)



Provide 2 transparent plastic plates with holes to adhere on KEY BOARD, printed-layout key paper can be designed and perforated holes, and including plastic poles to tighten board.



- Example of assembling ET-CONVER KEY AVR328 PLUS with ET-AVR328 PLUS



ET-PROJECT BOX 2B (A-BX-E-00026)

ET-PROJECT BOX 2W (A-BX-E-00027)

This all-purposed plastic box has holes to tighten Board ET-AVR328 PLUS1/2 by nuts.
Box Size: 5.25 x 12.00 x 17.50 cm.
Has 2 colors; the model B is black color and the model W is cream color.



- Example of assembling ET-PROJECT BOX 1B with ET-AVR328 PLUS



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



This Board converts Signal from RS232 PORT to mini USB PORT, it is inexpensive. It directly interfaces with Connector USB 2.0 of computer PC.

- Use IC No.FT232RL from FTDI Company and IC No.MX1483, so there is no any problem of the latest DRIVER of the Operating System OS in the future.
- Connector RS232 DB9 PIN MALE and Connector USB TYPE A
- Run on the Operating System of OS WINDOWS 98/ SE/ ME/ 2000/ XP/ 7/ 8/ LINUX/ MAC OS
- ET-USB/RS232 MINI R1 includes ...

1. ET-USB/RS232 MINI R1
2. CD-ROM

NUCLEO-F746ZG (C-YA-A-00217)



This STM32 Development kit from ST uses a large MCU No.STM32F746 144-PIN LQFP; there is a part of DOWNLOAD, DEBUG and MCU on board.



1. A part of ON BOARD DOWNLOAD and DEBUG is ST-LINK V2-1 to DOWNLOAD Program and DEBUG the operation through PORT USB MINI-B; moreover, it provides Connector SWD to connect DOWNLOAD DUBUG outside Board NUCLEO conveniently.
 2. A part of Board
 - MCU No.STM32F746ZG, 32 BIT, RUN 216 MHZ, 1 M FLASH PROGRAM, 320 KB RAM, LQFP-144 TYPE
 - RJ45 ETHERNET IEEE-802.3-2002
 - USB OTG FULL-SPEED Connector MICRO-AB
 - 2 Types of Connector I/O
 - Connector I/O as Arduino UNO V3
 - Connector I/O Standard ST MORPHO that externally connected I/O to outside MCU
 - 1 SW. for use and 1 SW.RESET
- 5VDC Power Supply for board from Connector USB ST LINK from Connector I/O 3.3V, 7-12V, 5V
- DOWNLOAD Program, example Programs to write and develop from www.st.com
- (** This NUCLEO-F746ZG is imported products, there is no any warranty).

STM32F407G-DISC1 (C-YA-A-00218)

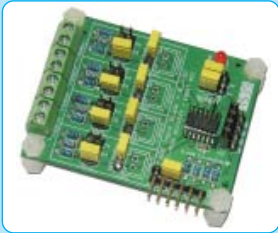


This STM32F407G-DISC1 is designed by ST to replace STM32F4 DISCOVERY; all specifications are the same. There are 2 parts on Board; DOWNLOAD, DEBUG, and MCU.



1. A part of ST-LINK V2 is used to DOWNLOAD and DEBUG the operation that is connected through PORT USB MINI-B; it provide Connector SWD to externally connect DOWNLOAD, DEBUG outside board.
 2. A part of Board
 - MCU No.STM32F407VGT6, 32 BIT ARM-CORTEX-M4F, 1 M FLASH PROGRAM, 192 KB RAM, LQFP-100 TYPE
 - 3-AXIS ACCELEROMETER No.LIS302D on Board
 - DIGITAL MICROPHONE No.MP45DT02 on board
 - Expansion part for Speaker No.CS43L22 AUDIO DAC on board
 - 4-LED for display, 4-LED for test, 1-SW. for use, and 1-SW.RESET
 - USB OTG FS with Connector MICRO-AB
 - 2 of Connector I/O as PIN HEADER under PCB 25 x 2 (2.54 mm.)
 - 5VDC POWER SUPPLY from Connector USB ST-LINK
- DOWNLOAD Program, example programs to write and develop from website www.st.com
- (** This STM32F407G-DISC1 is imported products, there is no any warranty).

