

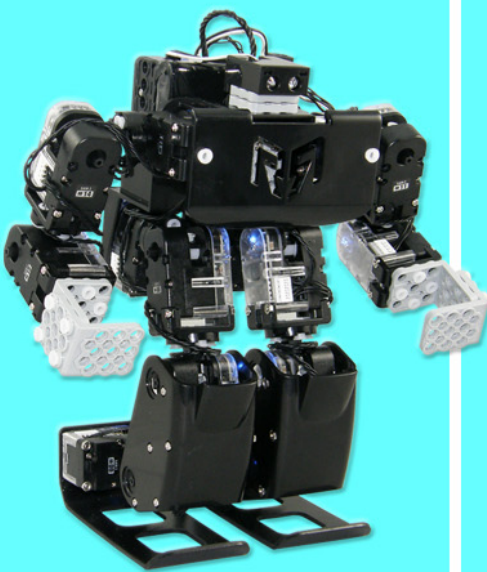
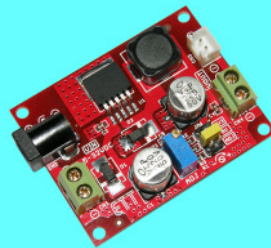
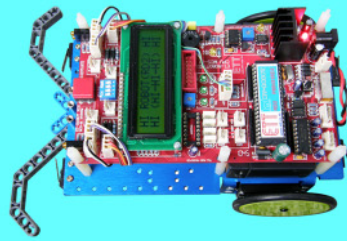
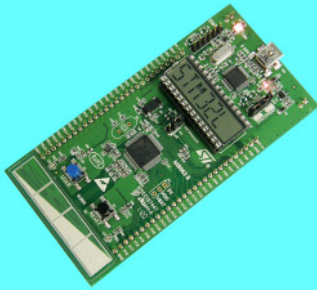
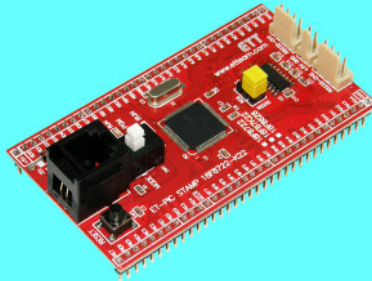


**Electronics  
Technology  
Team**



**บริษัท อีทีที จำกัด  
ETT CO., LTD.**

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**Training Board for Education**  
ET-Robotics Serial  
Embedded Boards :  
ARM-Cortex-M3, ARM7, PIC/dsPIC,  
Arduino/AVR, Z8051/Mcs-51,  
Z80180, Basic Stamp  
Expansion Boards  
USB & Serial Converter  
LCD Display  
Digital Clock  
Counter Display  
Barcode & Magnetic Reader  
Universal Programmer  
Electronic Components  
Servo Motor/TAMIYA/GPS



**PRODUCT CATALOG | 2014**



LINE



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LINE



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**ET-BASE AVR EASY32U4 TRAINING BOX (P-ET-A-00490)**

**ET-BASE AVR EASY328 TRAINING BOX (P-ET-A-00498)**

**ET-BASE AVR EASY168 TRAINING BOX (P-ET-A-00389)**

**ET-BASE AVR EASY88 TRAINING BOX (P-ET-A-00388)**

This Training Kit is designed for learning and understanding the operation of AVR MCU in the format of C Language (C++) of Arduino Project as OPEN SOURCE. It can write C Language Program and it can directly DOWNLOAD data from computer PC to board. Moreover, it provides various tools in the Kit in order to interface and test circuits properly, including C Language Program for testing each circuit; it is full of description and illustration. In this case, it is divided into 4 versions as follows;



**1. ET-BASE AVR EASY32U4 TRAINING BOX**

- Board Microcontroller uses AVR MCU No.ATMEGA32U4 44-PIN TQFP to be MCU on board; RUN Frequency 16.00 MHz
- Use 32 KBYTE FLASH Memory (reserved 4 KBYTE for BOOTLOADER), 2.5 KBYTE RAM, 1 KBYTE EEPROM
- Has USB CONTROLLER insides in the format of USB 2.0 FULL SPEED/LOW SPEED
- When developed by Program Arduino, it can directly program through PORT USB, without using any external Programmer. It is compatible with the Operation System of Windows 98/ XP/ 2000/ VISTA/ 7/ MAC OSX/ LINUX
- Has totally 24PIN DIGITAL I/O (D0-D23); these DIGITAL I/O Pins are used as 12-CH ANALOG INPUT (ADC 10 BIT), 7-CH PWM, 1-CH SPI, 1-CH I2C, 1-CH USART
- Has 4 of 10 PIN ET Connector
- Has RS232 PORT 4 PIN ET with 1-CH LINE DRIVER
- Has Connector USB TYPE B

**2. ET-BASE AVR EASY328 TRAINING BOX**

**3. ET-BASE AVR EASY168 TRAINING BOX**

**4. ET-BASE AVR EASY88 TRAINING BOX**

- Board Microcontroller uses AVR MCU **No.ATMEGA328** for Board "ET-BASE AVR EASY328 TRAINING BOX", **No.ATMEGA168** for Board "ET-BASE AVR EASY168 TRAINING BOX" and **No.ATMEGA88** for Board "ET-BASE AVR EASY88 TRAINING BOX"
- ATMEGA68 has 8 KBYTE FLASH Memory; ATMEGA168 has 16 KBYTE FLASH Memory, 1 KBYTE SRAM, 512 BYTE EEPROM, RUN Frequency 16.00 MHz; and ATMEGA328 has 32 KBYTE FLASH Memory, 2 KBYTE SRAM, 1 KBYTE EEPROM, RUN Frequency 16.00 MHz
- Has 3 of PORT I/O 20 BIT (PB 6 BIT), (PC 6 BIT), (PD 8 BIT); it is RS232, SPI, I2C, TIMER/COUNTER, A TO D 10 BIT 6-CH
- 3 of Connector 10PIN ET, and Connector OUTPUT with 1 of 74HC595 10 PIN IDE ET
- Has SW RESET and SW BL (PD2) to Reset board to run as BOOTLOADER through PORT RS232
- Has PORT RS232 4 PIN ET for use and DOWNLOAD Program



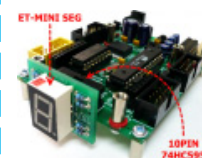
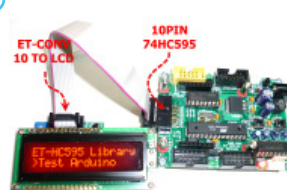
Board Microcontroller version "ET-BASE AVR EASY32U4 TRAINING BOX"



Board Microcontroller version "ET-BASE AVR EASY328 TRAINING BOX", "ET-BASE AVR EASY168 TRAINING BOX", "ET-BASE AVR EASY88 TRAINING BOX", it has the same board's figure but MCU of each version is different.

**It can test and learn**

1. Structure of writing C Language Program
2. How to use C Language Commands
3. How to test DIGITAL INPUT/OUTPUT
4. How to test ANALOG INPUT
5. How to test with LCD Display
6. How to test with SOUND SPEAKER
7. How to test with STEPPING MOTOR
8. How to test with DC MOTOR
9. How to test with 1-WIRE BUS Device
10. How to test with I2C BUS Device
11. How to test with SPI Device
12. How to test with INTERNAL MEMORY



This Training Kit is contained in the high quality plastic box, so it can use and keep this Training Kit properly. This Training Kit includes

1. Board Microcontroller
2. ET-MINI MCP4922
3. ET-MINI DC MOTOR
4. ET-MINI SMCC V2
5. ET-MINI DS1307
6. ET-MINI PCF8583
7. ET-MINI PCF8574
8. ET-MINI 24xx
9. ET-MINI SEG-A
10. ET-TEST 10P/OUT
11. ET-TEST 10P/INP
12. ET-CONV 10 TO LCD
13. 1-WIRE BUS DS1990A
14. LCD LED BACKLIGHT 16-Character 2-Line
15. SPEAKER, VOLUME, DS18S20
16. DC ADAPTER 10VDC 850mA
17. Manual for testing (THAI LANGUAGE)
18. CD-ROM with C Language and Example Programs for testing
19. Cable USB TYPE A/B (for "ET-BASE AVR EASY32U4 TRAINING BOX")
20. High quality plastic box to keep the Training Kit "ET-BOX1"



**ET-PIC24WEB TRAINING V1 BOX (P-ET-A-00349)**

**ET-dsPIC33WEB TRAINING V1 BOX (P-ET-A-00350)**

**ET-PIC24WEB TRAINING V1 BOX** and **ET-dsPIC33WEB TRAINING V1 BOX** is a training device set to learn and develop 16 BIT PIC MICROCONTROLLER System and ETHERNET into WEB SERVER CONTROL. ETT takes SOURCE CODE of TCP/IP STACK from MICROCHIPS to modify and adapt it for ETT Boards, so it can be connected to test Circuit DIGITAL OUTPUT (LED), DIGITAL INPUT (SW), ANALOG INPUT (ADC), and test LCD DISPLAY by using C Language to develop program.

There are 2 versions of board that has different CONTROLLER Board but other parts of board and components are the same.

- ET-PIC24WEB TRAINING V1 BOX;** especially CONTROLLER Board that is ET-PIC24WEB V1 version and its specifications are;
  - 16 BIT MCU No.PIC24FJ128GA008 from MICROCHIPS
  - PROGRAM MEMORY 128 KBYTE, SRAM 8 KBYTE
  - 16 MIPS to process data, 70 BIT I/O, RS232 2 PORT
- ET-dsPIC33WEB TRAINING V1 BOX;** especially CONTROLLER Board that is ET-dsPIC33WEB V1 version and its specifications are;
  - 16 BIT MCU No.dsPIC33F128GP708 from MICROCHIP
  - PROGRAM MEMORY 128 KBYTE, RAM 16 KBYTE
  - 40 MIPS to process data, 69 BIT I/O, RS232 2 PORT

Moreover, it includes circuits to test operation such as 8 DIGITAL OUTPUT (LED), 4 DIGITAL INPUT (SW), and 1 ANALOG INPUT (ADC).



**dsPIC33WEB**



**dsPIC33WEB V1.0**



**PIC24WEB**

Stack version: v4.02  
 Build date: Aug 20...  
 Actions:  
 Toggle LEDs:  LED  
 write to LCD:   
 Status: Ar... S...


  
 Download by ET-PGM  
 PIC USB V1 / V1 PLUS

WEB SERVER CONTROL





The same components in this TRAINING Set consist of;

- ET-MINI ENC28J60 is Module ETHERNET and uses IC No.ENC28J60.
- ET-25LC256 is Board with 32 KBYTE EEPROM that uses IC No.25LC256 to store data.
- LCD MODULE with PCB CONVER 16 Characters x 2 Lines
- 20 Cables of ET-FF WR 22 to interface with board
- CROSS LAN Cable to interface with computer PC
- Cable RS232 9 PIN to be 4 PIN
- CD-ROM User's Manual, Example Programs, and C Language Program
- DC POWER SUPPLY 10V/850mA
- Plastic box to keep TRAINING SET

**\*\*\* OPTION** that is necessary components will be used with this TRAINING SET but it is not included in this TRAINING Set; so, user must additionally purchase it by self if has not. There are 6 types of devices to program data into MCU; in this case, it is interfaced through PORT USB of computer PC.

- ET-PGM PIC USB V1** There is no TEXT TOOL 40 PIN and 20 PIN. (See more details of this board on Page 42)
- ET-PGM PIC USB V1 PLUS** There is TEXT TOLL 40 PIN and 20 PIN. (See more details of this board on Page 42)
- ET-PGM PIC USB V2** (See more details of this board on Page 43)
- ET-ICDX V1.0** (See more details of this board on Page 42)
- ET-PGM PIC PK3** (See more details of this board on Page 41)
- ET-PGM PIC PK3 PLUS** (See more details of this board on Page 41)



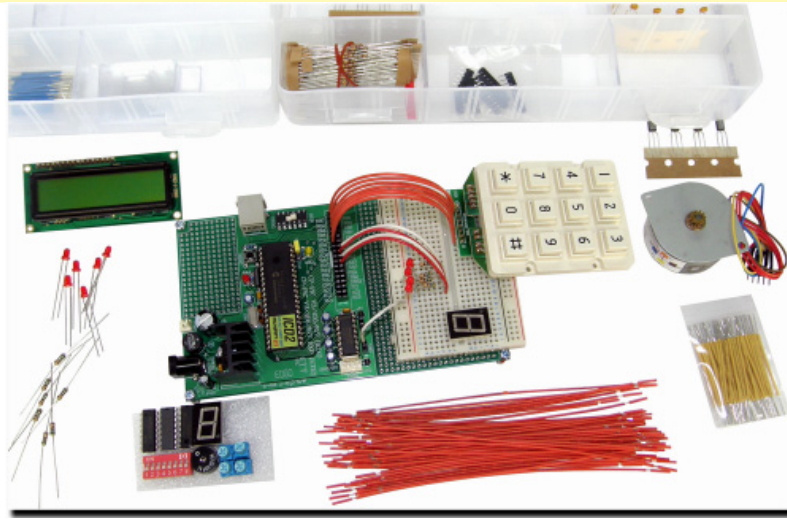
# CP-PIC TRAINING V3 (ICD2) BOX (P-CP-A-00100)

It is the Training Board that is designed to learn and understand the operation of CPU MICROCONTROLLER in the series of PIC No.PIC16F877. It makes user understand HARDWARE and SOFTWARE well and user is able to connect circuit on the PROJECT BOARD by self with provided devices such as LCD Display, STEPPING MOTOR, Key Telephone and etc. Moreover, it makes user understand better because user can learn commands of CPU PIC from ASSEMBLY Language and BASIC Language. In this case, user only writes program on computer PC by ASSEMBLY Language or BASIC Language, then connects the circuit and finally, LOAD program into CPU PIC through PORT USB. This Training Board is compatible with many versions of Board Program such as ET-PGM PIC USB V1, ET-PGM PIC USB V1 PLUS, ET-PGM PIC USB V2, or ET-ICDX V1.0(OPTION). Moreover, there is manual to learn and understand CPU 16F877.



Users can learn experiments in ET-PIC TRAINING V3 BOX ;

1. HARDWARE AND SOFTWARE CPU PIC NO. PIC16F877
2. ASSEMBLY LANGUAGE OF PIC16F877
3. BASIC LANGUAGE OF PIC
4. TEST LCD MODULE
5. TEST STEPPING MOTOR
6. TEST ANALOG TO DIGITAL CONVERTER OF CPU PIC
7. EXTERNAL INTERRUPT
8. TEST MINI SE INPUT
9. TEST BUZZER OUTPUT
10. TEST LED 7-SEGMENT
11. TEST LED OUTPUT
12. TEST DIP SW INPUT




## PIC Training



CP-PIC TRAINING V3(ICD2) BOX s contained in high quality plastic box that can keep the Training Board perfectly; moreover, it is more convenient to use and keep the devices. This kit consists of...

1. BOARD CP-PIC V3/877 EXP(ICD2) uses CPU PIC16F877
  - RUN Frequency 10MHz
  - 8K BYTE FLASH Memory
  - A TO D 10 BIT 8 CHANNEL
  - 34 PIN I/O BUS CONNECTOR
  - HIGH CURRENT SINK/ SOURCE 25/25 mA
  - RJ-11(ICD2) is used to DOWNLOAD program into MCU by ET-PGM PIC USB V1/V1 PLUS/V2/ET-ICDX V1.0, ET-PGM PIC PK3/PK3 PLUS (OPTION); moreover, there is SW to choose the operationmodes
  - PROJECT BOARD Size: 8 x 6 CM.
2. ET-HARD WARE KIT V1 consists of many devices such as STEPPING MOTOR, DIP SW, LED, IC ULN2003, RESISTOR, CAPACITOR, KEY TELEPHONE, VR 10K, SPEAKER, DIODE, TRANSISTOR
3. LCD MODULE 16-CHARACTER 2-LINE with Connector
4. ET-JWBOX300; there are 300 wires with 6 different sizes and it is ready to use with PROJECT BOARD instantly.
5. 10VDC DC ADAPTER to be Power Supply for Training Board
6. Book "Learn and Understand Architectural Structure of Microcontroller PIC16F877" published with high quality paper. 240 pages. (Thai language.)
7. Book "User's Manual of PIC16F877 and PIC18F458 by ASSEMBLY Language and BASIC Language"; it describes how to use programs to write CPU PIC and how to interface circuit to test with PROJECT BOARD. (Thai language.)
8. BASIC Language Program of PIC with User's Manual
9. High quality plastic box to keep Training Board ET-BOX1
10. CD-ROM Program runs on the Operating System of WINDOWS 98/ME/XP

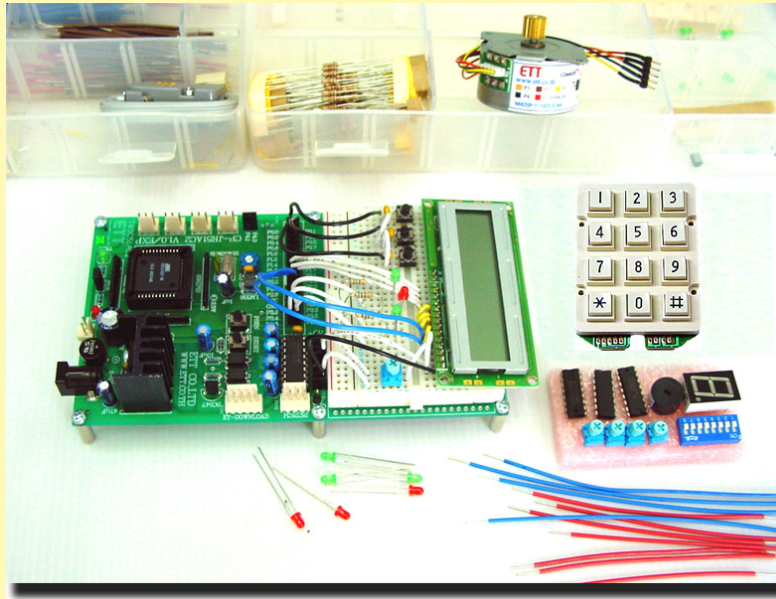
\*\*\* OPTION that is necessary components will be used with this TRAINING SET but it is not included in this TRAINING Set; so, user must additionally purchase it by self if has not. There are 6 types of devices to program data into MCU; in this case, it is interfaced through PORT USB of computer PC.

<p><b>ET-PGM PIC USB V1</b></p>  <p>(See more details of this board on Page 42)</p>	<p><b>ET-PGM PIC USB V1 PLUS</b></p>  <p>(See more details of this board on Page 42)</p>	<p><b>ET-PGM PIC USB V2</b></p>  <p>(See more details of this board on Page 43)</p>	<p><b>ET-ICDX V1.0</b></p>  <p>(See more details of this board on Page 42)</p>	<p><b>ET-PGM PIC PK3</b></p>  <p>(See more details of this board on Page 41)</p>	<p><b>ET-PGM PIC PK3 PLUS</b></p>  <p>(See more details of this board on Page 41)</p>
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# ET-MCS51 TRAINING V1 BOX (P-CP-A-00073)

MCS-51 TRAINING MICROCONTROLLER is designed to study MCS-51 MICROCONTROLLER with Basic Language and users can understand about HARDWARE and SOFTWARE easily. Users can connect circuit on Project Board easily with other accessories in ET-HARDWARE KIT and ET-JWBOX300 Wire Connector. Users may be write Basic Language program with Assembly Language on Computer PC, and then load program into CPU. User may be adapt and change independently.



**Users can learn experiments in MCS51;**

1. HARDWARE AND SOFTWARE CPU MCS51  
-TIMER/COUNTER, INTERRUPT, PCA, A TO D
2. BASIC LANGUAGE OF CPU MCS51
3. TEST CHARACTER LCD MODULE
4. TEST STEPPING MOTOR
5. TEST ANALOG TO DIGITAL CONVERTER OF CPU AVR
6. TEST BUZZER OUTPUT
7. TEST LED OUTPUT
8. TEST DIP SW INPUT
9. TEST RS232 PORT TO SEND/RECEIVE DATA
10. OTHER EXPERIMENT THAT USERS NEED TO BUY MORE ACCESSARIES SUCH AS I2C BUS, SERVO MOTOR, RS422/485, 1-WIRE, MAGNETIC CARD READER, 240 x 64 DOT OR 128 x 64 DOT GRAPHIC LCD



## Mcs-51 Training

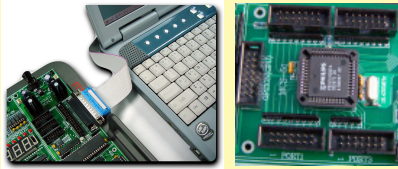
**ET-MCS51 TRAINING V1 BOX includes:**

1. BOARD CP-JR51AC2 V1 EXP CPU 44 PIN PLCC AT89CC51AC2  
  - RUN 18.432 MHz
  - 32 K BYTE FLASH MEMORY
  - 10 BIT 8 CHANNEL A-TO-D
  - 34 PIN I/O BUS CONNECTOR ETT
  - IN-CIRCUIT DOWNLOAD INTO CPU DIRECTLY
  - 8 x 6 CM PROJECT BOARD
2. ET-HARDWARE KIT V1  
  - STEPPING MOTOR, DIP SW, LED, VR, IC ULN2003, R, C
3. 16 CHARACTER 2 LINES LCD MODULE WITH PROJECT BOARD PORT
4. 6 SIZES 300 WIRES OF ET-JWBOX300
5. 10VDC/850mA DC ADAPTER
6. BOOK NAMED "EXPERIMENT AND USE MICROCONTROLLER WITH BASIC BASCOM-8051 LANGUAGE". (Thai Language)
7. BOOK WITH EXAMPLE PROGRAM NAMED "LEARN AND UNDERSTAND MICROCONTROLLER MCS51 WITH BASIC LANGUAGE". (Thai Language)
8. ET-BOX1 PLASTIC BOX



# ET-LAB3A (J-AA-L-00005)

## EXPERIMENT LAB for ... Computer



ETT is one of Development and Research Microcomputer, Single Board, Microcontroller Board such as CPU Z80, Z180, MCS51, PIC, BASIC STAMP, 68HC11, AVR, RABBIT 2000. Today, ETT's ET-LAB3A is designed for study about Microcontroller with MCS-51 inside and be able to connect with Computer PC for write program. Users who have ETT's Single Board or want to control from external can connect ET-BOARD with ET-LAB3A. Other accessories are high technologies as I<sup>2</sup>C BUS, 1 WIRE BUS, SPI BUS, ADC, DAC, and etc. Moreover, users can study the connection between Digital and Analog for support Microcontroller that uses with Analog circuit.



### 2 in 1 BOARD

- Experiment LAB for ... MCS-51
- Experiment LAB for Interface with COMPUTER PC Asm, "C51", Delphi



Mcs-51 Training RD2 [INCIRCUIT](#) [DOWNLOAD](#)

Users can learn 12C BUS, 1-WIRE, iBUTTON and etc. in one board because of Input/Output in ET-LAB3A Board. Be able to study and understand Microcontroller MCS51 in Assemble Language and C51 Language better. Board is designed to connect with Computer PC directly and be able to interface with other accessories and be able to write program controller through Computer PC Test Board.

## CPU MCS51 OF ET-LAB3A BOARD

It uses PHILIPS' No.P89C51RD2/V51RD2 as CPU with 64 KBYTE INTERNAL FLASH MEMORY and can download program in Computer PC into CPU P89V51RD2 through RS232 Port directly. Be able to write program with Assembly Language or C Language. For example, there's DOS and WINDOWS ASSEMBLY MCS51 LANGUAGE in OS, MICRO C51 DOS in C LANGUAGE, and KEIL 51 WINDOWS.



- CPU P89V51RD2
- 64 KBYTE INTERNAL FLASH
- RUN X'TAL 18.432 MHz

## INTERFACE WITH COMPUTER PC

The connection between ET-LAB3A BOARD and Computer PC through PRINTER PORT DB25 PIN of computer to board, it uses 3-CH.8 BIT PORT INPUT/OUTPUT controls to IC PORT 8255 on board. Users need to select high language "DELPHI" to write program to run on OS of WINDOWS



### ET-LAB3A INCLUDES

1. ET-LAB3A
2. CD-ROM
3. DC ADAPTER POWER SUPPLY ET-A05 12VDC 1.5 A
4. ET-BOX 1
5. PAIR CABLE CONNECTOR
6. ET-RS232 DB 9 PIN
7. USER MANUAL (THAI)



### SPECIFICATIONS ET-LAB3A

- TEST STEEPING MOTOR WITH INDICATOR
- 2-CH.OPTO INPUT SENSOR FOR TEST DIRECTION AND SPEED OF DC MOTOR
- 8 POINTS TEST LED DISPLAY
- 4 DIGIT 7-SEGMENT TEST LED
- 4 POINTS TEST DIP SWITCH
- 15 x 7 DOT TEST DORT MATRIX
- 4 x 3 KEYS TEST KEYBOARD
- 2-CH.8 BIT No.ADC0832 TEST A/D CONVERTER WITH;
  - 1-CH.LDR
  - 1-CH.THERMISTER
- 8 BIT R-2R TEST D/A CONVERTER
- TEST OPTO ISOLATOR DC INPUT, IT IS 4-CH.OPTO ISOLATION INPUT AND CAN SELECT 5 VDC OR 24 VDC INPUT
- TEST TEMPERATURE SENSOR, 3 PIN 1-WIRE DS1820
- TEST RELAY 4 CHANNELS, IT USES SOLID STATE RELAY AS SEMICONDUCTOR TO CONTROL ALTERNATING CURRENT AND ZERO CROSSING OPTO ISOLATION TO RUN WITH TRIAC
- MACHANIC RELAY FOR TEST RELAY 1 CHANNEL
- TEST LCD DISPLAY 16 CHARACTERS 2 LINES
- TEST SOUND SPEAKER
- 12C BUS SYSTEM TEST WITH
  - 2 KBYTE IC 24C16 FOR MEMORY OF EEPROM
  - IC DS1307 RTC (REAL TIME CLOCK) WITH BATTERY BACKUP
  - I<sup>2</sup>C INPUT PORT AND OUTPUT PORT, 8 BIT IC PCF8574
  - I<sup>2</sup>C 4-CH.A-TO-D AND 1-CH.D-TO-A, IC PCF8591
- TEST 1-WIRE CONNECTING OR IBUTTON, IT IS CONNECTING ONLY ONE WIRE WITH OTHER
  - DS1990A CONTROLS SERIAL NUMBER
- CLOCK, IT IS TESTED SYSTEM OF INTERRUPT, TIMER, COUNTER IN CPU MCS-51 WITH TEST SWITCH
- ADAPTER from 34 PIN ET-BUS IC 8255 TO CONNECT WITH PRINTER PORT OF COMPUTER BE ABLE TO USE WITH ET-LAB3A WITH 34 PIN ET-BUS TO CONNECT WITH ET-BOARD V6.0
- LOCKED CONNECTOR AS TEST PAIR CABLE
- CPU MCS-51 No.P89V51RD2 WITH 64 KBYTE FLASH MEMORY BE ABLE TO DOWNLOAD TO COMPUTER PC FROM RS232 PORT INTO CPU P89V51RD2 DIRECTLY, ALTHOUGH IT IS WRITTEN WITH ASSEMBLY LANGUAGE OR C LANGUAGE INTERFACE WITH COMPUTER PC THROUGH PRINTER PORT OF COMPUTER PC TO ET-LAB3A BOARD. IT IS CONTROLLED TO IC PORT 8255 WHICH IS 3-CH.8 BIT INPUT/OUTPUT PORT IS ON BORAD WITH WRITTEN HIGH LEVEL LANGUAGE "DELPHI LANGUAGE" TO CONTROL TEST. CONNECTING WITH ET-BOARD V6.0, IT TAKES Z-80 CPU AND MCS-51 CPU IN ET-BOARD V6.0 CONTROL ALL ACCESSARIES ON ET-LAB3A BOARD THROUGH 8255 PORT.



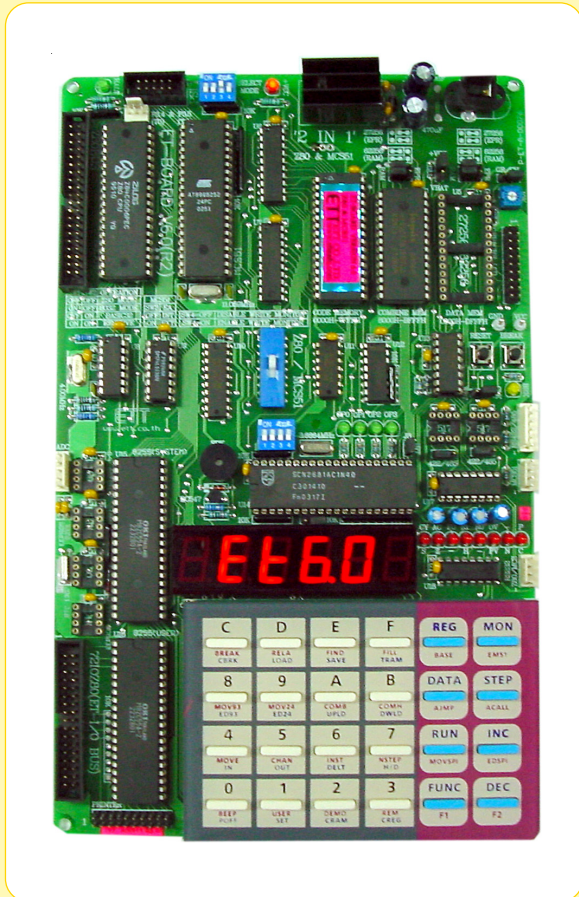
**ET-BOARD V6.0 (P-ET-A-00076)**

**Double CPU**

Single Board for Solution ...

- CPU Z80
- CPU MCS-51

ET-BOARD V6.0 includes CPU Z80A RUN 4MHz and CPU AT89S8253 (MCS51) RUN 11.059MHz. It works with 2-CPU in one Board, adapt MODE CPU via SW on Board.



**NOTICE:** In the same basic board, you can learn 2-CPU in one board. It includes I/O accessories such as CHIP ASYNCRONOUS, CHIP A-TO-D, CHIP RTC,CHIP EEPROM on board. Although, users are students or teachers, can use **ET-BOARD V6.0** perfectly. Users may study about Ports of Microprocessor Z80 well before study Microcontroller CPU because it is the basic knowledge of computer system.

**SPECIFICATIONS ET-BOARD V6.0**

<b>FEATURE</b>	SINGLE BOARD
<b>CPU</b>	8 BIT Z-80 MCS-51 No.AT89S8253
<b>3 MODE</b>	Z80 SINGLE BOARD MODE MCS-51 SINGLE BOARD MODE MCS BASIC-52 MODE
<b>DISPLAY</b>	6-DIGIT 7-SEGMENT DISPLAY WITH LED DISPLAY 8 POINT FLAG, 4 POINT LED USER, 2 POINT LED INTERRUPT AND 1 POINT LED HALT
<b>EPROM</b>	128 KBYTE FLASH MONITOR PROGRAM
<b>RAM</b>	32 KBYTE WITH BATTERY BACKUP
<b>CLOCK</b>	Z80 RUN 4MHz MCS-51 RUN 11.0592 MHz
<b>KEYBOARD</b>	24 RUBBER KEY SWITCH
<b>SWITCH</b>	SWITCH RESET & SWITCH INTERRUPT
<b>DIP-SWITCH</b>	4 POINT FOR SYSTEM, 4 POINT FOR USER
<b>CONNECTOR</b>	40 PIN-HEADER STRIP FOR Z80 BUS 34 PIN-HEADER STRIO FOR 8255 I/O PORT 20 PIN-HEADER STRIP FOR LCD (BOTH CHARACTER AND GRAPHIC LCD) 20 PIN-HEADER STRIP FOR PRINTER 6 PIN CONNECTOR FOR RS422/485 2-CH.4 PIN CONNECTOR FOR RS232 5 PIN CONNECTOR FOR A/D
<b>USER PORT</b>	40 BIT I/O PORT
<b>SERIAL PORT</b>	2-CH.SCN2681 2-CH.RS232 1-CH.RS422/485 (OPTION)
<b>EXPANSION SOCKET</b>	32 KBYTE MEMORY EXPANSION BY SELECT RAM No. 62256 OR EPROM No.27256 (OPTION) EEPROM No.93C46 OR 93C56 OR 93C88 (OPTION) EEPROM No.24C01-24C256 TYPE 12C (OPTION) RTC DS1307 (OPTION) A-TO-D SIZE 2-CH.12 BIT No.LTC1298 (OPTION)
<b>WATCH DOG/POWER ON</b>	MAX 691
<b>SPEAKER</b>	0.5"
<b>BATTERY</b>	3 VOLT FOR BACKUP RAM & RTC
<b>POWER SUPPLY</b>	10 VDC 850 mA
<b>PCB SIZE</b>	6" x 9.75"
<b>SOFTWARE</b>	<b>Z-80 MODE</b> 32 FUNCTION (USE REMOTE 120 SUBROUTINES SYSTEM CALL WITH COMPUTER PC THROUGH PORT RS232) <b>MCS-51 MODE</b> 22 FUNCTION (USE REMOTE 112 SUBROUTINES SYSTEM CALL WITH COMPUTER PC THROUGH PORT RS232 AND EMULATOR51 MODE) <b>MSC BASIC/52</b> (RUN BASIC52 LANGUAGE WITH COMPUTER PCTHROUGH PORT RS232)



ET-BOARD V6.0 includes ...

1. ET-BOARD V5.0 Board
2. 3 User manual
3. CD-ROM
4. ET-RS232 DB 9 PIN
5. 10VDC ADAPTER



**ET-BOARD V6.0 BOX (P-ET-A-00210)**

There's same specifications like ET-BOARD V6.0 and is added 15 work sheets of Z-80 and 14 work sheets of MCS-51. Each of work sheet includes summary theory for users revise before experiment CPU Z-80 and MCS-51. Moreover, there's ET-BOX 1 to keep experimental set in the box.

ET-BOARD V6.0 SINGLE BOARD is one of Board in Thailand is developed continuously more than 20 years. So, today, ET-BOARD V6.0 SINGLE BOARD 2 Sytems 2 CPUs is the answer for you to study CPU and MCS51.





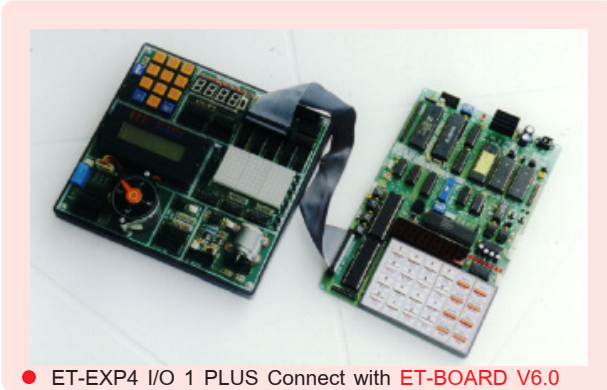
**ET-EXP4 I/O 1 PLUS (J-AA-L-00006)****It can use with ET-BOARD V6.0, V5.0, V4.0, 8.32, V3.5 R1**

Users can Test Interface and adapt to use with all version of ETT's SINGLE BOARD and CONTROLLER BOARD such as CP-SB31 V2.0, CP-S8252 V2 through ETT's 34 PIN BUS I/O with 2 Books of User Manual of CPU Z80 and CPU MCS51.

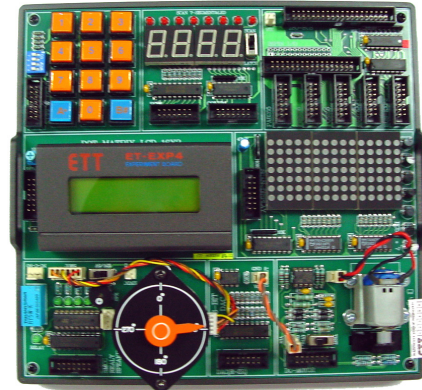


There's Input and Output accessories to Test Interface in ET-EXP4 I/O PLUS such as LCD DISPLAY, 15x7 DOT SCAN DOTMATRIX DISPLAY LED, STEERING MOTOR, D-TO-A 8 BIT,DC MOTOR, 7 SEGMENT LED, etc.

Board is designed to connect with I/O through PAIR CABLE and LOCKED CONNECTOR. Moreover, there's plastic box and CD-ROM program to load into SINGLE BOARD as in the User Manual.



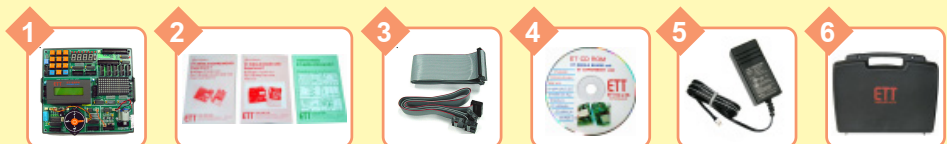
● ET-EXP4 I/O 1 PLUS Connect with ET-BOARD V6.0

**There's Outputs and Inputs in ET-EXP4 I/O 1 PLUS, such as;**

- PLATED-THROUGH HOLES PCB ET-EXP4 I/O Plus
- 4 POINTS DIP-SWITCH for TEST INPUT and 4 x 3 INPUT KEY BOARD for TEST SW SCAN KEY BOARD
- RED 8 POINTS for TEST LED DISPLAY and RED 4 DIGIT 7-SEGMENT LED for TEST SCAN LED
- 16 CHARACTER WITH 2 LINES for TEST LCD DISPLAY
- 15x7 DOT for TEST SCAN DOTMATRIX DISPLAY LED
- 4 CYCLE WITH INDICATOR for TEST UNIPOLAR STEPPING MOTOR
- TEST RELAY OUTPUT PORT AND SMALL TEST SOUND SPEAKER PORT
- 8 BIT R-2R D-TO-A CIRCUIT and OP-AMP POWER IC for OUTPUT EXPANSION
- TEST DC MOTOR WITH 2-CH.OPTO INPUT SENSOR for test direction and speed of DC MOTOR
- ADAPTER from 34 PIN ET-BUS 8255 PORT of SINGLE BOARD PORT connecting with ET-EXP4 I/O WITH 40 PIN BUS CPU as DECODE PORT and DATA BUS

**Ex-EXP4 I/O 1 PLUS includes;**

1. ET-EXP4 I/O 1
2. User manual
3. 1-CH 14 PIN PAIR CABLE, 34 PIN PAIR CABLE
4. CD-ROM
5. POWER SUPPLY 5VDC
6. ET-BOX 1

**Accessories and Tools which users need to purchase are; (Because there's no in ET-EXP4 I/O 1 PLUS.)**

EPROM is connected with SINGLE BOARD in case of not loading from Computer PC or not loading into SINGLE BOARD by yourself.

EPROM ET-EXP1 Z80 (1) uses with ET-BOARD V6.0, V5.0

EPROM ET-EXP1 Z80 (2) uses with ET-BOARD V3.5, V4.0

EPROM ET-EXP1 51 uses with ET-BOARD V6.0, ET-8032 V2.0

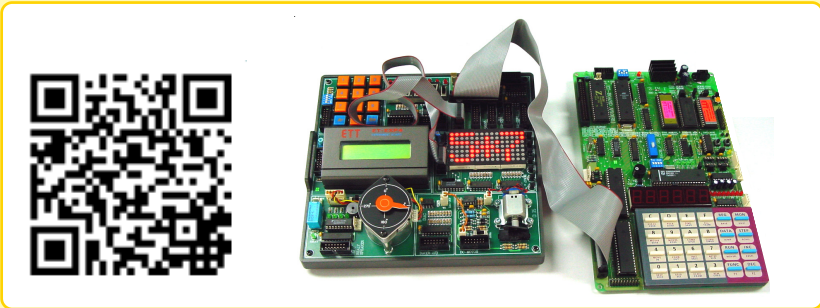
Experimental Manual of ET-SINGLE BOARD Z80 (for Test ET-BOARD V3.5, V4.0, V5.0, V6.0 in the part of Z80 Mode)

Experimental Manual of ET-SINGLE BOARD MCS51 (for Test ET-BOARD V6.0 in the part of MCS51, ET-8032 V2.0 Mode)

ET-5VDC (POWER SUPPLY 5 VDC /850mA)

**ET-EXP4 I/O 1 V6.0 (J-AA-L-00010)**

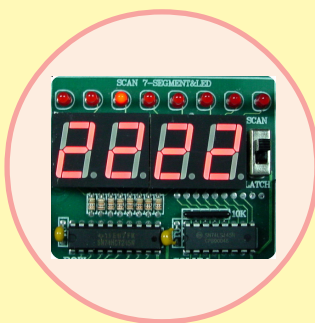
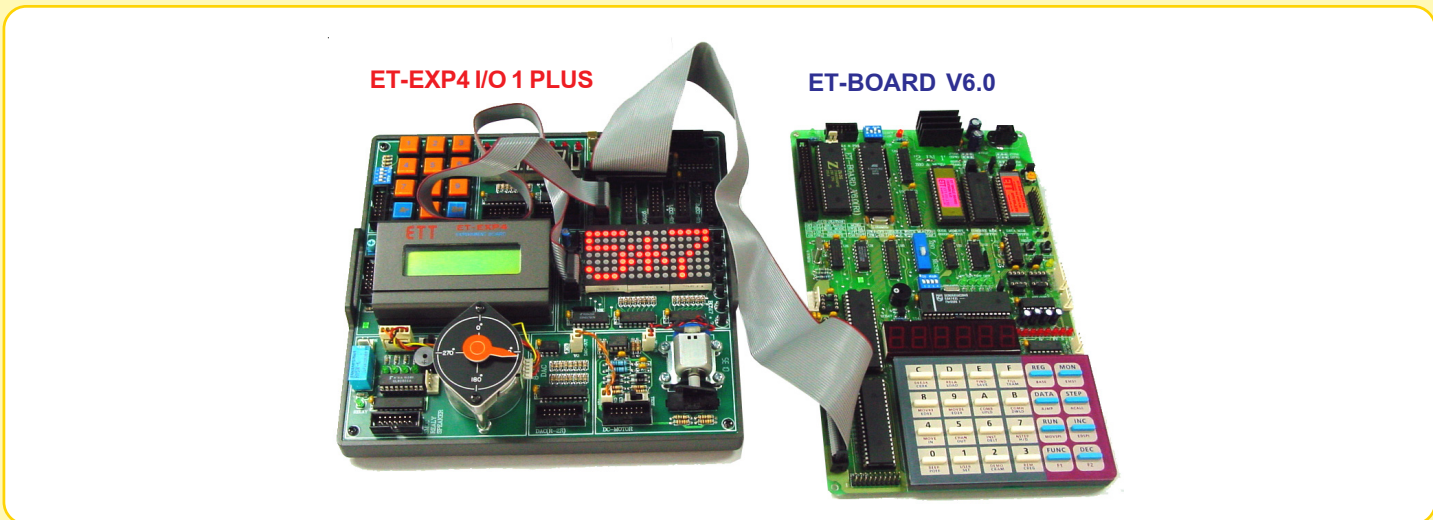
- EXPERIMENTING CPU Z80
- EXPERIMENTING CPU MCS-51
- EXPERIMENTING INTERFACE WITH INPUT/OUTPUT



ET-EXP4 I/O 1 V6.0 is Training Board for study Z80 Microprocessor and MCS-51 Microcontroller in one board. CPU Z80 and MCS-51 of ET-BOARD V6.0 control input and output on BOARD ET-EXP4 I/O 1 PLUS through PORT8255. It includes;

- PROGRAM TO CONTROL LED
- 7-SEGMENT- DOT MATRIX LCD
- RELAY
- DOT MATRIX LED DISPLAY
- MATRIX KEYBOARD & SWITCH
- DC MOTOR - STEPPING MOTOR, etc.

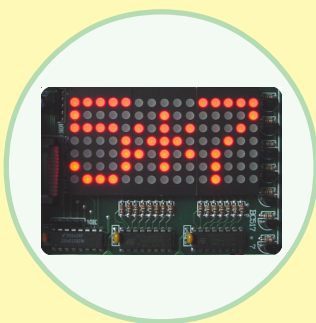
It makes users understand the structure of CPU better, and can adapt efficiently.



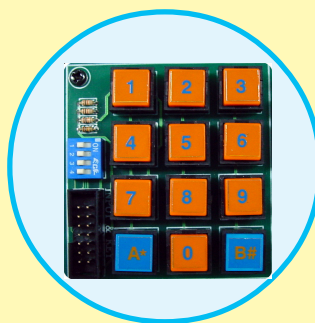
TEST LED  
TEST 7-SEGMENT



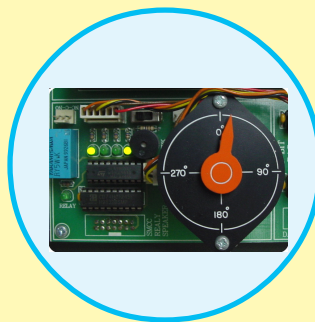
TEST LCD DISPLAY (16 X 2)



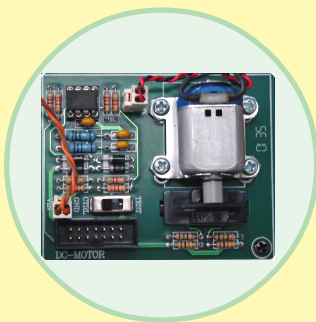
TEST DOT MATRIX  
LED DISPLAY



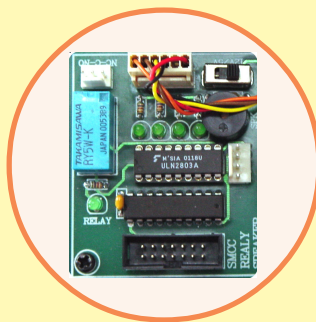
TEST DIP-SW  
TEST KEYBOARD



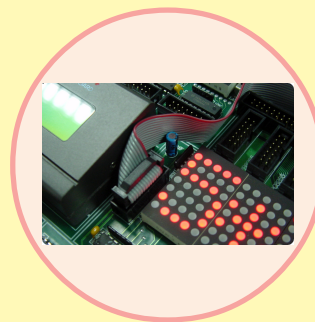
TEST STEPPING MOTOR



TEST DC MOTOR WITH SENSOR



TEST RELAY ,  
SOUND SPEAKER



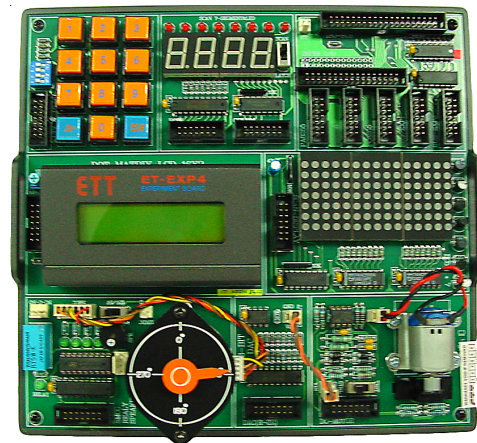
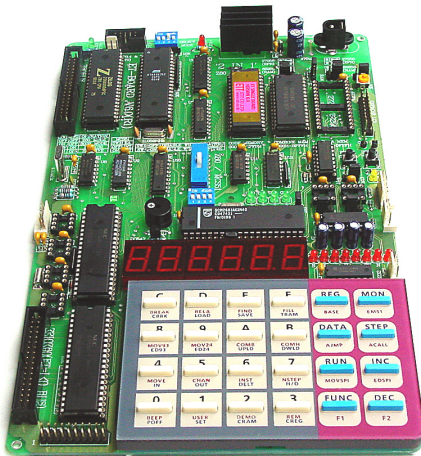
USING PAIR CABLE FOR  
EXPERIMENT WITH  
LOCKED CONNECTOR



ET-BOARD V6.0

ET-EXP4 I/O 1 V6.0

ET-EXP4 I/O 1 PLUS



SPECIFICATIONS ET-BOARD V6.0

<b>FEATURE</b>	SINGLE BOARD
<b>CPU</b>	8 BIT Z-80 MCS-51 No.AT89S8253
<b>3 MODE</b>	Z80 SINGLE BOARD MODE MCS-51 SINGLE BOARD MODE MCS BASIC-52 MODE
<b>DISPLAY</b>	6-DIGIT 7-SEGMENT DISPLAY WITH LED DISPLAY 8 POINT FLAG, 4 POINT LED USER, 2 POINT LED INTERRUPT AND 1 POINT LED HALT
<b>EPROM</b>	128 KBYTE FLASH MONITOR PROGRAM
<b>RAM</b>	32 KBYTE WITH BATTERY BACKUP
<b>CLOCK</b>	Z80 RUN 4MHz MCS-51 RUN 11.0592 Mhz
<b>KEYBOARD</b>	24 RUBBER KEY SWITCH
<b>SWITCH</b>	SWITCH RESET & SWITCH INTERRUPT
<b>DIP-SWITCH</b>	4 POINT FOR SYSTEM, 4 POINT FOR USER
<b>CONNECTOR</b>	40 PIN-HEADER STRIP FOR Z80 BUS 34 PIN-HEADER STRIO FOR 8255 I/O PORT 20 PIN-HEADER STRIP FOR LCD (BOTH CHARACTER AND GRAPHIC LCD) 20 PIN-HEADER STRIP FOR PRINTER 6 PIN CONNECTOR FOR RS422/485 2-CH.4 PIN CONNECTOR FOR RS232 5 PIN CONNECTOR FOR A/D
<b>USER PORT</b>	40 BIT I/O PORT
<b>SERIAL PORT</b>	2-CH.SCN2681 2-CH.RS232 1-CH.RS422/485 (OPTION)
<b>EXPANSION SOCKET</b>	32 KBYTE MEMORY EXPANSION BY SELECT RAM No.62256 OR EPROM No.27256 (OPTION) EEPROM No.93C46 OR 93C56 OR 93C88 (OPTION) EEPROM No.24C01-24C256 TYPE 12C (OPTION) RTC DS1307 (OPTION) A-TO-D SIZE 2-CH.12 BIT No.LTC1298 (OPTION)
<b>WATCH DOG/POWER ON</b>	MAX 691
<b>SPEAKER</b>	0.5"
<b>BATTERY</b>	3 VOLT FOR BACKUP RAM & RTC
<b>POWER SUPPLY</b>	10 VDC 850 mA
<b>PCB SIZE</b>	6" x 9.75"
<b>SOFTWARE</b>	<b>Z-80 MODE</b> 32 FUNCTION (USE REMOTE 120 SUBROUTINES SYSTEM CALL WITH COMPUTER PC THROUGH PORT RS232) <b>MCS-51 MODE</b> 22 FUNCTION (USE REMOTE 112 SUBROUTINES SYSTEM CALL WITH COMPUTER PC THROUGH PORT RS232 AND EMULATOR51 MODE) <b>MSC BASIC/52</b> (RUN BASIC52 LANGUAGE WITH COMPUTER PCTHROUGH PORT RS232)

SPECIFICATIONS ET-EXP4 I/O 1 PLUS

4 POINTS DIP-SWITCH FOR TEST INPUT
4x3 INPUT KEYBOARD FOR TEST INPUT
8 POINTS TEST LED DISPLAY
4 DIGIT 7-SEGMENT LED
16 CHARACTER LCD DISPLAY x 2 LINE
15x7 DOT SCAN DOTMATRIX DISPLAY LED
4 CYCLE UNIPOLAR STEEPING MOTOR WITH INDICATOR
RELAY OUTPUT PORT AND SOUND SPEAKER PORT
D-TO-A WITH OP-ARM POWER IC TO EXPAND OUTPUT
DC MOTOR WITH 2 OPTO INPUT SENSOR SIGNAL CHANNEL FOR TEST
DC MOTOR

ET-EXP4 I/O 1 V6.0 includes

- 314 PIN
- RS232 DB 9 PIN Cable and DB 25 PIN Cable
- User Manual
- Experimental Manual
- 10 VDC 850mA Adapter Power Supply
- 5 VDC 2A Switching Adapter Power Supply
- 2 ET-BOX 1 Plastic Box



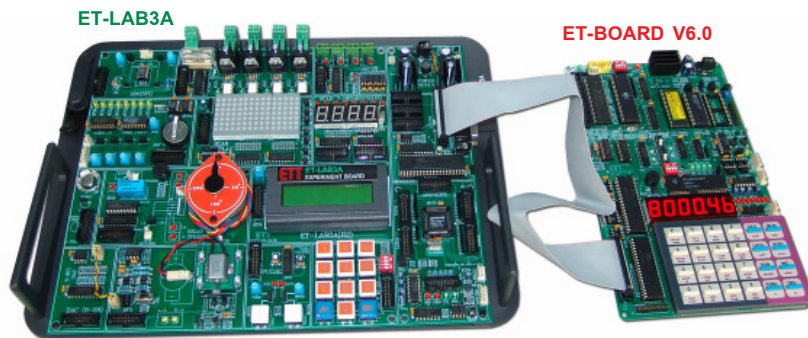


**ET-LAB3A V6.0 (J-AA-L-00008)**

- Experiment for **CPU Z80**
- Experiment for **CPU MCS-51**
- Experiment for **INTERFACE** with **INPUT/OUTPUT**
- Experiment for **INTERFACE** with **COMPUTER PC**

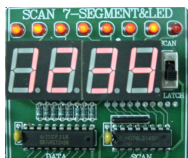


ET-LAB3A V6.0 is training board for study Microprocessor Z80 and Microcontroller MCS-51 in one board. There's CPU Z80 and MCS-51 of ET-BOARD V6.0 to control INPUT/OUTPUT on ET-LAB3A BOARD through PORT 8255. For example, writing program to control LED, 7-SEGMENT DOT MATRIX LCD, SOLID STATE RELAY and MACHANIC RELAY, DOT MATRIX LED DISPLAY, MATRIX KEYBOARD & SWITCH, DC MOTOR, STEEPING MOTOR and etc. It makes users understand structures of CPU better and be able to adapt in other project efficiently. Moreover, users can connect between ET-LAB3A BOARD and Computer PC through PRINTER PORT DB 25 PIN of Computer to Board to study writing program to control from Computer. It controls to IC PORT 8255 which is 8 BIT PORT INPUT/OUTPUT connects with other accessories on board with DELPHI LANGUAGE.

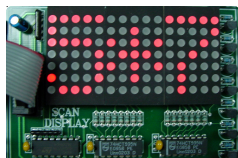


ET-LAB3A V6.0, it is CPU Z80 and MCS-51 of ET-BOARD V6.0 to control INPUT/OUTPUT on ET-LAB3A BOARD through PORT8255...

- ET-LAB3A V6.0 INCLUDES;**
1. ET-BOARD V6.0 BOARD
  2. ET-LAB3A BOARD
  3. 3-CH.14 PIN AND 34 PIN PAIR WIRE
  4. 25 PIN DB WIRE CONNECTOR
  5. ET-RS232 DB 9 PIN
  6. CD-ROM
  7. IC EPROM LAB3A-80 IS CONTAINED EXAMPLE PROGRAM Z80  
IC EPROM LAB3A-51 IS CONTAINED EX AMPL E PROGRAM Mcs51
  8. USER MANUAL DATA SHEET P89C51RD2 (Thai Language)
  9. USER MANUAL C Micro-C51 LANGUAGE (Thai Language)
  10. 3 EXPERIMENTAL MANUAL AND USER MANUAL OF ET-LAB3A (Thai Language)
  11. 2 USER MANUALS OF ET-BOARD V6.0 (Thai Language)
  12. 2 EXPERIMENTAL MANUALS OF ET-BOARD V6.0 AND ET-LAB3A (Thai Language)
  13. ADAPTER 10 VDC 850 mA
  14. ET-SWITCHING ADAPTER 12VDC
  15. 2 PLASTIC ET-BOX1



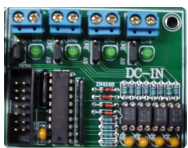
TEST LED 8 POINT & 4 DIGIT 7-SEGMENT



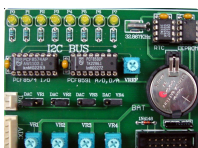
15 X 7 DOT TEST DOT MATRIX LED



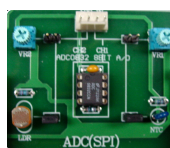
16 CHARACTER 2 LINES TEST LCD DISPLAY



TEST DC - IN OPTO ISOLATION 4 CH



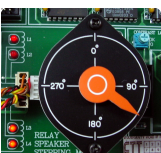
TEST I2C BUS



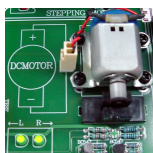
TEST A/D 8 BIT 2 CHANNELS



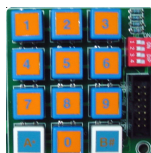
TEST RELAY/ SOUND SPEAKER



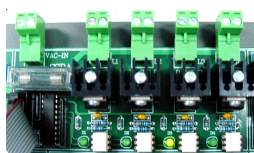
TEST STEPPING MOTOR



TEST DC MOTOR



TEST KEYBOARD & DIP SW



TEST SSR (SOLID STATE RELAY) ขนาด 4 CHANNELS



TEST D/A



TEST 1-WIRE



PULSE GENERATOR



ET-LAB3A BE ABLE TO CONNECT WITH COMPUTER AND WRITE PROGRAM TO CONTROL



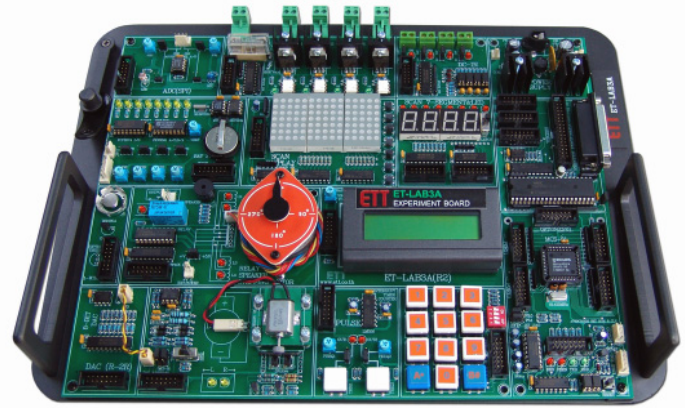
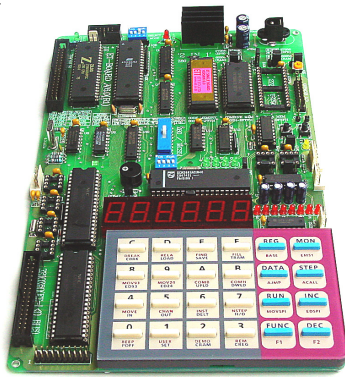
CPU MCS-51 OF ET-LAB3A AS NO. P89V51RD2 WITH 64 KBYTE INTERNAL FLASH MEMORY



ET-BOARD V6.0

ET-LAB3A V6.0

ET-LAB3A



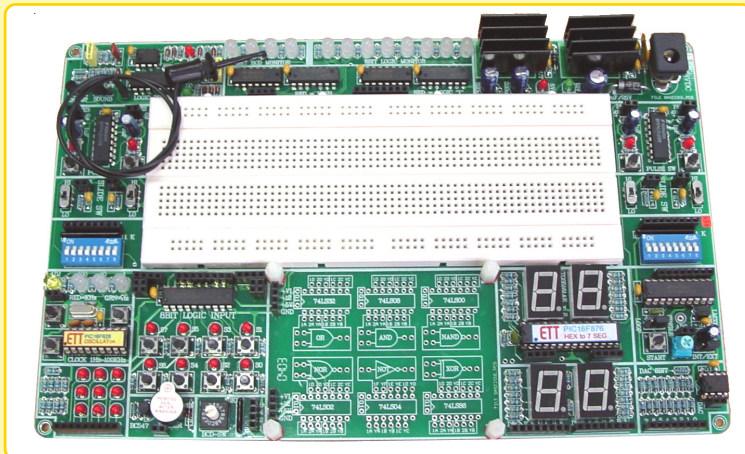
SPECIFICATIONS ET-BOARD V6.0	
<b>FEATURE</b>	SINGLE BOARD
<b>CPU</b>	8 BIT Z-80 MCS-51 No.AT89S8253
<b>3 MODE</b>	Z80 SINGLE BOARD MODE MCS-51 SINGLE BOARD MODE MCS BASIC-52 MODE
<b>DISPLAY</b>	6-DIGIT 7-SEGMENT DISPLAY WITH LED DISPLAY 8 POINT FLAG, 4 POINT LED USER, 2 POINT LED INTERRUPT AND 1 POINT LED HALT
<b>EPROM</b>	128 KBYTE FLASH MONITOR PROGRAM
<b>RAM</b>	32 KBYTE WITH BATTERY BACKUP
<b>CLOCK</b>	Z80 RUN 4MHz MCS-51 RUN 11.0592 MHz
<b>KEYBOARD</b>	24 RUBBER KEY SWITCH
<b>SWITCH</b>	SWITCH RESET & SWITCH INTERRUPT
<b>DIP-SWITCH</b>	4 POINT FOR SYSTEM, 4 POINT FOR USER
<b>CONNECTOR</b>	40 PIN-HEADER STRIP FOR Z80 BUS 34 PIN-HEADER STRIO FOR 8255 I/O PORT 20 PIN-HEADER STRIP FOR LCD (BOTH CHARACTER AND GRAPHIC LCD) 20 PIN-HEADER STRIP FOR PRINTER 6 PIN CONNECTOR FOR RS422/485 2-CH.4 PIN CONNECTOR FOR RS232 5 PIN CONNECTOR FOR A/D
<b>USER PORT</b>	40 BIT I/O PORT
<b>SERIAL PORT</b>	2-CH.SCN2681 2-CH.RS232 1-CH.RS422/485 (OPTION)
<b>EXPANSION SOCKET</b>	32 KBYTE MEMORY EXPANSION BY SELECT RAM No.62256 OR EPROM No.27256 (OPTION) EEPROM No.93C46 OR 93C56 OR 93C88 (OPTION) EEPROM No.24C01-24C256 TYPE 12C (OPTION) RTC DS1307 (OPTION) A-TO-D SIZE 2-CH.12 BIT No.LTC1298 (OPTION)
<b>WATCH DOG/POWER ON</b>	MAX 691
<b>SPEAKER</b>	0.5"
<b>BATTERY</b>	3 VOLT FOR BACKUP RAM & RTC
<b>POWER SUPPLY</b>	10 VDC 850 mA
<b>PCB SIZE</b>	6" x 9.75"
<b>SOFTWARE</b>	<b>Z-80 MODE</b> 32 FUNCTION (USE REMOTE 120 SUBROUTINES SYSTEM CALL WITH COMPUTER PC THROUGH PORT RS232) <b>MCS-51 MODE</b> 22 FUNCTION (USE REMOTE 112 SUBROUTINES SYSTEM CALL WITH COMPUTER PC THROUGH PORT RS232 AND EMULATOR51 MODE) <b>MSC BASIC/52</b> (RUN BASIC52 LANGUAGE WITH COMPUTER PCTHROUGH PORT RS232)

SPECIFICATIONS ET-LAB3A	
<b>TEST STEEPING MOTOR WITH INDICATOR</b>	
<b>2-CH.OPTO INPUT SENSOR FOR TEST DIRECTION AND SPEED OF DC MOTOR</b>	
<b>8 POINTS TEST LED DISPLAY</b>	
<b>4 DIGIT 7-SEGMENT TEST LED</b>	
<b>4 POINTS TEST DIP SWITCH</b>	
<b>15 x 7 DOT TEST DORT MATRIX</b>	
<b>4 x 3 KEYS TEST KEYBOARD</b>	
<b>2-CH.8 BIT No.ADC0832 TEST A/D CONVERTER WITH;</b>	
-1-CH.LDR	
-1-CH.THERMISTER	
<b>8 BIT R-2R TEST D/A CONVERTER</b>	
<b>TEST OPTO ISOLATOR DC INPUT, IT IS 4-CH.OPTO ISOLATION INPUT AND CAN SELECT 5 VDC OR 24 VDC INPUT</b>	
<b>TEST TEMPERATURE SENSOR, 3 PIN 1-WIRE DS1820</b>	
<b>TEST RELAY 4 CHANNELS, IT USES SOLID STATE RELAY AS SEMICONDUCTOR TO CONTROL ALTERNATING CURRENT AND ZERO CROSSING OPTO ISOLATION TO RUN WITH TRIAC</b>	
<b>MACHANIC RELAY FOR TEST RELAY 1 CHANNEL</b>	
<b>TEST LCD DISPLAY 16 CHARACTERS 2 LINES</b>	
<b>TEST SOUND SPEAKER</b>	
<b>12C BUS SYSTEM TEST WITH</b>	
- 2 KBYTE IC 24C16 FOR MEMORY OF EEPROM	
- IC DS1307 RTC (REAL TIME CLOCK) WITH BATTERY BACKUP	
- 1°C INPUT PORT AND OUTPUT PORT, 8 BIT IC PCF8574	
- 1°C 4-CH.A-TO-D AND 1-CH.D-TO-A, IC PCF8591	
<b>TEST 1-WIRE CONNECTING OR IBUTTON, IT IS CONNECTING ONLY ONE WIRE WITH OTHER</b>	
- DS1990A CONTROLS SERIAL NUMBER	
<b>CLOCK, IT IS TESTED SYSTEM OF INTERRUPT, TIMER, COUNTER IN CPU MCS-51 WITH TEST SWITCH</b>	
<b>ADAPTER from 34 PIN ET-BUS IC 8255 TO CONNECT WITH PRINTER PORT OF COMPUTER BE ABLE TO USE WITH ET-LAB3A WITH 34 PIN ET-BUS TO CONNECT WITH ET-BOARD V6.0</b>	
<b>LOCKED CONNECTOR AS TEST PAIR CABLE</b>	
<b>CPU MCS-51 No.P89V51RD2 WITH 64 KBYTE FLASH MEMORY BE ABLE TO DOWNLOAD TO COMPUTER PC FROM RS232 PORT INTO CPU P89V51RD2 DIRECTLY,ALTHOUGH IT IS WRITTEN WITH ASSEMBLY LANGUAGE OR C LANGUAGE</b>	
<b>INTERFACE WITH COMPUTER PC THROUGH PRINTER PORT OF COMPUTER PC TO ET-LAB3A BOARD. IT IS CONTROLLED TO IC PORT 8255 WHICH IS 3-CH.8 BIT INPUT/OUTPUT PORT IS ON BORAD WITH WRITTEN HIGH LEVEL LANGUAGE "DELPHI LANGUAGE"TO CONTROL TEST.</b>	
<b>CONNECTING WITH ET-BOARD V6.0, IT TAKES Z-80 CPU AND MCS-51 CPU IN ET-BOARD V6.0 CONTROL ALL ACCESSARIES ON ET-LAB3A BOARD THROUGH 8255 PORT.</b>	



**ET-BASIC I/O V1.0 (P-ET-A-00132)**

**TRAINING BOARD FOR STUDY INPUT, OUTPUT WITH LOGIC PROBE AND FOR STUDY DIGITAL AND MICRO SYSTEM**



ET-BASIC I/O V1.0 is made for study and experiment many types of INPUT/OUTPUT. Be able to connect independently through Jumper Wire and user can connect with Project Board or Digital Circuit or ETT's Micro Board such as CPU Mcs-51, AVR, PIC, Basic Stamp and etc. Moreover, users can connect with CPLD (Complex Programmable Logic Device).

**SPECIFICATIONS ET-BASIC I/O V1.0**

2-COLORS LED 12 BIT LOGIC MONITOR FOR DISPLAY LO,HI STATUS

2-CH. INPUT DIP SWITCH 8 BIT

8 BIT LOGIC INPUT

2-CH. MONOSTABLE PULSE SWITCHES; BOTH NON-INVERTED AND INVERTED

1-CH. 4 BIT BCD SWITCH

4-CH. SLIDE SWITCH SELECTED AS HI OR LO

PIEZO BUZZER SPEAKER

HEX TO 7-SEGMENT WITH LED 2 DIGIT 7-SEGMENT BE ABLE TO DISPLAY 0-9, A-F

DIRECT CONNECTION LED 2 DIGIT 7-SEGMENT

3 x 3 MATRIX LED DISPLAY

8 BIT DIGITAL TO ANALOG CONVERTOR (DCA)

8 BIT ANALOG TO DIGITAL CONVERTOR (ADC)

CLOCK AS 1Hz, 10Hz, 100Hz, 1KHz, 10KHz, 100KHz

LOGIC PROBE

840 POINTS 172 x 65 mm.PROJECT BOARD

BE ABLE TO CONNECT WITH CPLD OR CPU

POWER 7805 5V AND 7812 12V WITH DC ADAPTER 12VDC 1.5A (ETA05)

6 SIZES OF ET-JWBOX 300 WITH 300 WIRES

ET-BASIC I/O V1.0 includes;

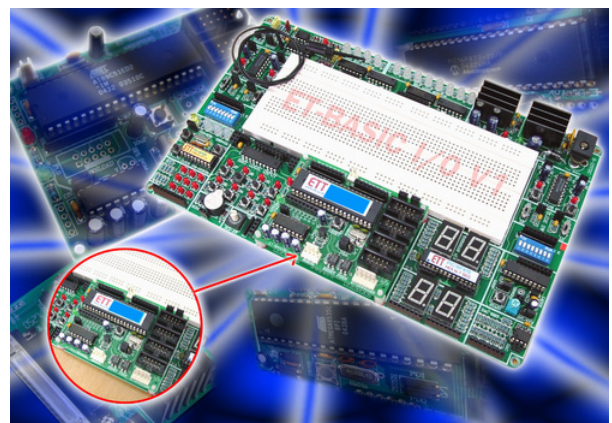
1. BOARD WITH BASIC I/O BOX
2. USER MANUAL
3. ET-JWBOX300
4. ETA05 DC ADAPTER 12 VDC
5. ET-BOX1 PLASTIC BOX

**ET-BASE MODULE**

ETT designs specifications of Microcontroller Board and CPLD Board to use with ET-BASIC I/O V1.0 in many types for users select preferably.



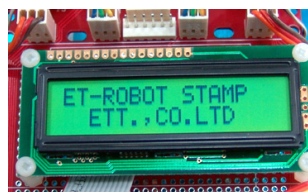
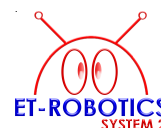
\*\*\* THESE MODULES ARE NOT INCLUDED IN ET-BASIC I/O V1.0.  
YOU CAN PURCHASE FROM ETT CO., LTD. \*\*\*



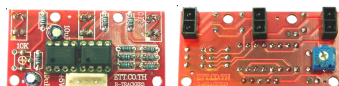
# ET-ROBOT STAMP P40 PLUS (P-ET-A-00301)



The Robot System kit for learning and studying with BASIC STAMP Language



LCD DISPLAY 16 Characters 2 Lines



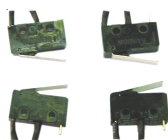
R-TRACKER 3

SENSOR to be 3 point light detector on the line

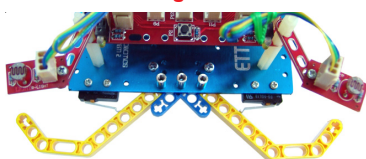


Use Basic Stamp 2P40 from Parallax that has the most I/O.

4 SW Sensee Micro SW on the front and the back with Lego Buffer



Use 2 SW to be light detector



BATTERY 6V-1.2/1.3A

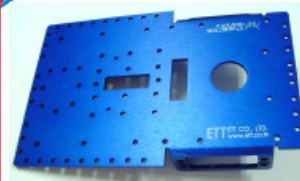


ET-CHARGER BOX 6V

SERVO MOTOR S03T/STD/JR with Torque 7.2 Kg - cm



Use 3mm. Aluminium to be the car plate.



**ET-ROBOT STAMP P40 Plus** is the ROBOT SERVO MOTOR kit in the ROBOT System of ETT that uses BASIC STAMP Language to write and develop program, so it makes user can understand them easier. When user can understand this BASIC Language well, user can use this language to actually control applications. It uses Chip BASIC STAMP 2 P40 from PARALLAX that is newer than Chip BASIC 2SX. The Chip STAMP 2 P40 uses CPU No.UBICOM SX48BD that is the set of BASIC STAMP; moreover, it is high efficiency and there is the most I/O in the family of this BASIC STAMP. Furthermore, this board family has the same format of Board CONTROL as ETT. So, ETT makes BASIC STAMP P40 to be controller for the operation of ET-ROBOT STAMP P40; it comes complete with BATTERY and CHARGER, including LCD DISPLAY.

### Specifications of ET-ROBOT STAMP P40 Plus

**BOARD CONTROL:** Use CPU BASIC STAMP 2 P40, RUN Frequency 20 MHz, writ program more than 4000 lines, 32 + 2 I/O PORT, 10 PIN I/O BUS, 14 PIN LCD BUS, MINI SPEAKER, PCB SIZE 8.5 x 6 cm.

**Driving System:** Use 2 SERVO MOTOR version S03T, TORQUE 7.2 Kg-cm AT 4.8V, with wheels

**Car Plate:** Use ALUMINUM that is 3mm. blue ANODIZED-plated

**SENSOR System:** Use SENSOR TRACKER to be 3-point light detector on the line, 4 SENSOR MICRO SW to detect the clash, 2 SENSOR to be light detector

**Program Command:** Use BASIC STAMP Language to write program on computer PC, transmit data into ET-ROBOT STAMP Plus through PORT RS232 of computer PC and operate on OS WINDOWS 95/ME/XP/2000

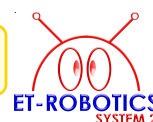
- Board ET-ROBOT STAMP P40, SENSOR R-TRACKER3, 4 R-SW with the LEGO buffer, 2 R-LIGHT, MINI SPEAKER
- LCD DISPLAY 16 Characters with 2 lines to display results
- Car plate with SERVO MOTOR and front and back wheels, BATTERY 6V 1.2-1.3A, Charger for BATTREY version ET CHARGER BOX 6V
- User's Manual and Guide Book for ET-ROBOT STAMP P40, Handbook of SERVO MOTOR, CD-ROM Program, Cable DOWN-LOAD RS232



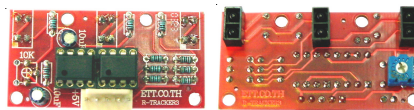
**ET-ROBOT 877 (P-ET-A-00142)**



It is set for learn and study robot with CPU PIC ๖๖๓ MICROCHIP PIC16F877



LCD DISPLAY 16 CHARACTER 2 LINES

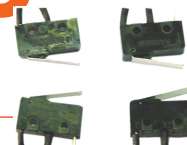


R-TRACKER 3  
SENSOR TRACKER 3 CHANNEL

**CPU PIC16F877**



**8 Kwords Flash**



SW SENSOR MICRO SW WITH BUMPER LEGO SET

SERVO MOTOR S03T/STD/JR TORQUE 7.2 Kg - cm



BATTERY 6V-1.2/1.3A



ET-CHARGER BOX 6V



ET-ROBOT 877-IC7407

**ET-ROBOT 877 (CPU MICROCHIP PIC16F877)** ROBOT SERVO MOTOR FROM ETT TEAM. IS USED CPU MICROCONTROLLER PIC FAMILY No. PIC16F877 FREOM MICROCHIP WHICH IS ABLE TO DEVELOP PROGRAM FOR USING WITH COMPUTER AND DOWNLOAD PROGRAM ON COMPUTER INTO BOARD ET-ROBOT RD2 DIRECTLY THROUGH PARALLEL PORT.

BE ABLE TO DEVELOP THEN PROGRAM FOR USING WITH CPU IN VARIOUS STYLE SUCH AS LANGEAUE ASSEMBLY, C, BASIC.

**SPECIFICATIONS ET-ROBOT 877**

- ROBOT PLATE MADE OF ALUMINUM GUILTED WITH ANODIAED BLUE 3MM. THICK
- USE 2-DC SERVO MOTOR S03T/STD/JR WITH TORQUE 7.2 KG.CM/ SERVO MOTOR TO MODIFY WHEEL TO TURN LEFT/RIGHT
- CPU PIC16F877 FROM MICROCHIP WITH CPU PIC 8 KWORDS FLASH MEMORY WHICH IS ABLE TO DELETE AND REWRITE, 386 BYTE RAM, 256 BYTE EEPROM, RUN 10 MHz ON BOARD
- LCD DISPLAY 16 CHARACTER 2 LINE
- RS232 PORT MAX232 ON BOARD
- A TO D 4 CH 10 BIT
- RTC DS1307 (OPTION), EEPROM 24XX (OPTION), CIRCUIT LOW VOLT DETECT (OPTION)
- 1 INPUT SW, 4 INPUT DIP SW, 10 BIT I/O PORT, 4 LED OUTPUT, 3 INPUT LED, MINI SPEAKER ON BOARD

- There are various languages to develop and write program for using with CPU such as ASSEMBLY, C, BASIC.
- Provide " ET-ROBOT 877-IC7407 " to interface through IC 7407. It has to remove IC 7407 first and then insert " ET-ROBOT 877-IC7407 " instead; so, it can download DATA into MCU through Connector RJ11 Standard of MICROCHIP (ICD2) (it is compatible with " ET-PGM PIC USB V1/V1 PLUS/V2, ET-PGM PIC PK3/PK3 PLUS "(OPTION)). In this case, it can download data through PORT USB instead of PRINTER PORT).

- If there is no any PRINTER PORT to download data, it can purchase following product to download data through USB PORT
  - ET-PGM PIC USB V1, ET-PGM PIC USB V1 PLUS, ET-PGM PIC USB V2, ET-PGM PIC PK3, ET-PGM PIC PK3 PLUS

**ACCESSARIES OF SENSOR ON BOARD ET-ROBOT 877**

- R-TRACKER 3 IS LINE DETECTED SENSOR WITH INFRARED 3 CHANNEL, USE INFRARED SENSOR NO. PRP-359F x 3 WITH IC OPAMP NO.TLC272 WHICH IS ABLE TO DETECT MORE 3 CM DISTANCE IN BLACK LINE AREA
- 4-SW SENSOR WITH MICRO SW FOR BUFFER LOGO

**ACCESSARIES OF POWER SUPPLY**

- SEALED RECHARGEABLE BATTERY 6V 1.3A, BE ABLE TO USE MORE THAN 2 HOURS, WITH BATTERY CHARGER ET-CHARGER 6V
- THERE'S MANUAL,CD-ROM, ET-CAB10P CABLE, RS232 9 PIN CABLE

**OPTION : R-LOGO 877 (P-ET-A-00176)**



It is additional set for ET-ROBOT LOGO 877 and use with LOGO Language. There's PIC16F877 with LOGO INTERPRETER, EEPROM 24LC256, Manual with CD-ROM of ET-ROBOT LOGO 877, and Document for installing program.(Thai Language)

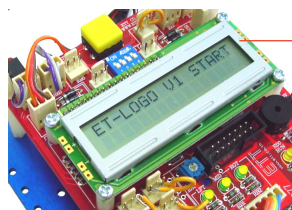
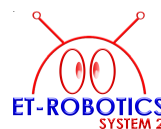




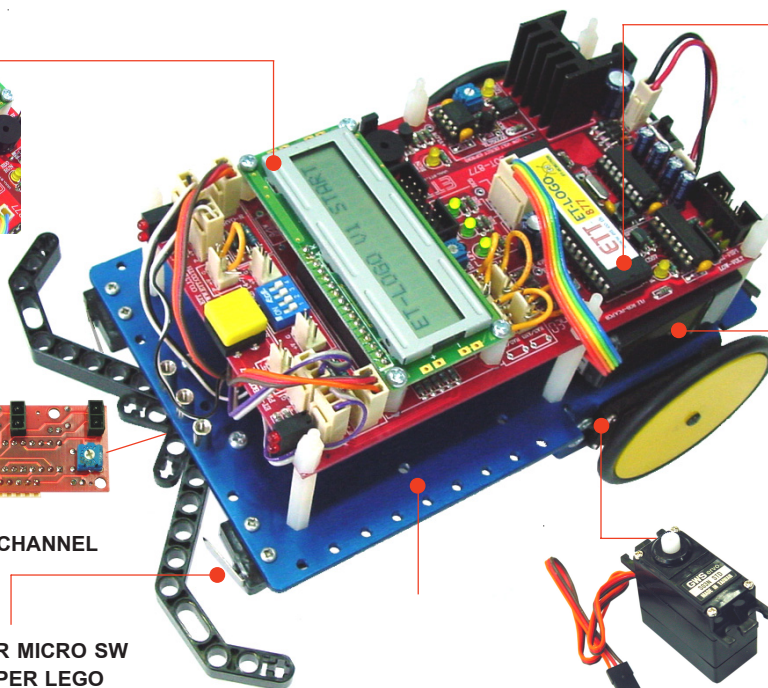
**ET-ROBOT LOGO 877 (P-ET-A-00175)**



It is set for learn and study robot with LOGO language  
CPU PIC, it is suitable for students or higher for study more difficultly.



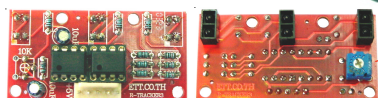
LCD DISPLAY 16 CHARACTER  
2 LINES



CPU PIC16F877 WITH LOGO  
INTERPRETER



BATTERY 6V-1.2/1.3A



R-TRACKER 3  
SENSOR TRACKER 3 CHANNEL



ET-CHARGER BOX 6V

SW SENSOR MICRO SW  
WITH BUMPER LEGO



SERVO MOTOR S03T/STD/JR TORQUE 7.2 Kg · cm

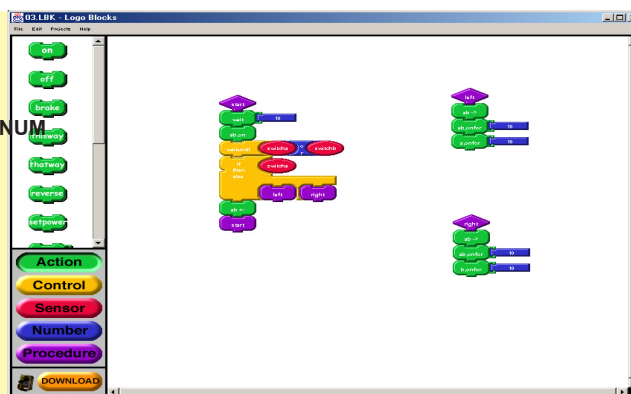
ET-ROBOT LOGO 877 is robot from ETT is designed with LOGO language, is suitable for students to learn and study and BASIC language program for higher.

PLATE ALUMINUM

ET-ROBOT LOGO 877 is used LOGO Language which is easy for students and is able to write in various styles. For example, LOGO BLOCK Language is instructions mode for block arrangement or CRICKET LOGO language for character text. Users can write on Computer PC and download data into ROBOT which is able to run immediately.

**SPECIFICATIONS ET-ROBOT LOGO 877**

- ROBOT PLATE MADE OF ALUMINUM GUILTED WITH ANODIAED BLUE 3MM. THICK
- USE 2-SERVO MOTOR S03T/STD/JR WITH TORQUE 7.2 KG.CM/ SERVO MOTOR TO MODIFY WHEEL TO TURN LEFT/RIGHT
- CPU PIC16F877 WITH LOGO INTERPRETER PROGRAM FROM ETT
- LCD DISPLAY 16 CHARACTER 2 LINE
- RS232 PORT MAX232 ON BOARD
- EEPROM 24LC256 32K BYTE ON BOARD, RTC DS1307 (OPTION), CIRCUIT LOW VOLT DETECT (OPTION), MINI SPEAKER ON BOARD
- 1 INPUT SW, 4 INPUT DIP SW, 10 BIT I/O PORT, 4 LED OUTPUT, 3 INPUT LED



**ACCESSORIES ON BOARD OF ET-ROBOT LOGO 877**

- R-TRACKER 3 FOR LINE DETECED SENSOR WITH INFRARED 3 CHANNEL, USE INFRARED SENSOR NO. RPR359F x 3 WITH IC OP-AMP
- SW SENSOR 4 POINTS WITH LEGO BUFFER, POWER SUPPLY
- SEALED RECHARGEABLE BATTERY 6V 1.3A, BE ABLE TO USE MORE THAN 2 HOURS, WITH BATTERY CHARGER
- THERE'S MANUAL , CD-ROM, DOWNLOAD ET-CAB10P CABLE , RS232 DB 9 PIN CABLE
- ET-ROBOT LOGO 877 SIZE(WxLxH) : 15CM x 20.5CM x 10CM

**OPTION : R-PIC877 (P-ET-A-00177)**

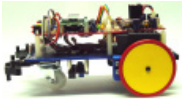


It is additional set for ET-ROBOT LOGO 877 and use with BASIC Language and ASSEMBLY Language with PIC BASIC Program. There's Manual with CD-ROM of ET-ROBOT LOGO 877, Manual with CD-ROM of BASIC Language, CPU PIC16F877, and Document for installing program.

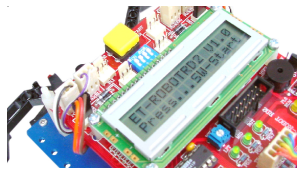




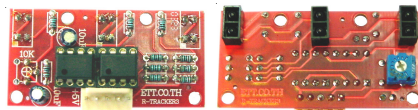
**ET-ROBOT RD2 (P-ET-A-00141)**



It is set for learn and study robot with CPU PHILIPS P89C51RD2/V51RD2



LCD DISPLAY 16 CHARACTER 2 LINE



R-TRACKER 3  
SENSOR TRACKER 3 CHANNEL

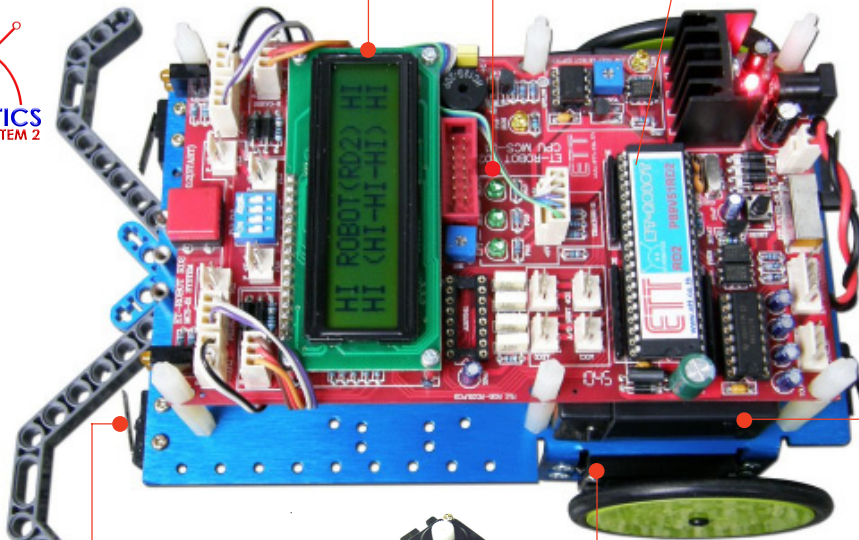
**64 Kbyte Flash**



CPU Mcs51 89V51RD2



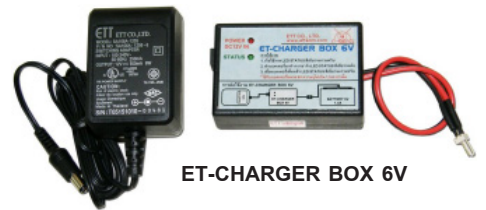
PLATE ALUMINUM wide 3 mm.



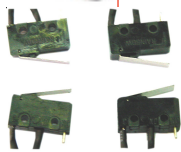
BATTERY 6V-1.2/1.3A



SERVO MOTOR S03T/STD/JR  
TORQUE 7.2 Kg - cm



ET-CHARGER BOX 6V



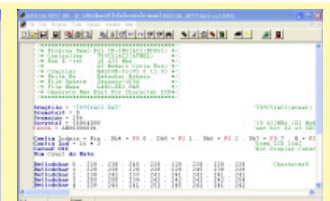
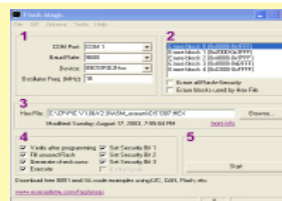
SW SENSOR MICRO SW  
WITH BUMPER LEGO

**ET-ROBOT RD2 (CPU MCS51)** ROBOT SERVO MOTOR FROM ETT TEAM USE CPU MICROCONTROLLER MCS51 FAMILY No. P89C51RD2/V51RD2 FROM PHILIPS WHICH IS ABLE TO DEVELOP PROGRAM FOR USING WITH COMPUTER AND DOWNLOAD PROGRAM ON COMPUTER INTO BOARD ET-ROBOT RD2 DIRECTLY THROUGH RS232 PORT.

BE ABLE TO DEVELOP THEN PROGRAM FOR USING WITH CPU IN VARIOUS STYLE SUCH AS LANGUAGE ASSEMBLY, C, BASIC.

**SPECIFICATIONS ET-ROBOT RD2**

- ROBOT PLATE MADE OF ALUMINUM GUILTED WITH ANODIAED BLUE 3MM. THICK
- USE 2-DC SERVO MOTOR S03T/STD/JR WITH TORQUE 7.2 KG.CM/ SERVO MOTOR TO MODIFY WHEEL TO TURN LEFT/RIGHT
- CPU MCS-51 P89C51RD2/V51RD2 FROM PHILIPS WITH 64 KBYTE FLASH MEMORY WHICH IS ABLE TO DELETE AND REWRITE, 1 KBYTE RAM, RUN 6 CLOCK/18.432 MHz ON BOARD
- LCD DISPLAY 16 CHARACTER 2 LINE
- RS232 PORT MAX232 ON BOARD WITH CIRCUIT ETT DOWNLOAD
- A TO D 4 CH 12 BIT IC ADS7841 (OPTION)
- RTC DS1307 (OPTION), EEPROM 24XX (OPTION)
- CIRCUIT LOW VOLT DETECT (OPTION), MINI SPEAKER ON BOARD
- 1 INPUT SW, 4 INPUT DIP SW, 10 BIT I/O PORT, 4 LED OUTPUT, 3 INPUT LED,



Write program on Computer PC, download program into BOARD ET-ROBOT RD2 directly

Be able to develop then program for using with CPU in various style such as Language ASSEMBLY, C, BASIC

**ACCESSORIES OF SENSOR ON BOARD ET-ROBOT RD2**

- R-TRACKER 3 IS LINE DETECTED SENSOR WITH INFRARED 3 CHANNEL, USE INFRARED SENSOR NO. PRP-359F x 3 WITH IC OPAMP
- 4-SW SENSOR WITH MICRO SW FOR BUFFER LOGO

**ACCESSORIES OF POWER SUPPLY**

- SEALED RECHARGEABLE BATTERY 6V 1.2-1.3A, BE ABLE TO USE MORE THAN 2 HOURS, WITH BATTERY CHARGER ET-CHARGER 6V
- THERE'S MANUAL, CD-ROM EXAMPLE ASSEMBLY LANGUAGE PROGRAM, C LANGUAGE, BASIC LANGUAGE, ET-DOWNLOAD RD2 CABLE, RS232 9 PIN CABLE
- ROBOT RD2 WITH BATTERY 6V 1.3A SIZE (WxLxH): 15 x 20.5 x 10 CM. WEIGHT 0.95 KG. AND BE ABLE USE MORE THAN 2 HOURS

**R-TANK V1 KIT**

(P-ET-A-00149)

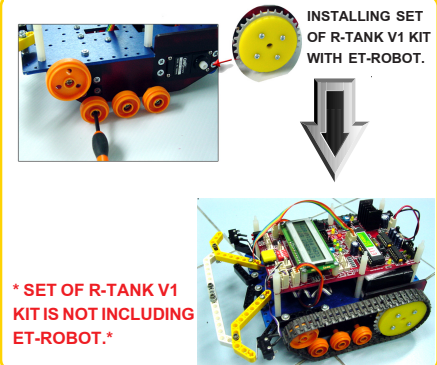


**MODIFY ET-ROBOT RD2, 877, STAMP P40, LOGO 877**



R-TANK V1 KIT is a set for modify ET-ROBOT of ETT. There's accessories to modify tank with machine belt to movable well and accessories of buffer to modify with

- SET OF ET-ROBOT RD2, 877, STAMP P40, LOGO 877

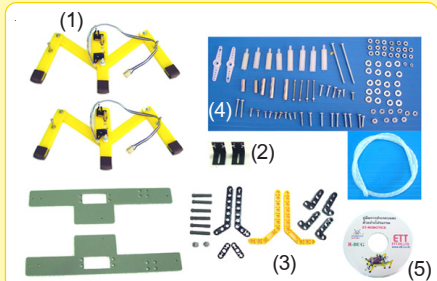


\* SET OF R-TANK V1 KIT IS NOT INCLUDING ET-ROBOT.\*

**R-BUG V1 KIT**

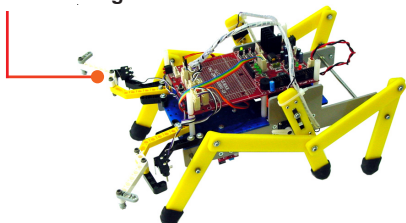
(P-ET-A-00178)

**MODIFY ET-ROBOT RD2, 877, STAMP P40, LOGO877**



R-BUG V1 KIT is a set for modify ET-ROBOT of ETT. To modify as BUG with 6 legs and SW for test its walk and set of BUFFER LEGO.

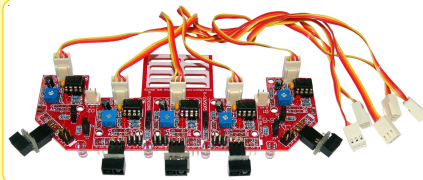
When users installed set of R-BUG V1 KIT with ET-ROBOT, it is Robot with 6 legs. Be able to study writing program to control robot walking.



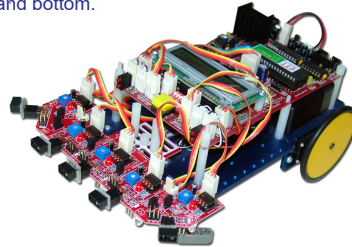
**R-SENSOR 5**

(P-ET-A-00314)

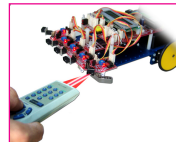
It's R-OPA 5 Channel with 5 SENSOR (R-REFLEX S5) that is designed to interface with ETT Robot. There's R to adjust signal level from signal Analog to TTL Output and 5 of 3PIN ROBOT Cable. It can be used to be electronic buffer; moreover, it can modify SENSOR types to be light (R-LIGHT) and sound (R-SOUND).



• There are three positions to install R-SENSOR 5 with ET-ROBOT; front, back and bottom.



• R-SENSOR 5 can be applied for moving by light, moving by signal REMOTE IR, moving without falling, moving without crashing and moving by sound.



**R-REFLEX S5**

(P-ET-A-00315)



It is an extra REFLEX SENSOR that can be applied up to 8 cm. long distance.

**R-LIGHT S5**

(P-ET-A-00316)



It is a light SENSOR with R that can adjust the brightness of light and configure Robot moving by light.