ET-MINI MCP3424 ADC (P-ET-A-00537)



ET-MINI MCP3424 ADC is Board A TO D with 18-BIT 4-CH, run as I2C Interface. Use IC No.MCP3424 of MICROCHIPS to measure both Signal Current and Voltage as SINGLE END MODE (0-2V) and DIFFERENTIAL MODE (+2V, +2V).

- Use IC No.MCP3424-E/SL, SOIC-14, 18 BITS A/D, 4 CHANNELS



- Have 4-CH Adjustable JUMPER for measurement as follows;
 - Measure 4-20 mA Current by 100 Ohm Resistor
 - Measure +2V Voltage as SINGLE Type and +2V to -2V as DIFF Type
 - Measure +5V Voltage as SINGLE Type and +5V to -5V as DIFF Type
- Provide Connector ICSP to interface to PICKIT SERIAL ANALYZER
- Choose and setup 8 of I2C Address Positions by JUMPER
- Use Power Supply 2.7-5.5 VDC for running board
- Signal Connection on I2C side is PIN HEADER 1 x 4 MALE and 1 x 4 FEMALE
- Signal INPUT is 2 PIN TERMINAL 4-CH
- Board Size: 4.4 x 5.6 cm.
- ET-MINI MCP3424 ADC includes... 1. Board ET-MINI MCP3424 2. CD-ROM Manual

ET-MINI RS422/485 V2 (P-ET-A-00547)



- This is used to test or actually assemble circuit for RS422/485.
- IC No.ISL83076E that is IC RS422/485 HIGH SPEED DATA RATE 20Mbps
 - DEVICES ON BUS 256; POWER SUPPLY 3.3V can be connected with Board Microcontroller as CPU 3.3V directly, without using BUFFER 5V to 3.3V
 - Connector JUMPER to choose and SET the operation of RS422, 485 and choose R LOAD
 - PCB size: 4.5 x 5.6 cm.
 - Package of ET-MINI RS422/485 V2 includes...
1. Board ET-MINI RS422/485 V2
 2. Document

ET-SENSOR SHT15 (P-ET-A-00538)

ET-SENSOR SHT31 (P-ET-A-00539)

ET-SENSOR AM2302 (P-ET-A-00540)

All of 3 ET-SENSOR measure humidity and temperature, it assembles IC on PCB that is ready to test the operation and connect with Micro System to read values of humidity and temperature.

- ET-SENSOR SHT15 consists of SENSOR SHT15
- ET-SENSOR SHT31 consists of SENSOR SHT31-DIS-B
- ET-SENSOR AM2302 consists of SENSOR AM2302 (DHT22)
- PCB SIZE 4.9 x 1.6 cm.
- Provide Connector 5PIN and Cable 5PIN with 30 cm. in length

Table shows HUMIDITY and TEMPERATURE SENSOR



NO.	HUMIDITY ACCURACY (% RH)	TEMP. ACCURACY (° C)	INTERFACE	SUPPLY DC
SHT15	± 2.0 % RH	± 0.3 °C	DIGITAL 2-WIRE	2.4 - 5.5V
SHT31-DIS-B	± 2.0 % RH	± 0.3 °C	I ² C	2.4 - 5.5V
AM2302	± 2.0 % RH	± 0.5 °C	SINGLE BUS	3.3 - 5.5V

ET-MINI CNT6 (P-ET-A-00544)



ET-MINI CNT6 ... is mini COUNTER with 7-Digit and 3-Row; it displays quantity, Target and Difference of production to notify employees in the factory to know how many piece of product they can produce in a day. It is more convenient to install, save money and space; it can count-up, count-down, and RESET as required.