**R-SOUND S5**

(P-ET-A-00317)

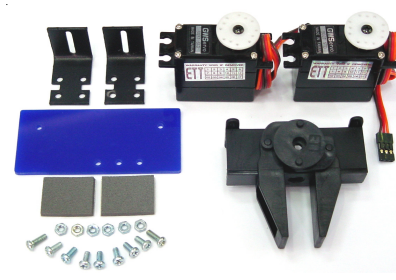


It is a sound SENSOR to detect sound volume by using Microphone to receive audio signal and configure ROBOT moving by sound.

**ET-ROBOT GRIP SET**

(P-ET-A-00189)

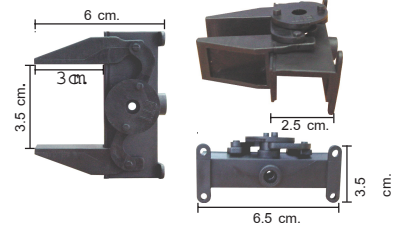
GRIP IS CONTROLLED BY SERVO MOTOR AND MOVABLE WITH 2 AXLES



ET-ROBOT GRIP SET is grip is controlled by SERVO MOTOR and be able to move with 2 axes. Grip is made of black plastic and is designed to use with 2 SERVO MOTOR for controlling grip. One SERVO MOTOR runs for IN/OUT of grip and one SERVO MOTOR runs for turn axle. There's plate for attach with ETT robot directly and is able to connect with ET-ROBOT RD2, 877, LOGO 877, STAMP P40 or adapt for mechanic arms well.

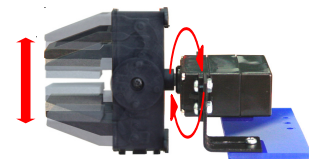
ET-ROBOT GRIP SET INCLUDES;

1. R-SERVO GRIP 1 PIECE
2. SERVO MOTOR S03T/STD/JR 2 PIECES
3. PLASTIC PLATE FOR ATTACH ET-ROBOT AND R-SERVO MOUNT
4. CD-ROM

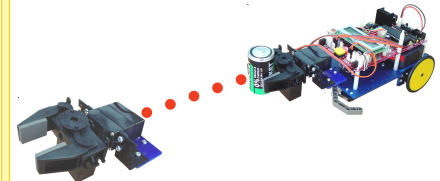


SIZE AND DISTANCE OF GRIP

- WIDEST 3.5 CM.
- DEEPEST 3 CM.
- GRIP SIZE NOT INCLUDING SERVO MOTOR (LxWxH) 6cm. x 6.5cm. x 3.5cm.
- WEIGHT NOT INCLUDING SERVO MOTOR 0.02 kg.
- WEIGHT INCLUDING SERVO MOTOR 0.12 kg.
- BE ABLE TO CONTAIN 0.5kg. WITH MOVABLE BY AXLE



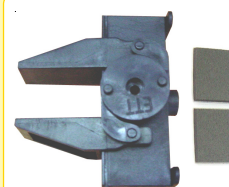
• ET-ROBOT GRIP SET เมื่อประกอบแล้ว



• ET-ROBOT GRIP SET WHEN CARRIED OUT.

**R-SERVO GRIP**

(A-MO-M-00076)



There's only plastic GRIP not including SERVO MOTOR and be able to connect with 2 SERVO MOTOR for S03T, S03N, S03NXF, FUTABA S3003



**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 DIGITALOUTPUT 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 stoppingcar.

**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**

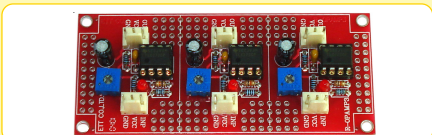
(P-ET-A-00124)



• **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**

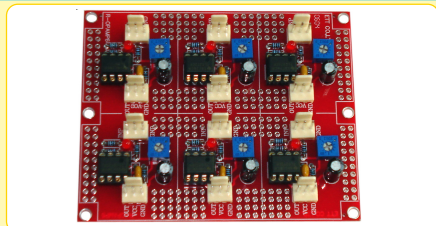
- Use IC No.MMA7331L LGA-14PIN TYPE from FREESCALE
- Give ANALOG OUTPUT (2.2V-3.6V) at Pin X, Y, Z
- Run by 2.2V-3.6V Power Supply, LOW CURRENT (not be higher than 3.6V)
- Has FUNCTION SELF TEST for FREE FALL DETECTION (it measures the value while material is falling from the upright position)
- Has 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**

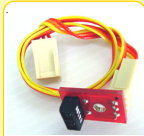
(P-ET-A-00164)



**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**

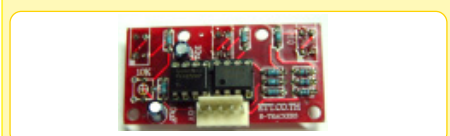
(P-ET-A-00150)



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

**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**

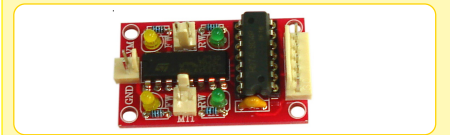
(P-ET-A-00122)



• **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**

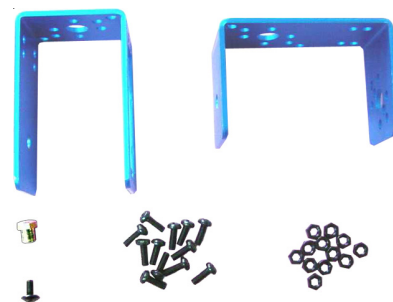
(P-ET-A-00127)



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

**R-JOIN SERVO**

(A-BX-I-00039)



It is able to connect with ETT SERVO MOTOR such as S03N, S03NXF, S03T, S03TXF, S03TBB, S03T/BBMG and FUTABA S3003 as turning, joint turning of robotics arms.

• **R-JOINT SERVO** is made of ALUMINUM Plate guilting with ANODIAED, Blue color, 1.5mm. thick and light with metalturning and nuts.



\*An example of connecting between R-JOINT SERVO and SERVO MOTOR.

SUPPORTED ACCESSORIES FOR ET-ROBOTICS SYSTEM FROM ETT



**BATTERY SL6-1.3**  
(A-BA-B-00008)

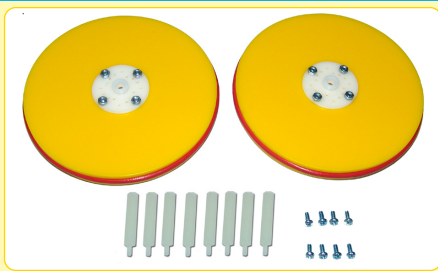
● **BATTERY SL6-1.3** It is Sealed Rechargeable battery 6 V 1.3 AMP size 97x24x51x55 mm. weight 0.32 Kg. with wire connector.



**R-WHEEL SERVO**  
(A-MO-M-00022)

Wheels with rubber diameter 6.7CM. is designed for connecting with SERVO MOTOR S03N, S03T

**R-WHEEL SERVO BIG 1**  
(P-ET-A-00057)



It's a wheel set with a large rubber that can be used with ET-ROBOT. It interfaces with SERVO MOTOR of ROBOT, it makes robot moving better and more rapid. Moreover, there's plastic pole that can modify the front wheel and SENSOR Board suitably.

- 2 Plastic wheels and rubbers with pole to hold SERVO MOTOR and diameter of wheel is 12 CM.
- 8 of 3 cm plastic poles and male nuts
- When using Wheel Servo BIG1, it needs to adjust R on Board R-TRACKER3 and program Time delay for moving to increase or expand line to detect the moving.

**R-JOIN LEGO SET**  
(P-ET-A-00179)



It is joint set with port connector to attach or adapt board sensor such as R-SW2, R-REFLEX or build preferably with nuts to attach with plate of car.

1. TECHNIC CONNECTOR 2 x3
2. TECHNIC BALL JOINT
3. TECHNIC ANGLE
4. TECHNIC AXLE 8
5. TECHNIC AXLE 3 WITH STUD
6. TECHNIC AXLE 3
7. TECHNIC CONNECTOR WITH AXLE HOLE
8. TECHNIC AXLE JOINT OFFSET WITH PLASTIC POLE HTS-315, HTS-306 AND METAL NUTS



**ET-CHARGER BOX 6V**  
(P-ET-A-00284)

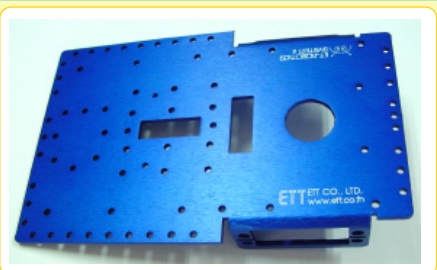
● **CHARGERS ET-CHARGER BOX 6V** It is battery charger 6V 1.5AMP and is able to use with battery SL6-1.3



**R-WHEEL FRONT 25**  
(A-MO-M-00036)

It is front wheel and mini caster wheel with diameter 2.5 CM.

**R-BASE**  
(A-BX-I-00035)



● **R-BASE** It is structure of car made of ALUMINUM and gilded with ANODIAED Blue with 3mm. thick for using with SERVO MOTOR S03N, S03T.

**ET-ROBOTICS SYSTEM 2 BASE**  
(P-ET-A-00123)

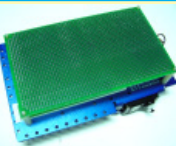
It is a set of building robotic car, there's many accessories in package;



1. 1-R-BASE
2. 2-SERVO MOTOR S03T/STD/JR (BE ABLE TO MODIFY ROTATION AS 360°)
3. 2-WHEEL SERVO
4. 1-R-WHEEL FRONT 25
5. 12-PLASTIC POL EHTS-325 (WITH NUTS)
6. 1-USER MANUAL SERVO MOTOR

**PROJECT PCB M4**  
(C-YE-B-00009)

● **PROJECT PCB M4** PCB size 15.3 x 9 cm. for connecting with R-BASE



**CHARGERS S-II**  
(A-AP-C-00003)

● **CHARGERS S-II** It is battery charger with battery NI-MH or NI-CD size AA or AAA TYPE. Be able to charge 2 batteries / time and be able to use DC 220V and VC 12V.



**R-WHEEL LEGO 43.2**  
(P-ET-A-00205)

Wheel set with rubber and Modify Set to connect with SERVO MOTOR S03N, S03T with diameter 4.32 CM.

**R-WHEEL LEGO 81.6**  
(P-ET-A-00209)



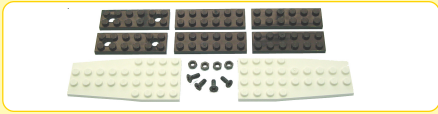
Wheel set with rubber and Modify Set to connect with SERVO MOTOR S03N, S03T with diameter 8.16 CM.

**R-SERVO MOUNT**  
(P-ET-A-00206)

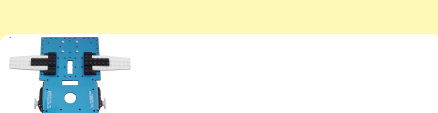
It is 2 metal plates to attach SEVO and 4 nuts to attach SERVO S03 and be able to adapt SERVO in many project works.



**R-PLATE 2X6 LEGO SET**  
(P-ET-A-00212)



It is LEGO with 2 x 6 Black Plate x 6 and 4 x 9 White Wing x 2 with MODIFY and Nuts to attach with ET-ROBOT 877, RD2 and STAMP P40 beside of car and users can attach ET-ROBOT with other LEGO.





# ROBOBUILDER RQ-HUNO (C-YA-A-00183)

new

ROBO  
BUILDER

\* This ROBOBUILDER is only designed for users with age 14 and up \*

ROBOBUILDER RQ-HUNO is the latest HUMANOID ROBOT from ROBOBUILDER Company, Korea. It is upgraded and improved better, it is easy use but it is lower price. The program is properly developed and designed for both beginners who initially study and learn the robotic structure in order to use the robot easier and customers who have experience in the robot and can write additional program by self.

ETT provides the completed Robot for customers to reduce any possible problems with assemble of robot, especially beginners. Moreover, ETT provides the high quality plastic box to keep the completed robot, especially for ETT's customers.



Gift from the Future  
**RQ-HUNO**

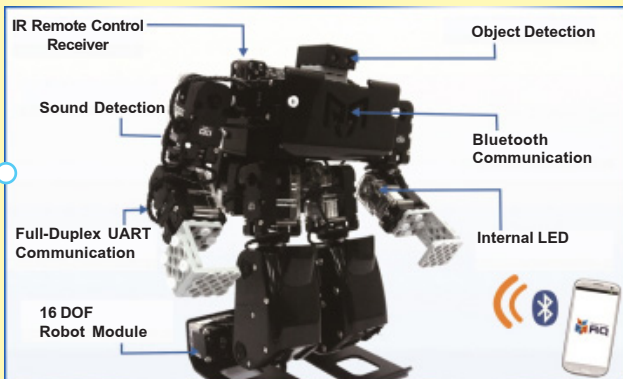


ROBOBUILDER RQ-HUNO Kit includes

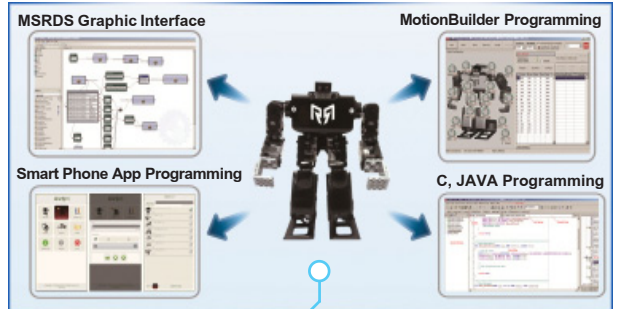
1. The completed Robot RQ-HUNO
2. High quality plastic box to keep the completed Robot RQ-HUNO

Specifications of RQ-HUNO are listed below;

- Has 16 SMART SERVO MOTOR with LED insides, use MCU No.STM8S10 to command, use SERIAL UART(TTL) Communication, TORQUE 3 kg/cm.
- Specifications of Board Controller RQ SMART CONTROLLER are listed below;
  - Use 32 BIT ARM PROCESSOR
  - Use 4 CH to interface INPUT SENSOR
  - Use 4 CH to interface with SMART SERVO MOTOR (a maximum of 254)
  - 1 CH UART TTL
  - 2 CH LED PORT
  - Include MIC and BUZZER
  - IR REMOTE RECEIVERS



- SENSOR OBJECT DETECTION:** To detect Remote Signal or white object
- SOUND DETECTION:** To detect volume
- BLUETOOTH MODULE:** It specially provides in the set to control the robot through BLUETOOTH such as from Android cell phone that has BLUETOOTH
- IR REMOTE CONTROL:** To control the robot by IR
- USB TO SERIAL ADAPTER:** To interface with Computer to LOAD program into the robot
- Rechargeable Battery:** LI-ION 9V-12V
- DC ADAPTER 220VAC TO 12.6V/1.5A:** To recharge Battery



Program and Command

- Run on OS WINDOWS 7/8 as MOTION BUILDER PROGRAMMING to create various MOTION; MSRDS GRAPHIC INTERFACE provides program and examples; C (IAR), JAVA PROGRAMMING only provides example
- Run on SMART PHONE APP PROGRAMMING, especially for Android, load free from PLAY STORE to command RQ-HUNO through BLUETOOTH to perform various MOTION that has been created and kept



# ROBOBUILDER 5720T-A03 (C-YA-A-00124)

This **ROBOBUILDER 5720T-A03** is robot from ROBOBUILDER Company, Korea. It uses 16 of DIGITAL SERVO MOTOR to perform, it is dependent to adjust format of assembly according to idea or creativity because there is outstanding joint of Motor that is easy to connect together. It designs the joint of Motor better than general robots.



\* This ROBOBUILDER is only designed for users with age 14 and up \*



**HUNO:** Humanoid Robot with 2 legs



**DINO:** Dinosaurian Robot with 2 legs and tail



**DOGY:** Doglike Robot with 4 legs



### Specifications of ROBOBUILDER 5720T-A03

- HUNO Robot with 2 legs is 28.5cm. in height and 1.25kg. in weight
- Structure of robot and 16 of DIGITAL SERVO MOTOR is transparent plastic, user can see through the internal mechanization with 2 colored LEDs inside SERVO; in this case, user can enable/disable these LED to ON/OFF according to the motions of robot. Control degree of rotation, control SPEED of rotation, so user can control speed and motions of the robot well.
- Has circuit internal the robot to measure acceleration and incline of axis X, Y, Z (ACCELERATION SERVO)
- Board Controller uses MCU No.ATMEGA128 from ATMEL
- Use BATTERY NI-MH 8.4V, including DC ADAPTER for recharging BATTERY
- Has REMOTE CONTROL to control the robot by INFARED

### Program and Command

- Run on OS WINDOWS XP, VISTA, 7 in the format of GRAPHIC; command or adjust the operation in the format of C Language or other Languages of AVR as preferred
- DOWNLOAD the written program into the robot through PORT RS232 (can use PORT USB, it provides "USB TO RS232 ET-USB/RS232 MINI" in the kit)
- Can DOWNLOAD the latest COMMAND or MOTION from INTERNET: <http://www.robobuilder.net>
- Expand and add more connection in the near future such as DISTANCE SENSOR, SOUND DETECTION, ACCELERATION SENSOR, BLUETOOTH



### ROBOBUILDER 5710K and 5720T-A03 include...

1. Assembled robot in the platform of HUNO
2. REMOTE CONTROL
3. Cable DOWNLOAD RS232
4. ET-USB/RS232 MINI
5. NI-MH 8.4V BATTERY, and DC ADAPTER to recharge BATTERY
6. CD-ROM Program and User's Manual
7. High quality plastic box to keep robot ET-BOX1

★ ETT provides devices and spare parts of SERVO and ROBOBUILDER's body to serve our customer who buys this product from ETT. It can be checked and repaired instantly, without sending to aboard, 1-year warranty for ROBOBUILDER that is ordered from ETT.



## WCK-1111K (A-MO-M-00124)

## / WCK-1108K (A-MO-M-00123)



It is DIGITAL SERVO MOTOR that uses MCU ATMEGA8 to control the operation of internal SERVO in the format of PID CONTROL (+-0.8 degree).

- WCK-1111K runs at 6-10VDC, TORQUE 11kg/ cm., 1.8A MAX
- WCK-1108K runs at 6-10VDC, TORQUE 8kg/ cm., 1.8A MAX
- Can rotate through 360 degrees, so it can be wheel.
- Can control the position of rotation in the range of 0-333 degrees
- Transmit-recvie data into MOTOR in the format of MULTI-DROP FULL DUPLEX UART (TTL); moreover, it can be interfaced with many MOTOR together.
- Can choose SPEED and rotational direction.



## RBO-JOINT03 BLK (A-MO-M-00125)

## / RBO-JOINT02 BLK (A-MO-M-00126)



It is plastic joint assembly to hold DIGITAL SERVO MOTOR of ROBOBUILDER and it can be compatible with version WCK-1111K, WCK-1108K. The SERVO MOTOR can be adapted and modified into various types such as arm machine or other as required, Now, there are 2 versions.



- RBO-JOINT01 BLK has totally 39 pieces in 11 types of joint assembly.

It is the only one DIGITAL SERVO MOTOR that has machine system and plastic joint assembly together, so user can be interface and assemble robot independently.

- RBO-JOINT02 BLK has totally 8 pieces in 8 types of joint assembly.



**Be experts to invent robots, mechanical arms, robot cars with SERVO MOTOR from ETT**

Users can invent robots, mechanical arms, robot cars easily with SERVO MOTOR by themselves. They don't design gear and in part of controller is used only 1 signal cable. There's range of Torque between 2.3 Kg-CM to 28.8 Kg-CM. SERVO MOTOR is DC MOTOR is consist of Gear set and controller in one Module. There's 1 signal cable, 2 VCC and GND only but it is able to contole robot to turn left/right +90°/-90° (180°) by SERVO MOTOR without any sensor reflection. It is able to adapt in various project works easily.



- Be controlled SERVO MOTOR by input pulse into SERVO MOTOR and be direction and position of rotation
- Be able to use Power Supply DC 4-6 Volt, Rotation 180° and be able adapt SERVO MOTOR to rotate around as 360° for using with wheel of robot
- Port JR Type Standard
- There's 14 modes for distribution from GWS Co, Ltd., and FUTABA Co, Ltd. for S3003.

- ◆ **GWS MICRO/STD/JR** (A-MO-M-00007) It is small and light.
- ◆ **GWS S03N/STD/JR** (A-MO-M-00005) It is standard for using.
- ◆ **GWS S03N/STD/JR** (A-MO-A-00044) It is hi-speed but low S03N.
- ◆ **GWS S03T/STD/JR** (A-MO-A-00006) It is standard but high S03N.
- ◆ **GWS S03T/2BB/J** (A-MO-A-00073) It is the same size as S03T and Ball Bearings.
- ◆ **GWS S03T/2BBMG/J** (A-MO-A-00074) There's Ball Bearings and brass gearbox.
- ◆ **GWS S03TXF/STD/JR** (A-MO-A-00045) It is hi-speed but low S03T.
- ◆ **GWS S04/BBM/JR** (A-MO-A-00008) It is large with 13 Kg-CM.
- ◆ **GWS S666/FET/JR** (A-MO-A-00009) It is the largest with 22 Kg-CM.
- ◆ **GWS S677 2BB/MG** (A-MO-A-00116) There's Ball Bearings and brass gearbox with 26.50 Kg-CM.
- ◆ **GWS PICO/STD/JR** (A-MO-A-00023) It is the smallest with 5.4 g.
- ◆ **GWS MICRO/2BBMG/JR** (A-MO-A-00037) It is small and light with metal gear.
- ◆ **GWS S35/STD/JR** (A-MO-A-00111) It is to turn 360°
- ◆ **FUTABA S3003** (A-MO-Y-00025) It is a standard of FUTABA with 4.1 Kg-CM.

Model	STD	BBM	Size (L x W x H) Mm/in	Weight		4.8V			6V			Modify 360°
				g	oz	SPEED (sec / 60°)	Torque		SPEED (sec / 60°)	Torque		
							Kg-cm	Oz-in		Kg-cm	Oz-in	
Micro	✓		28 x 14 x 29.8 1.1 x 0.55 x 1.17	18	0.63	0.16	1.8	25	0.13	2.30	32	✓
S03N	✓		39.5 x 20.0 x 35.6 1.56 x 0.79 x 1.40	41	1.44	0.23	2.40	47	0.18	4	56	✓
S03NXF	✓		39.5 x 20.0 x 35.6 1.56 x 0.79 x 1.40	41	1.45	0.15	2.20	31	0.12	2.45	34	✓
S03T	✓		39.5 x 20.0 x 39.6 1.56 x 0.79 x 1.56	46	1.62	0.33	7.20	100	0.27	8	111	✓
S03TXF	✓		39.5 x 20.0 x 39.6 1.56 x 0.79 x 1.56	46	1.62	0.21	5	69	0.17	6.20	86	✓
S04		✓	54.4 x 26.5 x 51.5 2.14 x 1.04 x 2.03	114	4	0.25	10	138.88	0.20	13	180.5	
S666/FET	✓		63.0 x 32.0 x 61.6 2.48 x 1.26 x 2.43	142.4	5.02	0.25	18	250	0.21	22	306	✓
PICO	✓		22.8 x 9.5 x 15.5 0.90 x 0.37 x 0.61	5.40	0.19	0.12	0.70	10	0.09	0.84	12	✓
MICRO/ 2BBM		✓	28 x 14 x 29.8 1.1 x 0.55 x 1.17	18	0.63	0.16	1.80	25	0.13	2.30	32	✓
S35	✓		39.5 x 20.0 x 39.5 1.56 x 0.79 x 1.56	42	1.48	-	-	-	0.13	2.8	39.2	✓
S3003	✓		41 x 20 x 36 1.6 x 0.8 x 1.4	37.2	1.3	0.23	3.2	44	0.19	4.1	56.8	✓
S03T/ 2BB/J		✓	39.5 x 20.0 x 39.6 1.56 x 0.79 x 1.56	46.0	1.62	0.33	7.2	100	0.27	8	111	✓
S03T/2BB MG/J		✓	40.6 x 20.0 x 42.8 1.60 x 0.79 x 1.70	73	2.57	0.33	7.4	103	0.27	8.6	119	✓
S677 2BB/MG		✓	63.0 x 32.0 x 61.6 2.48 x 1.26 x 2.43	180	6.35	0.17	21.50	298	0.145	26.50	368	✓

● STD = Oiliness Bearing    2BB = 2 Ball Bearings    MG = Metal Gear With Ball Bearings    NMG = 2BBMG

**GEAR SET is a spare part of SERVO MOTOR GWS from ETT. Users can repair gear system inside SERVO MOTOR. There's 4 Gear Set;**

**1. GWS05/GS**

There's 4-Gearwheel in package.  
● USE WITH SERVO MOTOR  
S03N/S03T/S03NXF/S03TXF  
(A-MO-M-00070)

**2. GWS04BBM/GS**

There's 4-Gearwheel and 1-iron Gearwheel in package.  
● USE WITH SERVO MOTOR  
GWS S04BBM  
(A-MO-M-00071)

**3. GWS MICRO/GS**

There's 4-Gearwheel in package.  
● USE WITH SERVO MOTOR  
GWS MICRO/STD  
(A-MO-M-00072)

**4. GWS 605/GS**

There's 4-Gearwheel in package.  
● USE WITH SERVO MOTOR  
GWS S666/STD/JR  
(A-MO-M-00091)



**SR431** (A-MO-M-00135)



It is SERVO MOTOR that can rotate 180 degrees; it is designed to assembler robot. There is a point for holding on the other side of SERVO, so it is more convenient to makes it as rotating point on both sides of SERVO. Internal GEAR is metal, and it is ANALOG SERVO.

	SIZE : 42.0 x 20.5 x 39.5 mm.
	WEIGHT : 62 g
	SPEED : 0.2 sec/60° (6.0V), 0.18 sec/60° (7.4V)
	TORQUE : 12.2 kg.cm. (6.0V), 14.5 kg.cm. (7.4V)
	GEAR : 5 METAL GERA, 2 BEARING

**SR430** (A-MO-M-00136)

It is SERVO MOTOR as same as version SR431 but internal GEAR of this version is plastic instead.

SIZE : 42.0 x 20.5 x 39.5 mm.
WEIGHT : 62 g
SPEED : 0.2 sec/60° (6.0V), 0.18 sec/60° (7.4V)
TORQUE : 12.2 kg.cm. (6.0V), 14.5 kg.cm. (7.4V)
GEAR : 5 METAL GERA, 2 BEARING

**SM-S4306R** (A-MO-M-00134)



It is SERVO MOTOR that rotates through 360 degrees from SPRING MODEL Company. It can turn left, turn right, and stop rotating to run as ANALOG SERVO.



SIZE : 41.3 x 20.7 x 40 mm. WEIGHT : 41 g
SPEED : 43 r.p.m (4.8V), 55 r.p.m (6V)
TORQUE : 5.0 kg.cm (4.8V), 6.2 kg.cm (6V)
GEAR : 1 METAL GEAR, 4 PLASTIC GEAR, 2 BEARING

**GWSD03PXFJ** (A-MO-M-00138)

- It is DIGITAL SERVO that uses Signal in the format of ANALOG SERVO, it is high accuracy. User can position to any degree as preferred.
- Can rotate +/-60 degree only
- Use with 4.8V, 6.0V, 7.4V, 8.4V



(S03N2 + XF D HP 2BB) CAN ROTATE +60 DEG, -60 DEG
WEIGHT 33 GRAM
SIZE 38.4 x 19.95 x 37.8 mm. (L x W x H)
4.8V : SPEED SEC/60DEG = 0.089 : TORQUE 8.5kg/cm
6.0V : SPEED SEC/60DEG = 0.078 : TORQUE 10.5kg/cm
7.4V : SPEED SEC/60DEG = 0.070 : TORQUE 12.8kg/cm

**GWS03PFJ** (A-MO-M-00137)



- It is ANALOG SERVO that has TORGE and high speed with BALL BEARING.



WEIGHT 33 GRAM
SIZE 38.4 x 19.95 x 37.8 mm. (L x W x H)
4.8V:SPEED SEC/60 DEG = 0.131:TORQUE 9.80 kg/cm
6.0V:SPEED SEC/60 DEG = 0.123:TORQUE 12.00 kg/cm
GEAR : 2BB (2 BALL BEARINGS)

**STEPPING MOTOR # 14PM-M252-P1ST** (A-MO-M-00118)

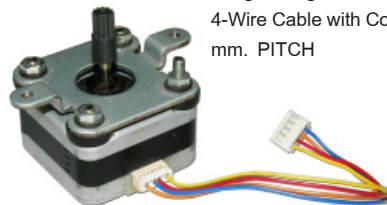
It is 2-PHASE BIPOLAR STEPPING MOTOR

24 VDC, 1.8 Degree, 0.5 AMPS/ a coil, 7.5 OHMS/ a coil HOLDING TORQUE 0.034 Nm (0.35 kg-cm)

Size: 5.4 x 3.6 x 4.1 cm.

Weight: 80 g

4-Wire Cable with Connector CON-HOUSING 4 PIN/1.25 mm. PITCH



**STEPPING MOTOR # M55SP-IN** (A-MO-M-00038)



- STEPPING MOTOR 4 PHASE
- POWER 24VDC/216mA / PHASE
- 120 OHM / PHASE
- 7.5° / STEP
- HOLDING TORQUE 127.4 mN-M
- DIMENSIONS 55 mm. Wide 23 mm.

**DC MOTOR TN740908** (A-MO-M-00040)



RATING :	24 VDC
STALL CURRENT :	2.5 A
STALL TORQUE :	28.70 N-cm (40.68 in-oz)
NO LOAD SPEED :	4550 rpm
WEIGHT :	224 grams
NO LOAD CURRENT :	0.15 A
START UP VOLTAGE :	2 VDC
SHAFT DIAMETER :	3.10 mm.
MOTOR DIAMETER :	37 mm.
MOTOR LENGHT :	64 mm.



**TAMIYA** 

**72005 6 - SPEED GEAR BOX**  
(A-MO-Y-00016)



It is 1-DC MOTOR with auto Gear system 6 level.  
11.6:1, 29.8:1, 76.5:1, 196:1, 505.9:1, 1300.9:1

**70093 3 - SPEED GEAR BOX**  
(A-MO-Y-00021)



It is 1-DC MOTOR with auto Gear system 3 level.  
101:1, 269:1, 719:1

**70097 TWIN MOTOR GEAR BOX**  
(A-MO-Y-00001)



It is t 2-DC MOTOR with 2-auto Gear system  
2 level. 58.2:1, 203.7:1

**72001 PLANETARY GEAR BOX**  
(A-MO-Y-00014)



It is efficient 1-DC MOTOR with auto Gear system 8 level.  
4:1, 5:1, 16:1, 20:1, 25:1, 80:1  
100:1, 400:1

**72003 HIGH POWER GEAR BOX**  
(A-MO-Y-00015)



It is efficient 1-DC MOTOR with auto Gear system 2 level.  
41.7:1, 64.8:1

**70110 4-SPEED GEAR BOX**  
(A-MO-Y-00010)



It is small 1-DC MOTOR with auto Gear system 4 level.  
126:1, 441:1, 1543.5:1, 5402:1

**70145 NARROW TIRE SET**  
(A-MO-Y-00002)



There's 2 plastic wheels with set for connecting with Gear Box.  
Diameter : 56mm.  
Width : 16mm. Hubs : 2 round shaft and 2 hex shaft

**70111 SPORTS TIRE SET**  
(A-MO-Y-00004)



There's 2 plastic wheels with thick and wide rubber and set for connecting with Gear Box.  
Diameter : 56mm. Width : 25mm. Hubs : 2 round shaft and 2 hex shaft

**70103 UNIVERSAL GEAR BOX**  
(A-MO-Y-00009)



It is 1-DC MOTOR with Gear system 3 level.  
101:1 269:1 719:1

**70096 OFF ROAD TIRES**  
(A-MO-Y-00006)



There's 2 plastic wheels with soft rubber and set for connecting with Gear Box.  
Diameter : 50mm.  
Width : 30mm.  
Shaft : 3 x 100mm.

**70144 BALL CASTER**  
(A-MO-Y-00005)



It is front wheel of robot and is able to rotate in many directions and there's 2 ball custer/set.  
Height : Adjustable

**70101 TRUCK TIRE SET**  
(A-MO-Y-00008)



There's 4 plastic truc tire / set with a set for connecting with Gear Box. Diameter : 36mm. Width : 16mm. Shaft : 3 x 100mm.

**70100 TRACK & WHEEL SET**  
(A-MO-Y-00007)



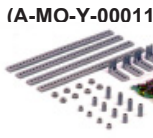
There's 3 styles of track and wheel set to select for suitable routes.  
Tracks: (2) 30-link, (4) 10-link and (4) 8-link

**70157 UNIVERSAL PLATE SET\*2**  
(A-MO-Y-00028)



Plastic plate is able to set with gear Box and wheel set is able to build with car and is able to build with CPU Control.

**70143 UNIVERSAL ARM SET**  
(A-MO-Y-00011)



There's plastic arm to build and set with car or robot.  
Hole Diameter: 3mm  
Spacing: 5mm

**70168 DOUBLE GEAR BOX (4-SPEED)**  
(A-MO-Y-00033)



It is t 2-DC MOTOR with 2-auto Gear system 4 level.  
344.2:1, 114.7:1, 38.2:1, 12.7:1

**70106 4 CHANNEL REMOTE CONTROL BOX**  
(A-MO-Y-00023)



Remote control 4 Channel be able to adapt in many project works.

**71112 MECHANICAL RACEHORSE GALLOPING TYPE**  
(A-MO-Y-00035)



**72101 GEAR HEAD MOTOR 380K75 & 064 SPONGE TIRE SET**



**GEAR HEAD MOTOR 380K75 SPECIFICATION**

Voltage	7.2V
RPM at no load	242 r/min
Current consumption at no load	0.67A
Torque at best efficiency	0.49N.m(5kgf.cm)
Weight	180g

(A-MO-Y-00030)

**72102 GEAR HEAD MOTOR 380K75 & 0130 PIN SPIKE TIRE SET**



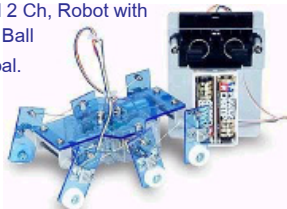
**GEAR HEAD MOTOR 380K75 SPECIFICATION**

Voltage	7.2V
RPM at no load	242 r/min
Current consumption at no load	0.67A
Torque at best efficiency	0.49N.m(5kgf.cm)
Weight	180g

(A-MO-Y-00031)

**71107 REMOTE CONTROL INSECT SIX - LEG CRAWLING TYPE** (A-MO-Y-00013)

Robot with 6 legs is controlled by remote control 2 channel and be able to control as going forward/backwardIt and turning left/right. It includes; Remote Control 2 Ch, Robot with 6 legs, Ball and Goal.



**70162 RC ROBOT CONSTRUCTION SET**  
(A-MO-Y-00012)

Be ble to build a car with arm for study well. It includes;  
Remote Control 4 Ch  
Twinmotor Gear Box  
Crank Axie Gear Box, Ball Caster  
Universal Plate 160 x 60mm.  
Universal Arm 170 mm. x 8  
3 mm. Push Rivet



**70115 REMOTE FORKLIFT** (A-MO-Y-00024)

Be ble to build a forklift for study well. It includes;  
Remote Control 3 Ch  
Twinmotor Gear Box  
Dc MOTOR  
Wheel Set  
Tank Set  
Lift Set



**70170 REMOTE CONTROL ROBOT CRAWLER**  
(A-MO-Y-00034)



It includes; Remote Control 4 Ch,  
Twin Motor Gear Box  
Crank Axie Gear Box Universal Arm Set  
Universal Plate  
Track & Wheel Set

**70169 RESCUE CRAWLER (3CH R/C)**  
(A-MO-Y-00029)

Be ble to build a Rescue Crawler for study well. It includes;  
Remote Control 4 Ch, Twinmotor  
Gear Box, Crank Axie Gear Box  
Universal Plate/Arm  
Track Sprocket Idler Wheel



**RASPBERRY-B-512M+SD4G (C-YA-A-00180)**



It is a set of RASPBERRY PI MODULE B, 512 MB with 4 GB SD CARD that has been installed the Operating System completely.

PASPBERRY PI is 32 BIT mini Board Computer with 512 MB Memory that is enough to install the Operating System of LINUX, it is developed by RASPBERRY PI FOUNDATION.

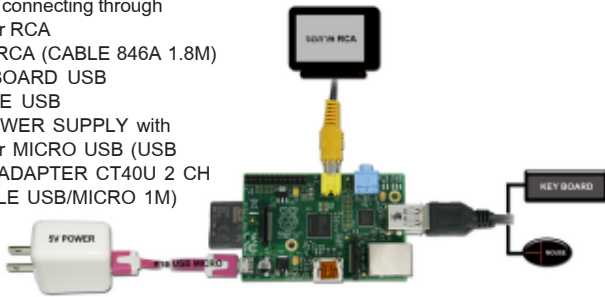


- Use CHIP SoC BROADCOM BCM2835 that includes CPU, GPU, and SDRAM in
- Has Central Processing Unit(CPU) 700MHz ARM11 version ARM1176JZF-S CORE
- Has Graphics Processing Unit(GPU) BROADCOM VIDEO CORE IV, OPEN GL ES2.0, OPEN VG 1080P30 H.264 HIGH-PROFILE ENCODE/DECODE
- Has 512 MB SDRAM, USB 2.0 PORT 2-CH
- Has Connector Image Signal as JACK RCA and HDMI (choose only one type while using)
- Connector Audio Signal uses JACK 3.5mm. or connecting though Connector HDMI
- Connector 26 PIN for INPUT/OUTPUT (GPIO), SPI, I2C, UART (INPUT or OUTPUT of Board can be connected with 3.3V only, it cannot be connected with 5V)
- Has PORT LAN 10/100 MB that is Connector RJ45 ON BOARD
- Use 5VDC Power Supply for board with at least 700mA Current through Connector MICRO USB
- Run the Operating System of board from SD CARD on board
- PCB size: 85.0 x 56.0 mm.

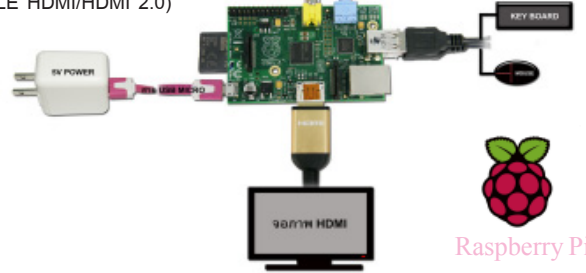
The Devices are connected with Board RASPBERRY PI that has SD CARD completely.

Way 1: Interface Screen through JACK RCA, it requires

1. Screen connecting through Connector RCA
2. Cable RCA (CABLE 846A 1.8M)
3. KEY BOARD USB
4. MOUSE USB
5. 5V POWER SUPPLY with Connector MICRO USB (USB POWER ADAPTER CT40U 2 CH and CABLE USB/MICRO 1M)



Way 2: Interface Screen through Connector HDMI, it requires  
It is similar to the Way 1 but it changes the Cable from RCA to HDMI (CABLE HDMI/HDMI 2.0)



Way 3: Interface through RJ45 LAN, it requires

1. COMPUTER
2. ROUTER (DHCP SERVER)
3. Cable LAN DIRECT 2M
4. 5V POWER SUPPLY with Connector MICRO USB (USB POWER ADAPTER CT40U 2CH and CABLE USB/MICRO 1 M)



**OPTION**

- RASPBERRY-B-512 (C-YA-A-00179)



- USB POWER ADAPTER CT40U 2CH (A-AP-A-00097)



- CABLE USB/MICRO 1 M (A-CB-A-00045)



- สาย LAN DIRECT 2 M (P-CB-A-00028)



- CABLE HDMI/HDMI 2.0M (A-CB-A-00046)



- SD CARD 4 GB+LINUX (A-CM-A-00044)



- CABLE 846A 1.8 M (A-CB-A-00048)



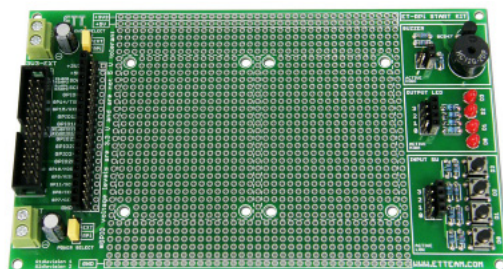
\*\*\* This Board is imported from foreign country, the circuit of the device is SMD that cannot be fixed or repaired. ETT checks all parts and circuits of board in order to make sure that it can work well before selling.  
\*\*\* There is no any warranty for this product. If customer cannot accept the CONDITION, please DON'T UNSEAL and return the product to ETT in order to get money back.\*\*\*

**ET-RPI START KIT (P-ET-A-00500)**



**new**

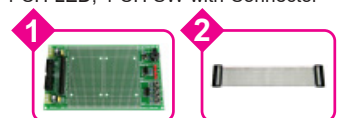
This Board is connected with Board RASPBERRY PI through Connector 26 PIN and Pair Cable 26PIN that is externally interfaced with I/O PORT of board or, it is used to interface with devices on board. It is lower price.



It illustrates how to connect and use Board ET-RPI START KIT with Board RASPBERRY PI.

- Change Connector Pair Cable 26 PIN to Connector 20 PIN for both MALE and FEMALE; next, type name of I/O, and it can be interfaced and used instantly.
- Use I/O to simply test the operation on Board MINI BUZZER, 4 CH LED, 4 CH SW with Connector
- Provide Connector POWER 5V, 3.3V
- PCB size: 15.3 x 9 cm. With PCB Photo Board
- ET-PRI START KIT includes

1. Board
2. Pair Cable 26 PIN





**ET-NXP ARM KIT LPC1769**

(P-ET-A-00453)

**ET-NXP ARM KIT LPC1769 & TFT LCD**

(P-ET-A-00454)

**ET-NXP ARM KIT LPC1768**

(P-ET-A-00409)

**ET-NXP ARM KIT LPC1768 & TFT LCD**

(P-ET-A-00410)

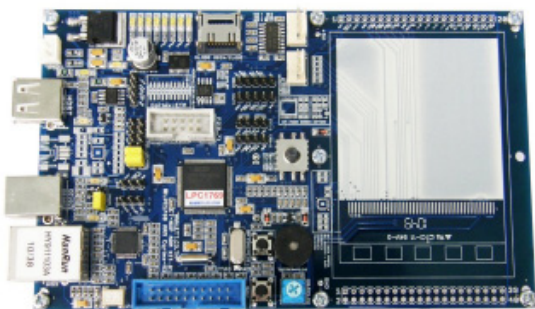
This is the ultimate ARM Board from NXP Company that includes many devices such as ETHERNET LAN, USB 2.0, USB HOST, SD CARD, RS232, TFT LCD, 5-DIRECTIONAL JOY SWITCH and etc. There are 4 versions with 2 MCU as follows;

1. ET-NXP ARM KIT LPC1769
2. ET-NXP ARM KIT LPC1768
3. ET-NXP ARM KIT LPC1769 & TFT LCD
4. ET-NXP ARM KIT LPC1768 & TFT LCD

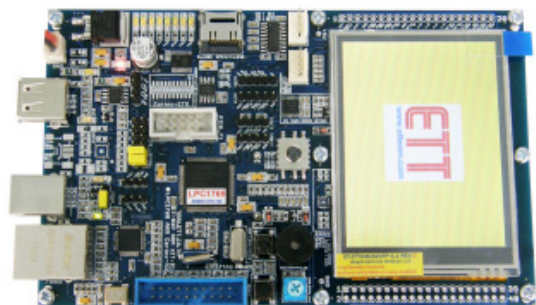
All of 4 versions have the same board and standard devices as follows;

- IN-SYSTEM PROGRAMING (ISP) and IN-APPLICATION PROGRAM (IAP) through ON-CHIP BOOT-LOADER through PORT RS232, it is unnecessary to purchase any COPY PROGRAMMER.
- 20PIN PORT JTAG ARM Standard for REAL TIME DEBUGGER
- SD CARD Interface(MICRO SD)
- 2-CH 4PIN ETT PORT RS232
- Adjustable VR 10K as R for testing Circuit A TO D
- USB HOST TYPE A
- AVAILABLE 22BIT GPIO for various application such as D/A, I<sup>2</sup>C, I<sup>2</sup>S, CAN and INPUT/OUTPUT (it can interface with I/O 5V)
- 10PIN HEADER P2(0-7) for GPIO or FULL-DUPLEX SERIAL UART
- 3PIN HEADER P4(29) for GPIO
- 4PIN HEADER P0(0-1) and P0(4-5) for GPIO or CAN 1 and CAN2 BUS
- 5PIN HEADER P0(23-25) and P2(11-13) for GPIO and I<sup>2</sup>S-RX and I<sup>2</sup>S-TX
- 5VDC/850mA POWER SUPPLY for board (it is compatible with "ET-SWITCHING ADAPTER 5V 2A TYPE B (A-A-A-00095) ); it uses 2PIN Connector or it uses POWER SUPPLY from USB CONNECTOR TYPE B
- PCB SIZE: 15.3 x 9 cm.
- All 4 board versions consist of...

1. Board
2. CD-ROM User's Manual and Example Programs
3. Cable DOWNLOAD ET-RS232 DB 9 PIN

**ET-NXP ARM KIT LPC1769** consists of ...

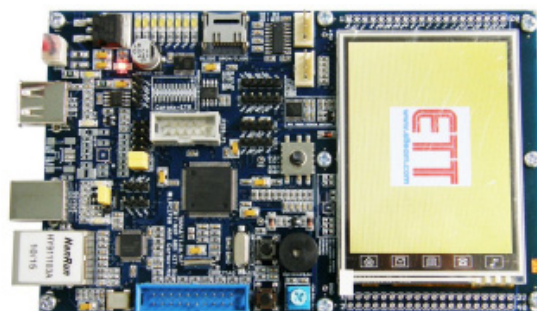
- MCU ARM CORTEX M3 No.LPC1769 that is 32BIT and 100PIN (TQFP) with 512KB FLASH MEMORY, 64KB RAM, A TO D 12 BIT, D TO A 10 BIT and etc.
- X' TAL 12.00MHz for Phase-Locked-Loop and it can run at the maximum frequency of 120MHz
- Part of standard devices on board
- (Can purchase and install "Board ET-TFT240320TP-3.2 REV.B" into this board; in this case, it installs more CONNECTOR 2x20 and 1x20)

**ET-NXP ARM KIT LPC1769 & TFT LCD** consists of ...

- ET-NXP ARM KIT LPC1769
- TFT COLOR LCD with TOUCH SCREEN 240x320 PIXEL, 32" wide Screen, and 65536 Colored Resolution
- CHIP TOUCH SCREEN CONTROLLER No.ADS7846 (ON BOARD)

**ET-NXP ARM KIT LPC1768** consists of ...

- MCU ARM CORTEX M3 No.LPC1768 that is 32BIT and 100PIN (TQFP) with 512KB FLASH MEMORY, 64KB RAM, A TO D 12 BIT, D TO A 10 BIT and etc
- X'TAL 12.00MHz for Phase-Locked-Loop and it can run at the maximum frequency of 100MHz
- Part of standard devices on board
- (Can purchase and install " Board ET-TFT240320TP-3.2 REV.B " into this board; in this case, it installs more CONNECTOR 2x20 and 1x20)

**ET-NXP ARM KIT LPC1768 & TFT LCD** consists of ...

- ET-NXP ARM KIT LPC1768
- TFT COLOR LCD with TOUCH SCREEN 240x 320PIXEL, 32" wide Screen, and 65536 Colored Resolution
- CHIP TOUCH SCREEN CONTROLLER No.ADS7846 (ON BOARD)

**ET-STM32F ARM KIT**

(P-ET-A-00416)

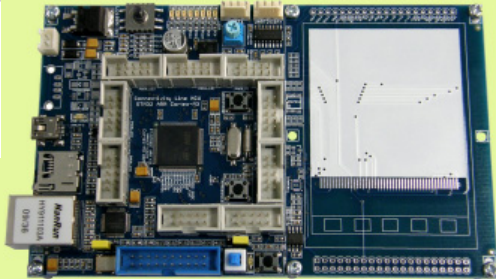
**ET-STM32F ARM KIT & TFT LCD**

(P-ET-A-00417)

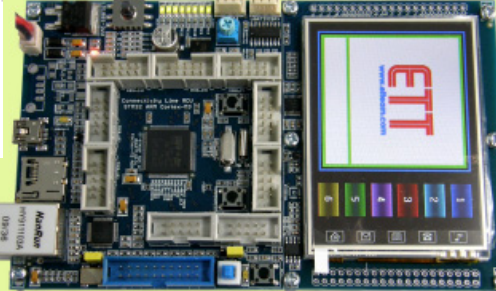
Board ET-STM32F ARM KIT is the Board Microcontroller in the family of ARM CORTEX M3 that is 32BIT 100PIN (LQFP) Microcontroller No.STM32F107VCT6 from ST Company. It is developed from version STM32F103 to improve its capacity higher. In this case, it adds ETHERNET LAN and USB to this board version.

ETT designs this board version to support the customers who require learning, studying, testing; and the customers who really require developing or modifying this board. The board's structure consists of basic devices that are necessary to learn and test various applications such as LED OUTPUT, PUSH BUTTON SW, JOY SW, and VOLUME to adjust A TO D. Moreover, there are high-level devices to support higher applications such as USB DEVICE/HOST/OTG, SD CARD, ETHERNET LAN, GRAPHIC LCD, RS232 and etc.

● **ET-STM32F ARM KIT**



● **ET-STM32F ARM KIT & TFT LCD**



**Specifications of Board ET-STM32F ARM KIT and version TFT LCD**

- Use IN-SYSTEM PROGRAMMING(ISP)through USART 2 BOOT-LOADER(RS232), without purchasing or using any COPY Programmer
- Use ARM CORTEX M3 MCU No.STM32F107VCT6 that is 32BIT 100PIN(LQFP) MCU from ST Company
- Has 256KB FLASH Memory, 64KB RAM, A TO D 12BIT 16-CHANNEL, D TO A 12BIT 2-CHANNEL
- Use CRYSTAL 25.00MHz; it is able to process data at the maximum high-speed of 72MHz by using PLL internal MCU
- Has Circuit RTC with X'TAL 32.768KHz and BATTERY BACKUP(OPTION)
- Has circuit to interface with standard 20PIN JTAG RAM for REAL TIME DEBUG
- Has USB 2.0 FULL SPEED to support the operation of DEVICE //(HOST/OTG(OPTION)) inside itself
- Has ETHERNET LAN 10/100 Mb with Connector RJ45
- Has SD CARD(MICRO SD) with SPI Interface
- Has 2 sets of PUSH BUTTON SWITCH with SWITCH RESET
- Has 5-Directional JOY SWITCH
- Has 8 sets of LED OUTPUT with Circuit BUFFER
- Has Adjustable Resistor to test A/D
- Has Circuit RS232 Communication by using Connector 4PIN ETT 2-Channel
- Has 80BIT GPIO; in this case, there are available 72BIT GPIO for independent application (it is able to connect with I/O at 5A, except A TO D that is not higher than 3.3V). There are 9 sets of Connector 10PIN IDE that can be chosen and used to be 72BIT GPIO or other functions such as A/D, D/A, I2C, CAN, ETHERNET
- Use 5VDC POWER SUPPLY for board (it is able to use ET-SWITCHING ADAPTER 5V 2A TYPE B (A-AP-A-00095)) with Connector 2PIN and Circuit REGULATE No.LD1085-3V3
- PCB Board size: 15.3 X 9 cm.
- Both of board versions consist of...

1. Board
2. CD-ROM, User's Manual and Example Programs
3. Cable DOWNLOAD RS232 DB 9 PIN

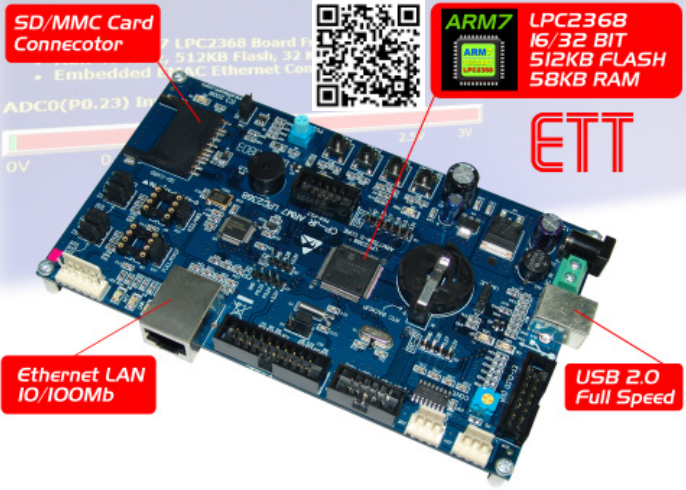


**ET-STM32F ARM KIT & TFT LCD** has more additional devices than ET-STM32F ARM KIT as follows;

- TFT COLOR LCD with 240 X 320 PIXEL TOUCH SCREEN, 3.2" Wide Screen, 65536 colored Resolution and it uses SINGLE CHIP DRIVER No.SPF65408A
  - CHIP TOUCH SCREEN CONTROLLER No.ADS7846 (ON BOARD)
- (\*ETT does not recommend user to interface LCD TFT COLOR in another formats by self because this board maybe unacceptable, including no program to support).

**CP-JR ARM7 LPC2368**

(P-CP-A-00097)



**CP-JR ARM7 LPC2368** is the Board Microcontroller in the family of ARM7 TMDI-S CORE No.LPC2368 from PHILIPS (NXP) with circuits such as ETHERNET LAN 10/100Mb, USB 2.0, SD CARD, RS232, RS485 and etc.

- Use MCU ARM7 TMDI-S No.LPC2368 from PHILIPS (NXP) 16/32 BIT, 100 PIN (LQFP), 512KB FLASH Memory, 58KB RAM, 10 BIT A TO D, 10 BIT D TO A, RTC, PWM, CAN
- 12.00MHz CRYSTAL can be made PHASE-LOCKED LOOP; maximum rate to run is 72 MHz.
- IN-SYSTEM PROGRAMMER (ISP) through PORT PS232 ON BORAD
- PORT JTAG ARM 20 PIN STANDARD to DEBUG as REAL TIME
- PORT USB 2.0 as FULL SPEED, Connector TYPE B ON BOARD
- PORT ETHERNET LAN 10/100Mb, Connector RJ45 ON BOARD
- Circuit to connect with Memory CARD as SD or MMC with Connector
- PORT RS232 4 PIN ETT 2-Channel
- PORT RS422/485 6 PIN ETT 1-Channel (OPTION IC 75176 or MAX3088)
- 14 PIN LCD PORT as CHARACTER TYPE
- 3 TACT SW, 2 LED DOT, 1 MINI SPEAKER
- 1 VR 10K R to test A/D
- Independent 25 BIT GPIO for many applications such as A/D, D/A, I2C, SPI, and INPUT/OUTPUT (can be interfaced with I/O at 5V)
  - 10 PIN HEADER P2 (0-7) for GPIO or FULL-DUPLEX UART
  - 10 PIN HEADER P0 (4-7), P1 (20-23) for GPIO or KEY 4 X 4
  - 3 PIN HEADER P0 (26) for GPIO or D/A
  - 4 PIN HEADER P0 (24-25) for GPIO or A/D
  - 4 PIN HEADER P0 (27-28) for GPIO or I2C BUS
  - 6 PIN HEADER P0 (15-18) for GPIO or SPI BUS
- POWER SUPPLY can be used with Board that is 7 - 12VDC (can use version ET-SWITCHING ADAPTER 12V 0.5A TYPE J) and there is REGULATE 5V and 3.3 V ON BOARD
- PCB Size: 15.3 X 9 CM.
- **CP-JR ARM7 LPC2368** consists of...
  1. Board CP-JR ARM7 LPC2368
  2. CD-ROM of User's Manual and Program
  3. CABLE DOWNLOAD ET-RS232 DB P PIN



**OPTION**

<ul style="list-style-type: none"> <li>● CABLE LAN CROSS 2 M (P-CB-A-00027)</li> <li>● CABLE LAN DIRECT 2 M (P-CB-A-00028)</li> </ul>	<ul style="list-style-type: none"> <li>● CABLE USB 2.0 AM/BM 1.8M (A-CB-A-00043)</li> </ul>	<ul style="list-style-type: none"> <li>● CABLE USB TO 5P MINI (A-CB-A-00044) *</li> </ul>
<ul style="list-style-type: none"> <li>● LCD 16 X 2 &amp; CONVER 14 PIN (LCD 16 Character 2 Line with PCB to interface into Connect PORT 14 PIN LCD) (P-ET-A-00364)</li> </ul>	<ul style="list-style-type: none"> <li>ET-SWITCHING ADAPTER 5V 2A TYPE B (A-AP-A-00095)</li> <li>INPUT: 220VAC</li> <li>OUTPUT: 5VDC 2A</li> </ul>	<ul style="list-style-type: none"> <li>ET-SWITCHING ADAPTER 12V 0.5A TYPE J (A-AP-A-00057)</li> <li>INPUT: 100 - 240VAC</li> <li>OUTPUT: 12VDC 0.5A</li> </ul>



**ET-STM32F103/512**

(P-ET-A-00459)

**ET-STM32F103**

(P-ET-A-00366)



32 Bit ARM Cortex-M3 Processor  
Run 72MHz Clock / 90MIPS (1.25DMIPS/MHz)  
128KByte Flash Memory / 20KByte Static RAM  
64LQFP Packet 51 Bit I/O (16 External Interrupt) with 5V-Tolerant Logic Level

7-Channel DMA For Peripherals ADC, SPI, I<sup>2</sup>C, USART  
16 CH / 12 Bit ADC Converter

4 x 16 Bit Timer (16-Input Capture / 16-Output Copare / 18-PWM)  
2-SPI / 2-I<sup>2</sup>C / 3-USART / 1-USB / 1-CAN / 2-WDG / RTC  
★ Support Debug with Serial wire Debugger (SWD) & JTAG Interface

STM32

ARM Cortex-M3  
72MHz  
128KByte Flash  
20KByte Static RAM

USB FULL SPEED  
SD CARD SLOT  
RS232

**Specification of Board**

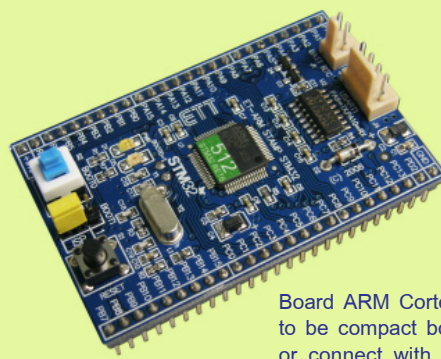
- Use MCU 32 Bit ARM Cortex-M3 No.STM32F103RBT6 from ST Micro-electronics
  - Has 128KB Flash Memory and 20KB Static RAM internal MCU
  - Use Crystal 8.00 MHz + Phase-Locked Loop (PLL), Run 73MHz frequency with 1.25DMIPS/MHz speed to process data that is equal to 90 MIPS
  - RTC Circuit (Real Time Clock) with X'TAL 32.768 kHz and Battery Backup
  - Support In-System Programming (ISP) and In-Application Programming (IAP) through on-Chip Boot-Loader Software via PORT USART-1 (RS232)
  - Circuit to connect with standard 20 PIN JTAG ARM Interface to debug as Real Time
  - +5VDC Power Supply; in this case, user can use it from either USB Port or external CPA-2PIN Connector with +3.3V/3A Regulate Circuit internal board
  - Standard USB 2.0 as Full Speed
  - Circuit to connect with SD Card by using 1 Channel SPI Mode
  - RS232 Communication circuit by using 2-Channel standard ETT 4-PIN Connector
  - Circuit to connect with Dot-Matrix LCD with the circuit to adjust the brightness by using Standard ETT 14 PIN Connector with Jumper to select +3.3V or +5V Power Supply for LCD
  - 2 Push Button Switch Circuits
  - 8 LED Circuits to display status of testing Output
  - 1 Circuit to generate 0-3.3V voltage by using adjustable Resistor to test A/D
  - Has independent 46 Bit GPIO to apply to A/D,I<sup>2</sup>C,SPI and Input Output with Jumper to select ON/OFF signal for using as either GPIO or Hardware Self-Test such as 8 Bit LED, Push Button SW, Volume, USART2 and SD Card, so it makes user can select and use all functions perfectly without any limitation of Hardware system on board
    - Header 10Pin IDE (PA[0..7])
    - Header 10Pin IDE (PA[8..15])
    - Header 10Pin IDE (PB[0..7])
    - Header 10Pin IDE (PB[8..15])
    - Header 10Pin IDE (PC[0..7])
    - Header 10Pin IDE (PC[8..13])
- **ET-STM32F103** consists of...
1. Board ET-STM32F103
  2. CD-ROM User's Manual, Program DOWNLOAD, Example Programs
  3. Cable Download RS232 DB 9 Pin

**ET-ARM STAMP STM32F103/128**

(P-ET-A-00370)

**ET-ARM STAMP STM32F103/512**

(P-ET-A-00371)



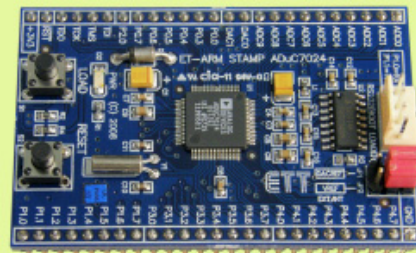
Board ARM Cortex-M3 32 BIT is designed to be compact board that is easy to apply or connect with PROJECT BOARD. There are 2 versions that are the same structures and circuits, but it only is different in the part of CPU as follows;

1. Version **ET-ARM STAMP STM32F103/128** uses CPU No.**STM32F103RBT6** that has **128 KBYTE FLASH** Memory and **20 KBYTE RAM**.
  2. Version **ET-ARM STAMP STM32F103/512** uses CPU No.**STM32F403RET6** that has **512 KBYTE FLASH** Memory and **64 KBYTE RAM**.
- 32 BIT ARM Cortex-M3, RUN 72 MHz CLOCK/90MIPS
  - 64 LQFP Packet 48 BIT I/O (16 External Interrupt) with 5V-Tolerant except A TO D that is not higher than 3.3V.
  - Support programming into CPU through RS232 PORT on 4 PIN ETT ICL3232 On Board
  - Board ET-ARM STAMP is placed on Connector 50 PIN HAEDER (25 PIN per each side with 2.54 mm. distance)
  - 3.3 VDC POWER SUPPLY
  - PCB Size: 40 x 65 mm.
  - **ET-ARM STAMP STM32** consists of...
1. Board
  2. Cable DOWNLOAD ET-RS232 DB 9 PIN
  3. CD-ROM User's Manual

**ET-ARM STAMP ADUC7024**

(P-ET-A-00374)

It is ARM7 Board No.ADUC7024 from ANALOG DEVICE Company that is designed as mini size, so it is easy to adapt it for many application or interface with PROJECT BOARD.



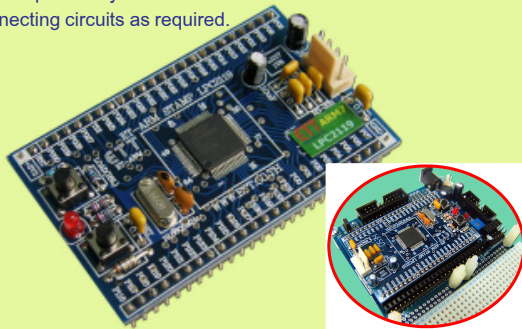
- Use ARM7 TDMI CORE MCU No.ADUC7024; Signal CLOCK 32.768 KHz; and can operate as PHASE LOCK LOOP, RUN 41.78 MHz, 64 PIN LQFP TYPE
  - 62 KBYTE FLASH MEMORY, 8 KBYTE RAM
  - A TO D 12 BIT 10 CH. (0 - 2.5V)
  - D TO A 12 BIT 2 CH. (0 - 2.5V)
  - 5 PORT I/O; P0(6 BIT), P1(8 BIT), P2 (1 BIT), P3(8 BIT), P4(8 BIT)
  - I/O PIN is able to interface with Signal 5V
  - RS232 PORT 4 PIN ETT 1 CH
  - CONNECTOR is placed on 50 PIN HEADER in the distance range of 2.54 mm. (25 PIN per each side)
  - PCB SIZE: 40 x 65 mm.
  - 3.3 VDC POWER SUPPLY
  - Can directly download program from computer PC into internal FLASH Memory through PORT RS232.
  - **ET-ARM STAMP ADUC7024** includes...
1. BOARD ET-ARM STAMP ADUC7024
  2. CD-ROM User's Manual and Program
  3. CABLE DOWNLOAD ET-RS232 DB 9 PIN F



### ET-ARM STAMP LPC2119

(P-ET-A-00271)

It is designed to be a small board, so it can be interfaced independently or interfaced with PROJECT BOARD for connecting circuits as required.



• **EXAMPLE OF CONNECTING WITH ET-ARM7 START KIT V1 EXP**

- ARM7 NO. LPC2119 16/32 BIT MCU 64 PIN LQFP
- 128 KBYTE FLASH MEMORY, 16 KBYTE INTERNAL RAM
- X'TAL 19.6608 MHz WITH MAXIMUM HIGH SPEED 58.9824 MHz (PLL CONFIG)
- IN-SYSTEM PROGRAMMING (ISP) THROUGH ON-CHIP-BOOT-LOADER SOFTWARE OF PORT UART 0 THAT CONNECTED WITH PORT RS232 OF COMPUTER PC
- 46 I/O PIN BE ABLE CONNECT WITH 5V I/O ( TO LERANT I/O 5V except A TO D that is not higher than 3.3V)
- 2 CHANNEL UART 0 4 PIN ETT MAX232 ON BOARD, TTL UART 1
- 4 CHANNEL 10 BIT A/D CONVERTER, PWM 6 OUTPUT, WATCHDOG TIMER
- 3.3V POWER SUPPLY, 1.8V POWER SUPPLY ON BOARD
- ET-ARM STAMP LPC2119 IS ON PIN HEADER 25 PIN FOR EACH SIDE TOTAL 50 PIN, 2.54 mm. SPACE, BE ABLE TO PUT ON ET-ARM 7 START KIT V1, V1 EXP OR CONNECT WITH PROJECT BOARD
- PCB SIZE 40 X 65 mm

• **ET-ARM STAMP LPC2119 INCLUDES;**

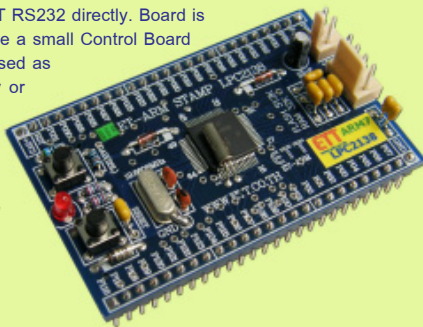
1. ET-ARM STAMP LPC2119 BOARD
2. ET-RS232 DB 9 PIN CABLE
3. CD-ROM



### ET-ARM STAMP LPC2138

(P-ET-A-00274)

ET-ARM STAMP LPC2138 which is one Board AVR family from ETT is CPU 16/32 Bit of PHILIPS No. LPC2138. We can download program into internal Flash memory through PORT RS232 directly. Board is designed to be a small Control Board and can be used as independently or can be interfaced on PROJECT BOARD for demonstrative circuits.



- ARM No. LPC2138 16/38 BIT MCU 64 PIN LQFP TYPE
- INTERNAL FLASH MEMORY 512KBYTE, INTERNAL RAM 32KBYTE
- X'TAL 19.6608 MHz AND MCU CAN COLLECT DATA MAXIMUM 58.9824 MHz
- SUPPORT IN-SYSTEM PROGRAMMING (ISP) THROUGH ON-CHIP-BOOT-LOADER SOFTWARE UART 0 BY INTERFACING WITH PORT RS232 OF COMPUTER PC DIRECTLY
- 47 I/O CAN BE INTERFACED WITH I/O SYSTEM FOR SIGNAL LEVEL 5V (except A TO D that is not higher than 3.3V)
- POWER SUPPLY 3.3 VDC
- UART FULL-DUPLEX 2 CHANNELS: UART 0 STANDARD 4 PIN ETT FOR RS232 LEVEL AND UART 1 FOR TTL LEVEL
- SPI 2 CHANNEL, I2C 2 CHANNEL
- A TO D 10 BIT 8 CHANNEL, D TO A 10 BIT 1 CHANNEL
- TIMER 32 BIT 2 CHANNEL, PWM 6 CHANNEL, WATCHDOG TIMER, REAL TIME CLOCK
- INTERNAL CPU WITH X'TAL 32.768 MHz AND CONNECTOR BATTERY
- BOARD ET-ARM STAMP LPC2138 IS PLACED ON PIN HEADER FOR 25 PINS PER SIDE (TOTAL 50 PIN) WITH 2.54 MM. DISTANCES. IT CAN BE PLACED ON DEMONSTRATIVE BOARD ET-ARM7 START KIT V1, V1 EXP OR CAN BE INTERFACED WITH PROJECT BOARD
- PCB SIZE 40 x 65 MM.

• **ET-ARM STAMP LPC 2138 INCLUDES...**

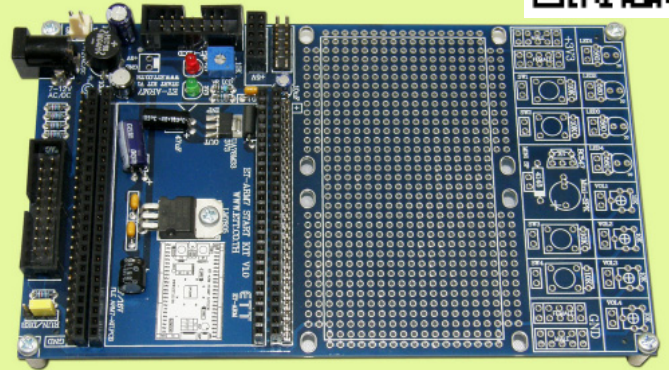
1. BOARD ARM STAMP LPC 2138
2. CABLE DOWNLOAD ET-RS232 9 PIN
3. CD-ROM



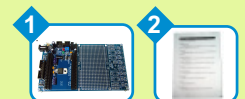
### ET-ARM7 START KIT V1

(P-ET-A-00272)

ET-ARM7 START KIT V1 and ET-ARM7 START KIT V1 EXP are base board connecting with ET-ARM STAMP LPC2119/LPC2138. There's Power Supply to provide electricity to ARM STAMP with Wire Connector for KIT V1 and KIT V1 EXP is experimented to connect with ARM STAMP.



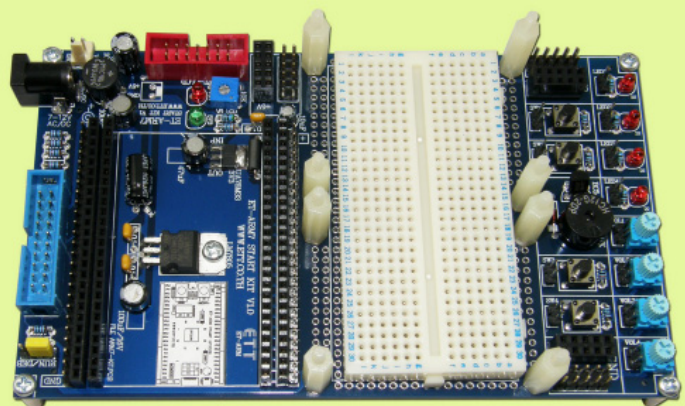
- 25 PIN X 2 FEMALE HEADER FOR CONNECT WITH ARM STAMP
  - 25 PIN X 2 FEMALE AND 25 PIN X 2 MALE HEADER FOR CONNEC FROM BOARD
  - 3.3V POWER SUPPLY AND 5VDC
  - 14 PIN CHARACTER LCD PORT
  - 7-12VDC POWER SUPPLY (BE ABLE TO USE POWER SUPPLY ETT DC ADAPTER 10VDC/850mA)
  - PCB SIZE 15.3 X 9 CM.
  - **ET-ARM7 START KIT V1 INCLUDES;**
1. ET-ARM7 START KIT V1 BOARD
  2. MANUAL



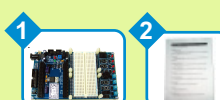
### ET-ARM7 START KIT V1 EXP

(P-ET-A-00273)

We interface Board ET-ARM7 START KIT V1 EXP with ET-ARM STAMP LPC2119 and ET-ARM STAMP LPC2138 by using Board ET-ARM7 START KIT V1 EXP to be base board. Moreover, there's circuit POWER SUPPLY 3.3V and 5VDC for supplying power into ARM STAMP and PORT for interfacing LCD CHARACTER.



- PROJECT BOARD AD-100 (SIZE 81 x 42 x 9 MM.) WITH 360 PONTs
  - 4 VR WITH INTERSECTION POINT
  - 4 TACT SW WITH INTERSECTION POINT
  - 4 LED DOT WITH INTERSECTION POINT
  - 1 MINI SPEAKER WITH INTERSECTION POINT
  - **ET-ARM7 START KIT V1 EXP INCLUDES...**
1. ET-ARM7 START KIT V1 EXP BOARD
  2. USER MANUAL

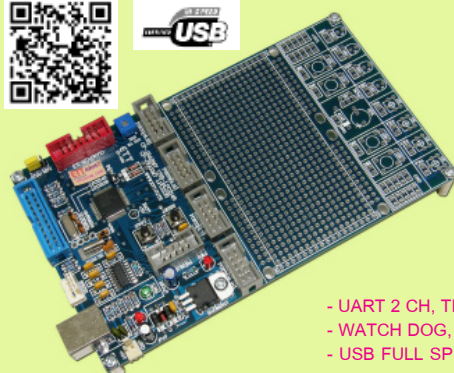




CP-JR ARM7 USB-LPC2148 and CP-JR ARM7 LPC2438 are the new release board ARM7 TDM-s CORE can be run with both 16 BIT and 32 BIT. We design board to be controller and IN-CIRCUIT DOWNLOAD Program into internal Memory directly through PORT RS232. Both 2 versions use the same PCB set but it only is different MCU and circuit USB for version LPC2148.

**CP-JR ARM7 USB-LPC2148**

(P-CP-A-00080)



**Specifications of Version**

**LPC2148**

- MCU ARM7 No.LPC2148 from PHILIPPS
- X' TAL 12.00MHz with maximum high speed 60MHz
- 512KB Flash Memory, 40KB RAM
- PORT 47 I/O PIN to interface with 5V Power Supply
- A TO D 10 BIT 14 CH (except A TO D that is not higher than 3.3V)
- D TO A 10 BIT 1 CH
- UART 2 CH, TIMER 32 BIT 4 CH
- WATCH DOG, REAL TIME CLOCK
- USB FULL SPEED 2.0

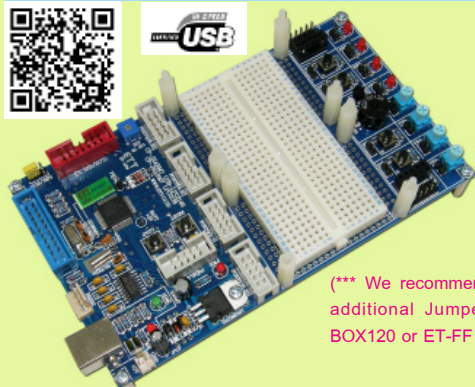
- 14 PIN LCD CHARACTER TYPE
- 20 PIN BUS JTAG ARM
- POWER SUPPLY 5VDC can be used with both 2 versions (can apply ET-SWITCHING 5V 1.2A TYPE H)
- PCB 15.3 x 9 CM. and PCB size 8.5 x 5.3 CM.
- CP-JR ARM7 USB-LPC2148 consist of

1. CP-JR ARM7 USB-LPC2148 Board
2. CD-ROM
3. ET-CABLE RS232 DB 9 PIN
4. USB CABLE



**CP-JR ARM7 USB-LPC2148 EXP**

(P-CP-A-00081)



It has the same specifications as version LPC2148. For version EXE has additional circuit, Project Board and Example Program to test and study. Moreover, user can purchase additional components to test with ET-MINI I/O.

(\*\*\* We recommend user should purchase additional Jumper Wire version ET-FF BOX120 or ET-FF WR12/22.)

- PROJECT BOARD version AD-100
- 4 TACT SW
- 1 MINI SPEAKER
- CP-JR ARM7 USB-LPC2148 EXP consist of

1. CP-JR ARM7 USB-LPC2148 EXP Board
2. CD-ROM
3. ET-CABLE RS232 DB 9 PIN
4. USB CABLE



**CP-JR ARM7 LPC2138**

(P-CP-A-00078)



**Specifications of Version**

**LPC2138**

- MCU ARM7 No.LPC2138 from PHILIPPS
- X'tal 19.6608MHz with maximum high speed 58.982MHz
- 512KB FLASH Memory, 32KB RAM
- PORT 47 I/O PIN to interface with 5V Power Supply
- A TO D 10 BIT 8 CH (except A TO D that is not higher than 3.3V)
- D TO A 10 BIT 1 CH
- UART 2 CH, TIMER 32 BIT 4 CH
- WATCH DOG, REAL TIME CLOCK

- 14 PIN LCD CHARACTER TYPE
- 20 PIN BUS JTAG ARM

- A TO D 10 BIT 8 CH (except A TO D that is not higher than 3.3V)
- D TO A 10 BIT 1 CH
- UART 2 CH, TIMER 32 BIT 4 CH
- WATCH DOG, REAL TIME CLOCK

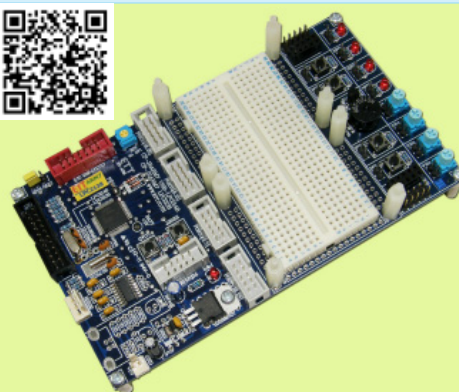
- POWER SUPPLY 5VDC can be used with both 2 versions (can apply ET-SWITCHING 5V 1.2A TYPE H)
- PCB 15.3 x 9 CM. and PCB size 8.5 x 5.3 CM.
- CP-JR ARM7 USB-LPC2138 consist of

1. CP-JR ARM7 USB-LPC2138 Board
2. CD-ROM
3. ET-CABLE RS232 DB 9 PIN



**CP-JR ARM7 LPC2138 EXP**

(P-CP-A-00079)



It has the same specifications as version LPC2148. For version EXE has additional circuit, Project Board and Example Program to test and study. Moreover, user can purchase additional components to test with ET-MINI I/O

- PROJECT BOARD version AD-100
- 4 TACT SW
- 1 MINI SPEAKER
- CP-JR ARM7 USB-LPC2138 EXP consist of

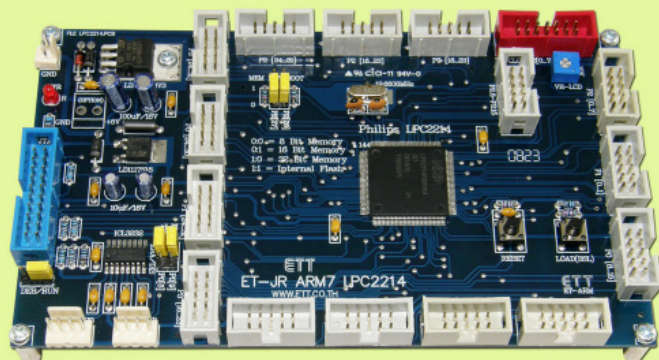
1. CP-JR ARM7 USB-LPC2138 EXP Board
2. CD-ROM
3. ET-CABLE RS232 DB 9 PIN



**ET-JR ARM7 LPC2214**

(P-ET-A-00300)

ET-JR ARM LPC2214 ... is Board Microcontroller ARM7 TD M-S CORE that uses No.LPC2214 144 PIN LQFP TYPE from PHILIPS. There is special and interesting specifications such as PORT I/O maximum 112 I/O Pin and can DOWNLOAD Program into internal FLASH Memory directly through PORT RS232.



- MCU No.LPC2214 114 PIN LQFP
- X'TAL 19.6608MHz and can collect data maximum 58.9824MHz
- Support IN-SYSTEM PROGRAMMING through PORT RS232
- 256KB Internal FLASH Memory, 16KB RAM
- 112 I/O PIN can be interfaced with Signal DIGITAL I/O 5V level.

There are many FUNCTIONS as follows;

- SPI 2 CH
- A TO D 10 BIT 8 CH (0-3.3V)
- TIMER 32 BIT 2 CH
- REAL TIME CLOCK
- I2C 1 CH
- UART 2 CH 4 PIN ET
- WATCH DOG
- PWM 6 OUTPUT

- 15 of 10 PIN ET to be I/O
- 14 PIN LCD CHARACTER TYPE
- PORT JTAG 20 PIN for REAL TIME DEBUGGER
- POWER SUPPLY can be used with Board 5V (can apply version ET-SWITCHING 5V 2A TYPE H OPTION)
- PCB size 15.3 x 9 cm.
- ET-JR ARM7 LPC2214 consists of

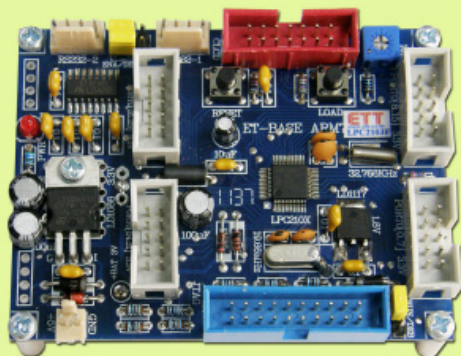
1. ET-JR ARM7 LPC2214 Board
2. CD-ROM
3. ET-CABLE RS232 DB 9 PIN.





**ET-BASE ARM2103**

(P-ET-A-00287)



... It is a new a Board Microcontroller ARM7 family that can run both 16 BIT and 32 Bit. It is higher speed than Microcontroller Ver. 8 Bit and can be directly Incircuit Download program from computer PC into FLASH Memory through PORT RS232. Additionally, Board is designed to be a small standard size as Board "ET-BASE";

we can use this board independently or use it with Board "ET-BASIC I/O V1".

- MCU ARM7 TDMI-S No.LPC2103 from PHILIPS 48 PIN LQFP TYPE
- 32 KBYTE FLASH MEMORY and 8 KBYTE RAM
- X'TAL 19.6608 MHz with maximum high speed 58.9824 MHz
- IN-SYSTEM PROGRAMMING (ISP)through ON-CHIP BOOT LOADER SOFTWARE through PORT RS232 ON BOARD
- PORT JTAG 20PIN for REAL TIME DEBUGGER
- 32 IO PIN can be interfaced with I/O 5V, CONNECTOR I/O 10 PIN ET and there's functions as following; (except A TO D that is not higher than 3.3V)
  - SPI 2 CHANNEL, I2C 2 CHANNEL
  - A TO D 10 BIT 8 CHANNEL, UART 2 CHANNEL to be RS232-1, RS232-2 as 4 PIN ET TYPE
  - TIMER 32 BIT, TIMER 16 BIT, WATCHDOG, PWM OUTPUT
- 14 PIN LCD PORT as CHARACTER TYPE
- RTC internal MCU and X'TAL 32.768 KHz with BATTERY HOLDER BOX 3V
- POWER SUPPLY for using with board (can be using version ET-SWITCHING ADAPTER 5V 1.2V TYPE H OPTION)
- PCB size 6.2 x 8.1 cm.

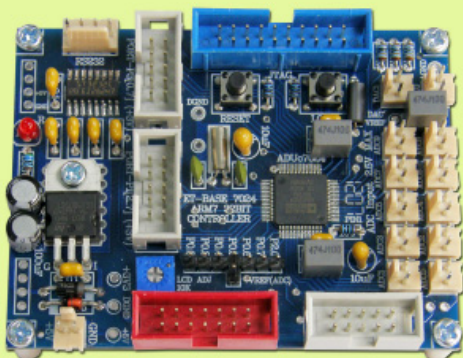
ET-BASE ARM 2103 consists of...

1. ET-BASE ARM 2103
2. CABLE DOWNLOAD ET-RS232 DB 9 PIN
3. CD-ROM



**ET-BASE ARM7024**

(P-ET-A-00294)



It is a Board Microcontroller ARM7 family No. ADUC7024 from ANALOG DEVICE that is a permanent MCU on board. There's A TO D 12 BIT 10 CHANNEL and D TO A 12 BIT 2 CHANNEL. Board is designed as a small standard size as Board "ET-BASE"; we can use this Board independently or used with Board "ET-BASIC I/O V1".

- MCU No.ADUC7024 64 PIN LQFP TYPE with 62 KBYTE FLASH MEMORY, 8 KBYTE RAM
- A TO D 12 BIT 10 CHANNEL (0-2.5V)      • D TO A 12 BIT 2 CHANNEL (0-2.5V)
- I/O PIN can be interfaced with I/O 5V
- RUN X'TAL 32.768KHz and it can be set to run with PHASE LOCK LOOP 41.78MHz
- 3 PORT I/O 10 PIN ET      • RS232 PORT 1 CHANNEL
- CONNECTOR ARM-JTAG 20 PIN
- 14 PIN LCD PORT as CHARACTER TYPE
- TIMER/COUNTER, SPI, 16 BIT PWM, WATCHDOG
- POWER SUPPLY 5VDC (can be used with ET-SWITCHING ADAPTER 5V 2A TYPE H OPTION)
- PCB size 6.2 x 8.1 cm.
- Can be DOWNLOAD program from computer PC into internal FLASH memory through RS232 PORT and can be used with Program ARMWSD for running on WINDOWS 98/ME/XP/2000

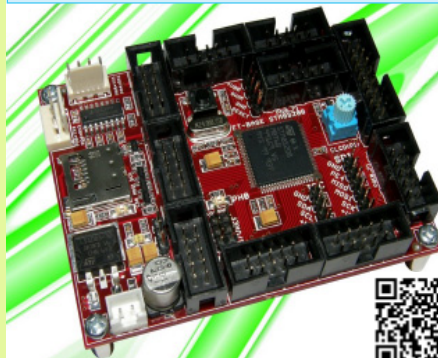
ET-BASE ARM7024 consists of...

1. ET-BASE ARM7024
2. CD-ROM
3. CABLE DOWNLOAD ET-RS232 9 PIN



**ET-BASE STM8S208**

(P-ET-A-00421)



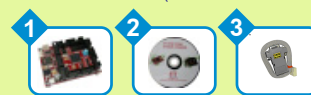
This is new 8BIT Board Microcontroller from ST Company that includes basic devices completely. It is able to write program into MCU through RS232 PORT and through Connector SWIM DOWNLOAD by STM8S-DISCOVERY with C Language Program to develop. If user registers, user got 32Kbyte free for using and writing program.

Specifications of Board ET-BASE STM8208

- Use 80PIN LQFP STM8 MCU No.STM8S208MBT6B from ST Company
- 128KBYTE FLASH Memory; re-program 10,000 times
- 6KBYTE RAM, 2KBYTE EEPROM; re-written 300,000 times
- Use X'TAL RUN Frequency 24.00MHz with high speed at 20 MIPS, 3-STAGE PIPELINE
- A TO D 10 BIT 16-CHANNEL, CAN 1-CHANNEL, SPI 1-CHANNEL, UART 2-CHANNEL, I2C 1-CHANNEL, WATCHDOG, run at 2.95V-5.5V, I/O PORT 68 BIT
- Program data into MCU through PORT RS232 and through Connector SWIM DOWNLOAD by STM8S-DISCOVERY/ST-LINK
- PORT RS232 4PIN ETT 2-CHANNEL
- 16PIN LCD PORT as CHARACTER TYPE (it is standard 14PIN LCD and another 2PIN is Connector LED BACKLIGHT) SLOT CARD for SD CARD(MICRO SD) with Circuit LOGIC LEVEL 3.3V Has 68BIT I/O, there are 8 of Connector 10PIN HEADER ETT
- Use C Language to develop program by using Program ST VISUAL DEVELOP to be EDITOR and Program COSMIC CXSTM8 to be COMPILER. User got 16KBYTE free for using; if registered through website, user got 32KBTYTE free.
- PCB Size is 8.23 X 6.2 CM.
- Has JUMPER to select the Voltage Level between 5V and 3V3 (use ADAPTER 5V)

ET-BASE STM8S208 consists of...

1. Board
2. CD-ROM User's Manual and Program
3. Cable ET-RS232 DB9



**ET-STM8S STAMP**

(P-ET-A-00422)



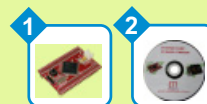
Structure of STM8 Board is designed to be mini board that is easy to modify or connect with other Board I/O.

Specifications of Board ET-STM8S STAMP

- Use 80PIN LQFP STM8MCUNo.STM8S208MBT6B
- Use X'TAL RUN Frequency 24.00MHz      • PCB Size is 5.20 x 3.56 cm.
- Program data into MCU through Connector SWIM by using STM8S-DISCOVERY/ST-LINK
- Has 68 BIT I/O
- Use Connector PIN HEADER with 2.54mm. pitch; there are 80PIN in total that are divided into 2 rows (20 X 2)
- Use 2PIN POWER SUPPLY 5V or 3.3V (can use POWER SUPPLY from ETT version "ET-SWITCHING ADAPTER 5V 1.2A TYPE B")

ET-STM8 STAMP consists of ...

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



**STM8S DISCOVERY**

(C-YA-A-00120)



This 8BIT STM8S-DISCOVERY is the new and economy kit to develop MICROCONTROLLER in the STM8 family from ST Company. It consists of 2 main parts as follows;

1. Training board: It consists of circuits...
  - MCU No.STM8S105C6T6, 32KB FLASH PROGRAM, 2KB RAM, 1KB EEPROM
  - Circuit for testing operation is designed to be SW TOUCH SENSING BUTTON
  - Connector PORT I/O 10PIN
2. ST-LINK
  - Use MCU No.STM32F103C8T6 to connect with computer PC through USB PORT (Connector USB MINI)
  - Can IN-CIRCUIT DEBUGGING and PROGRAM with STM8 MCU
  - Can break or divide this board into 2 parts to use with other STM8 Boards

( \*\*\* This economy STM8S-DISCOVERY Kit is imported from foreign country; so, ETT has no warranty for this product.)



**STM8L DISCOVERY (C-YA-A-00181)**

STM8L-DISCOVERY is Development Kit for 8BIT STM8L MCU that is ULTRALOWER POWER from ST Company, it is inexpensive. It divides into 2 main groups according to use and study.



- Part of Training Board or use includes
  - MCU No.STM8L152C6T6, 32KB FLASH, 2KB RAM, 1KB EEPROM, 48PIN LQFP
  - LCD Display 28PIN DIP (24 SEGMENTS, 4 COMMANDS)
  - 6-Digit Display, 2 LEDs, 1 SW for testing
- Part of ST LINK
  - Use MCU No.STM32F103 to connect with computer PC through USB PORT (connector of board is as USB MINI)
  - Can do IN-CIRCUIT DEBUGGING directly and can interface SWIM with MCU from external board

(\*\*\* This STM8L DISCOVERY is imported, there is no any warranty for this product \*\*\*)

**STM32F4 DISCOVERY (C-YA-A-00162)**

This is inexpensive 32 BIT Microcontroller from ST Company; it is the new series of STM32 ARM CORTEX-M4F. This board consists of 2 main parts as listed below;



- ST-LINK/V2 is used to download and debug into MCU STM32F407VGT6 on board through PORT USB.
  - The part of ST-LINK/V2, it uses MCU No.STM32F103 to connect the operation between computer PC through USB PORT (CABLE USB TYPE A TO B MINI-B is OPTION, it is not included in the package).
  - IN-CIRCUIT DEBUG and PROGRAM with MCU STM32F4 on board.
  - Connector 6 PIN SWD is externally interfaced for DEBUG and PROGRAM with external board.

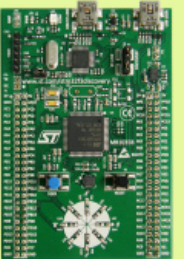
**2. STM32F4**

- Use MCU No.STM32F407VGT6, 32 BIT ARM CORTEX-M4F 1MB FLASH, 192KB RAM, LQFP100 TYPE
- Use +5V Power Supply from USB Connector or from External 5V Power Supply
- Has 3-AXIS ACCELEROMETER No.LIS302DL on board
- Has DIGITAL MICROPHONE No.MP45DT02 on board
- Has USB OTG FS with Connector MICRO-AB
- Body of Board is made as 2 of Connector PIN HEADER underneath PCB 25x2

(\*\* This STM32F4 DISCOVERY set is imported product, so there is no any warranty for this mode\*\*)

**STM32F3 DISCOVERY (C-YA-A-00177)**

This STM32F3 DISCOVERY is Development Kit in the family of STM32 from ST Company that uses MCU STM32F3 ARM CORTEX M4. There is the part of DOWNLOAD with DEBUG on board and the part of MCU with full of components such as INPUT, OUTPUT, etc.



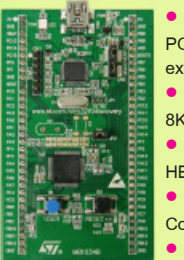
- Part of ST-LINK/V2 is used to DOWNLOAD data and DEBUG on board, and Connector SWD for using and connecting outside board
- Use MCU No.STM32F303VCT6 with 256 KB FLASH, 48 KB RAM, 100 PIN LQFP
- Use Power from USB Connector or from external DC 3V or 5V
- Has 3-AXIS DIGITAL GYROSCOPE No.L3GD20 from ST Company on board
- Has ACCELERATION SENSOR and MAGNETIC SENSOR No.LSM303DLHC from ST Company on board

- Has 8-LED to display operating status of GYROSCOPE and ACCELERATION in the format of electronic compass
- Has 1-Port USB MINI Connector for interfacing with computer (OPTION: it is not included in the kit and user needs to additionally purchase if customer has not CABLE USB TO 5P MINI (A-CB-A-00044) and it uses Connector from MCU as USB MINI 1 PORT.
- Board is made as PIN HEADER, it can be connected with 2 of PCB 25x2 PIN

(\*\*\* This STM32F3 DISCOVERY is imported, there is no any warranty for this product \*\*\*)

**STM32F0 DISCOVERY (C-YA-A-00176)**

This development kit is 32 BIT Microcontroller in the series of STM32 ARM CORTEX-M0 from ST Company. There is the part of DOWNLOAD and DEBUG on board with STM32M0.