This mini COUNTER has 7-SEGMENT LED with 0.56 inch in height and 7-Digit 3-Row. It can count-up, count-down, store and remember the counting, and display the difference of counting by self. There are 3 parts of Display as follows;

- 1.TARGET: It displays the target or quantity of production; this TARGET can be independently set by Key in the range of +/-999,999.
- 2.ACTUAL: It displays the actual counting in the range of +/-999,999. This counting value comes from 2-CH INPUT; INPUT Count-Up and INPUT Count-Down.
- 3.DIFF.(DIFFERENCE): It displays the difference between TARGET and ACTUAL; it can display the value in the range of the positive value 9,999,999 and the negative value -999,999. If the negative value is higher than -999,999, there is a dot at the end; for example, -999,999 will be displayed as 999999.

	<ul style="list-style-type: none"> • There is a 3-CH Circuit to receive INPUT OPTO-ISOLATE that can be connected as SW. or Sensor as NPN/PNP SENSOR; moreover, it provides +12VDC or 24VDC to supply SENSOR. • Setup Program ALARM by a OUTPUT Contact RELAY (NO,NC,COM) 	<ul style="list-style-type: none"> • Has 1-CH PORT RS422/485 to receive and send the counting to other devices. • Has 3 positions of DIP SW that can be independently setup ID for each position
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SPECIFICATIONS of ET-MINI CNT6

- DISPLAY is 7-SEGMENT red LED with 0.56 inch height, 7-Digit 3-Row
- Has 3-CH Circuit to receive INPUT OPTO-ISOLATE that can be connected as SW. or SENSOR as NPN/PNP SENS to supply SENSOR according to the DC POWER SUPPLY.
- Speed of counting is 40-500 Hz (40-500 pieces per minute), depend on setting program
- Setup Parameters through IR REMOTE SW. (included in the package); it can setup through PORT RS422/485.
- Setup target of counting (TARGET) and start counting (ACTUAL)
- Setup Program ALARM that must be related to the Target by 1 OUTPUT Contact RELAY (NO,NC,COM)
- In case of power failure or blackout, it stores and remembers the counting and Parameters because there is BATTERY BACKUP in the package.
- Has 1-CH PORT RS422/485 to receive and send the counting to the other devices.
- ET-MINI CNT6 can be used as Counter Display to add more positions of COUNTER Displays to display the same values as the main ET-MINI CNT6; for example, it is used as Monitor to check the operation of production line and display the same values to the control room.
- Has special FUNCTION as TERMINAL DISPLAY. It receives data through PORT RS422/485 to display on all 3-Row of 7-SEGMENT LED Display; moreover, there is DIP SW to setup ID CODE for each. There are 3 formats of receiving data to display as listed below;
 1. ASCII CODE COMMAND
 2. BINARY HEX CODE COMMAND
 3. COUNTR CODE COMMAND
- Be compatible with 12-24 VDC Current 250 mA; Connector 2 PIN as SCREW TERMINAL BLOCK (can modify Cable POWER DC of ET-SWITCHING ADAPTER 12V 1A TYPE J (A-AP-A-00098) **OPTION**)
- Box size: 5.25 x 12.00 x 17.50 cm.; 0.35 Kg. in weight
- Package of ET-MINI CNT6 includes...
 1. ET-MINI CNT6
 2. CD-ROM Program and Manual
 3. ET-IR REMOTE KEY



ET-MINI CNT6 DIN (P-ET-A-000545)

		<p>This ET-MINI CNT6 DIN has the same specifications as ET-MINI CNT6, it adds 2pcs of DIN RAIL (35 mm. rack mount) for ET-MINI CNT6; so, it can install to 35mm. DIN RAIL conveniently.</p>		
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• It shows how to install ET-MINI CNT6 with DIN RAIL.

ET-MC16 (P-ET-A-00086)

This additional device of ETT enhances the operation of COUNTER that increase INPUT channels for counting up to 16 channels.



- 16-CH COUNTER can be independently used as INPUT Contact or OPEN COLLECTOR as required.
- Setup and choose DEBOUNCE TIME of Signal INPUT as 0-15 msec.
- Separate INPUT of Signal by OPTO ISOLATION
- POWER SUPPLY 220VAC

- Size: 15.8 x 6.00 x 12.20 cm; 1.00 kg in weight
- Package of **ET-MC16** includes ... 1. ET-MC16 2. DB 37 PIN MALE with COVER 3. Document

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 x0.75 cm.