- The part of ST-LINK/V2, it is used to download data from USB PORT of computer; and, it uses Connector SWD for internal and external board.
- Use MCU No.STM32F051R8T6, 64 KB FLASH, 8KB RAM, LQFP 64 PIN
- Body of Board is made as Connector PIN HEADER underneath PCB 33x2
- Use Power Supply from USB PORT, Connector USB is in the format of USB MINI.
- Provide PCB in set



(\*\*\* This STM32F0 DISCOVERY is imported product, so there is no any warranty for this model\*\*\*)

**STM32L DISCOVERY (C-YA-A-00182)**

STM32L DISCOVERY is Development Kit for 32BIT MCU that is ARM CORTEX-M3 ULTRA-LOW-POWER from ST Company, it is inexpensive. It divides into 2 main groups;



- Part of Training Board or use includes
  - MCU No.STM32L152RBT6, 128 KB FLASH MEMORY, 16KB RAM, 4 KB EEPROM, RUN 32 MHz, IC TYPE 64-LQFP
  - LCD 28PIN DIP (24 SEGMENT, 4 COMMANDS) 6-Digit Display
  - 4 LED, LD1 for using with USB, LD3 POWER 3.3, LD3 and LD4 are connected from PORT
  - Has LINEAR TOUCH SENSOR or 4 TOUCH SW to test PIN HEADER 28x2 is connected from MCU for interfacing with external board
- Part of ST-LINK
  - Use MCU No.STM32F103, interface with computer PC through USB PORT (connector is as USB MINI)
  - Can do IN-CIRCUIT DEBUGGER with MCU on board directly, without using other Development Kit. Moreover, it can connect SWIM to use with MCU from external board.

(\*\*\* This STM32L DISCOVERY is imported, there is no any warranty for this product \*\*\*)

**STM32 VALUE LINE DISCOVERY (C-YA-A-00127)**

This is economical device to learn and develop STM32. STM32 VALUE LINE DISCOVERY is 32BIT STM32 ARM Cortex-M3 from ST to develop Microcontroller. It consists of 2 main devices in the package. Firstly, it is ST-LINK that is used to DOWNLOAD and DEBUG; secondly, it is Board MICRO STM32F100RBT6B.



- ST-LINK: It uses MCU No.STM32F103 to connect with computer PC through PORT USB (Connector USB MINI and Cable USB are not provided in the package).

- Do IC-CIRCUIT DEBUG and PROGRAM into MCU STM32 on board

- Has Connector 4PIN SWD that is externally connected to DEBUG and PROGRAM with external MCU

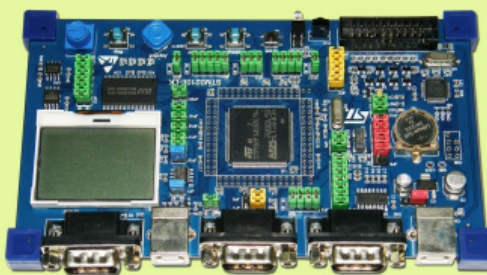
**2.Training Board**

- Use MCU No.STM32F100RBT6B that is ARM Cortex-M3, 64PIN LQFP, 128KB FLASH, 8KB RAM, 51 I/O, RUN 24MHz.

- Board is designed as Connector PIN HEADER under PCB 28 X 2PIN and 6PIN, so it can be actually used to connect or test the operation.

\*\* (STM32 VALUE LINE DISCOVERY is imported from abroad with limited amount, and no warranty).

**STM3210E-LK (C-YA-A-00139)**



STM3210E-LK is a learning kit to study the operation of 32BIT STM3210E-LK from ST Company, especially in the family of STM32 ARM CORTEX-M3. This board consists of 2 parts as follows;



- ST-LINK JTAG: It uses MCU No.STM32F103 to link the device to computer PC through USB PORT. Can operate as EMULATION, DEBUGGING and FLASH PROGRAMMING with Training Board that is connected on board. Has Connector 20PIN JTAG as ST-LINK to interface with external MCU STM32F10X

- Training Board: There are many devices on board that are useful to learn and study. Use MCU No.STM32F103ZET6, 512 KBYTE FLASH, 144-LQFP Circuits on board for testing the operation

- 128 KB FSMC SRAM
- 512 KB FSMC NOR FLASH
- 128 MB FSMC NAND FLASH
- 8 MB SPI FLASH
- RS232
- CAN
- USB
- SD CARD SOCKET
- 4 LED
- 128 X 64 DOT GRAPHIC LCD
- 1 VR TEST A/D
- 5-DIRECTION JOYSTICK
- IR LED TRANSMITTER & RECEIVER

- Use Connector USB as Power Supply of board

- STM3210E-LK consists of... 1. Board STM3210E 2. 3 of CD-ROMs; IAR KICKSTART, KEIL RELEASE 1.2009 and STM32

3. Cable USB A-B TYPE, Cable RS232

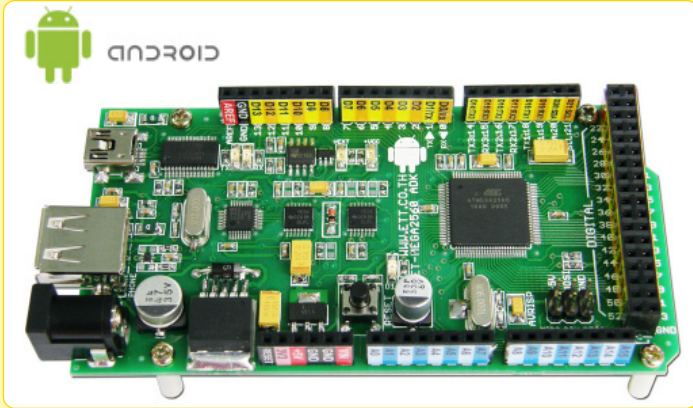


Arduino is Italian Language that calls the project's name to develop AVR Microcontroller in the format of OPEN SOURCE. Its characteristic feature is simple to learn and apply because there are simple commands that support the application and can be applied efficiently. Moreover, skilled user is able to build new commands and Library by self to support Windows, Linux and Macintosh OSX.

**ET-MEGA2560 ADK (P-ET-A-00449)**



ET-MEGA2560 ADK is new board in the family of Arduino, it increases capability of communicating and commanding Board Arduino through Android OS devices such as cell phone or Tablet.



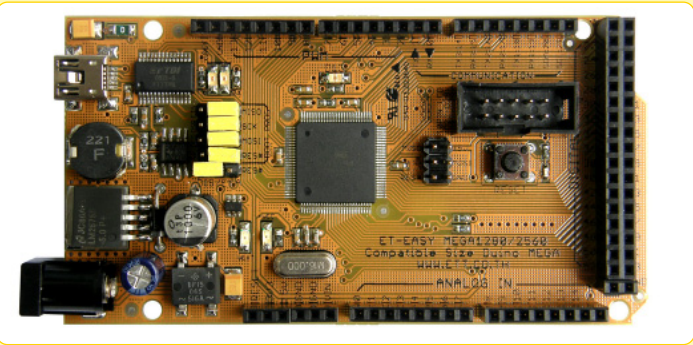
... Nowadays, ETT has developed and used AVR MCU No. ATMEGA2560 and MAX3421 to be Board Arduino that has USB HOST; it supports the connection with USB DEVICE and Android OS devices. It designs and chooses PIN I/O, including board size according to the standard of Board Arduino MEGA.

**Specifications of Board ET-MEGA2560 ADK**

- Use ATMEGA2560 to be MCU on board, RUN by 16MHZ Frequency, 100PIN TQFP
- Has 256 KBYTE FLASH to write program (8 KBYTE for BOOTLOADER)/ 8 KBYTE SRAM/ 4 KBYTE EEPROM
- 100% Support in developing program by C++ Language of Arduino according to the format of Arduino MEGA; support in running on computer PC; WINDOWS, LINUX, and MACINTOSH OSX
- Connector USB MINI use USB BRIDGE No.FT232RL from FTDI to communicate and download the written CODE into board, without purchasing any DOWNLOAD device anymore; and add Connector 6PIN to directly adjust PROGRAM for MCU, without using Program BOOTLOADER of Arduino
- ON BOARD USB HOST (using MAX3421) for interfacing with USB DEVICE or Android devices
  - Support in developing by ADK (Android Open Accessories Development Kit) when using with Android V2.3.4 or higher
  - Support in developing by ADB (Android Debug Bridge) of Microbridge when using with Android V1.5 or higher
- 54PIN DIGITAL I/O (5V TTL LOGIC) and there are...
  - 14PIN can be programmed to be function PWM
  - 16PIN ANALOG INPUT (10BIT 16-CH A/D)
  - 4 PORT UART (HARDWARE SERIAL PORT) as 5V TTL LOGIC
  - 1 HARDWARE TWI (I2C)
  - 1 HARDWARE SPI (UP TO 8 MBPS)
- PCB Board size and positions of PIN CONNECTOR accords to the standard of all Board Arduino MEGA; so, it can be used with Board SHIELD that are made by manufacturers to use with Board Arduino MEGA well
- PCB size; 5.3 x 10.2 x 2.0 cm.
- Use POWER SUPPLY 7-12V; it uses Connector MAIL JACK 2.5mm. to supply power into board. It is compatible with both AC and DC. It uses SWITCHING 5V REGULATE No.LM2575-5 to reduce heat and REGULATE 3.3V No.LM1117-3V3 (be compatible with DC ADAPTOR version 10VDC/850mA (OPTION) (A-AP-A-00001) )
- Can use Power Supply from PORT USB if using current for all board is not higher than 500mA. There is circuit to choose source of Power Supply automatically on board.
- ET-MAGA2560 ADK consists of ...
  1. Board ET-MEGA2560 ADK
  2. CD-ROM User's Manual and Program



**ET-EASY MEGA1280 (P-ET-A-00404)**



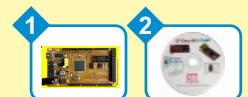
Arduino Project The AVR Board of ETT that is developed program by C++ Language of Arduino such as ET-BASE AVR EASY88/168/328, ET-EASY168 STAMP is restricted by amount of I/O and memory size; there is no enough resource to support bigger project. Nowadays, ETT develops and improves Arduino Board to support bigger projects; it improves Program to use with bigger Chip AVR and increases more I/O; DIGITAL, ANALOG, PWM, UART and larger memory size. However, the method to develop program is still the same as the mini version. ETT uses ATMEGA1280 to develop board and its operating structure is the same as Arduino Mega, it is called "ET-EASY MEGA1280 (DUINO MEGA)". It improves some restrictions better than the standard version of Arduino Mega; so, it is cheap and makes user more convenient to do any project as required.



**Features of Board ET-EASY MEGA1280(DUINO MEGA)**

- Use ATMEGA1280 to be MCU on board, run with 16MHZ, 100PIN TQFP
- 128KBYTE FLASH (4KBYTE is reserved for BOOTLOADER), 8KBYTE SRAM/ 4KBYTE EEPROM, and MCU has already been installed BOOTLOADER of Arduino Mega
- 100% Support program development by C++ Language of Arduino in the format of Arduino Mega
- Connector USB MINI uses USB BRIDGE No.FT232RL of FTDI with OVER CURRENT PROTECTION for communication and download the written code from computer PC into board, JUMPER to adjust operation of board to PROGRAM BOOTLOADER into MCU from PORT USB on board without using any external AVR ISP Programmer.
- 54 PIN DIGITAL I/O (5V TTL LOGIC), there are 14 PIN to program function as PWM.
- 16 PIN ANALOG INPUT(as A TO D 10 BIT 16 CHANNEL)
- 4 PORT UART 5V TTL LOGIC (as HARDWARE SERIAL PORT)
- Connector 10 PIN (HEADER IDE) 8 BIT, DIGITAL I/O (D22-D29) to connect with Character LCD from ETT such as ET-CONV 10 TO LCD, ET-CONV SPI TO LCD and I/O BOARDS from ETT
- Size of PCB Board and positions of PIN CONNECTOR are according to the standard of Board Arduino Mega.
- Board size: 5.3 x 10.2 x 2 cm.
- POWER SUPPLY 7-12V is compatible with both AC and DC by using SWITCHING LM2575-5 REGULATE to reduce heat when using very high current. It is able to use Power Supply from PORT USB if it uses current not higher than 500 mA. There is circuit to choose Power Supply automatically and it will remove Power Supply from USB automatically if interfacing with external Power Supply into board.
- ET-EASY MEGA1280(DUINO MEGA) consists of..

1. BOARD ET-EASY MEGA1280(DUINO MEGA)
2. CD-ROM Program and Manual



**OPTION**



- **CABLE USB TO 5P MINI** (A-CB-A-00044)  
(It is used to download program.)

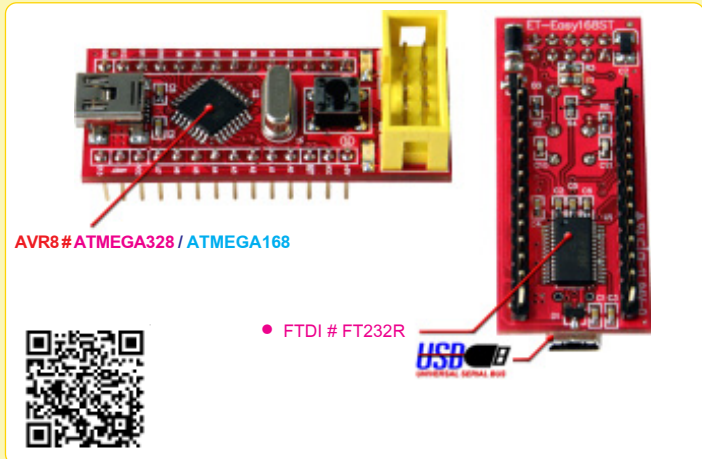


- **DC ADAPTER 10VDC/850mA** (A-AP-A-00001)  
(It is used to download program.)



**ET-EASY328 STAMP (P-ET-A-00493)**

**ET-EASY168 STAMP (P-ET-A-00381)**



AVR8 #ATMEGA328 / ATMEGA168

• FTDI # FT232R

• ET-EASY168 STAMP is mini AVR Microcontroller Board that uses ATMEGA168 to be MCU on board; moreover, internal board consists of IC USB BRIDGE No.FT232R from FTDI. It is able to connect with computer PC through PORT USB directly, so it makes this Board ET-EASY168 STAMP to be mini board but perfect and full of basic resources. In this case, user only interfaces USB Cable from computer PC with Connector USB of Board ET-EASY168 STAMP, it makes user can write program and download Code into board to test operation instantly.

**There are 2 methods to develop program of Board ET-EASY168 STAMP as follows;**

**1. ARDUINO PROJECT** is the format of developing program by program and instruction set of C Language (C++) of ARDUINO PROJECT. It develops AVR Microcontroller in the format of OPEN SOURCE; user can use it free without any charge, see more information from <http://www.arduino.cc>. For MCU of ET-EASY168 STAMP Kit has already been installed Program BOOTLOADER, so user is able to directly download it through PORT USB.

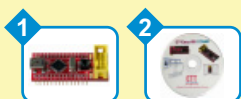
**2. AVR MICROCONTROLLER** is the format of developing program according to ordinary AVR, user can choose any language program that is compatible with the application of AVR NO.ATMEGA168 such as BASIC Language, BASCOM-AVE, C Language CODE VISION, or WIN AVR. It downloads data through BOOTLOADER or through Connector IDE 10PIN AVR ISP; in this case, user needs to have additional DOWNLOAD Kit such as ET-AVR PROG MINI, or ET-AVR ISP USB V1.

**Specifications of Board ET-EASY168 STAMP:**

- Use AVR MCU No.ATMEGA168 from ATMEL and run at Frequency 16.00 MHz.
- Has 16 KBYTE FLASH, 1 KBYTE SRAM, 512 BYTE EEPROM.
- Has 22 BIT GPIO that is divided into 14 BIT for DIGITAL and 8BIT for 10BIT A TO D.
- Has 5VDC POWER SUPPLY that is able to use 5VDC from both PORT USB and external 5VDC POWER SUPPLY; moreover, there is LED POWER to display its status.
- Has EXTERNAL RESET Circuit in the format of RC RESET and SW SWITCH.
- Connector is place on PIN HEADER in the distance range of 2.54mm. and 28PIN in the distance range of 600MIL that is easy to apply and interface with Project Board.
- Board size is 2x5cm. that is as equal as IC 28PIN.
- Has Connector USB MINI and IC USB BRIDGE No.FT232R of FTDI on board.
- Connector IDE 10PIN AVR ISP is able to download data into MCU on board if not download through PORT USB.

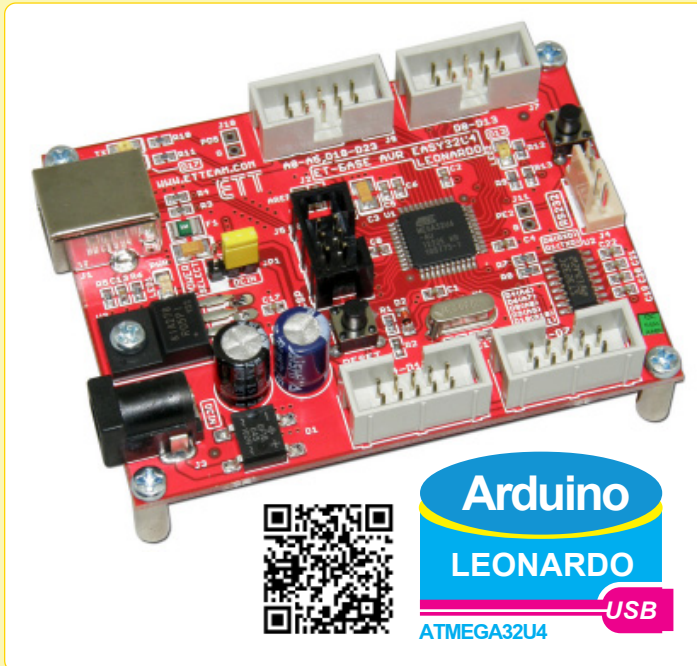
• **ET-EASY168 STAMP** Kit includes;

1. Board ET-EASY168 STAMP
2. CD-ROM User's Manual



**ET-BASE AVR EASY32U4**

(P-ET-A-00472)



Board ET-BASE AVR EASY32U4 or Arduino LEONARDO is AVR Board, it can develop program by C or C++ Language of Arduino that is OPEN SOURCE. This board version uses AVR MCU No.ATMEGA32U4 that has USB PORT, so it can interface with Connector USB PORT of computer directly. It writes program by C Language on computer and DOWNLOAD from computer into board, it is ready to use.

**How to develop program of Board ET-BASE AVR EASY32U4**

**1. Arduino PROJECT** is the format of developing program by C or C++ Language, it is OPEN SOURCE and user can use it free. For Board ET-BASE AVR EASY32U4, ETT has installed Program BOOTLOADER internal MCU completely; so, user can write program and DOWNLOAD into the board through PORT USB directly.

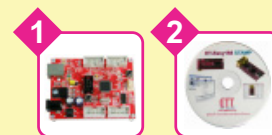
**2. AVR MICROCONTROLLER** is a format of developing program according to the normal AVR; so, user can choose any language that supports the operation with AVR No.ATMEGA32U4 such as ASM, BASIC, C to write and develop program. In this case, it has to use with external Programmer such as ET-AVR ISP mkII, ET-AVR PROG MINI through Connector ICSP (6PIN) on board.

**Specifications of Board ET-BASE AVR EASY32U4**

- Use ET-MEGA32U4 44 PIN TQFP to be MCU on board; RUN by Frequency 16 MHz
- Has 32 KBYTE FLASH (reserve 4 KBYTE for BOOTLOADER), 2.5 KBYTE RAM, 1 KBYTE EEPROM
- Has USB CONTROLLER insides that is USB 2.0 FULL SPEED/ LOW SPEED
- Has 24 PIN DIGITAL I/O (D0-D23) in total, it can use this DIGITAL I/O to be ANALOG INPUT (ADC 10 BIT) 12-CH, PWM 7-CH, SPI1-CH, I<sup>2</sup>C 1-CH, USART 1-CH
- Has 4 of Connector 10 PIN ET
- Use IC REGULATOR No.KIA278R05 to be LOW DROPOUT to provide power into MCU 5V
- Connector USB TYPE B (be compatible with Cable USB TYPE A/B (OPTION))
- RS232 PORT 4 PIN ET with Circuit LINE DRIVER 1-CH
- Has Connector 6 PIN ICSP for programming by External Programmer
- When developing Program Arduino, user can do instantly through PORT USB without using any external Programmer. It runs under the operating system of Windows 98/XP/2000/VISTA/7/MAC OSX/ LINUX
- Use external POWER SUPPLYAC 7-12V, it is compatible with both AC and DC (it can be used with DC ADAPTER ETT 12V 0.5A TYPE J (OPTION) (A-AP-A-00057))
- PCB size: 8.12 x 6.09cm.

• **ET-BASE AVR EASY32U4** consists of ...

1. Board ET-BASE AVR EASY32U4
2. CD-ROM User's Manual and Program



**ET-BASE AVR EASY88**

(P-ET-A-00383)

**ET-BASE AVR EASY168**

(P-ET-A-00382)

**ET-BASE AVR EASY328**

(P-ET-A-00403)



EASY88/168



EASY328

**ET-BASE AVR EASY88/168/328** is AVR Microcontroller Board No.ATMEGA88 and No.ATMEGA168 from ATMEL. Its characteristic feature is mini Microcontroller but it is full of the basic resources; for example, it runs by the maximum frequency of 20 MHz at 1 CLOCK/MACHINE CYCLE, 512 BYTE EEPROM, 1 KBYTE SRAM, SPI, UART, I2C, WATCHDOG, A TO D and etc. Moreover, Board can directly download program into Microcontroller through PORT RS232, not providing any more Board DOWNLOAD. Board structure is designed to be compatible with Board I/O from ETT directly such as Board ET-MINI I/O. For example, Board ET-MINI ENC28J60 that is able connect with LAN System.

- There are 2 methods to develop ET-BASE AVR EASY88/168 easily;
  1. Develop program by C Language (C++) of Arduino Project in the format of OPEN SOURCE; in this case, this MCU of ETT has already been installed Program BOOTLOADER into MCU; so, user can download it through RS232 PORT directly (if downloading through PORT USB, user can add ET-USB/RS232 MINI).
  2. Develop program by ordinary AVR; in this case, user can use develop program by any Language Program that supports the application of AVR such as BASIC Language, C Language or WIN AVR. It downloads data by BOOTLOADER through PORT RS232 or through Connector AVR ISP IDE 10PIN on board. It can be used with Board ET-AVR PROG MINI, ET-AVR ISP USB V1 and etc.

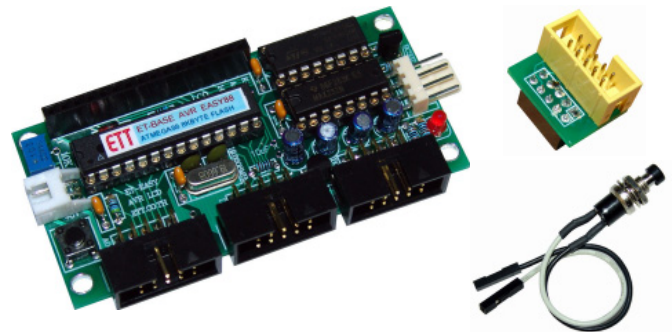
**Specifications of Board ET-BASE AVR EASY88/168/328**

- Use AVR MCU No.ATMEGA88 for Board ET-BASE AVR EASY88 and No.ATMEGA168 for Board ET-BASE AVR EASY168 and No.ATMEGA328 for Board ET-BASE AVR EASY328
- ATMEGA88 has 8 KBYTE FLASH MEMORY and ATMEGA168 has 16 KBYTE FLASH MEMORY and ATMEGA328 has 32KBYTE FLASH MEMORY.
- Has 1 KBYTE SRAM, 512 BYTE EEPROM, and run at Frequency 16.00 MHz
- Has 3 of 20BIT PORT I/O(PB 6BIT), (PC 6BIT), (PD 8BIT) that are RS232, SPI, I2C, TIMER/COUNTER, A TO D 10BIT 6-CHANNEL.
- Has 3 of Connector 10PIN ET and 1 of Connector OUTPUT 10PIN IDE ET by 74HC595.
- Has SW RESET and SW BL(PD2) to reset board to operate in BOOTLOADER through PORT RS232.
- Has RS232 PORT 4PIN ET for using and downloading program.
- Has 10PIN IDE according to the standard of AVR ISP to program value, not through PORT RS232.
- Has Base on board to directly install Test Boards such as ET-MINI I/O , so it is more inconvenient to test.
- Use 7-10VDC POWER SUPPLY, LM2940 (LOW DROP) ON BOARD
- PCB size: 8 x 6 cm.
- **ET-BASE AVR EASY88/168/328** Kit includes...
  1. Board
  2. CD-ROM User's Manual Program
  3. Cable ET-RS232 DB 9 PIN



**ET-EASY AVR LCD**

(P-ET-A-00384)



- Be able to connect with LCD TC1602A-10T LED BACKLIGHT directly (OPTION)

**ET-EASY AVR LCD** is Microcontroller Board that is designed as same as ET-BASE AVR EASY88; in this case, it is designed as mini size as same as LCD MTC-16205D. So, it is suitable for receiving data from RS232 to display or the project that has LCD Display and mini I/O.



- There are 2 methods to develop ET-EASY AVR LCD easily;
  1. It uses the C Language (C++) of Arduino Project, it can download data into MCU through PORT RS232.
  2. It uses the ordinary AVR that downloads data into MCU by BOOTLOADER through PORT RS232 .

**Specifications of Board ET-EASY AVR LCD**

- Use AVR MCU No.ATMEGA88 that has 8 KBYTE FLASH Memory, 1 KBYTE SRAM, and 512 BYTE EEPROM.
- Run at Frequency 16.00 MHz
- Has 3 PORT I/O 20BIT (PB 6BIT), (PC 6BIT), (PD 8BIT)
- Has 3 Connector 10 PIN ET
- Use Connector 16PIN Female straight row to interface with LCD Character and use 74HC595 on board to control with Circuit ON/OFF LED BACKLIGHT
- Has RS232 PORT 4 PIN for using and downloading program into board
- Be able to connect with LCD TC1602A-10T LED BACKLIGHT directly (OPTION)
- 5VDC POWER SUPPLY
- PCB Size: 80.0(W) x 36.0(H) mm.
- Board **ET-EASY AVR LCD** includes...
  1. Board ET-EASY AVR LCD
  2. CON 10PIN/ISP
  3. CD-ROM User's Manual
  4. Cable ET-RS232 DB9 PIN
  5. Cable SW PUSH BUTTON



**TC1602A-10T LED BACKLIGHT \* 190.-**  
(A-LC-C-00023)



- It is inexpensive LCD that replaces LCD version MTC-16205D that is ran out now.
- It is 16 Character with 2 Line LCD; there is white LED BACKLIGHT in the format of STN, TRANSFLECTIVE, POSITIVE, T-G
- LSolder Connector 16PIN HEADER straight line, it can interface with ET-CONV 10 TO LCD, ET-CONV SPI TO LCD directly; moreover, there is iron legged-stand to hold LCD.

- LLCD size is 80.0(W) x 36.0(H) x 13.5(D) mm.
- LLCD Display size is 64.5(W) x 13.8(H) mm.
- LCharacter size is 8 x 5 DOT, 2.95(W) x 4.35(H) mm.

- LCD TC1602A-10T interfaces with ET-CONV 10 TO LCD.

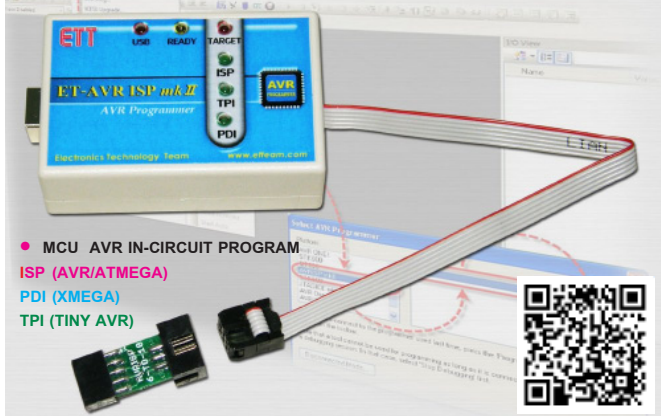




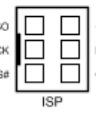


### ET-AVR ISP mkII

(P-ET-A-00429)

ET-AVR ISP mkII is the programmer for AVR Microcontroller by using PROTOCOL. Its capabilities are equivalent to AVR ISP mkII of ATMEL. It connects with computer through PORT USB and can program AVR MCU in the format of ISP, PDI, and TPI; moreover, it is compatible with AVR STUDIO of ATMEL.



• MCU AVR IN-CIRCUIT PROGRAM  
ISP (AVR/ATMEGA)  
PDI (XMEGA)  
TPI (TINY AVR)

 <p>ISP Interface(6 Pin)</p>	 <p>AVRISP 6-TO-10</p>	 <p>ISP Interface(10 Pin)</p>
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- Be compatible with Program AVR STUDIO
- Support AVR MCU programming in the format of IN-CIRCUIT PROGRAM; ISP(AVR/ATMEGA), PDI(XMEGA), TPI(TINY AVR)
- Can program both FLASH Memory and EEPROM internal MCU
- Can program both FUSE BIT and LOCK BIT of MCU
- Be compatible with TARGET BOARD that uses Power Supply in the range of 1.8V-5.5V
- Connect with computer PC through PORT USB 2.0 FULL SPEED
- Use Power Supply from PORT USB of PC

ET-AVR ISP mkII kit consists of...

1. Board ET-AVR ISP mkII
2. Cable 6PIN 2-Header Terminal
3. PCB CONVER 6 TO 10
4. Cable USB TYPE A/B
5. CD-ROM User's Manual and Program

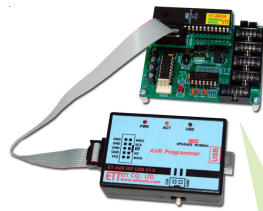
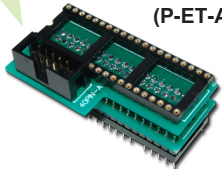


### ET - ADAPTER AVR MODULE SET

#### ET-ADAPTER AVR ISP-40A

It uses with AVR 40 PIN such as AT90S8535, M8583, M16 and M32.

(P-ET-A-00325)

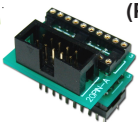


• The example of interfacing ET-ADAPTER MODULE with ET-AVR ISP USB V1.

#### ET-ADAPTER AVR ISP-20A

It uses with AVR 20 PIN such as AT90S2313 and TN2313.

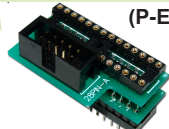
(P-ET-A-00322)



#### ET-ADAPTER AVR ISP-28A

It uses with AVR 28 PIN (NARROW PIN) such as M8, M48, M88 and M168.

(P-ET-A-00324)



#### ET-ADAPTER AVR ISP-20B

It uses with AVR 20 PIN such as TN26

(P-ET-A-00323)



#### ET-ADAPTER AVR ISP-8A

It uses with AVR 8 PIN such as TN12.

(P-ET-A-00321)



### ET-AVR ISP USB V1

(P-ET-A-00320)



AVR PROGRAMMER

ET-AVR ISP USB V1 is a board that is designed to download Program HEX FILE into AVR MCU of ATMEL. It uses ISP INTERFACE through Connector 10 PIN ET AVR ISP. It runs on computer PC through Connector USB PORT and it must be used with Program AVR STUDIO 1.XX or other software that supports AVR ISP. Its special specification is interfacing with ADAPTER and can program into MCU of AVR on board directly. Now, there are 5 types.

- Specifications of ET-AVR ISP USB V1 are equivalent to AVR ISP of ATMEL
- Can update new Firmware directly through Program AVR STUDIO 4
- Use POWER SUPPLY from 2.7V to 5.5V through USB PORT
- 10 PIN BUS ET AVR ISP can be used with ETT Board that has Connector 10 PIN ET-PSPI such as ET-AVR STAMP ATMEGA64/128, ET-BASE AVR ATMEGA64/128 and etc.

• ET-AVR ISP USB V1 consists of

1. Board ET-AVR ISP with box and cable 10 PIN
2. Cable USB TYPE A/B
3. CD-ROM.



### ET-AVR PROG MINI

(P-ET-A-00387)



ET-AVR PROG MINI is the new mini kit that is designed to download Program HEX File into AVR MCU of ATMEL in the format of ISP INTERFACE through Connector 10PIN ET AVR ISP and through Connector 6PIN ISP of ATMEL. It connects with computer PC through PORT USB to operate.

- Program data through PORT ISP and it is able to read, write, erase and protect data from reading.
- Be compatible with Target Board that uses 2.5V-5.5V Power Supply.
- Communicate through PORT USB
- Has Signal CLOCK to edit FUSE BITS if setting FUSE BITS of signal wrongly.
- Has LED to display status of USB, STATUS.
- Use Connector ISP according to the standard of ISP 10PIN and be compatible with Boards such as ET-AVR STAMP ATMEGA64/128, ET-BASE AVR, ET-EASY168 STAMP and etc.
- Kit includes Connector CONVERT to convert connector from ISP 10 PIN into ISP 6 PIN, so it is compatible with other AVR Boards
- Be compatible with Programs that support PROTOCOL AVR910 such as AvrProg, AvrOspII, AVRdude, CodeVision
- Support the application of WINDOWS 98, ME, 2000, XP, VISTA
- Kit includes high quality of Cable USB TO 5P MINI that is no problem if using with LABTOP as same as the general Cable USB in the market.

• ET-AVR PROG MINI consists of

1. Board ET-AVR PROG MINI
2. Cable 10PIN Header
3. PCB CONVER ISP-10 TO 6
4. Connector USB TO 5P MINI
5. CD-ROM User's Manual and Program



**ET-BASE XMEGA128A1**

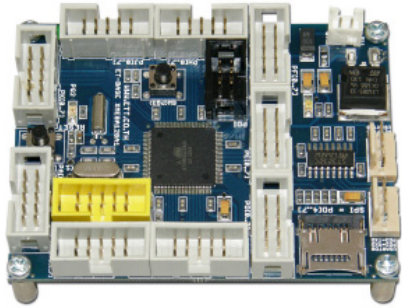
(P-ET-A-00426)

**ET-BASE MEGA1280**

(P-ET-A-00427)

**ET-BASE MEGA2560**

(P-ET-A-00428)



New board from ETT that uses AVR MCU of ATMEL has been developed and improved its capabilities from the old version 'ATMEGA' to new version 'XMEGA'. Its outstanding feature is higher speed to process data, low power consumption, higher stability of Clock System, INTERRUPT INPUT Detection.

**Features of ATXMEGA128A1 that is used as MCU of Board ET-BASE XMEGA128A1**

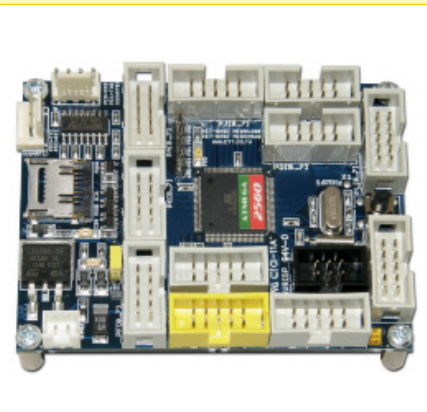
- 128KBYTE FLASH Program/ 8KBYTE SRAM/ 2KBYTE EEPROM
- 100PIN TQFP, run at 1.6V-3.6V (RUN 32MHz at 2.7V-3.6V and 12MHz at 1.6V)
- Circuit internal PLL can program CLOCK to 32MHz at the maximum
- 4 CH DMA, 8 CH 16 BIT TIMER/ COUNTER, 4 CH I2C, 4 CH SPI
- 8 CH USART and 1 CH can be programmed to be IRDA
- 16 CH 12 BIT ADC(2MSPS), 4 CH 12 BIT DAC(1MSPS)
- Circuit AES and DES to encode and decode
- Set priority level of INTERRUPT
- Has JTAG System (IEEE 1149.1) to PROGRAM and DEBUG
- Has PDI (PROGRAM AND DEBUG INTERFACE) for PROGRAM and DEBUG

**Features of Board ET-BASE XMEGA128A1**

- Use XMEGA MCU No.ATXMEGA128A1
- Use X'TAL 8MHz; can use Circuit PLL internal MCU to run 32MHz
- Use Circuit RTC with X'TAL 32.768KHz internal MCU
- Support IN-SYSTEM PROGRAM in the format of PDI through Connector 6PIN HEADER (according to standard of ATMEL) (be compatible with ET-AVR ISP mkII)
- Can program data into MCU through PORT RS232 on board, without using any COPY or DOWNLOAD. Moreover, ETT has already installed BOOT LOADER into MCU.
- 10 PIN HEADER AVR-JTAG to REAL TIME DEBUG
- MICRO-SD CARD SOCKET
- 2 CH 4 PIN ETT PORT RS232
- 1 SW INPUT PORT TEST, 1 OUTPUT LED TEST, 1 SW RESET
- Has 72 BIT I/O that has 9 of Connectors 10 PIN HEADER ETT for A/D, D/A, I2C, SPI, USART and INPUT OUTPUT (I/O PORT run 3.6V at the maximum)
- Use +5VDC POWER SUPPLY with Circuit 3.3V REGULATE ON BOARD and Connector 2PIN (be compatible with ET-SWITCHING ADAPTER 5V 2A TYPE B (A-AP-A-00095))
- PCB size: 8.23 X 6.20 cm.

**ET-BASE XMEGA128A1 kit consists of...**

1. Board ET-BASE XMEGA128A1
2. CD-ROM User's Manual and Program
3. Cable ET-RS232 DB9 F to DOWNLOAD



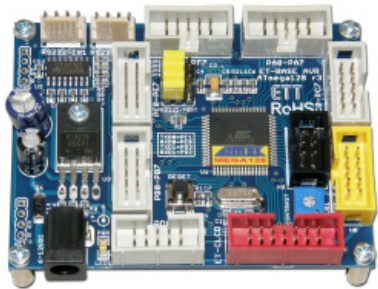
This is new AVR Board from ATMEL that has been developed and improved capabilities of board better. It includes many PERIPHERAL I/O internal MCU, so user can program operation modes conveniently. There are 2 versions as followed;

- ET-BASE MEGA1280 uses MCU No.ATMEGA1280-16 as MCU on board and there are 128KBYTE FLASH, 8KBYTE RAM, 4KBYTE EEPROM, A/D 16 X 10BIT, 100PIN TQFP.
- ET-BASE MEGA2560 uses MCU No.ATMEGA2560-16 as MCU on board and there are 256KBYTE FLASH, 8KBYTE RAM, 4KBYTE EEPROM, A/D 16 X 10BIT, 100PIN TQFP
- RUN X'TAL 16MHz
- 12 CH 16 BIT PWM, 4 CH USART, 16 CH A TO D 10 BIT, 86 BIT GPIO, 2 CH 8 BIT TIMER/ COUNTER, 4 CH 16 BIT TIMER/COUNTER, 1 CH I2C, 1 CH SPI
- Has JTAG (IEEE 1149.1) for PROGRAM and DEBUG
- Has ISP(IN-SYSTEM PROGRAMMING) for PROGRAM

**Specifications of Board ET-BASE MEGA1280/2560**

- Has RTC with X'TAL 32.768KHz internal MCU
- Support ISP(IN-SYSTEM PROGRAMMING) through Connector 6PIN HEADER (according to the standard connector of ATMEL) (it can use ET-AVR ISP mkII, ET-AVR ISP PROG MINI, ET-AVR ISP USB V1)
- Can program data into MCU through PORT RS232 on board without using any COPY or DOWNLOAD. ETT has already installed BOOTLOADER into MCU on board.
- 10 PIN HEADER AVR JTAG for REAL TIME DEBUG
- SOCKET MICRO-SD CARD with BUFFER 5V TO 3V
- 2 CH 4PIN ETT PORT RS232
- 1 OUTPUT LED TEST
- Independent 83BIT GPIO; there are 10 of Connector 10PIN HEADER ETT for applications such as A/D, I2C, SPI, USART, and INPUT OUTPUT (I/O PORT is compatible with 5V)."
- Use +5VDC POWER SUPPLY with +3.3V/3A REGULATE internal board, it uses Connector 2PIN (it is compatible with ET-SWITCHING ADAPTER 5V 2A TYPE B ((A-AP-A-00095)). Moreover, there is JUMPER on board to choose the Power Supply between 5V and 3.3V.
- PCB Size: 8.23 x 6.20 CM.
- ET-BASE MEGA1280/2560 consists of

1. Board
2. CD-ROM User's Manual and Sample Programs
3. Cable ET-RS232 DB9 F for DOWNLOAD

**ET-BASE AVR ATMEGA64 R3 (P-ET-A-00424)****ET-BASE AVR ATMEGA128 R3 (P-ET-A-00425)**

It is a Board AVR family from ATMEL No.ATMEGA64 and No.ATMEGA128 as TQFP 64 PIN type. Board is designed to be a small size and can be used as general usage or can be interfaced with "ET-BASE I/O V1".

- Version ET-BASE AVR ATMEGA64 uses No .ATMEGA64-16 to be permanent MCU on board with internal 64 KBYTE FLASH MEMORY, 4 KBYTE RAM, 2 KBYTE EEPROM
- Version ET-BASE AVR ATMEGA128 uses No.ATMEGA128-16 to be permanent MCU on board with internal 128 KBYTE FLASH MEMORY, 4 KBYTE RAM, 4 KBYTE EEPROM
- RUN X'TAL 16MHz
- RS232 PORT 2 CHANNEL as 4 PIN ETT type
- 14 PIN LCD PORT as CHARACTER TYPE
- A TO D 10 BIT 8 CHANNEL, SPI 1 CHANNEL, I2C 1 CHANNEL
- TIMERS/COUNTER 8 BIT, TIMERS/COUNTERS 16 BIT, PWM, WATCHDOG, RTC
- 6 PORT I/O 10 PIN ET
- POWER SUPPLY 7-12VDC POWER 7805 REGULATOR ON BOARD
- Can DOWNLOAD program into FLASH Memory directly by using "ET-AVR ISP" through PRINTER PORT and using with PROGRAM PONY PROG2000 for running on WINDOWS 98/ME/XP/2000
- ET-BASE AVR ATMEGA64 and 128 consists of

1. BOARD
2. CD-ROM
3. CABLE DOWNLOAD ET-AVR ISP



ATMEGA64



ATMEGA168



**ET-AVR STAMP ATMEGA64 V2.0**

(P-ET-A-00433)

**ET-AVR STAMP ATMEGA128 V2.0**

(P-ET-A-00367)



ET-AVR STAMP ATMEGA64 is Board AVR family from ATMEL Co. Ltd. It is designed to be a small board, so user can apply it for many project works easily and can be interfaced with PROJECT BOARD for demonstrative circuits.

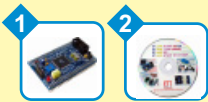
- MCU AVR FAMILY No.ATMEGA64-16AI 64 PIN TQFP FLASH MEMORY 64KBYTE, RAM 4KBYTE AND EEPROM 2KBYE
- MCU AVR family No.ATMEGA128-16 64PIN TQFP type 128 KBYTE FLASH Memory, 4 KBYTE RAM, 4 KBYTE EEPROM
- X'TAL RUN 16MHZ
- Support 2 procedures to program data into MCU internal Board;

1. Using economical set "ET-AVR ISP" to interface with PRINTER PORT
2. Using "ET-AVR JTAG (RS232) V1 and "ET-AVR START KIT", it can be DOWNLOAD program and DEBUG as REAL TIME type by "ET-AVR JTAG (RS232)V1.0

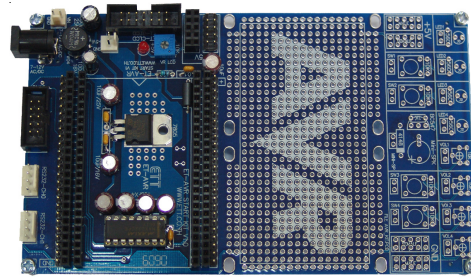
- 53 I/O PIN can be interfaced with I/O 5V
- 10 BIT A TO D 8 CHANNEL
- USART 2 CHANNEL
- TIMER/COUNTER 8-16 BIT
- RTC
- POWER SUPPLY can be interfaced with 5VDC
- ET-AVR STAMP is designed to be board for placing on Connector PIN HEADER 2.5mm. (25PIN per side) and can be interfaced with "ET-AVR START KIT V1/EXP" directly.

• ET-AVR STAMP ATMEGA128 consists of

1. BOARD ET-AVR STAMP ATMEGA128
2. CD-ROM User's Manual Program and Example Program



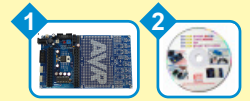
**ET-AVR START KIT V1 (P-ET-A-00279)**



We interface board ET-AVR START KIT V1 with board ET-AVRSTAMP ATMEGA64. In this case, we must interface board ET-AVR START KIT V1 to be base Board of AVR-STAMP. Moreover, there's POWER SUPPLY and CONNECTOR for interfacing circuit or interfacing with demonstrative board.

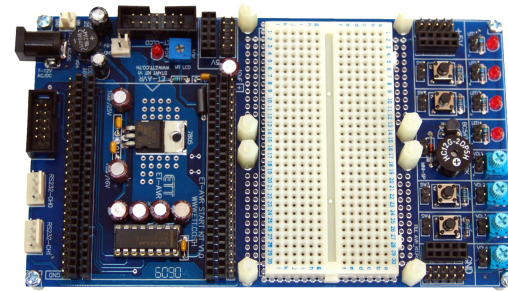
- 2 SETS OF 25 PIN x 2 FEMALE HEDAE, 25 PIN x 2 MALE
- CIRCUIT POWER SUPPLY 5VDC, 2 SETS OF CIRCUIT RS232 4 PIN
- 14 PIN LCD PORT AS CHARACTER TYPE
- 10 PIN AVR JTAG, USING POWER SUPPLY WITH BOARD 7-12 VDC (VERSION ETT DC ADAPTER 10VDC/800mA)
- PCB SIZE 15.3 x 9 CM.
- ET-AVR STRAT KIT V1 INCLUDES...

1. BOARD ET-AVR STRAT KIT V1
2. CD-ROM WITH USER AMNUAL AND SAMPLE PROGRAM, SAMPLE PROGRAM FOR DEMONSTRATION WITH BOARD, AND SAMPLE DEMONSTRATION WITH ET-MINI I/O BY USING ASSEMBLY, BASIC, AND C LANGUAGE.



**ET-AVR START KIT V1 EXP**

(P-ET-A-00280)

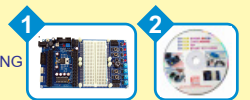


• ET-AVR START KIT EXP IS EXPANDED FROM VERSION KIT V1, WE USE THIS VERSION FOR INTERFCAING WITH ET-MINI I/O BOARD AND THE ADDITIONAL CIRCUITS AS SHOWN BELOW;

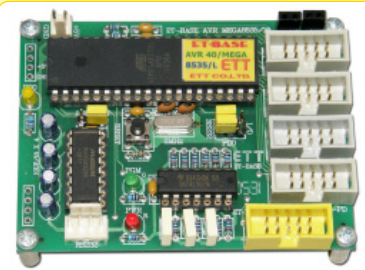
- PROJECT BOARD AD-100 - 4 VR
- 4 TACT SW - 4 LED DOT
- 1 MINI SPEAKER

• ET-AVR START KIT V1 EXP INCLUDES...

1. BOARD ET-AVR START KIT V1 EXP
2. CD-ROM WITH USER AMNUAL AND SAMPLE PROGRAM, SAMPLE PROGRAM FOR DEMONSTRATION WITH BOARD, AND SAMPLE DEMONSTRATION WITH ET-MINI I/O BY USING ASSEMBLY, BASIC, AND C LANGUAGE.



**ET-BASE AVR40/8535 (P-ET-A-00267)**



It is board AVR family No. ATMEGA8535 40 PIN from ATMEL can be used as general controller or interfaced with ET-BASE I/O V1. Moreover, it can be used with Cable ET-FF BOX 120 (OPTION) or ET-FM BOX 120 (OPTION)

- CPU ATMEGA DIP 40 PIN, 8K BYTE FLASH MEMORY, 512 BYTE INTERNAL RAM, 512 BYTE EEPROM
- A TO D 10 BIT INTERNAL 8 CHANNEL
- 4 PORT I/O 10PIN ET
- POWER SUPPLY 5VDC (can use POWER SUPPLY ET-SWITCHING ADAPTER 5V 1.2A TYPE H OPTION)
- DOWNLOAD PROGRAM into INTERNAL FLASH MEMEORY by using ET-CAP10P through PORT PRINTER DB 25 PIN from computer PC
- PCB SIZE 6.2 x 8.1 cm.
- ET-BASE AVR40/8535 consists of

1. BOARD BASE AVR 40/8535
2. CD-ROM User's manual PROGRAM for running on WINDOWS 98/ME/XP/2000,
3. CABLE DOWNLOAD ET-CAB10P V2



**ET-AVR JTAG USB V1 (P-ET-A-00319)**

ET-AVR JTAG USB V1 is a board that is designed to download and debug AVR MCU of ATMEL. There's a part of JTAG INTERFACE on MCU that can interface through 10 PIN AVR JTAG. It must use with Program AVR STUDIO 4.XX by interfacing through Connector USB PORT of computer PC.



**AVR Debugger & Programmer**

- Specifications of ET-AVR JTAG USB V1 are equivalent to AVR JTAG of ATMEL
- Programming into MCU and debugging as Real Time
- Can upgrade new Firmware directly through Program AVR STUDIO 4 for using with new MCU numbers
- Can interface with board that has POWER SUPPLY from 2.7V to 5.5V
- 10 PIN AVR JTAG can be used with ETT Boards that have Connector 10 PIN AVR JTAG such as ET-AVR START KIT V1/EXP

• ET-AVR JTAG USB V1 consist of

1. Board ET-AVR JTAG USB with box and cable 10 PIN
2. Cable USB TYPE A/B
3. CD-ROM

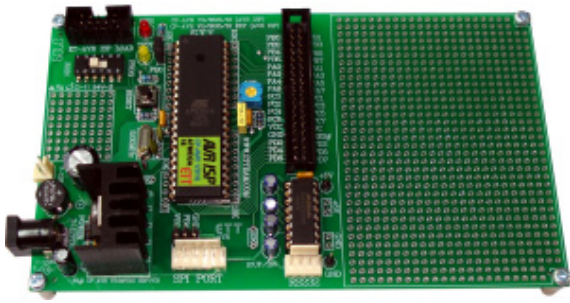


**CP-AVR V3/8535 (AVR ISP)**

(P-CP-A-00082)

**CP-AVR V3/16 (AVR ISP)**

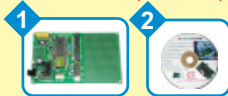
(P-CP-A-00083)



- **CP-AVR V3/8583 (AVR ISP)** USES CPU ATMEGA8535; RUNS WITH FREQUENCY 8 MHZ AND CAN WRITE FLASH MEMORY PROGRAM 8 KBYTE, EEPROM 512 BYTE, RAM 512 BYTE
- **CP-AVR V3/16 (AVR ISP)** USES CPU ATMEGA16; RUNS WITH FREQUENCY 8 MHZ AND CAN WRITE FLASH MEMORY PROGRAM 16 KBYTE, EEPROM 512 BYTE, RAM 1024 BYTE
- A TO D 10 BIT 8 CH
- 34 PIN I/O ET BUS
- 4 PIN RS232 (MAX232 ON BOARD)
- 7805 POWER SUPPLY ON BOARD
- POWER SUPPLY 7-12VDC
- PROJECT PCB SIZE 8.5 X 6 CM.
- PCB SIZE 15.3 X 9 CM.
- CAN DOWNLOAD PROGRAM HEX FILE INTO MCU AS ISP INTERFACE (AVR ISP) THROUGH CONNECTOR 10 PIN ET AVR ISO; CAN USE IT WITH ET-AVR ISP USB V1 FOR DOWNLOADING PROGRAM THROUGH CONNECTOR USB PORT; OR USE IT WITH ET-AVR ISP FOR PROGRAMMING THROUGH CONNECTOR PRINTER PORT

- **CP-AVR V3/8583, V3/16 (AVR ISP)** CONSIST

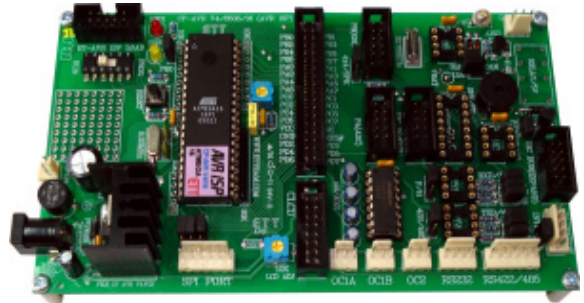
1. BOARD
2. CD-ROM

**CP-AVR V4/8535 (AVR ISP)**

(P-CP-A-00086)

**CP-AVR V4/16 (AVR ISP)**

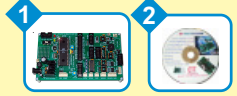
(P-CP-A-00087)



- **CP-AVR V4/8583 (AVR ISP)** uses CPU ATMEGA8535 that runs frequency 8 MHz. It can write Program FLASH 8KBYTE, EPROM 512 BYTE, RAM 512 BYTE
- **CP-AVR V4/16 (AVR ISP)** uses CPU ATMEGA16 that runs frequency 8 MHz. It can write Program FLASH 16KBYTE, EEPROM 512 BYTE, RAM 1024 BYTE
- A TO D 10 BIT 8 CH
- 34 PIN I/O ET BUS
- 10 PIN I2C IN/OUT
- 10 I2C BUS
- 10 PIN ET PORT
- 10 PIN ADC I/O
- CONNECTOR MAGNETIC CARD ETT
- 4PIN RS232 ON BOARD (MAX232)
- 6PIN RS422/485 (75176 OPTION)
- PCF8574 I/O PORT I2C (OPTION)
- RTC PCF8583 I2C Interface with internal RAM 240 BYTE (OPTION)
- 24XX EEPROM 32K-512K BIT Memoy (OPTION)
- 1 RELAY 2 CONTRAC COIL 5VDC (OPTION), MINI SPEAKER ON BOARD
- 14 PIN LCD PORT CHARACTER TYPE
- 7805 POWER SUPPLY ON BOARD
- POWER SUPPLY 7-12VDC
- PCB SIZE 15.3 x 9 cm.
- Download Program HEX FILE into MCU by ISP INTERFACE (ISP USB) through Connector 10 PIN ET AVR ISP; using it with ET-AVR ISP USB V1 to download Program through Connector USB PORT; or using it with ET-AVR ISP to program through PRINTER PORT

- **CP-AVR V4/8583 and V4/16 (ISP USB)** consist

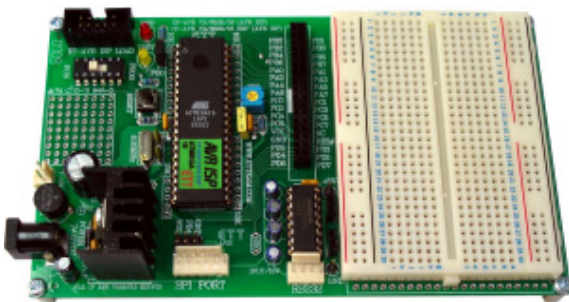
1. Board
2. CD-ROM

**CP-AVR V3/8535 EXP (AVR ISP)**

(P-CP-A-00084)

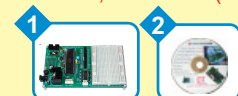
**CP-AVR V3/16 EXP (AVR ISP)**

(P-CP-A-00085)



- **CP-AVR V3/8583 EXP (AVR ISP)** uses CPU ATMEGA8583 that can run frequency 8 MHz. It can write Program FLASH 8KBYTE, EEPROM 512 BYTE, RAM 512 BYTE
- **CP-AVR V3/16 EXP (AVR ISP)** uses CPU ATMEGA16 that runs frequency 8 MHz. It can write Program FLASH 16K BYTE, EEPROM 512 BYTE, RAM 1024 BYTE
- Its specifications are as same as version CP-AVR V3/8583 (ISP USB) and V3/16 (ISP USB) but there's additional Project Board and change Connector from Connector 34 PIN Male to 34 Pin Female and increase 2 Connector VCC and GND Female
- Use PROJECT BOARD AD-102 that is 8x6 cm. and good quality
- **CP-AVR V3/8583 EXP, V3/16 EXP (AVR ISP)** consist

1. Board
2. CD-ROM

**ET-BASE AVR TINY2313**

(P-ET-A-00304)



It is AVR Board MICROCONTROLLER from ATMEL that is designed to be a small size ET-BASE of ETT. It can be used to control general purpose or interface with ET-BASE I/O V1.0.

- Use ATTINY2313 20 PIN DIP and run with X'TAL 7.3728MHz (Collect data 1 CYCLE CLOCK/Command)
- 2KBYTE FLASH PROGRAM, 128BYTE INTERNAL RAM, 128BYTE EEPROM
- Can directly DOWNLOAD program into FLASH Memory through Connector PRINTER PORT with ET-AVR ISP that is attached with set
- 15 BIT I/O by interfacing to be 1 of 10 PIN ET, 6 PIN & 3 PIN WAFER
- 4 PIN RS232 PORT MAX232 ON BOARD
- 14 PIN LCD CONNECTOR as CHARACTER TYPE, DS1307 RTC (OPTION), 24XX EEPROM (OPTION), PCB SIZE 6.2 x 8.1 cm
- 7805 POWER ON BOARD INPUT 7 - 12VDC can be used with DC ADAPTER version 10VDC/850mA (A-A-P-A-00001)

- **ET-BASE AVR TINY2313** consists of

1. Board
2. CD-ROM
3. Cable DOWNLOAD ET-AVR ISP.





**ET-PGM PIC PK3 (P-ET-A-00463)****ET-PGM PIC PK3 PLUS (P-ET-A-00464)**

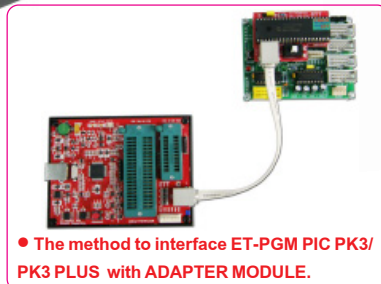
**ET-PGM PIC PK3** and **ET-PGM PIC PK3 PLUS** is the Programmer device for PIC Microcontroller from MICROCHIP; specifications of HARDWARE and SOFTWARE are equivalent to PICKit3 Programmer from MICROCHIP. It can program and debug many PIC Microcontroller numbers that have FLASH MEMORY such as Microcontroller PIC10, PIC12, PIC16, PIC18, dsPIC30, dsPIC33, PIC24, PIC32.

ET-PGM PIC PK3 and ET-PGM PIC PK3 PLUS are connected with computer PC through PORT USB; it uses Power Supply from PORT USB and it can program with high speed. Moreover, user can upgrade newer Firmware versions by oneself through computer.

Furthermore, ETT has designed additional ADAPTER for programming into MCU of MICROCHIP directly, without having any Connector for programming on board; so, it is more convenient to develop program because it is unnecessary to remove any IC from board or design any connector for programming. Now, there are 6 ADAPTER versions that are compatible with MCU DIP TYPE 40PIN, 28PIN (wide pin), 28PIN (narrow pin), 20PIN, 18PIN, 14PIN (ET-ADAPTER PIC USB-XXX). It is important to users when the product is out of order, user can send the product to ETT to repair and maintain all the time because this ET-PGM PIC PK3 is made by ETT. It does not waste much time to send it to foreign country to repair like in the past.

**ET-PGM PIC PK3****ET-PGM PIC PK3 PLUS**

**PIC**  
Programmer & Debugger **USB**



**Be compatible with Microcontroller MICROCHIP Ver.12 BIT / 14 BIT - PIC10FXX, PIC12FXX, PIC16FXX**

**PIC18FXX**

**PIC18FXJXX**

**PIC18FXKXX**

**PIC24XX**

**dsPIC33XX**

**PIC32XX**

- Support PIC Microcontroller that is equivalent to PICKIT3 of MICROCHIP; it is compatible with newer PIC numbers that PICKIT2 cannot support such as No.PIC18F46K80, PIC32MX460F512L, PIC32MX795F512L, and etc
- Interface through USB PORT (Full Speed 12 Mbits/s)
- Has Circuit POLY SW 500mA and 50mA to protect board from short-circuit
- Can program and debug board numbers in series of PIC and dsPIC
- Be compatible with board that uses Power Supply in the range of 2.0-6.0V
- Has 512 KBYTE FLASH Memory and can use Function Programmer-TO-GO
- Can program MCU by using TEXT TOOL 40PIN and 20 PIN; version ET-PGM PIC PK3 PLUS is compatible with MCU PIC 8PIN to 40PIN
- Has 2 types of Connector IN-CIRCUIT SERIAL PROGRAMMING
  - Connector MODULAR JACK RJ11 according to the standard of MICROCHIP(ICD2); it can interface with ETT Board in the series of PIC USB and other series of PIC Board that uses Connector MODULAR JACK RJ11, according to the standard of MICROCHIP
  - Connector 6PIN WAFER 2.54mm.
- Can connect with Module ET-ADAPTER for EMULATOR Programming into Board TARGET directly such as ET-ADAPTER PIC USB-XXX
- PCB Size: 10x7.5 cm. with Base
- Can be used with Program MPLAB IDE, PICKit 3 Programmer of MICROCHIP; and support the operation under OS WINDOWS XP, WINDOWS Vista, WINDOWS 7
- **ET-PGM PIC PK3** consists of ...
  1. Board ET-PGM PIC PK3
  2. Cable USB TYPT A/B
  3. Cable RJ-ICD2
  4. CD-ROM
- **ET-PGM PIC PK3 PLUS** consists of ...
  1. Board ET-PGM PIC PK3 PLUS with TEXT TOOL 40PIN and 20PIN
  2. Cable USB TYPE A/B
  3. Cable RJ-ICD2
  4. CD-ROM

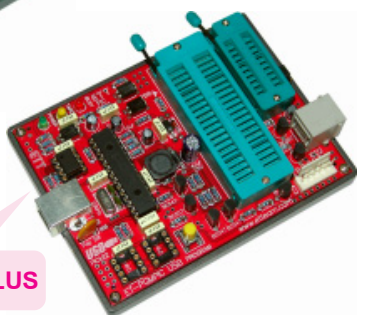
**ET-PGM PIC USB V1**

(P-ET-A-00326)

**ET-PGM PIC USB V1 PLUS**

(P-ET-A-00327)

**ET-PGM PIC USB** is a PIC Microcontroller Programmer of MICROCHIP Co, Ltd., and its specifications are equivalent to PICKIT 2 Programmer of MICROCHIP. It can program many numbers of PIC Microcontroller that is FLASH MEMORY (see more detailed from READ ME of Program PICKIT 2 of MICROCHIP). **ET-PGM PIC USB** can interface with computer PC through PORT USB; use POWER SUPPLY from USB PORT, be high speed for programming. Moreover, it can upgrade new Firmware versions or new numbers from WEB by self (www.microchip.com ). Furthermore, ETT designs additional ADAPTER for programming into MCU of MICROCHIP directly, so it is unnecessary to have any Connector on Board for programming. It makes user more convenient to develop program because user does not take off any IC component or design Connector for programming. Now, there are 6 types of ADAPTER and it can be used with MCU DIP TYPE 40 PIN, 28 PIN (WIDE PIN), 28 PIN (NARROW PIN), 20 PIN, 18 PIN, and 14 PIN.

**ET-PGM PIC USB V1****ET-PGM PIC USB V1 PLUS**

It can be used with various MICROCHIP versions such as:

**VERSION 12 BIT/ 14 BIT****PIC10FXX, PIC12FXX****PIC16FXX, VERSION PIC18FXX****VERSION PIC18FXJXX****VERSION PIC18FXKXX****VERSION PIC24XX****VERSION dsPIC33XX**

• The method to interface ET-PGM PIC V1/ V1 PLUS with ADAPTER MODULE.

- Support applications of PIC Microcontroller and its specifications are equivalent to PICKIT 2 of MICROCHIP
- Interface through USB PORT
- Use POWER SUPPLY from USB Port
- Can program MCU by using TEXT TOOL 40 PIN and 20 PIN for version ET-PGM PIC USB PLUS and it can be used with MCU sizes from 8 PIN to 40 PIN
- There's no any part of TEXT TOOL 40 PIN and 20 PIN for version ET-PGM PIC USB
- There are 2 Connector types for IN-CIRCUIT SERIAL PROGRAMMING:
  - Connector MODULAR JACK RJ11 under standard of MICROCHIP Co., Ltd. (ICD2) can interface with PIC USB Board of ETT
  - Connector WAFER 2.54 mm. 6 PIN and its specifications are as same as ICD2
- Can program by pressing Switch PROGRAM on programmer
- Can directly interface with ADAPTER MODULE for EMULATOR Programming with TARGET Board
- PCB size: 10 x 7.5 cm. with plastic Base
- Use with Program PICKIT 2 of MICROCHIP CO., Ltd.; operate with computer PC and run on OS WINDOWS XP
- **ET-PGM PIC USB V1** consists of
  1. ET-PGM PIC USB V1 Board
  2. Cable USB TYPE A/B
  3. Cable RJ-ICD2
  4. CD-ROM



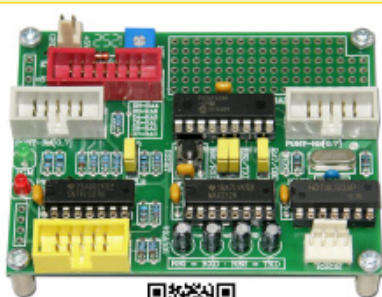
- **ET-PGM PIC USB V1 PLUS** consists of
  1. ET-PGM PIC USB V1 PLUS Board
  2. Cable USB TYPE A/B
  3. Cable RJ-ICD2
  4. CD-ROM

**ET-ICDX V1.0 (P-ET-A-00361)**

**ET-ICDX V1.0** is the device for IN-CIRCUIT DEBUGGER and PROGRAMMER CPU in the PIC and DsPIC family from MICROCHIP. Its capability is equivalent to MPLAB ICD2; moreover, it can be used with Program MPLAB.

**Specifications of ET-ICDX V1.0**

- Interface with computer PC through USB PORT (FULL SPEED 2 M BIT/S)
- Can program and debug Microcontroller PIC, dsPIC, PIC32 as REAL-TIME to test the operating results of program
- Can be used with Program MPLAB IDE (can download new version from WEB of MICROCHIP)
- Can upgrade new data in ET-ICDX V1.0 to be used with new Microcontrollers from MICROCHIP through computer by self
- Can be used with Board and Microcontroller that run in the range of 2.0V - 6.0V
- LED to display operating results of POWER, BUSY, ERROR
- Can read and write data into memory and EEPROM of the connecting Microcontroller
- Can program values in the part of CONFIGURATION BITS
- Use RJ11 6 PIN Connector and it is arranged under the standard ICD2 Connector of MICROCHIP; so, it can be connected with MICROCHIP Boards and ETT Boards without any problem such as CP-PIC V4 (ICD2), ET-BASE PIC8722 (ICD2)
- Can be connected with ADAPTER MODULES in the MICROCHIP family of ETT to expand operations; for example, TEXT TOOLS is used to add CPU to be COPY CPU of MICROCHIP such as ET-PGM PIC TEXT TOOLS; or using with MICROCHIP Boards that has not any ICD2 on board, it can be used ADAPTER MODULES of ETT instead such as ET-ADAPTER PIC USB-40A, 28A, 28B, 20A, 18A, and 14A
- Design circuit as SMD and contain in mini plastic box size 7.5 x 2.5 x 5.0 cm. to protect it from dust and short-circuit
- **ET-ICDX V1.0** includes...
  1. Board with box
  2. USB Cable TYPE A/B
  3. RJ-ICD2 Cable
  4. RJ-ICD2-FH Cable
  5. CD-ROM

**ET-BASE PIC16F628 V1 (P-ET-A-00277)**

**ET-BASE PIC16F628 V1** which is board PIC family from MICROCHIP Co, LTD. is small size and very cheap. There's circuit cable download, so we can write program on computer PC, and then can download program into board directly. We can use it for general purpose or for interfacing with ET-BASIC I/O V1.

- CPU PIC16F628A DIP 18 PIN

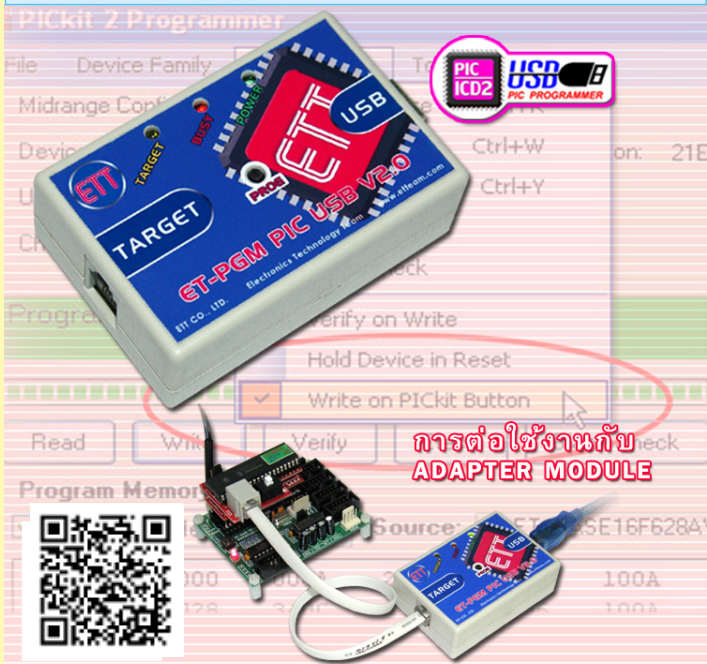
- FLASH MEMORY 2KWORD, RAM 224 BYTE, EEPROM 128 BYTE
- RUN X'TAL 10 MHz, 2 PORT I/O 10 PIN ET PORT A, B
- 14 PIN LCD PORT AS CHARACTER TYPE, 10 PIN ET-PSPI FOR DOWNLOADING
- POWER SUPPLY 5VDC (CAN USE ET-SWITCHING ADAPTER 5V 2A TYPE H OPTION)
- CAN DOWNLOAD PROGRAM INTO INTERNAL FLASH MEMORY BY USING ET-CAP10 THROUGH PORT PRINTER DB 25 PIN FROM COMPUTER PC
- PCB SIZE 6.2 x 8.1 CM., 4 PIN RS232 PORT
- **ET-BASE PIC16F628 V1** INCLUDES...
  1. BOARD ET-BASE PIC16F628 V1
  2. CABLE DOWNLOAD ET-CAP10P V2
  3. CD-ROM OF USER MANUAL FOR RUNNING ON WINDOWS 98/ME/XP/2000





**ET-PGM PIC USB V2**

(P-ET-A-00357)



การต่อใช้งานกับ  
ADAPTER MODULE

ET-PGM PIC USB V2 is developed from ET-PGM PIC USB V1; especially in the part of circuit that becomes mini circuit and extracts TEXT TOOL to do COPY from circuit. However, it is divided independently and user can buy it as option (ET-PGM PIC TEXT TOOLS).

ET-PGM PIC USB V2 is a PIC Microcontroller Programmer from MICROCHIP that has equivalent specifications as PICKIT2 Programmer of MICROCHIP. It can be interfaced with computer PC through PORT USB by using Power Supply from PORT USB and it is high speed to command and operate. Moreover, user can upgrade new Firmware version to increase more new number versions from website: [www.microchip.com](http://www.microchip.com) To design and contain circuit in the good quality of plastic box to protect it from dust and short-circuit with other circuit. Box size is 7.5 x 2.5 x 5cm that is mini box size and is convenient to use.

- Standard MODULAR JACK RJ11 Connector of MICROCHIP (ICD2)
- It can be interfaced with ETT Boards in the series of MICROCHIP that is ICD2 version directly such as ET-BASE PIC8722 (ICD2), CP-PIC V458/877 (ICD2), CP-PIC USB/4550 (ICD2), ET-PIC STAMP 18F8722 (ICD2), ET-dsPIC33WEB V1, ET-PIC24WEB V1 and etc.

- It can be interfaced with ADAPTER MODULES of ETT to do directly COPY data into CPU with board that has not any ICD2 Connector on board. In this case, there are many sizes of IC such as ET-ADAPTER PIC USB-40A, ET-ADAPTER PIC USB-28A, ET-ADAPTER PIC USB-28B, ET-ADAPTER PIC USB-20A, ET-ADAPTER PIC USB-18A, ET-ADAPTER PIC USB-14A.

- It can be interfaced with ET-PGM PIC TEXT TOOLS of ETT to do COPY CPU of MICROCHIP both 8 PIN - 40 PIN DIP TYPE and it can be also used with dsPIC.

- It can be used with USB PORT on computer PC, run on OS WINDOWS XP/VISTA by using Program PICKIT2 of MICROCHIP.

- ET-PGM PIC USB V2 consists of

1. ET-PGM PIC USB V2 Board with box,
2. USB TYPE A/B Cable
3. RJ-ICD2 Cable
4. CD-ROM.

**ET-PGM PIC TEXT TOOL**

(P-ET-A-00358)



ET-PGM PIC TEXT TOOLS is a set with TEXT TOOL that is designed to do COPY IC PIC. It can be used with Board ET-PGM PIC USB V1, ET-PGM PIC USB V2. The board consists of 3 TEXT TOOL that has 2 of 40 PIN and 1 of 20 PIN; it can be used with IC PIC and dsPIC from 8 PIN - 40 PIN DIP TYPE.

This ET-PGM PIC TEXT TOOLS consists of

1. ET-PGM PIC TEXT TOOL Board with TEXT TOOL
2. DC ADAPTER
3. 10VDC 850mA and CD-ROM.

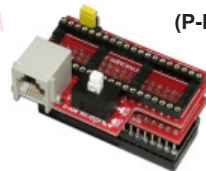


ADAPTER MODULES can use with ET-PGM USB and can copy it on board directly.

**ET-ADAPTER PIC USB-40A**

It uses with FLASH MCU 40 PIN DIP TYPE of MICROCHIP.

(P-ET-A-00333)

**ET-ADAPTER PIC USB-28A**

It uses with MCU 28 PIN DIP TYPE (WIDE PIN).

(P-ET-A-00331)

**ET-ADAPTER PIC USB-28B**

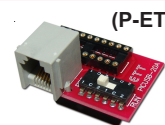
It uses with MCU 28 PIN DIP TYPE (NARROW PIN).

(P-ET-A-00332)

**ET-ADAPTER PIC USB-20A**

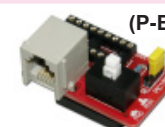
It uses with MCU 20 PIN DIP TYPE.

(P-ET-A-00330)

**ET-ADAPTER PIC USB-18A**

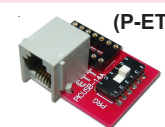
It uses with MCU 18 PIN DIP TYPE.

(P-ET-A-00329)

**ET-ADAPTER PIC USB 14A**

It uses with MCU 14 PIN DIP TYPE.

(P-ET-A-00328)

**ET-CONV ICSP TO RJ11**

It is PCB CONVER to convert Connector 6PIN of PICKIT2 or PICKIT3 of MICROCHIP(ICSP) into Connector RJ11 for using with ICD2, ICD3.

(P-ET-A-00439)

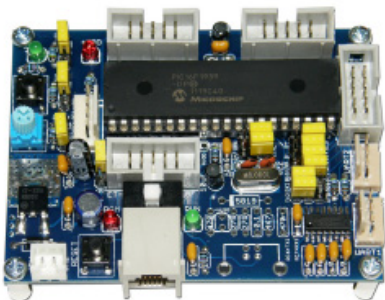
**ET-BASE PIC40/1939 (ICSP)** (P-ET-A-00467)

**ET-BASE PIC40/4550 (ICSP)** (P-ET-A-00468)

**ET-BASE PIC40/46K22 (ICSP)** (P-ET-A-00469)

**ET-BASE PIC40/46K80 (ICSP)** (P-ET-A-00470)

**1. ET-BASE PIC40/1939 (ICSP)**

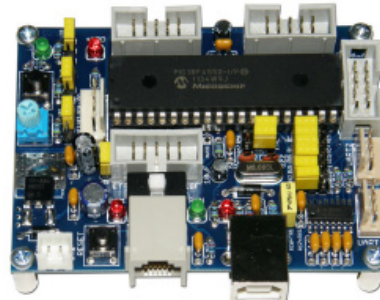


DOWNLOAD  
BY

USB

ET-PGM PIC USB V1  
ET-PGM PIC USB V1 PLUS  
ET-PGM PIC USB V2  
ET-ICDX V1  
ET-PGM PIC PK3  
ET-PGM PIC PK3 PLUS

**2. ET-BASE PIC40/4550 (ICSP)**

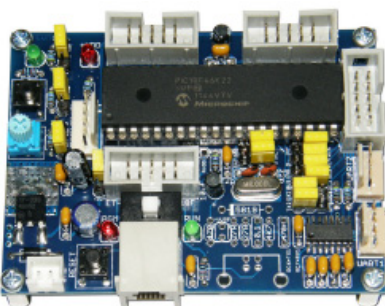


DOWNLOAD  
BY

USB

ET-PGM PIC USB V1  
ET-PGM PIC USB V1 PLUS  
ET-PGM PIC USB V2  
ET-ICDX V1  
ET-PGM PIC PK3  
ET-PGM PIC PK3 PLUS

**3. ET-BASE PIC40/46K22 (ICSP)**

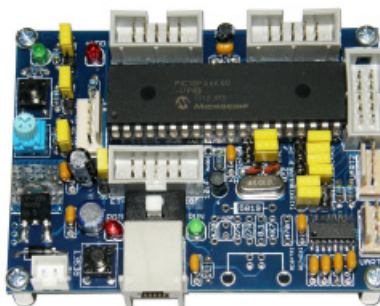


DOWNLOAD  
BY

USB

ET-PGM PIC USB V1  
ET-PGM PIC USB V1 PLUS  
ET-PGM PIC USB V2  
ET-ICDX V1  
ET-PGM PIC PK3  
ET-PGM PIC PK3 PLUS

**4. ET-BASE PIC40/46K80 (ICSP)**



DOWNLOAD  
BY

USB

ET-PGM PIC PK3  
ET-PGM PIC PK3 PLUS



All 4 new PIC Boards from ETT is economy price that is compatible with Programmer ET-PGM PIC USB V1/V1 PLUS, ET-PGM PIC USB V2, ET-ICDX V1, and ET-PGM PIC PK3/PK3 PLUS; it connects with computer PC through PORT USB and it programs into board through Connector RJ11(ICD2). Nowadays, there are 4 versions that have the same structure and circuit but it only is different in the part of MCU internal board.

**1. ET-BASE PIC40/1939 (ICSP)**

Use MCU PIC16F1939, RUN 32 MHz, 16K WORD FLASH/ 256 BYTE EEPROM/ 1024 BYTE SRAM, 36 GPIO, 10 BIT A/D, 1-CH EUART; it is compatible with all PIC USB Programmers from ETT for PROGRAM.

**2. ET-BASE PIC40/4550(ICSP)**

Use MCU PIC18F4550, RUN 48 MHz, 32K BYTE FLASH/ 256 BYTE EEPROM/ 2048 BYTE SRAM, 35 GPIO, 10 BIT A/D, 1-CH EUART; it is compatible with all PIC USB Programmers from ETT for PROGRAM.

**3. ET-BASE PIC40/46K22(ICSP)**

Use MCU PIC18F46K22, RUN 64 MHz, 64K BYTE FLASH/ 1024 BYTE EEPROM/ 3896 BYTE SRAM, 36 GPIO, 10 BIT A/D, 2-CH EUART; it is compatible with all PIC USB Programmers from ETT for PROGRAM.

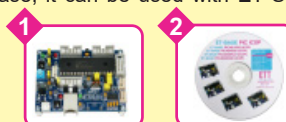
**4. ET-BASE PIC40/46K80(ICSP)**

Use MCU PIC18F46K80, RUN 64 MHz, 64K BYTE FLASH/ 1024 BYTE EEPROM/ 3896 BYTE SRAM, 35 GPIO, 12 BIT A/D, 2-CH EUART; it is only compatible with ET-PGM PIC PK3/PK3 PLUS for PROGRAM.

Elements on Board are listed below;

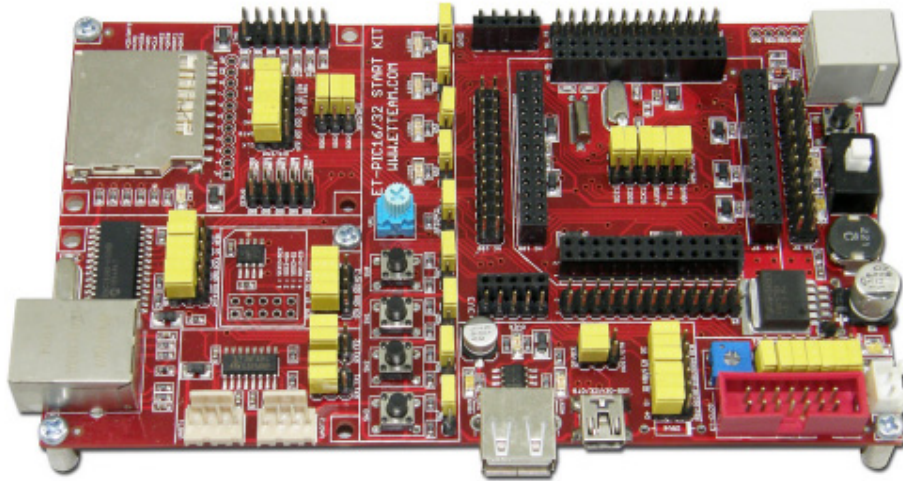
- Has CRYSTAL 8.00MHz on board (MCU uses Circuit PLL up to 8.00MHz to run) with JUMPER to Connect/Disconnect signal as required.
- Has Circuit LINE DRIVER for RS232 UART Serial PORT 2-CH 4PIN, according to the standard of ETT
  1. 1-CH for HARDWARE UART1 that uses PIN RC6(TX1) and RC7(RX2), according to the standard of PIC. All MCU versions have this PORT.
  2. 1-CH for SOFTWARE UART that uses PIN RC0(TX2) and RC1(RX2) with JUMPER to be set as independent PORT.
  3. 1-CH for HARDWARE UART2 (available in MCU PIC18F46K22 and K80) in the format of TTL LEVEL; it is used for general application.
- Has Connector ICSP according to the standard of ICD2 RJ11 for PROGRAMMER or DEBUGGER. It is compatible with ICD2/ICD3, PICKIT2, PICKIT3 or PIC USB Programmer of ETT.
- Has SW. to alternate signals between PROGRAM/DEBUG and Normal RUN; moreover, there is LED to display the operation mode of board.
- Has 4 of Connector I/O 10PIN ETT and 1 of HEADER CPA-5
- Has 1 SW. RESET, 1 VR to test A/D, 1 SW. TEST I/O BIT
- Use REGULATE 3.3V/1A ON BOARD with JUMPER to choose the Power Supply either 5VDC or 3.3VDC for MCU
- Use POWER SUPPLY +5VDC for board by using Connector TYPE B; in this case, it can be used with ET-SWITCHING ADAPTER 5V 2A TYPE B (A-AP-A-00095)
- PCB size is 6.2 x 8.1 cm., according to the standard of Board ET-BASE SIZE
- All 4 versions of Board ET-BASE PIC40 consist of ...

1. Board ET-BASE PIC40
2. CD-ROM; User's Manual and Programs





# ET-PIC16/32 START KIT (P-ET-A-00396)

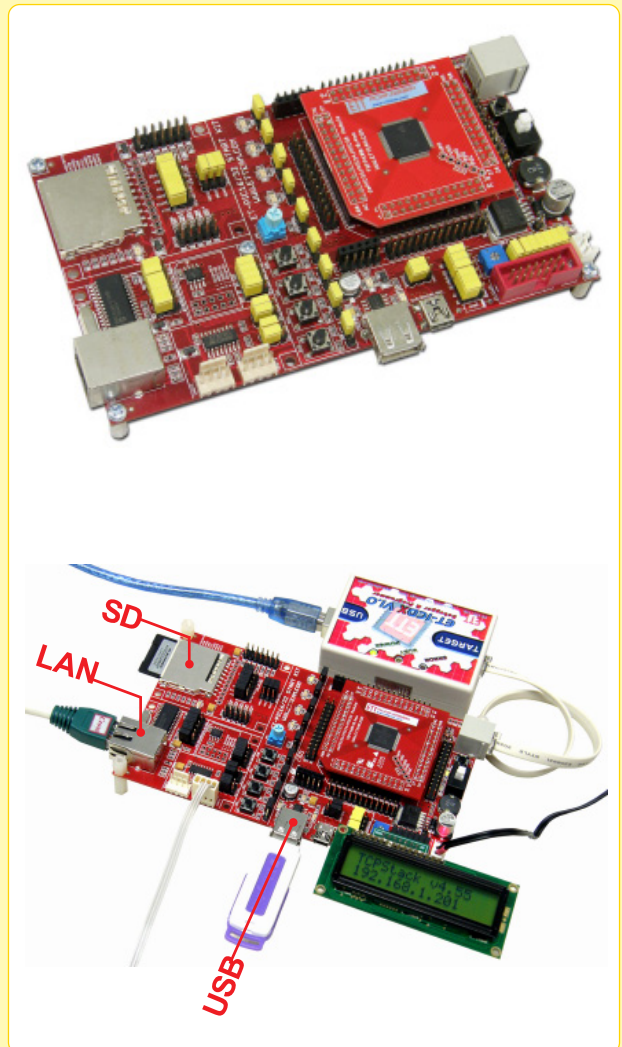


The great Training Kit "ET-PIC16/32 START KIT" is the device that user can choose and change MCU as preferred; now there are 4 available versions of MCU that are PIC24, PIC32.

ET-PIC16/32 START KIT is the Training Board for learning and developing Microcontroller of MICROCHIPS and support applications with Microcontroller 16/32 BIT 100 PIN PIC24F/PIC24H. This board is designed to be flexible, and compatible with various MCU numbers. In this case, user can change and remove MCU on board by self; so it decreases the problem if MCU is out of order or it can not FLASH any data into memory because it exceeds the prescribed amount. The board structure provides the important circuits and basic I/O for using and learning initially.

## Specifications of Board ET-PIC16/32 START KIT

- Support application of MCU 16 BIT and 32 BIT of MICROCHIPS 100 PIN and it is compatible with MCU in the family of PIC24F/PIC24F, dsPIC33 and PIC33. Now, ETT produces 4 versions of MCU MODULE as follows;
  - PIC24FJ28GB110, PIC24HJ256GP210
  - PIC32MX360F512L, PIC32MX460F512L
- X' TAL 8MHz for SYSTEM CLOCK SOURCE
- X' TAL 32KHz for RTC CLOCK SOURCE
- ETHERNET LAN DRIVER No.ENC28J60 with RJ45 LAN PORT
- SPI EEPROM No.25LC256 for using and storing WEB PAGE CODE to test ETHERNET LAN according to the examples from MICROCHIPS TCP/IP STACK
- SD CARD INTERFACE with signal CARD DETECT and WRITE PROTECT
- RS232 UART DRIVER with Connector 4 PIN standard of ETT 2-CHANNEL
- USB INTERFACE supports application of USB Interface that is both formats of DEVICE/OTG and HOST. It is compatible with MODULE PIC32MX460F512L and MODULE PIC24FJ128GGB110.
- 14 PIN HEADER LCD it interface with CHARACTER LCD
- 4 of LED INDICATOR for testing operation of OUTPUT
- 4 of SW PUSH BUTTON for testing operation of INPUT
- 1 of Adjustable VOLUME(VR) to adjust 0-3.3V Voltage for testing ADC (ADC in the part of MCU does not exceed 3.3V).
- RJ11 ICD2 PORT standard of ICD2 MICROCHIPS supports applications of IN-CIRCUIT and DEBUG; moreover, there is SW to ON/OFF signal pin for PROGRAM/DEBUG and general application of PORT, with LED to display the status.
- Programming data into MCU by ICD2 through ET-PGM PIC USB V1/V1 PLUS, ET-PGM PIC USB V2, ET-ICDX V1.0, ET-PGM PIC PK3, ET-PGM PIC PK3 PLUS
- JTAG PORT IDE HEADER 14PIN for PROGRAM/DEBUG with JTAG TOOLS of MICROCHIPS
- DEBUG PORT IDE HEADER 10PIN for DEBUG with DEBUG TOOLS(MPLAB REAL ICE IN-CIRCUIT EMULATOR) of MICROCHIPS
- SWITCHING REGULATE 3.3V/3A to reduce the heat from IC REGULATE
- PCB Size: 15.3 x 9 CM.
- Use POWER +5VDC with Connector TYPE B (it is compatible with ETT POWER version ET-SWITCHING ADAPTER 5V 1.2A TYPE B)



### \* OPTION



(P-ET-A-00364)

● LCD 16 X 2 & CONVER  
14 PIN ( LCD 16 CHARAC  
TERS 2 LINES WITH PCB  
CONNECT PORT 14 PIN  
LCD )



● CABLE USB TO  
5P MINI  
(A-CB-A-00044)



● CABLE LAN CROSS 2 M  
(P-CB-A-00027)  
● CABLE LAN DIRECT 2 M  
(P-CB-A-00028)



### ET-SWITCHING ADAPTER 5V 2A TYPE B

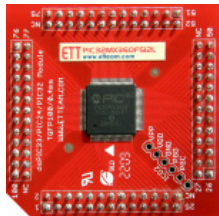


INPUT 220VAC  
OUTPUT 5VDC 2A (10W)  
HOUSING 2.50 mm. 2 PIN

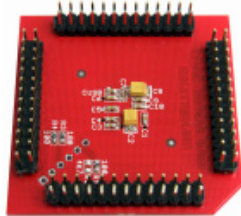
## ETT PLUG IN MODULE MICROCHIPS

It is the part of MCU MICROCHIPS that consists of Circuit R, C SMD TYPE on PCB to be all-purpose MODULE MCU; so, it can be used with ET-PIC16/32 START KIT or user maybe design and assemble these Modules with other circuits by self as follows;

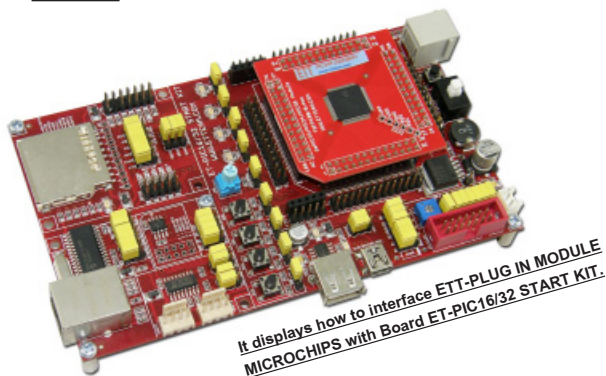
- MODULE can be used with MODULE of MICROCHIPS 100 PIN; in this case, there are 2 sizes according to the pin size of MCU; TQFP100/0.4mm. and TQFP100/0.5mm.
- 6 PIN ICD2 PIN HEADER on board (customer needs to expand it by self)
- 4 of Connector 26 PIN HEADER 2.54 mm. under PCB can be connected from MCU
- PCB Size: 5.1 x 5.1 cm.



**FRONT**



**BACK**



*It displays how to interface ETT-PLUG IN MODULE MICROCHIPS with Board ET-PIC16/32 START KIT.*

## ET-PIC24FJ128GB110

(P-ET-A-00397)



MCU MICROCHIPS, 128 KBYTE FLASH, 16 KBYTE RAM, 83 I/O, 32 MHz SPEED, 16 X 10 BIT A/D, 16 BIT CORE SIZE, 100-TQFP/0.4mm. It can be used with PORT USB and developed program by ET-PGM PIC USB V1, V1 PLUS, V2, ET-ICDX V1.0, ET-PGM PIC PK3, ET-PGM PIC PK3 PLUS.

## ET-PIC24HJ256GP210

(P-ET-A-00398)



MCU MICROCHIPS, 256 KBYTE FLASH, 16 KBYTE RAM, 85 I/O, 40 MIPS SPEED, 32 X 10 BIT A/D, 16-32 BIT CORE SIZE, 100-TQFP/0.5mm. It is developed by ET-PGM PIC USB V1, V1 PLUS, V2, ET-ICDX V1.0, ET-PGM PIC PK3, ET-PGM PIC PK3 PLUS.

## ET-PIC32MX360F512L

(P-ET-A-00399)



MCU MICROCHIPS, 512 KBYTE FLASH, 32 KBYTE RAM, 85 I/O, 80 MHz SPEED, 16 X 10 BIT A/D, 32 BIT CORE SIZE, 100-TQFP/0.4mm. It can be programmed by ET-ICDX V1.0, ET-PGM PIC PK3, ET-PGM PIC PK3 PLUS

## ET-PIC32MX460F512L

(P-ET-A-00401)



MCU MICROCHIPS, 512 KBYTE FLASH, 32 KBYTE RAM, 83 I/O, 80 MHz SPEED, 16 X 10 BIT A/D, 32 BIT CORE SIZE, 100-TQFP/0.4mm. It can be used with PORT USB and developed by ET-PGM PIC PK3, ET-PGM PIC PK3 PLUS, ICD3 OR PicKit3.

## ET-BASE dsPIC30F4011

(P-ET-A-00407)

## ET-BASE dsPIC30F2010

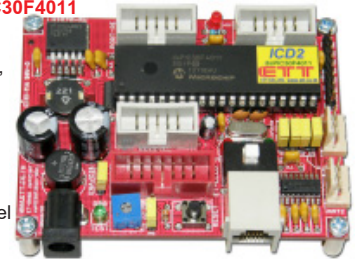
(P-ET-A-00406)

ET-BASE dsPIC30F2010/4011 is the new board from ETT in the series of dsPIC30F that uses dsPIC 28 PIN No.dsPIC30F2010 for version ET-BASE dsPIC30F2010 and uses dsPIC 40 PIN No.dsPIC30F4011 for version ET-BASE dsPIC30F4011.

This dsPIC30F2010/4011 is MCU from MICROCHIPS that is used to process 16 BIT data. Its outstanding ability is to process data as digital type, so it is suitable to control applications well. Internal structure of MCU is combined Microcontroller (MCU) and Circuit DSP (DIGITAL SIGNAL PROCESSING) together; so, it is called DIGITAL SIGNAL CONTROLLER.

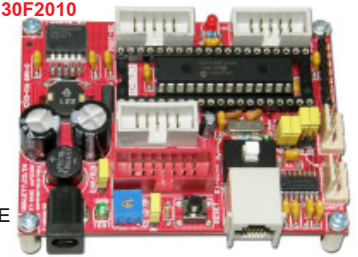
### Specifications of ET-BASE dsPIC30F4011

- Use dsPIC30F4011-30I/P
- Has 48 KBYTE FLASH Memory, 2 KBYTE RAM
- Has 1 KBYTE EEPROM
- Has 5 of 16 BIT TIMER/COUNTER
- Has INPUT CAPTURE 4-Channel
- Has 10 BIT A TO D/ 9-Channel 500KSPS
- Has 2-Channel UART
- Has circuit SPI, I2C, WATCHDOG, POWER ON RESET, PWM



### Specifications of ET-BASE dsPIC30F2010

- Use dsPIC30F2010-20I/P
- Has 12 KBYTE FLASH Memory, 512 BYTE RAM
- Has 1 KBYTE EEPROM
- Has 3 of 16 BIT TIMER/COUNTER
- Has 4-Channel INPUT CAPTURE
- Has 10BIT A TO D/ 6-Channel 500KSPS
- Has 1-Channel UART
- Has Circuit SPI, I2C, WATCHDOG, POWER-ON RESET, PWM



- Use CRYSTAL 7.3728 MHz; can use with PLL to run at the maximum speed of 29.4912 MHz (for version dsPIC30F4011)
- Has Connector RS232 4PIN ETT 1-Channel for version dsPIC30F2010 and 2-Channel for version dsPIC30F4011
- Use 14 PIN HEADER LCD for CHARACTER TYPE LCD
- Has 1 LED to test the operation by using RBO
- RJ11 ICD2 PORT according to ICD2 MICROCHIPS supports IN-CIRCUIT and DEBUG, SW to ON/OFF signal pins for PROGRAM/DEBUG and RUN, and LED to display operating modes (if using with this Connector RJ11 ICD2 PORT, it is compatible with ETT products such as ET-PGM PIC USB V1, ET-PGM PIC USB V1 PLUS, ET-PGM PIC USB V2, ET-ICDX V1.0, ET-PGM PIC PK3, ET-PGM PIC PK3 PLUS)
- Has 3 of Connector I/O PORT 10 PIN ETT
- Has POWER SUPPLY AC/DC INPUT 7-10V, use 5V/1A SWITCHING LM2575 REGULATE to reduce heat from the Circuit REGULATE
- Mini PCB SIZE 8x6cm. according to ETT standard
- ET-BASE dsPIC30F4011/2010 Kit consists of

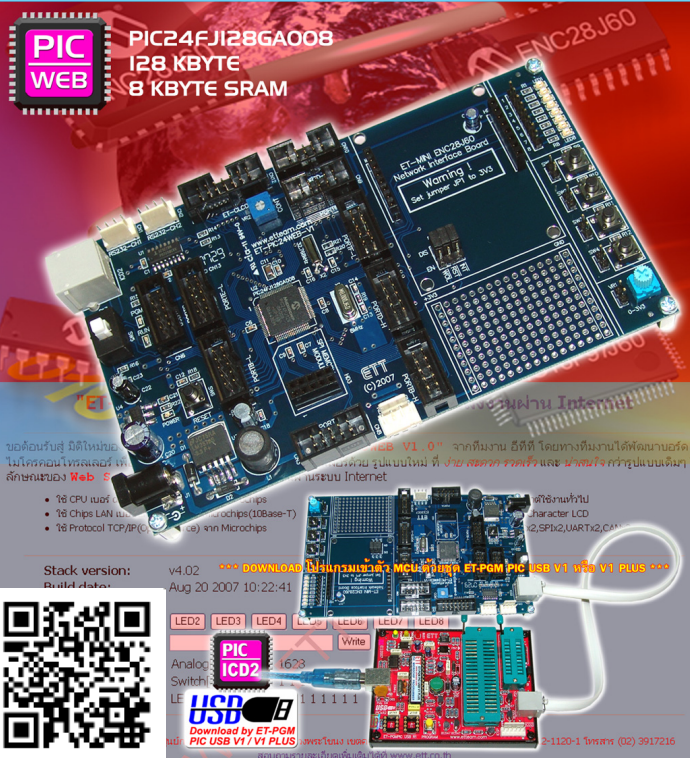
1. BOARD 2. CD-ROM User's Manual, Example Programs





**ET-PIC24WEB V1**

(P-ET-A-00347)



**PIC WEB** PIC24FJ128GA008  
128 KBYTE  
8 KBYTE SRAM

ขอด้วยรุ่นนี้ มีดีใหม่ของ ไมโครคอนโทรลเลอร์ด้วย รุ่นใหม่ ที่ **งาน Server Control** เพื่อการใช้งานผ่านระบบ Internet

- 16 CPU cores
- 16 Chips LAN
- 16 Protocol TCP/IP

Stack version: v4.02  
Build date: Aug 20 2007 10:22:41

Download ET-PGM PIC USB V1 PLUS V1 PLUS

LED2 LED3 LED4  
Analog Switch ICD2  
LE

Download by ET-PGM PIC USB V1 PLUS

ET-PIC24WEB V1 is PIC Board Microcontroller from MICROCHIP uses 16 BIT MICROCONTROLLER No.PIC24FJ128GA008 to be MCU on board.

- 80 PIN TQFP MCU PIC24FJ128GA008
- FLASH MEMORY 128 KBYTE, SRAM 8 KBYTE
- 16 MIPS to process data at CLOCK 32 MHz
- RUN X'TAL 8 MHz and can set to RUN up to 32 MHz
- Voltage 2.0V to 3.3V
- I/O PORT 70 BIT, 10 BIT 16 CH A TO D
- 14 PIN LCD PORT as CHARACTER TYPE
- RJ11 (ICD2) to download program into MCU by ET-PGM PIC USB V1/V1 PLUS/V2, ET-PGM PIC PK3/PK3 PLUS, ET-ICDX V1 with SW to select operation modes
- RS232 PORT 2 CH 4 PIN ETT (ICL3232)
- CIRCUITS to test operation
  - > 8 Circuits to interface with LED
  - > 4 Circuits to interface with SW
  - > 1 Circuit to interface with VR
- Connecting Point for Module ET-MINI ENC28J60 to interface with ETHERNET
- Connecting Point of EEPROM ET-25LC256
- 9 CONNECTOR 10 PIN ET BUS I/O
- 2 POWER SUPPLY ON BOARD; 3.3V uses LM2575-3.3 and 5V uses AP1117-5.0
- POWER SUPPLY DC 7 - 12 VDC
- PCB SIZE 15.3 x 9 cm.
- ET-PIC24WEB V1 consists of
  1. Board ET-PIC24WEB V1
  2. CD-ROM User's Manual and Example Programs

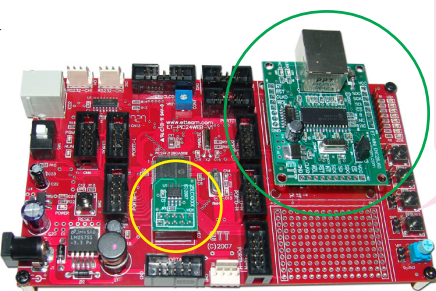
**ET-25LC256**

(P-ET-A-00345)



It is a board with EEPROM No.25LC256 from MICROCHIP that is SPI Interface. It is designed to use with ET-PIC24WEB V1 and ET-dsPIC33WEB V1 by using with Board ET-MINI ENC28J60.

> Example picture of interfacing Board ET-MINI ENC28J60 and Board ET-25LC256 with Board ET-dsPIC33WEB V1.0/ET-PIC24WEB V1.0.



**ET-dsPIC33WEB V1**

(P-ET-A-00348)



**dsPIC WEB** dsPIC33FJ128GP708  
128 KBYTE  
16 KBYTE RAM

ขอด้วยรุ่นนี้ มีดีใหม่ของ ไมโครคอนโทรลเลอร์ด้วย รุ่นใหม่ ที่ **งาน Server Control** เพื่อการใช้งานผ่านระบบ Internet

Stack version: v4.02  
Build date: Aug 20 2007 10:22:41

Download ET-PGM PIC USB V1 PLUS V1 PLUS

LED2 LED3 LED4  
Analog Switch ICD2  
LE

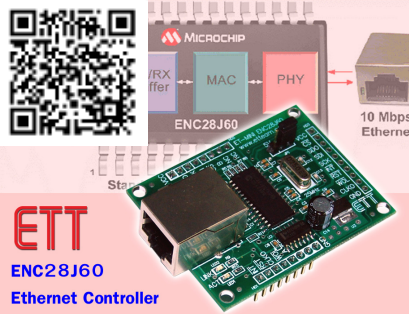
Download by ET-PGM PIC USB V1 PLUS

It is dsPIC BOARD MICROCONTROLLER from MICROCHIP by using 16 BIT MICROCONTROLLER No.dsPIC33FJ128GP708.

- 80 PIN TQFP DIGITAL SIGNAL CONTROLLERS MCU No. dsPIC33FJ128GP708
- FLASH MEMORY 128 KBYTE, RAM 16 KBYTE
- 40 MIPS to process data at CLOCK 40 MHz
- RUN X'TAL 8 MHz and can set to RUN up to 40 MHz by PLL
- I/O PORT 69 BIT, 10 BIT 24 CH A TO D and can program it to be 12 BIT 2 CH, CAN 2 CH
- RUN Voltage 3.0V to 3.6V and can interface with signal 5V TTL (5V TOLERANT)
- 14 PIN LCD PORT as CHARACTER TYPE
- RJ11 (ICD2) to download program into MCU by ET-PGM PIC USB V1/V1 PLUS/V2, ET-PGM PIC PK3/PK3 PLUS, ET-ICDX V1 with SW to select operation modes
- RS232 2 CH 4 PIN ETT (ICL3232)
- Circuits to test operation
  - > 8 Circuits to interface with LED
  - > 4 Circuits to interface with SW
  - > 1 Circuit to interface with VR
- Connecting Point for Module ET-MINI ENC28J60 to interface with ETHERNET
- Connecting Point of EEPROM ET-25LC256
- 9 CONNECTOR 10 PIN ET BUS I/O
- 2 POWER SUPPLY ON BOARD; 3.3V uses LM2575-3.3 and 5V uses AP1117-5.0
- POWER SUPPLY DC 7 - 12 VDC
- PCB SIZE 15.3 x 9 cm.
- ET-dsPIC33WEB V1 consists of
  1. Board ET-dsPIC33WEB V1
  2. CD-ROM User's Manual and Example Programs.

**ET-MINI ENC28J60**

(P-ET-A-00346)



It is Board in ET-MINI version; in this case, it is Module that is designed to be intermediate of communication system between Board Microcontroller and Ethernet Network to support operation of TCP/IP Protocol.

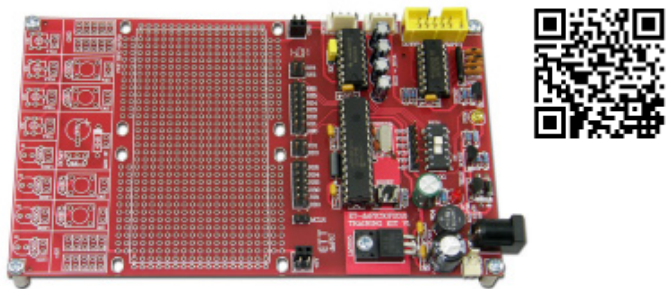
• Use IC ENC28J60 from MICROCHIP to be IC ETHERNET CONTROLLER to support IEEE 802.3 standard Communication

ENC28J60 Ethernet Controller

- Interface signal pin to control through SPI BUS with maximum high speed 10 MB/S
- Select types of Power Supply either 3.3V or 5V with Buffer Circuit, Connector RJ45 ETHERNET
- Can be used with Board ET-PIC24WEB V1 and ET-dsPIC33WEB V1 directly and there is example program to develop program from MICROCHIP (MICROCHIP TCP/IP STACK)
- PCB SIZE 4.4 x 5.6 cm.
- ET-MINI ENC28J60 consists of
  1. ET-MINI ENC28J60 Board
  2. CD-ROM User's Manual and Example Programs.



## ET-dsPIC30F2010 V1 (P-ET-A-00269)



ET-dsPIC 30F2010 V1 consists of;

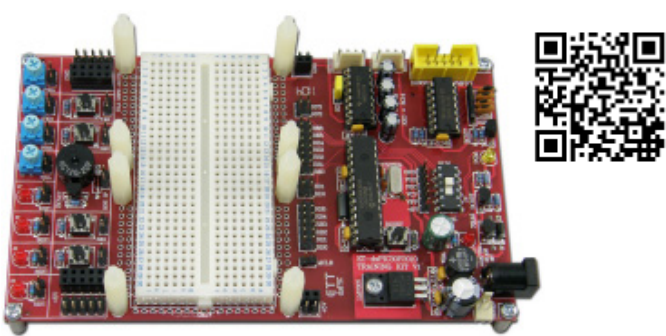
- MCU No.dsPIC30F2010 28 PIN DIP TYPE
- FLASH MEMORY 12 KBYTE (4KWORD), RAM 512 BYTE, EEPROM 1 KBYTE, TIMER 16 BIT 3 CH, INPUT CAP 4 CH, PWM 2 CH, MOTOR CONTROL PWM 6 CH, A TO D 10 BIT 6 CH
- X'TAL 7.3728 MHz (CAN BE MULTIPLIED BY 16 TO BE 117.9648 MHz)
- RS232 ON BOARD MAX232 4 PIN ET
- IN-CIRCUIT DOWNLOAD PROGRAM AS HIGH VOLT ON BOARD
- PIN HEADRER I/O 18 PIN WITH WHITE PRINTED NAME
- PCB 8.5 x 5.3 CM.
- PCB SIZE 15.3 x 9 CM.
- 7805 POWER SUPPLY and 13VDC/100 mA ON BOARD USING POWER INPUT DC 14-18V
- WE USE PROGRAM WINPIC800 FOR DOWNLOAD PROGRAM AND USE DOWNLOAD SET OF ET-CAB10P V2 TO INTERFACE WITH COMPUTER PC THROUGH DB 25 PIN PRINTER PORT AND THEN RUN ON OS WINDOWS 98/ME/2000/NT/XP
- **ET-dsPIC30F2010 V1 INCLUDES ...**

1. ET-dsPIC30F2010 BOARD
2. CD-ROM OF USER MANUAL AND SAMPLE PROGRAM FOR DOWNLOADING PROGRAM
3. DOWNLOAD SET OF ET-CAB10P V2



(Board ET-dsPIC30F2010 V1 and V1 EXP uses POWER SUPPLY 14-18V, we recommend user should use it with DC ADAPTER 16V version ET-A06 to be OPTION 180.-)

## ET-dsPIC30F2010 V1 EXP (P-ET-A-00270)



- PROJECT BOARD AD-100 (SIZE 81 x 42 x 9 MM.)
- 4 VR 10 K WITH INTERSECTION POINT
- 4 TACT SW WITH INTERSECTION POINT
- 4 LED DOT WITH INTERSECTION POINT
- 1 MINI SPEAKER WITH INTERSECTION POINT
- CAN BE INTERFACED WITH ETT MINI I/O BOARD (OPTION) WITH C LANGUAGE SAMPLE PROGRAM SUCH AS DC-MOTOR, STEPPING MOTOR, I<sup>2</sup>C PCF8574, I<sup>2</sup>C EEPROM, I<sup>2</sup>C RTC, SPI OUTPUT 74HC95, MATRIX KEYBOARD 4 x 4, 7-SEGMENT
- **ET-dsPIC30F2010 V1 EXP INCLUDES...**

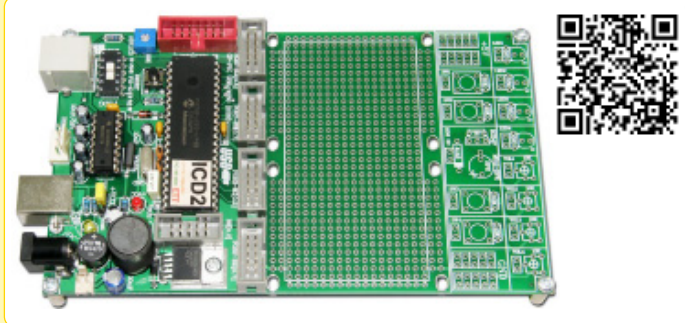
1. BOARD ET-dsPIC30F2010 V1 WITH EXP WITH PROJECT BOARD
2. DOWNLOAD SET OF ET CAB10P V2
3. CD-ROM OF USER MANUAL AND SAMPLE PROGRAM FOR DOWNLOADING PROGRAM
4. ET-CABLE RS232 DB9 PIN



## CP-PIC USB/4550 (ICD2) (P-CP-A-00094)

## CP-PIC USB/4553 (ICD2) (P-CP-A-00098)

It is a new release board that has USB Module Communication insides and can program data into PIC by ET-PGM PIC USB of ETT. There are 2 types; CP-PIC USB/4550 (ICD2) and CP-PIC USB/4553 (ICD2) for general applications.



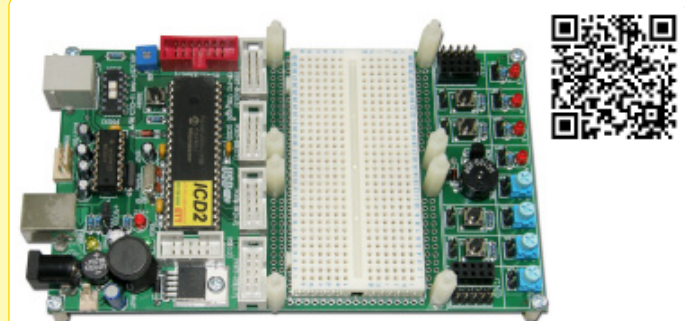
1. **CP-PIC USB/4550 (ICD2)** Use 40 PIN DIP MCU No.PIC18F4550 32 KBYTE FLASH Memory, 2048 BYTE RAM, 256 BYTE EEPROM, A TO D 10 BIT 13 CH.
  2. **CP-PIC USB/4553 (ICD2)** Use 40 PIN DIP MCU No.PIC18F4553 32 KBYTE FLASH Memory, 2048 BYTE RAM, 256 BYTE EEPROM, A TO D 12 BIT 13 CH.
- RUN X'TAL ON BOARD 20MHz; can used PLL to RUN 48MHz
  - I/O PORT 28 BIT on 5 CONNECTOR 10 PIN ET BUS I/O
  - A TO D 10 BIT 13 CHANNEL
  - 14 PIN LCD PORT CHARACTER TYPE
  - RJ-11 to download PROGRAM into MCU by ET-PGM PIC USB V1/V1 PLUS/ V2, ET-PGM PIC PK3/PK3 PLUS and SW. to select Operation Mode
  - RS232 PORT 1 CHANNEL 4 PIN ETT
  - PCB Size: 15.3 x 9 CM.
  - FULL SPEED USB PORT TYPE B ON BOARD
  - POWER SUPPLY 5V ON BOARD as SWITCHING No. LM2575T-5.0 can be used with DC ADAPTER version 10VDC/850mA (A-AP-A-00001 **OPTION**)
  - **CP-PIC USB/4550 (ICD2) / CP-PIC USB/4553 (ICD2) consists of**
1. BOARD
  2. CABLE USB A TO B TYPE
  3. CD-ROM User's Manual



## CP-PIC USB/4550 EXP (ICD2) (P-CP-A-00095)

## CP-PIC USB/4553 EXP (ICD2) (P-CP-A-00099)

Its specifications are the same as version CP-PIC USB/4550 (ICD2) / CP-PIC USB/4553 (ICD2) but this version includes circuit for experiment and PROJECT BOARD.



- PROJECT BOARD VERSION AD-100 (Size 81 x 42 x 19 mm.) 360 POINTS
  - 4 VR 10K R with connecting point
  - 4 TACT SW with connecting point
  - 4 LED DOT with connecting point
  - 1 MINI SPEAKER with connecting point
  - It can be connected with MINI I/O BOARD (OPTION) of ETT
  - **CP-PIC USB/4550 EXP (ICD2) / CP-PIC USB/4553 EXP (ICD2) consists of ...**
1. BOARD and PROJECT BOARD
  2. CABLE USB A TO B TYPE
  3. CD-ROM User's Manual and Example Program.

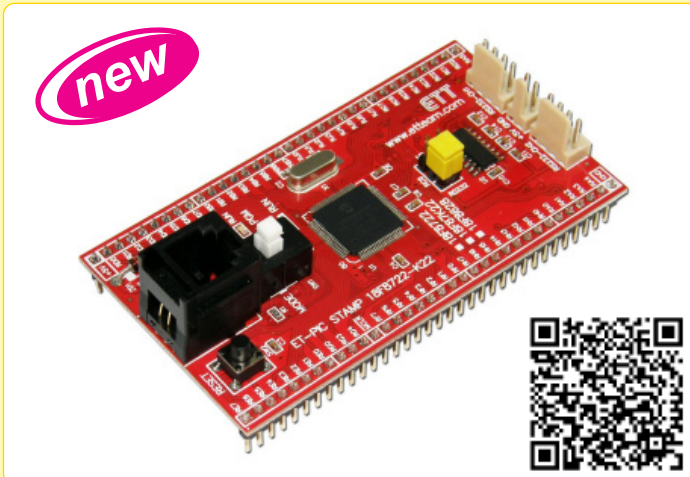




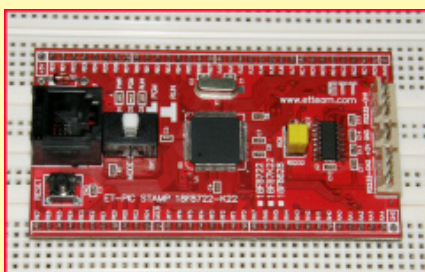
**ET-PIC STAMP 18F87K22 (ICSP)**

(P-ET-A-00487)

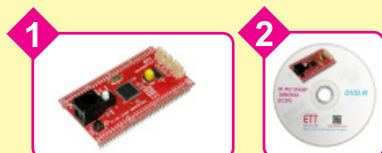
**ET-PIC STAMP 18F87K22** is Board Microcontroller in a series of PIC 18F87K22 80PIN TQFP from MICROCHIP. Board designs I/O of MCU to CONNECTOR in the format of DIP, so it is easier to apply this board or its interface with PROJECT BOARD easily. It provides 2-CH of Connector RS232 that has already been passed LINE DRIVER, including Connector +5V. DOWNLOAD program into board through Connector RJ11 by using Programmer ET-PGM PIC USB PK3, PK3 PLUS from ETT or PICKIT3, ICD3 from MICROCHIP.

**Specifications of MCU 18F87K22**

- MCU runs in the Frequency range of 1.8V-5.5VDC; 80 PIN TQFP
- The maximum Frequency is 64 MHz.
- 128 KBYTE FLASH PROGRAMMER; 1024 BYTE EEPROM; 4 KBYTE RAM
- Has I/O = 69 PIN, ADC 12 BIT 24 CH, I2C or SPI = 2 CH
- Has UART = 2 CH, PWM = 7 CH (CCP), and 3 CH (ECCP)
- Has TIMER 8 BIT = 6 TIMER and TIMER 16 BIT = 5 TIMER

**Specifications of Board ET-PIC STAMP 18F87K22**

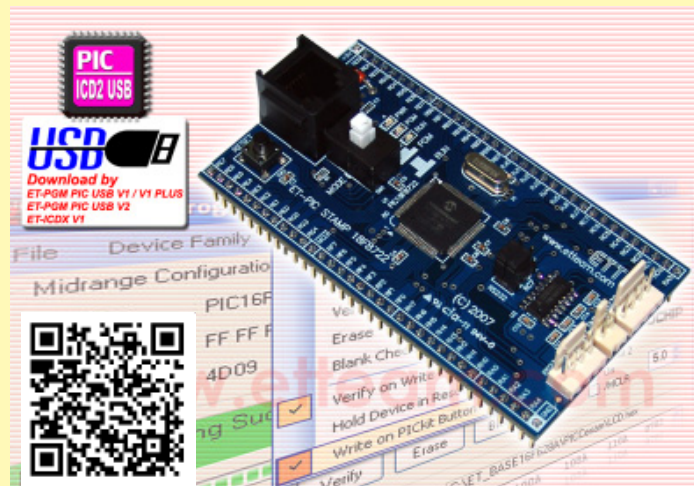
- DOWNLOAD program through Connector RJ11 by External Programmer such as ET-PGM PIC PK3, PK3 PLUS or PICKIT3, ICD3
- Has 2-CH of Connector RS232 4 PIN ETT that has already been passed LINE DRIVER
- Board uses X'TAL 16 MHz; it can use PLL internal MCU to increase the frequency up to 64 MHz
- Connector of board is designed to be PIN HEADER 2.54 mm. PITCH, 34 PIN per each side (68 PIN for both sides)
- POWER SUPPLY 5VDC is 2PIN POWER INPUT (it can use ET-SWITCHING ADAPTER 5V/2V TYPE H (OPTION))
- PCB Size: 8.8 x 4.8 cm.
- **ET-PIC STAMP 18F87K22** consists of...
  1. Board ET-PIC STAMP 18F87K22
  2. CD-ROM Program and Manual

**ET-PIC STAMP 18F8722 (ICD2)**

(P-ET-A-00400)

**ET-PIC STAMP 18F8628 (ICD2)**

(P-ET-A-00375)



PIC Board of MICROCHIP is designed as compact board that is easy to use or connect with PROJECT BOARD. Moreover, there's necessary devices to use or develop board with [ET-PGM PIC USB V1/V1 PLUS/V2](#), [ET-ICDX V1](#), [ET-PGM PIC PK3/PK3 PLUS](#) that can be connected PORT USB of computer and Board ET-PIC STAMP through standard Connector RJ-11 (ICD2).

There are 2 models

1. **ET-PIC STAMP 18F8722 (ICD2)** Use 80PIN TQFP TYPE MCU No. PIC18F8722 128 KBYTE FLASH MEMORY, 3936 BYTE RAM, 1024 BYTE EEPROM, A TO D 10 BIT 16 CH.
2. **ET-PIC STAMP 18F8628 (ICD2)** Use 80PIN TQFP TYPE MCU No. PIC18F8628 128 KBYTE FLASH MEMORY, 3936 BYTE RAM, 1024 BYTE EEPROM, A TO D 12 BIT 16 CH.

- RUN X'TAL ON BOARD 10MHz; can set RUN up to 40MHz inside MCU from X'TAL 10 MHz

- 70 BIT I/O PORT

- RJ-11 (ICD2) to download program into CPU by [ET-PGM PIC USB V1](#), [ET-PGM PIC USB V1 PLUS](#), [ET-PGM PIC USB V2.0](#), [ET-ICDX V1.0](#), [ET-PGM PIC PK3](#), [ET-PGM PIC PK3 PLUS](#) and there's SW to select operation mode

- RS232 PORT 2 CHANNELS CONECTOR 4 PIN ETT (ICL3232 ON BOARD)

- FUNCTION internal MCU; A TO D 10 BIT 16 CH, TIMER/COUNTER, PWM, WATCH DOG

- PIN HEADER Connector from board is 2.54mm wide interval between each pin; there are 34 PIN per each side (68 PIN)

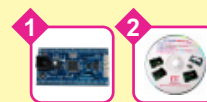
- POWER SUPPLY 5VDC, 2 PIN POWER INPUT (can be used with DC POWER ET-SWITCHING ADAPTER 5V/2A TYPE H (OPTION))

- PCB Size 8.8 x 4.8 cm.

- **ET-PIC STAMP 18F8722 (ICD2) / ET-PIC STAMP 18F8628 (ICD2)**

consists of

1. BOARD
2. CD-ROM User's Manual and Example Program



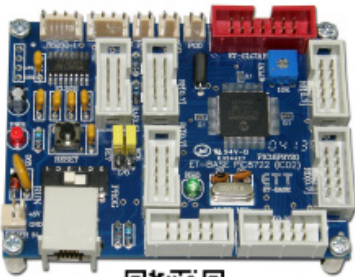
\*\*\* Board CP-PIC V3/458 (ICD2), CP-PIC V3/877 (ICD2), CP-PIC V3/458 EXP (ICD2), CP-PIC V3/877 EXP (ICD2), CP-PIC V4/458 (ICD2), CP-PIC V4/877 (ICD2) can download program into MCU by ET-PGM PIC USB V1 or ET-PGM PIC USB V1 PLUS or ET-PGM PIC USB V2.0 or ET-ICDX V1.0 through PORT RJ-11 (ICD2) \*\*\*

**ET-BASE PIC8722 (ICD2)**

(P-ET-A-00335)

**ET-BASE PIC8628 (ICD2)**

(P-ET-A-00376)



New PIC Board that can be used with Programmer "ET-PGM PIC USB V1 or V1 PLUS" is interfaced with ETT PORT USB of computer PC through standard Connector of MICROCHIP CO., Ltd. Connector RJ-11 (ICD2) that can be used independently or interface with Board ET-BASIC I/O V1. There are **2 models**

- ET-BASE PIC8722 (ICD2)** Use MCU No. PIC18F8722 80 PIN TQFP TYPE FLASH 128 KBYTE, RAM 3936 BYTE, EEPROM 1024 BYTE, A TO D 10 BIT 16 CH.
- ET-BASE PIC8628 (ICD2)** Use MCU No. PIC18F8628 80 PIN TQFP TYPE FLASH 128 KBYTE, RAM 3936 BYTE, EEPROM 1024 BYTE, A TO D 12 BIT 16 CH.
  - RUN X'TAL ON BOARD 10 MHz and can be set to run up to 40 MHz
  - I/O PORT 70 BIT
  - 7 CONNECTOR 10 PIN BUS I/O
  - 14 PIN LCD PORT CHARACTER TYPE
  - RJ-11 (ICD2) to download program into MCU by ET-PGM PIC USB V1/V1 PLUS/V2, ET-ICDX V1, ET-PGM PIC PK3/PK3 PLUS and SW. to select mode operation
  - RS232 PORT 2 CHANNEL 4 PIN ETT (ICL3232 ON BOARD)
  - A TO D 10 BIT 16 CH
  - TIMER/COUNTER, PWM, WATCHDOG
  - POWER SUPPLY 5VDC can be used with ETT POWER SUPPLY VERSION ET-SWITCHING ADAPTER 5V/1.2A TYPE H
  - PCB SIZE 6.2 x 8.1 cm standard ET-BASE SIZE
  - ET-BASE PIC8722 (ICD2) /**

**ET-BASE PIC8628 (ICD2)** consists

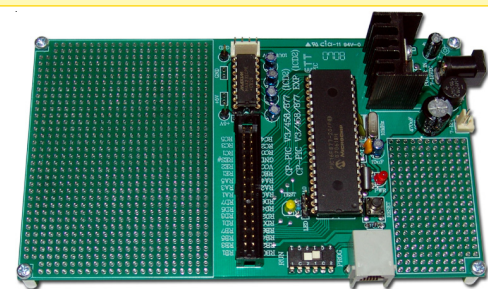
- Board
- CD-ROM User's Manual

**CP-PIC V3/458 (ICD2)**

(P-CP-A-00088)

**CP-PIC V3/877 (ICD2)**

(P-CP-A-00089)



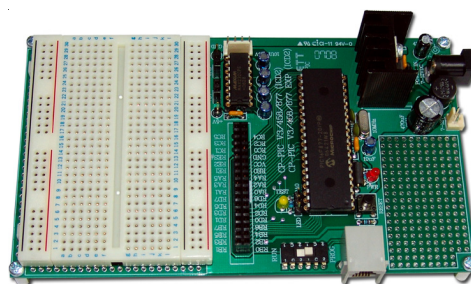
- VERSION **CP-PIC V3/485 (ICD2)** uses CPU No. PIC18F458 that can run frequency up to 40 MHz ON CHIP FLASH PROGRAM MEMORY 32K BYTE, RAM 1536 BYTE, EEPROM 256 BYTE, A TO D 10 BIT 8 CHANNEL
  - VERSION **CP-PIC V3/877 (ICD2)** uses CPU No. PIC16F877 that can run frequency up to 10 MHz ON CHIP FLASH PROGRAM MEMORY 8 KWOPDS, 368 BYTES RAM/256 BYTES EEPROM, A TO D 10 BIT 8 CHANNEL
  - HIGH CURRENT SINK/SOURCE 25/25 mA
  - RJ-11 (ICD2) to download program into MCU by ET-PGM PIC USB V1/V1 PLUS/V2, ET-ICDX V1, ET-PGM PIC PK3/PK3 PLUS and SW. to select mode operation
  - RS232 ON BOARD MAX232
  - Project PCB Board SIZE 8.5 x 6 cm.
  - 7805 POWER SUPPLY ON BOARD uses POWER DC 9-12 VOLT
  - PCB BOARD SIZE 15.3 x 9 cm.
  - CP-PIC V3/458, V3/877 (ICD2)** consist
- Board
  - CD-ROM User's Manual

**CP-PIC V3/458 EXP (ICD2)**

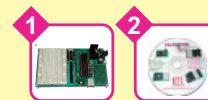
(P-CP-A-00090)

**CP-PIC V3/877 EXP (ICD2)**

(P-CP-A-00091)



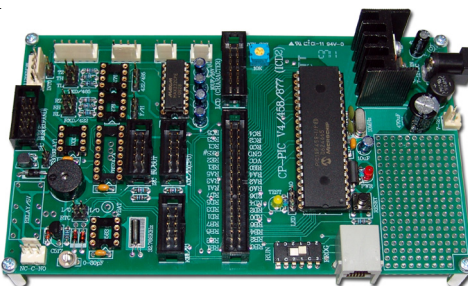
- CP-PIC V3/458 EXP (ICD2) and CP-PIC V3/877 EXP (ICD2) has the specifications as same as version CP-PIC V3/458 (ICD2) and CP-PIC V3/877 (ICD2) but there's additional PROJECT BOARD and change Connector 34 PIN ET BUS to PIN HEADER Female. So, it can interface Cable into Project Board and increase Connector Female in the part of VCC and GND to interface with Project Board.
  - PROJECT BOARD version AD-102 that is 8 x 6 cm. is good quality to interface circuit from Pin of CPU PIC easily. It is used to study operation of circuits by interfacing signal from Connector 34 PIN Female to PROJECT BOARD. We maybe use it with JUMPER SET ET-JWBOX 300 to test with PROJECT BOARD or using with Test Devices and PROJECT BOARD. There are basic devices for testing such as R, C, LED, 7-SEGMENT, KEY SWITCH 3x4, STEPPING MOTOR and etc. It is called ET-HARDWARE KIT V1.
  - CP-PIC V3/458 EXP and V3/877 EXP (ICD2)** consists
- Board
  - CD-ROM User's Manual.

**CP-PIC V4/458 (ICD2)**

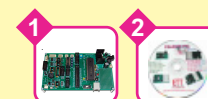
(P-CP-A-00092)

**CP-PIC V4/877 (ICD2)**

(P-CP-A-00093)



- CP-PIC V4/458 (ICD2) uses CPU PIC18F458 that can run frequency up to 40 MHz ON CHIP FLASH PROGRAM MEMORY 32K BYTE, RAM 1536 BYTE, EEPROM 256 BYTE, A TO D 10 BIT 8 CHANNEL
  - CP-PIC V4/877 (ICD2) uses CPU PIC16F877 that can run frequency up to 10 MHz ON CHIP FLASH PROGRAM MEMORY 8 KWOPDS, 368 BYTES RAM/256 BYTES EEPROM, A TO D 10 BIT 8 CHANNEL
  - HIGH CURRENT SINK/SOURCE 25/25 mA
  - RJ-11 (ICD2) to download program into MCU by ET-PGM PIC USB V1/V1 PLUS/V2, ET-ICDX V1, ET-PGM PIC PK3/PK3 PLUS and SW. to select mode operation
  - RS232 ON BOARD, RS422/485 75176 (OPTION)
  - PCF 8574 INPUT, I2C OUTPUT PORT (OPTION)
  - 34 PIN I/O ET BUS, 10 PIN ET PORT, 10 PIN I2C IN/OUT, 10 PIN I2C BUS, 10 PIN ADC/IO, CONNECTOR MAGNETIC CARD of ETT
  - RTC PCF8583 that is I2C Interface with internal RAM 240 BYTE (OPTION)
  - 24XX 1K-64K BYTE MEMORY (OPTION)
  - 1 RELAY 2 CONTRAC COIL 5 VDC (OPTION)
  - MINI SPEAKER ON BOARD
  - 14 PIN LCD PORT CHARACTER TYPE
  - 7805 POWER SUPPLY ON BOARD uses POWER DC 9-12 VOLT
  - CP-PIC V4/458 and V4/877 (ICD2)** consists
- Board
  - CD-ROM User's Manual





**ET-BASE PIC40/877**

(P-ET-A-00268)

**ET-BASE PIC40/458**

(P-ET-A-00285)

**ET-BASE PIC40/4620**

(P-ET-A-00286)



PIC Board from MICROCHIP CO, Ltd. is designed to be mini board to control general applications or use with ET-BASIC I/O V1 to test circuit. There are 3 versions depend on Flash memory size internal MCU.



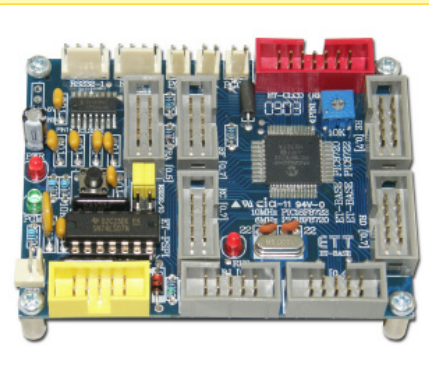
- Version **ET-BASE PIC40/877** uses PIC16F877-20 DIP 40 PIN, FLASH Memory 8K WORDS, RAM 368Byte, EEPROM 256Byte, A TO D 10 BIT 8 CH
- Version **ET-BASE PIC40/458** uses PIC18F458 DIP 40 PIN to be permanent MCU on board, FLASH Memory 32KBYTE, RAM 1536BYTE, EEPROM 256BYTE, A TO D 10 BIT 8 CH
- Version **ET-BASE PIC40/4620** uses PIC18F4620 DIP 40 PIN to be permanent MCU on board, FLASH Memory 64KBYTE, RAM 3986BYTE, EEPROM 1024BYTE, A TO D 10 BIT 13 CH
- RUN X'TAL 10 MHz, both MCU numbers (PIC18F458 and PIC18F4620) can PHASE LOCK LOOP frequency to run up to 40 MHz
- 4 PORT I/O 10 PIN ET
- 1 RS232 PORT 4 PIN ETT
- I/O HIGH-CURRENT SINK/SOURCE 25mA/25mA
- PWM, WATCHDOG
- POWER SUPPLY 5VDC (can be used with POWER SUPPLY of ETT version ET-SWITCHING ADAPTER 5V 2A TYPE H (OPTION))
- PCB SIZE 6.2 x 8.1 cm.
- Can download program into FLASH Memory directly as LOW VOLT, using Program WINPIC800 through PORT PRINTER and can run on WINDOWS 98/ME/XP/2000

• **ET-BASE PIC40/877/458 and 4620** consist

1. Board
2. CD-ROM User's Manual, Example Program
3. Cable DOWNLOAD ET-CAB10P V2

**ET-BASE PIC8720**

(P-ET-A-00313)



It is a PIC Board family from MICROCHIP No.PIC18F8722 that has Memory up to 128 KBYTE with I/O 70 BIT. It can be used as a general Board CONTROLLER or can be interfaced with ET-BASIC I/O V1.

• CPU No.PIC18F8720  
-I/P, 80 PIN TQFP TYPE,  
FLASH MEMORY 128 KBYTE, RAM 3936 BYTE,  
EEPROM 1024 BYTE

- RUN X'TAL ON BOARD 20MHz and can set to RUN up to 40MHz
- I/O PORT 70 BIT
- 7 of 10 PIN ET BUS I/O
- 14 PIN LCD PORT CHARACTER TYPE
- 10 PIN ET-PSPI for DOWNLOAD
- RS232 PORT 2 CHANNEL 4 PIN ETT (ICL3232 ON BOARD)
- A TO D 10 BIT 16 CH
- TIMER/COUNTER, PWM, WATCHDOG
- POWER SUPPLY 5VDC can be used with POWER SUPPLY from ETT version ET-SWITCHING ADAPTER 5V/1.2A TYPE H (A-AP-A-00058)
- PCB size 6.2 x 8.1 cm. standard ET-BASE SIZE

Continue ...

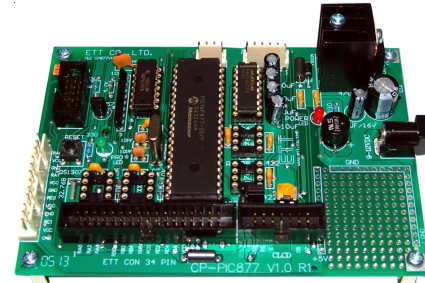
- Can directly DOWNLOAD Program into Internal FLASH Memory PIC18F8722 as LOW VOLT by using Program WINPIC800 through PRINTER PORT of PC and RUN on WINDOWS 98/ME/XP/2000

• **ET-BASE PIC8720** consists of ...

1. ET-BASE PIC8722 BOARD
2. CD-ROM User's Manual
3. CABLE DOWNLOAD ET-CAB10P V2

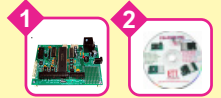
**CP-PIC877 V1**

(P-CP-A-00029)

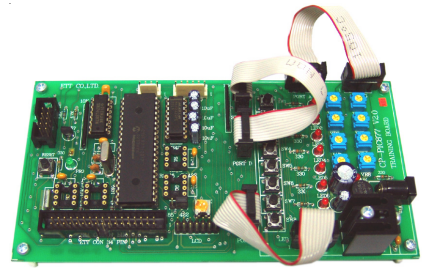


Be able to use ET FLASH TECHNOLOGY INCIRCUIT DOWNLOAD System and write program on Computer PC and then download into board. Uses write program with Basic Language named "PIC Basic PRO Compiler" or Assembly Language or C Language named PIC C COMPILER because it's easily and quickly to use.

- CPU NO.PIC16F877 HIGH PerformanceRisc CPU
  - X'TAL 4 MHz 250ns PER 1 INSTRUCTION
  - ON CHIP FLASH PROGRAM MEMORY 8 KWORDS (PIC877)
  - ON CHIP 368 BYTES RAM /256 BYTES EEPROM (PIC877)
  - ADC 10-BIT 8-CHANNEL
  - 14 INTERNAL / EXTERNAL INTERRUPT
  - SPI & 12C MASTER ON SLAVE MODE
  - POWER ON RESET
  - RS232 1-CHANNEL
  - RS422/485 1-CHANNEL (OPTION)
  - REAL TIM CLOCK DS107 (OPTION)
  - EEPROM 24XX (OPTION)
  - ET-BUS 34 PIN
  - LCD PORT 14 PIN (4 BIT INTERFACE)
  - 5 VOLT REGULATE ON BOARD
  - PCB SIZE 16.5 x 8.5 CM
  - **CP-PIC877 V1.0** INCLUDES;
1. CP-PIC877 V1.0 BOARD
  2. CD-ROM

**CP-PIC877 V2**

(P-CP-A-00030)



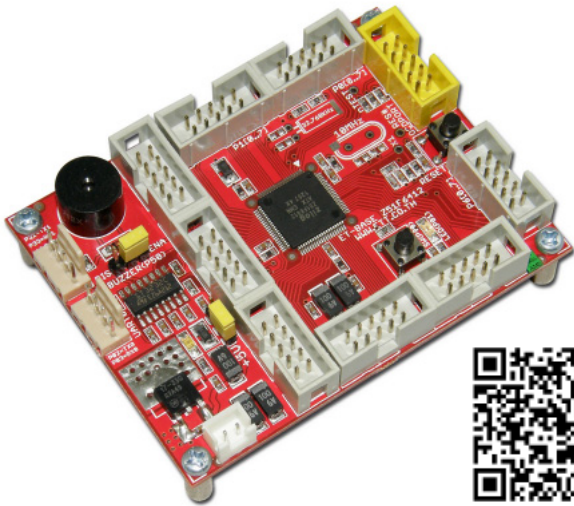
CP-PIC877 V2.0 BOARD is developed from CP-PIC877 V1 BOARD. There's 8-channel VR 10K as Analog Port in Input Port for Test Port A of CPU, 8-channel SW for Test Input, and 8-channel LED for Test Output.

- CPU NO.PIC16F877
  - X'TAL 4 MHz 250ns PER 1 INSTRUCTION
  - ON CHIP FLASH PROGRAM MEMORY 8 KWORDS (PIC877)
  - ON CHIP 368 BYTES RAM /256 BYTES EEPROM (PIC877)
  - ADC 10-BIT 8-CHANNEL
  - 14 INTERNAL / EXTERNAL INTERRUPT
  - SPI & 12C MASTER ON SLAVE MODE
  - POWER ON RESET
  - RS232 1-CHANNEL
  - RS422/485 1-CHANNEL (OPTION)
  - REAL TIM CLOCK DS107 (OPTION)
  - EEPROM 24XX (OPTION)
  - ET-BUS 34 PIN
  - LCD PORT 14 PIN (4 BIT INTERFACE)
  - VR 10K x 8 FOR TEST ANALOG PORT
  - LED x 8 FOR TEST OUTPUT, SWITCH x 8 FOR TEST INPUT
  - ETT CON 34 PIN PORTA, C, D
  - 5 VOLT REGULATE ON BOARD
  - PCB SIZE 16.5 x 8.5 CM
  - **CP-PIC877 V2.0** INCLUDES;
1. BOARD
  2. CD-ROM
  3. CABLE DOWNLOAD ET-CAB10P V2



**ET-BASE Z51F6412**

(P-ET-A-00475)



- Z 51F6412 ZILOG
- 2 CLOCK / 1 MACHINE CYCLE
- 4 CHANNEL UART
- A TO D 12 BIT 15 CHANNEL
- 64 KBYTE FLASH / 3 KBYTE XRAM

**ET-BASE Z51F6412** is the latest Board Microcontroller in the series of MCS51 from ZILOG, it improves specifications but it is cheap price; moreover, it changes the operation of I/O more special. For example, GPIO PORT is used to be PIN PULL-UP, PIN DEBOUNCE, PIN CHANGE INTERRUPT, USART, SPI, I2C, ADC, PWM, BUZZER CONTROL increase speed to 2 CLOCK per 1 command, increase Integer for calculation to 32BIT, A TO D 12 BIT, 4CH UART.

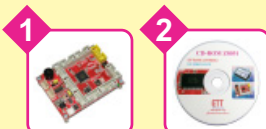
**Specifications of ET-BASE Z51F6412**

- Use MCU in the series of Z8051 (MCS51 BY ZILOG) No.Z51F6412, 80 PIN LQFP to be MCU on board. It runs at the high speed of 16MHz (2 CLOCK/ 1 Command).
- 64 KBYTE FLASH PROGRAM/ 3 KBYTE XRAM/ 256 BYTE IRAM
- INTERNAL OSC 16 MHz (+/-2%) divisor 2, 4, 8, 16 from program
- 66 BIT GPIO PORT can be programmed to be various I/O such as 15 CH 12 BIT ADC, 4 CH UART, 2 CH SPI, 1 CH 12C and etc
- Has Circuit CALCULATOR to multiply, divide 32Bit integer
- WATCH TIMER and WATCHDOG TIMER
- PROGRAMMABLE BROWN-OUT DETECT (1.6V,2.5V,3.6V and 4.2V)
- Has circuit to support CRYSTAL Frequency 10MHz and 32MHz

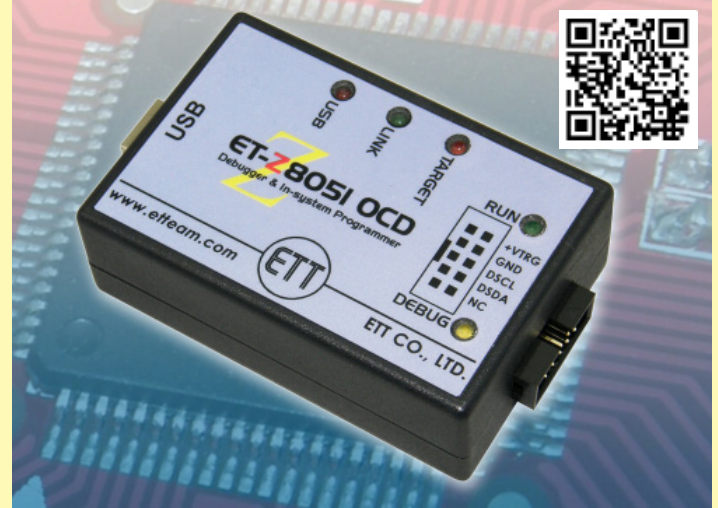
**(OPTION)**

- Support IN-SYSTEM PROGRAMMING (ISP) and DEBUGGER through 10 PIN HEADER by ET-Z8051 OCD (OPTION \*850.-)
- 64 BIT GPIO PORT is 8 of 10 PIN HEADER to apply to A/D, I<sup>2</sup>C, SPI, UART, INPUT, OUTPUT
- Has PORT RS232 with LINE DRIVER 2-CH 4 PIN ETT
- Has BUZZER with JUMPER, 1 Push Button SW to test
- 1 LED to test, 1 SW RESET
- 10 PIN HEADER OCD-PORT under the standard of ZILOG, it interfaces PROGRAM and DEBUGGER by Z8051 ON-CHIP-DEBUGGER or ET-Z8051 OCD
- Use +5VDC POWER SUPPLY for Board with REGULATE 3.3V/1A ON BOARD. There is JUMPER to choose level of Power Supply for MCU either to be 5V or 3.3V to interface with Board I/O easily, Connector POWER 2 PIN (it is compatible with ET-SWITCHING ADAPTER 5V 2A TYPE B (A-AP-A-00095))
- PCB size is 8.23 x 6.20 cm.
- **ET-BASE Z51F6412** consists of ...

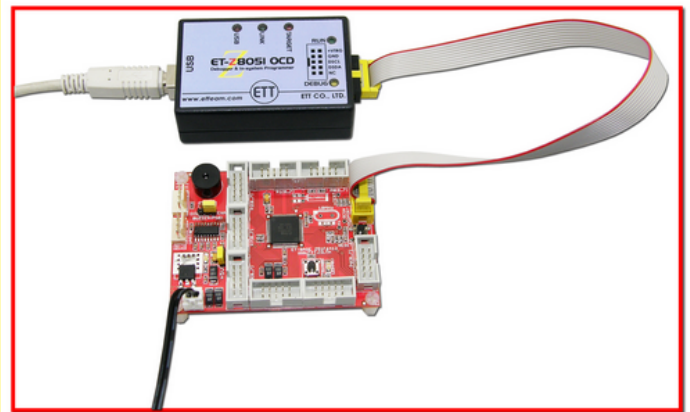
1. Board ET-BASE Z51F6412
2. CD-ROM User's Manual and Program

**ET-Z8051 OCD**

(P-ET-A-00476)



**ET-Z8051 OCD** is a tool to develop program MCU in the series Z8051 (MCS51) from ZILOG. It is used for DEBUG and IN-SYSTEM PROGRAM(ISP). MCU Z8051 can verify, test and see value of Registers, data in memory, variable of MCU while it actually is running.



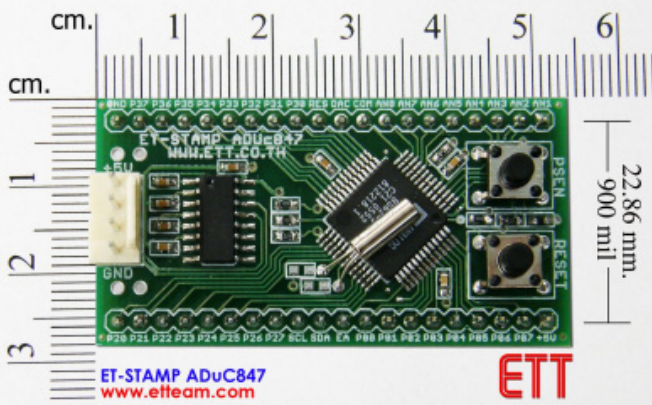
- Interface with computer PC through PORT USB, it is compatible with the Operating System of WINDOWS XP, VISTA 32/64 BIT, WINDOWS-7 32/64 BIT
  - Connector 10 PIN IDE to interface with TARGET BOARD of MCU
  - Support the operation with MCU in the series of Z8051 from ZILOG
  - Support HEX File and MAP/SYMBOL FILE
  - Can IN-SYSTEM PROGRAM(ISP) and DEBUGGER
  - Can access CODE in MCU, DEBUG by displaying the value in the format of variable
  - Show CODE and DISASSEMBLER
  - Setup PC and BREAK POINT, RUN, STEP, AUTO STEP...
  - AUTO DETECT MCU number and adjust Parameters by its own self
  - Support the operation with MCU throughout the standard range of voltage 2V-5.5V
  - Use Power Supply from PORT USB of PC
  - **ET-Z8051 OCD** consists of ...
1. Board ET-Z8051 OCD with Cable 10PIN
  2. Cable USB TYPE A/B
  3. CD-ROM User's Manual and Program





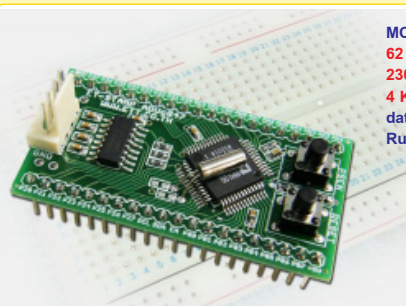
**ET-STAMP ADuC847(32K)**

(P-ET-A-00479)

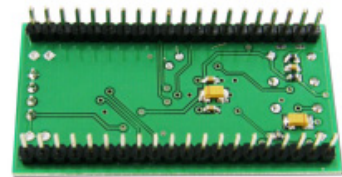


ET-STAMP ADuC847 is MCS51 Board Microcontroller No. ADuC847BS62-5 from ANALOG DEVICES Company. It runs at +5V (4.75-5.25V).

It is designed as a mini board that can be assembled with circuits easily and more convenient, including PROJECT BOARD.



MCU ADuC847BS62-5 52PIN MQFP  
62 KBYTE FLASH Memory,  
2304 BYTE RAM,  
4 KBYTE FLASH Memory for storing  
data  
Run as 1 CLOCK/1 Instruction



Board is placed on Connector PIN HEADER. There are 20 PIN per each side, so there is 40 PIN in total with 2.54 mm. PITCH. and 22.86 mm/900mil between row of PIN HEADER and 22.86 mm/900mil distance between row of PIN HEADER

**Specifications of ET-STAMP ADuC847**

- Use MCU No.ADuC847BS62-5 52PIN MQFP; 62 KBYTE FLASH Memory, 2304 BYTE RAM, and 4 KBYTE FLASH Memory for storing data
- MCU MCS51; run as 1 CLOCK/1 Instruction; use X'TAL 32.768KHz, Circuit PLL can process data 12.58 MIPS at the maximum
- Support programming data into MCU through PORT RS232; so, it is unnecessary to use any Programmer device
- Has 24BIT 8-CH A TO D and special functions; adjusting GAIN, Error Redemption, Interrupt Extermination, DIGITAL FILTER by SOFTWARE directly
- Has 12BIT 1-CH D TO A to generate maximum voltage of 0-5V (+VCC)
- Has Special 1-CH I2C BUS, it is not the same as standard PIN PORT
- Has additional circuits; WATCHDOG TIMER, 16BIT TIMER/COUNTER, 16BIT PWM
- Has 1 SW RESET, 1 SW PSEN for DOWNLOAD
- Has 4 PIN RS232 ICL3232 ON BOARD
- Has 5VDC POWER SUPPLY
- Board is placed on Connector PIN HEADER. There are 20 PIN per each side, so there is 40 PIN in total with 2.54 mm. PITCH. and 22.86 mm/900mil between row of PIN HEADER and 22.86 mm/900mil distance between row of PIN HEADER
- PCB SIZE: 2.8 x 5.4 cm.
- ET-STAMP ADuC847 consists of...
  1. Board ET-STAMP ADuC847
  2. CD-ROM Program and User's Manual

**CP-JR51ADU842 V1**

(P-CP-A-00077)

**ADuC842 MICROCONVERTER 12-BIT ADC AND DAC WITH EMBEDDED HIGH SPEED 62-KB FLASH MCU**

It is new MCU from ANALOG DEVICES which has higher potential than CPU No.ADU832.

- PIN COMPATABLE UPGRADE OF ADU832 52 PIN MQFP RUN 1 CLOCK per 1 COMMAND
- SINGLE-CYCLE 20 MIPS 8052 CORE
- HIGH SPEED 420 KSPS 12 BIT ADC
- 62 KBYTE ON-CHIP FLASH
- 4 KBYTE EEPROM DATA, RAM 2304 BYTE

New Board Development MCS51 family is developed from CP-JR51ADU832 V1. It is higher speed of MCU and A to D. we can write program on computer PC then send data DOWNLOAD through PORT RS232 into board directly without using other programmers. In this case, we use Program of ANALOG DEVICES and runs on OS WINDOWS 98/ME/XP/2000.

- MCU No.ADU842BS62 52 PIN MQFP
- RUN 1 CLOCK per 1 COMMAND maximum 16.78 MIPS (16.78 million COMMANDS per SECOND), FREQUENCY X'TAL 32.768 KHz
- A TO D 12 BIT 8 CHANNEL SPEED 420 KSPS with IC BUFFER OPAMP in the part of A TO D NO.TLV2474 for more consistently and accurately
- D TO A 12 BIT 2 CHANNEL with IC OPAMP to be BUFFER TLC272
- 62KBYTE FLASH PROGRAM, 4KBYTE EEPROM DATA, 256 +2KBYTE RAM
- 8 EXTERNAL EEPROM MEMORY VERSION 24LCXX 8 PIN DIP (OPTION) can be interfaced maximum 512KBYTE (using 8 OF 24LC15). It reduces problem of BATTERY BACKUP and board can use Port of MCU more efficiently because it does not share with ADDRESS and DATA.
- 4 ET-10 PIN PORT to be PORT 0, PORT 1, PORT 2, PORT 3
- 4 PIN RS232 MAX232 ON BOARD, 6 PIN RS422/485 75176 (OPTION)
- 10 PIN I2C BUS, RTC DS1307 (OPTION)
- PCB SIZE 15.3 x 9 cm, with PCB (Prototype Working Area)
- POWER SUPPLY 7 - 12VAC-DC, POWER 7805 REGULATOR ON BOARD
- CP-JR51ADU842 V1 consists of
  1. BOARD CP-JR51ADU842 V1
  2. CD-ROM User's Manual and Example
  3. CABLE DOWNLAOD ET-RS232 DB 9 PIN





**CP-JR51ADU832 V1**

(P-CP-A-00068)

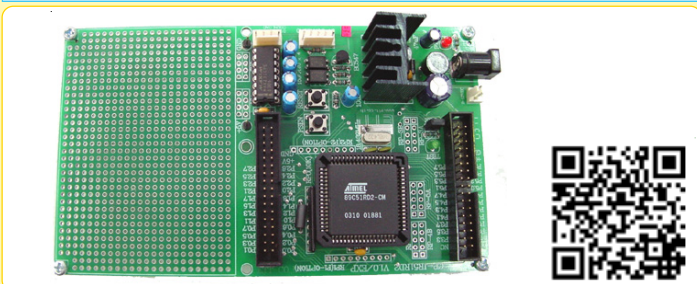


MCS51 CPU MICROCONTROLLER which is a new developed Board from ANALOG DEVICES can write and develop program on computer PC directly. Users download program into IC through RS232 Port to run program on Windows 98, ME, XP and use MCU No. AduC832BS from ANALOG DEVICES Co., Ltd. It is designed to adapt in many project, especially Data Logger.

- MCU NO.ADuC832BS 52 PIN MQFP
  - RUN MAXIMUM 16.78 MHZ FROM X'TAL 32.768 MHZ CAN PRGRAM AUTOMATICALLY RUN 12 CLOCK PER MACHINE CYCLE
  - 12 BIT 8 CHANNEL A-TO-D WITH IC OPAMP AS BUFFER OF A-TO-D NO.TLV2474
  - 12 BIT 2 CHANNEL D-TO-A WITH IC OPAMP AS BUFFER NO.TLC272
  - 62 KBYTE FLASH PROGRAM, 4 KBYTE FLASH DATA, 256 + 2 KBYTE INTERNAL RAM
  - EXPANSION RAM MAXIMUM AS 1 MBYTE (2-CH. NO.628512 AS OPTION AND 2-CH.DS1210 AS OPTION)
  - 4-CH.ET 10 PIN PORT AS P,P1, P2, P3
  - 4 PIN RS232 MAX232 ON BOARD, 6 PIN RS422/485 75176 AS (OPTION)
  - 10 PIN I2C BUS, RTC 1307 AS OPTION, EEPROM 24XX AS (OPTION)
  - BOARD SIZE 15.3 x 9 CM, 7805 ON BOARD
  - BE ABLE TO DOWNLOAD HEX FILE PROGRAM ON COMPUTER PC INTO BOARD THROUGH PORT RS232 DIRECTLY AND RUN ON WINDOWS 95/98/ME/EX
  - CP-JR5ADU832 V1.0 INCLUDES
1. BOARD CP-JR51ADU832 V1.0
  2. USER MANUAL
  3. CD-ROM
  4. CABLE DOWNLOAD ET-DOWNLOAD STAMP/RD2



**CP-JR51RD2 (P-CP-A-00066)**

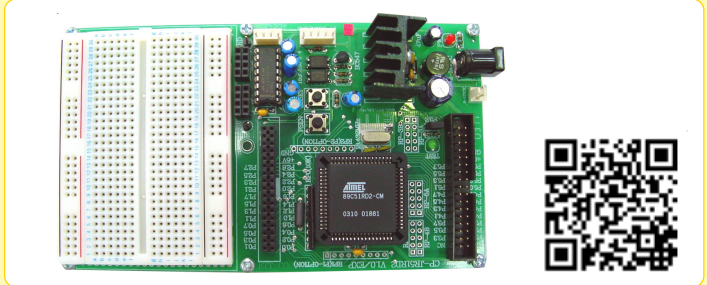


- CPU ATMEL PLCC 68 PIN 89C51ED2-IM
- X' TAL 18.432 MHz ON BOARD RUN 6 CLOCK OR 12 CLOCK PER 1 INSTRUCTION (36.864 MHz OR 18.432 MHz)
- 64 KBYTE FLASH FROM PC, 256 + 1 KBYTE RAM INTERNAL
- 6 PORT (40 BIT I/O PORT)
- 2 KBYTE EEPROM INSIDE CPU
- 4 PIN RS232 MAX232 ON BOARD
- 5 PIN ET-DOWNLOAD PROGRAM
- 7805 POWER SUPPLY ON BOARD
- 2-CH.34 PIN I/O ET BUS
- POWER SUPPLY 7-12VDC

- FREE AREA PCB SIZE 8.5 x 6 CM.
  - BOARD SIZE 15.3 x 9 CM.
  - DOWNLOAD HEX FILE PROGRAM ON PC INTO BOARD THROUGH PORT RS232 DIRECTLY RUN ON OS WINDOWS 95/98/ME/XP/2000
  - CP-JR51RD2 INCLUDES;
1. CP-JR51RD2 BOARD
  2. CD-ROM
  3. CABLE DOWNLOAD ET-DOWNLOAD RD2
  4. CABLE DOWNLOAD ET-RS232 DB 9 PIN



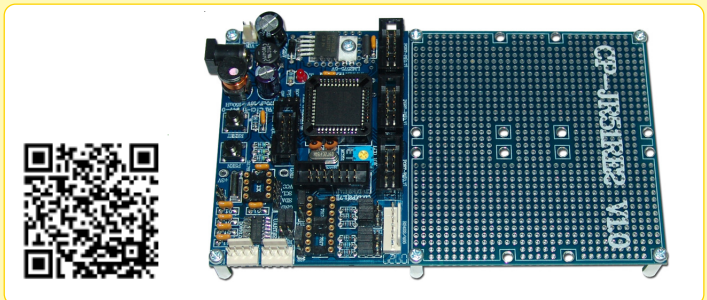
**CP-JR51RD2 EXP (P-CP-A-00067)**



- CP-JR51RD2 EXP ITS SPECIFICATIONS ARE AS SAME AS CP-JR51 RD2 AND THERE'S PROJECT BOARD, FEMALE PIN HEADER AND FEMALE VCC AND GND ADDITIONALLY
  - 81 x 62 x 9 CM.456 POINTS AD-102 PROJECT BOARD USES WITH 300-CH. 6-SIZE. 6 TYPE. JUMPER SET "ET-JWBOX300" OR ET-HARDWARE KIT V1 THAT HAS ACCESSARIES SUCH AS R, C, LED, 7-SEGMENT, SWITCH, STEPPING MOTOR
  - CP-JR51RD2 EXP INCLUDES;
1. CP-JR51RD2 EXP BOARD WITH PROJECT BOARD
  2. CD-ROM
  3. CABLE DOWNLOAD ET-DOWNLOAD RD2
  4. CABLE DOWNLOAD ET-RS232 DB 9 PIN

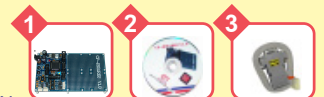


**CP-JR51RE2 V1.0 (P-CP-A-00096)**



CP-JR51RE2 V1.0 is board that uses new CPU of ATMEL that has FLASH Memory up to 128KBYTE. Moreover, there are 2 PORT RS232 that are separated independently, so user does not purchase any more DOWNLOAD Set because user can download program into CPU through PORT RS232 directly.

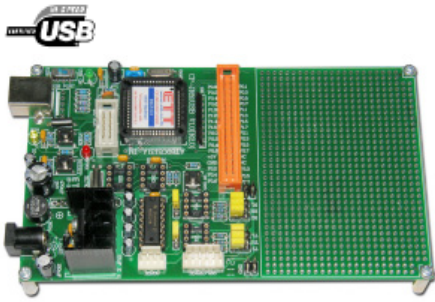
- CPU ON BOARD AT89C51RE2 PLCC 44 PIN
  - RUN X'TAL 18.432 MHz; can RUN 6 CLOCK or 12 CLOCK by Program
  - 128 KBYTE FLASH MEMORY, 8192 BYTE RAM
  - 4 ET-10 PIN PORT
  - 14 PIN LCD PORT CHARACTER TYPE
  - 2 of 4 PIN RS232 ICL3232 ON BOARD
  - 6 PIN RS422/485 (IC 75176 OPTION)
  - RTC DS1307 I2C INTERFACE (IC OPTION)
  - POWER SUPPLY ON BOARD as SWITCHING TYPE uses LM2575T-5.0 INPUT POWER 7-12 VDC (can use DC ADAPTER 10VDC/850mA OPTION)
  - PCB Size 15.3 x 9 cm.
  - DOWNLOAD the written program into CPU through PORT RS232 directly, run on OS WINDOWS 98/ME/XP
  - CP-JR51RE2 consists of
1. CP-JR51RE2 BOARD
  2. CD-ROM
  3. CABLE DOWNLOAD ETRS232 DB 9 PIN





**CP-JR51USB V1**

(P-CP-A-00075)

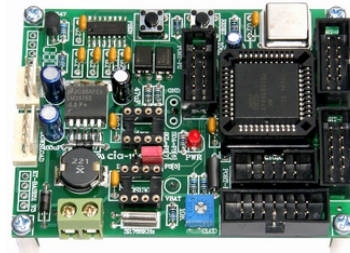


Use Control Board through V1.1 and V2.0 Port USB and use CPU MCS51 NO. AT89C5131 from ATMEL because user can select USB as 6 Clock or 12 Clock directly. It's suitable for development program through connecting PORT USB directly.

- CPU ON BOARD AT89C5131 PLCC TYPE 52 PIN
  - 6 CLOCK OR 12 CLOCK RUN X'TAL 24 MHZ
  - MEMORY AS FLASH 32 KBYTE, RAM 256 BYTE, FULL DUPLEX UART, ERAM 1024 BYTE, DUAL DTA POINTE, WATCH DOG,USB, PCA
  - DOWNLOAD PROGRAM INTO CPU THROUGH USB PORT DIRECTLY
  - 5 PORT CONNECT WITH P0, P1, P2, P3, P4 THROUGH 34 PIN ET-BUS I/O
  - I2C EEPROM NO.24XX (OPTION)
  - I2C RTC NO.DS1307 (OPTION)
  - I2C BUS ET 10 PIN
  - RS232 MAX232 ON BOARD, RS422/485 (75176 OR MAX3088 OPTION)
  - POWER SUPPLY 7805 ON BOARD • POWER SUPPLY 7-12VDC
  - PCB SIZE 15.3 x 9 CM
  - USE FLIP PROGRAM FROM ATMEL THROUGH USB TO DOWNLOAD PROGRAM INTO CPU TO RUN ON OS WINDOWS 98/ME/2000/NT/XP
  - CP-JR51USB INCLUDES
1. CP-JR51USB BOARD
  2. CABLE USB A-TO-B TYPE
  3. User's manual Guide
  4. CD-ROM

**ET-BASE 51 V3.0**

(P-ET-A-00395)

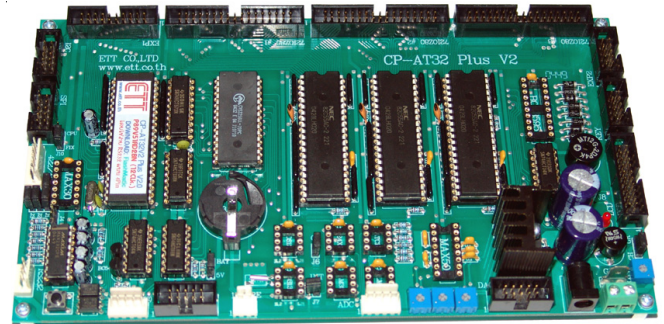


ET-BASE 51 V3.0 is the new board version that uses MCU in the family of MCS51 No.AT89C51ED2 PLCC-44 PIN from ATMEL on board. It is the stand alone device that can operate independently or connect with ET-BASIC I/O V1; moreover, it is able to add devices more than V2.

- MCU No.AT89C51ED2, PLCC-44 PIN, 64 KBYTES FLASH Memory, 1792 BYTES RAM, 2 KBYTES EEPROM and can be run 6 or 12 CLOCK at 1 MACHINE CYCLE.
  - 29.4912 MHz OSCILLATOR MODULE can be run in X2 MODE, so this board can run at the maximum high speed of 58.9824 MHz.
  - Directly DOWNLOAD data program into internal memory through PORT RS232 without additionally purchasing any more COPY Programmer.
  - 4 PORT I/O PIN HEADER 2x5 standard of ETT
  - RS232 PORT 4 PIN ETT
  - RTC No.DS1307 (OPTION)
  - EEPROM 24XX (OPTION)
  - 14 PIN HEADER LCD for interfacing with CHARACTER LCD
  - POWER SUPPLY AC/DC INPUT 7-10V, use SWITCHING REGULATE No.LM2575 to reduce the heat from IC REGULATE
  - PCB SIZE: 8x6 cm.
  - ET-BASE 51 V3.0 consists of...
1. Board ET-BASE 51 V3.0
  2. CD-ROM User's Manual Program
  3. Cable ET-RS232 DB 9 PIN

**CP-AT32 PLUS V2**

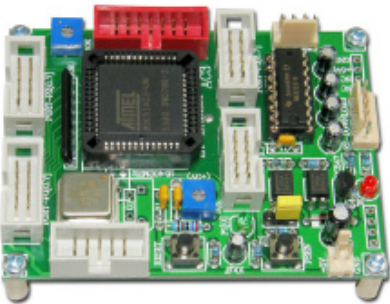
(P-CP-A-00033)



- CPU P89V51RD2 64 KBYTE PROGRAM, RUN 18.432 MHZ
  - 72 BIT I/O PORT 8255 ON BOARD USING 34 PIN ET-BUS
  - 32 KBYTE RAM ON BOARD 62256 (BACKUP IC OPTION DS1210)
  - COMPATIBLE MCS51 20 PIN PORT (CAN USE WITH 20 PIN MCS51 (AT89C2051, 1051, 4051))
  - 2-CH.12 BIT A-TO-D (OPTION LTC1298) SAMPLING RATE 11.1 KHZ
  - 4-CH.8 BIT D-TO-A (OPTION IC MAX 500, 2-CH.IC LM358), OUTPUT 2-10 V
  - 8 BIT OUTPUT HIGH CURRENT OPEN COLLECTOR (OPTION IC NC6B595), 8 BIT OUTPUT WITH DIODE IN CASE OF RELAY
  - RTC DS1307 (OPTION IC), EEPROM 2K-32K (24LCXX OPTION)
  - RS232 ON BOARD, RS422/485 (OPTION IC MAX3088 256-CH. TRANSCEIVER ON BUS)
  - KEY 4 x 4 PORT, 1 MINI SPEAKER
  - ET-SDP8 BUS, ET-12C BUS, ET-SPI BUS, ET 1-WIRE BUS
  - GRAPHICS & CHARACTER TYPE 20 PIN BUS
  - ON BOARD POWER SUPPLY 7805
  - POWER SUPPLY 7-12VDC
  - PCB SIZE 21 x 12 CM.
  - CP-AT32 PLUS V2 INCLUDES ;
1. CP-AT32 PLUS V2 BOARD
  2. CABLE DOWNLOAD ET-RS232 DB9
  3. CD-ROM

**ET-BASE51 AC3**

(P-ET-A-00288)



"ET-BASE 51 AC3" which is a Board Microcontroller is designed to be a small size. It can be used for general usage or using with "ET-BASIC I/O V1". This Board uses MCU MCS51 family from ATMEL No.AT89C51AC3 as DIP TYPE 52 PIN PLCC and can be run maximum 60MHz at 12 CLOCK or 30MHz at 6 CLOCK.

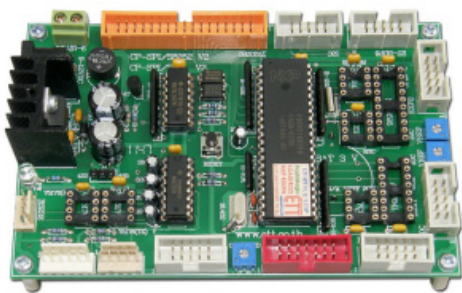
- Using AT89C51A3 with 64 KBYTE FLASH MEMORY, 2304 BYTE RAM, 2 KBYTE EEPROM
  - CIRCUIT OSC CLOCK 29.4912 MHz ON BOARD and if running as 6 CLOCK, it will be 58.9824 MHz.
  - Can be DOWNLOAD program directly from COMPUTER PC into internal FLASH memory through PORT RS232
  - 5 PORT I/O 10PIN ET (32+4 DIGITAL I/O)
  - 4 PIN RS232 PORT • A TO D 10 BIT 8 CHANNEL
  - 14 PIN LCD PORT as CHARACTER TYPE
  - POWER SUPPLY 5VDC (can be used with POWER SUPPLY version "ET-SWITCHING ADAPTER 5V 2A TYPE H")
  - PCB size 6.2 x 8.1 cm.
  - ET-BASE 51 AC3 consists of
1. BOARD ET-BASE51 AC3
  2. CD-ROM
  3. CABLE DOWNLOAD ET-DOWNLOAD RD2
  4. CABLE DOWNLOAD ET-RS232 DB 9 PIN







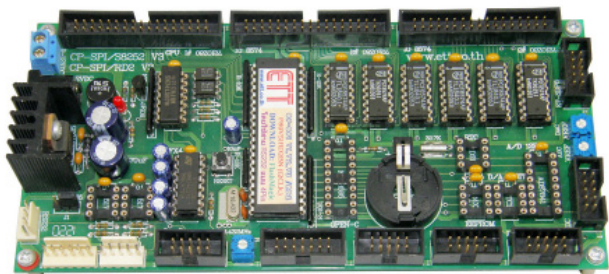
### CP-SPI/RD2 V2 (P-CP-A-00041)



- CPU P89V51RD2 64 KBYTE PROGRAM FLASH MEMORY, 1 KBYTE RAM IN CPU, RUN 6 CLOCK 1 INSTRUCTION
  - RUN 18.432 MHz ON BOARD
  - 24 BIT I/O PORT CPU IN 34 PIN ET-BUS
  - 14 PIN CHARACTER LCD PORT
  - RS232 IC MAX232 ON BOARD/RS422/485 USING IC 75176 (OPTION)
  - RTC USING IC NO. DS1307 (OPTION)
  - EEPROM NO. 24XX (24C16(2K)-24C256(32K) AS OPTION)
  - 4-CH. 12 BIT A-TO-D USING IC NO.ADS7841 (OPTION)
  - 2-CH. 10 BIT D-TO-A USING IC NO.LTC1661 (OPTION)
  - POWER LOGIC 8 BIT AS HIGH-VLTAGE OPEN COLLECTOR USING WITH 200 mA SINK AND USING IC NO. NC6B595 (OPTION)
  - ET-SDP8 BUS, ET-12C BUS, 7805 POWER SUPPLY ON BOARD
  - 48 BIT I/O PORT BY USING IC PCF8574 2-CH. 34 PIN ET-BUS
  - PCB SIZE 13 x 8.3 CM.
  - POER SUPPLY 7-12VDC
  - CP-SPI/RD2 V2 INCLUDES;
1. CP-SPI/RD2 V2 BOARD
  2. CABLE DOWNLOAD ET-RS232 DB 9 PIN
  3. CD-ROM



### CP-SPI/RD2 V3 (P-CP-A-00043)

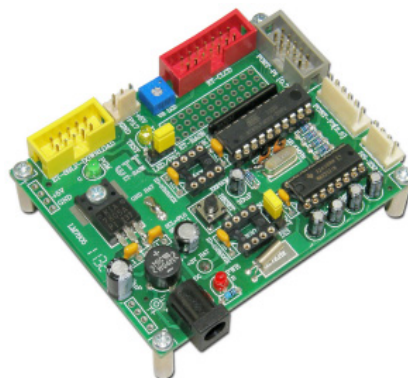


It is expanded I/O from CP-SPI V2 and PORT 12C NO. PCF8574 expands 6ports additionally, so it is 48 bit.

- CPU P89V51RD2 64 KBYTE PROGRAM FLASH MEMORY, 1 KBYTE RAM IN CPU, RUN 6 CLOCK 1 INSTRUCTION
  - RUN 18.432 MHz ON BOARD
  - 24 BIT I/O PORT CPU IN 34 PIN ET-BUS
  - 48 BIT I/O PORT BY USING IC PCF8574 2-CH. 34 PIN ET-BUS
  - 14 PIN CHARACTER LCD PORT
  - RS232 IC MAX232 ON BOARD/RS422/485 USING IC 75176 (OPTION)
  - RTC USING IC NO. DS1307 (OPTION)
  - EEPROM NO. 24XX (24C16(2K)-24C256(32K) AS OPTION)
  - 4-CH. 12 BIT A-TO-D USING IC NO.ADS7841 (OPTION)
  - 2-CH. 10 BIT D-TO-A USING IC NO.LTC1661 (OPTION)
  - POWER LOGIC 8 BIT AS HIGH-VLTAGE OPEN COLLECTOR USING WITH 200 mA SINK AND USING IC NO. NC6B595 (OPTION)
  - ET-SDP8 BUS, ET-12C BUS, 7805 POWER SUPPLY ON BOARD
  - PCB SIZE 17.5 x 8.3 CM.
  - POER SUPPLY 7-12VDC
  - CP-SPI/RD2 V3 INCLUDES;
1. CP-SPI/RD2 V3 BOARD
  2. CABLE DOWNLOAD ET-RS232 DB 9 PIN
  3. CD-ROM

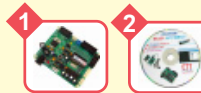


### ET-BASE LP4052 V1 (P-ET-A-00255)



BOARD MCS51 uses IC No.AT89LP4052 to be permanent and high speed CPU on board. The standard Board ET-BASE Size can be used with ET-BASE I/O V1.

- CPU AT89LP4052, RUN 18.432MHz, 4KBYTE FLASH PROGRAM, 256BYTE RAM
  - 15 BIT I/O STANDARD 10 PIN ET, 6 PIN HEADER
  - RS232 PORT ON BOARD, RTC DS1307 (OPTION), EEPROM 24XX (OPTION)
  - 14 PIN LCD PORT
  - 7805 ON BOARD POWER SUPPLY
  - POER SUPPLY 7-12VDC
  - PCB SIZE 6.2 x 8.1 cm.
  - 10 PIN ET-89LP DOWNLOAD can be written program and DOWNLOAD into CPU directly without using any COPY PROGRAMMER (using with ET-CAP LP4052)
  - ET-BASE LP4052 V1 consists of
1. ET-BASE LP4052 V1 BOARD
  2. CD-ROM



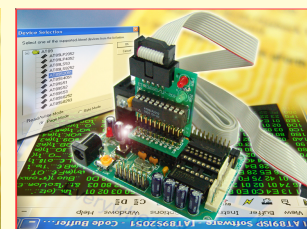
### ET-CAP LP4052 (P-CB-A-00018)



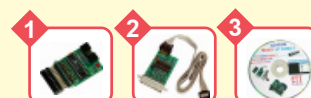
ET-CAP LP4052 which is the compact set with cable DOWNLOAD for using with Board that uses Connector 10 PIN ET-89LP. To interface with computer PC through DB 25 PIN PRINTER PORT and uses with program ATMEL "AT89ISP" for running on WINDOWS 98/ME/2000/XP.

### ET-EM89LP-20P (P-ET-A-00256)

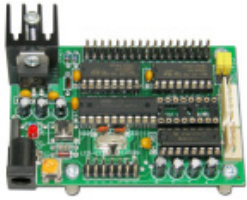
ET-EM89LP-20 which is the compact set to write and develop program can be used instead of CPU MCS51 20 PIN DIP TYPE from ATMEL. To write program on computer PC then transforms data into INTEL HEX and Download written program into CPU directly without taking off any CPU. It is very quickly and safe power.



- CPU AT89LP4052 20 PIN DIP TYPE, 4KBYTE FLASH MEMORY
  - Using instead of CPU 20PIN DIP No.AT89C2051, C4051, AT89S2051, S4051.
  - Interface with Computer PC through Printer Port 25 PIN and run on Windows 98/ME/2000/XP
  - ET-EM89LP-20 consists of
1. BOARD ET-EM89LP-20
  2. ET-CAP LP4052
  3. CD-ROM User's Manual and PROGRAM



**CP-2051 (P-CP-A-00020)**



- CPU AT89C2051 (2K FLASH) RUN 11.05 MHz
- MCS51 COMPATIBLE (P1,P3) 2K PROGRAM
- 15 BIT I/O (P1,P3 89C2051)34 PIN ET x 1
- 16 BIT TTL PORT (74HC595)
- 14 PIN LCD CONNECTOR
- RS232 PORT 1 CH RS422/485 (OPTION)
- POWER SUPPLY 7805 ON BOARD
- POER SUPPLY 7-12VDC

• PCB SIZE 5 x 7.5 CM

• DEVELOP PROGRAMME IN CPU 8031 BOARD CONNECTED WITH PORT P1, P3 AND COPY DATA INTO CPU 2051 OR ET-SPI51 V2.0

• CP-2051 INCLUDES;

1. CP-2051BOARD
2. DISK
3. USER'S MANUAL



- DEVELOP PROGRAMME IN CPU 8031 BOARD CONNECTED WITH PORT P1, P3 AND COPY DATA INTO CPU 2051 OR ET-SPI51 V2.0

• CP-2051 V2 PLUS INCLUDES;

1. CP-2051V2 V2 PLUSBOARD
2. DISK
3. USER'S MANUA



**ET-MCP V3.03 (P-ET-A-00085)**



MCS51 PROGRAMMER CPU ATMEL from ETT, be able to run on COMPUTER PC through PORT RS232 and be able to use with MCS51 and special be able to use with CPU ATMEI NO.AT89C55 WD and run program on Windows.

- BE ABLE TO USE WITH MCS51 CPU ATMEL 20 PIN AND 40 PIN NO.AT89C1051, AT89C2051, AT89C4051, AT89C51, AT89C52, AT89S8252, AT89S51, AT89S52, AT89S53, AT89C55 AND SPECIAL TO USE WITH AT 89C55 WD

- RUN ON COMPUTER PC THROUGH PORT RS232 ON WINDOWS 95, 98, NT, 2000

- BE ABLE TO COPY, PROGRAM, ERASE, BLANK, READ, VERIFY, FUSE EDIT, LOOK BIT 123, VIWE MEMORY, AUTO PROGRAM (ERASE / BLANK / PROGRAM /VERIFY /LOOKBIT 123)LOAD, SAVE, WITH MENU HELP IN THAI

- 40 PIN TEXT TOOL BE ABLE TO USE WITH 8 PIN, 20 PIN, 40 PIN

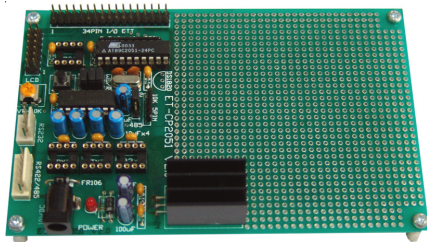
- PLASTIC BOX

• ET-MCP V3.0 INCLUDES;

1. ET-MCP V3.03 BOARD
2. 16VDC ADAPTER DC
3. CD-ROM
4. ET-RS232 DB 9 PIN CABLE



**CP-2051 V2 (P-CP-A-00021)**



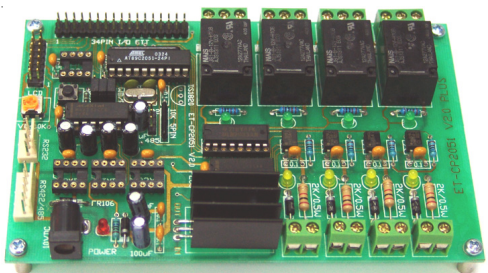
- CPU AT89C2051 (2K FLASH) RUN 11.05 MHz
- MCS51 COMPATIBLE (P1,P3) 2K PROGRAM
- 15 BIT I/O (P1,P3 89C2051)34 PIN ET x 1
- 16 BIT TTL PORT (74HC595)
- 14 PIN LCD CONNECTOR
- RS232 PORT 1 CH RS422/485 (OPTION)
- POWER SUPPLY 7805 ON BOARD
- DS1232 POWER ON RESET (OPTION)
- 93C46,93C56 EEPROM (OPTION)
- DS1820 DALLAS (OPTION)
- DEVELOP PROGRAMME IN CPU 8031 BOARD CONNECTED WITH PORT P1, P3 AND COPY DATA INTO CPU 2051 OR ET-SPI51 V2.0

• CP-2051 V2 INCLUDES;

1. CP-2051V2 BOARD
2. DISK
3. USER'S MANUAL



**CP-2051 V2 PLUS (P-CP-A-00022)**

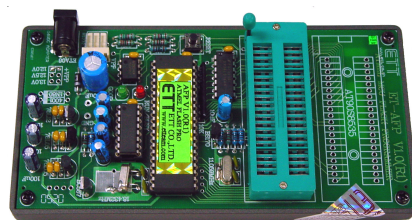


Microcontroller which is a small board is developed from CP-2051 Microcontroller.

- CPU AT89C2051 (2K FLASH), RUN 11.05 MHz
- MCS51 COMPATIBLE (P1,P3)2K PROGRAM
- 15 BIT I/O (P1,P3 89C2051)34 PIN ET x 1
- 16 BIT TTL PORT (74HC595)
- 14 PIN LCD CONNECTOR
- RS232 PORT 1 CH RS422/485 (OPTION)
- POWER SUPPLY 7805 ON BOARD
- POER SUPPLY 7-12VDC
- DS1232 POWER ON RESET (OPTION)
- 93C46,93C56 EEPROM (OPTION)
- DS1820 DALLAS (OPTION)
- 4 OUTPUT RELAY 10AMP NO,NC,COM,
- 4 INPUT OPTO ISOLATION PC817
- PCB SIZE 9 x 14 CM

Continue ...

**ET-AFP V1 (P-ET-A-00077)**



- BE ABLE TO USE WITH CPU ATMEL SIZE 20 PIN NO. AT89C1051, AT89C2051, AT89C4051 SIZE 40 PIN NO. AT89C51, AT89C52, AT89S8252, AT89S53, AT89C55

- BE ABLE TO COPY, PROGRAM, ERASE, BLANK, READ, VERIFY, FUSE EDIT, LOCK BIT 1, 2, 3

- BE ABLE TO SEARCH NO. CPU ATMEL MCS51, AVR

- 40 PIN TEXT TOOL AND BE ABLE TO USE WITH 40 PIN AND 20 PIN CPU IC
- CONNECTING WITH COMPUTER PC THROUGH RS232 PORT

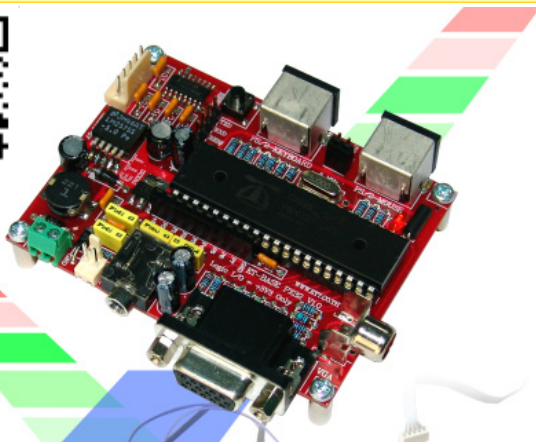
• ET-AFP V1.0 INCLUDES;

1. ET-AFP V1.0 BOARD
2. USER MANUAL
3. ADAPTER 16V DC
4. ET-RS232 DB 9 PIN CABLE





**ET-BASE PX32 V1.0** (P-ET-A-00363)



**Specifications of MCU P8X32A**

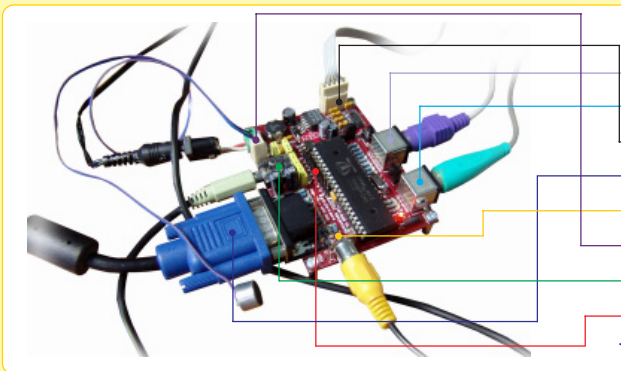
- 32 BIT MCU, 8 COG MULTIPROCESSOR, RUN 80MHZ
  - DIP TYPE 40 PIN, 32 PIN I/O PORT
  - RUN VOLTAGE 2.7 - 3.6 VDC, I/O can be SOURCE/SINK current 40mA at 3.3 VDC
  - Store 30KBYTE CODE Internal RAM, 20 MIPS/COG to run MCU
  - If using it as INPUT PORT, it can receive voltage not higher than 2.7-3.6 V
- (For Board ET-BASE PX32 V1.0, it can receives voltage not higher than 3.3V).

ET-BASE PX32 V1.0 is the one board that can be interfaced with many components such as PORT to interface with VGA, PORT to interface with TV (AV), PORT KEY BOARD PC/PS2, PORT MOUSE PC/PS2, PORT RS232, PORT MIC, and PORT HEADPHONE. It is the board that you can write program on PC and then can download to apply instantly.

ET-BASE PX32 V1.0 uses MCU No.P8X32A 40 PIN DIP from PARALLAX and its capability is obviously higher than BASIC STAMP. It is 32 BIT MCU, 8 COG MULTIPROCESSOR; so it is similar to having 8 MCU in one CHIP. The method to develop program is to use SOFTWARE TOOL "PROPELLER" that is run on WINDOWS XP/VISTA. It is the SOFTWARE that can write program, COMPILE CODE and DOWNLOAD CODE through RS232. In this case, it uses "SPIN" Language to write program, so it make user can write and develop program easily and quickly. Moreover, it includes LIBRARY VGA, TV, KEYBOARD, RS232, and MOUSE that are ready to apply and user does not waste time to write them by self.

> **Specifications of Board**

- Use MCU P8X32A, 40 PIN DIP TYPE, X' TAL 5MHz can be made PLL inside to be RUN at 80MHz.
- EEPROM No. 24LC256 (32KBYTE) to store code program.
- POWER SUPPLY 6-12VDC by using IC switching LM2575 for 5VDC and LM3940 for 3.3V
- PORT ON BOARD
- Board Size : 6.2 x 8.1 cm. Standard ET-BASE



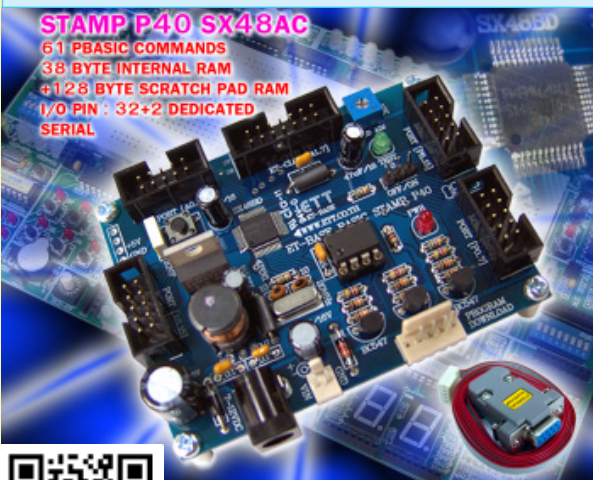
- PORT KEY BOARD (PS2) AS Mini JACK TO INTERFACE WITH KEY BOARD PC
- PORT MOUSE (PS2) AS Mini DIN JACK TO INTERFACE WITH MOUSE OF PC
- PORT RS232 AS 5 PIN WAFER TO INTERFACE WITH PORT RS232
- PORT VGA AS D-SUB 15 PIN TO INTERFACE WITH VGA SCREEN
- PORT TV (AV) AS RCA JACK TO INTERFACE WITH TV INTO THE AV CHANNEL
- PORT MIC AS 2 PIN WAFER TO INTERFACE MICROPHONE
- PORT HEADPHONE AS PHONE JACK TO INTERFACE WITH AUDIO OUT OF AMPLIFIER
- PORT I/O 8 PIN AS 10 PIN HEADER TO INTERFACE WITH I/O THAT IS NOT HIGHTER THAN 3.3V

• ET-BASE PX32 V1.0 include;

1. BOARD ET-BASE PX32 V1.0
2. CD-ROM WITH USER'S MANUAL AND EXAMPLE PROGRAM THAT CAN BE RUN ON WINDOWS XP/VISTA
3. CABLE DOWNLOAD ET-RS232 5 PIN TO DB 9 PIN



**ET-BASE STAMP P40** (P-ET-A-00302)



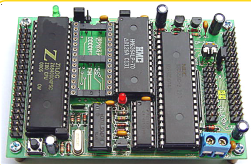
A small Board controller can be used for general purpose or can be connected with ET-BASE I/O V1. Using Basic Stamp Language to write and develop program, so it is not too difficult to apply for unskilled user for writing Program Assembly. Therefore, user can write program to test and apply for other project work easier.

- Use CPU SX48AC that has PBASIC from PARALLAX and has the all rights reserved inside.
- RUN 20MHz, INTERNAL RAM 38 BYTE + 128 BYTE SCRATCH PAD RAM (32 I/O, 26 VARIABLE)
- EEPROM PROGRAM 16 KBYTE No.24WC128 can be written by BASIC Language up to 4000 Commands, RUN with 12,000 Commands/Second, directly LOAD BASIC Language Commands from PC to Board through PORT RS232 without using any COPY.
- 61 PBASIC COMMANDS
- 4 of 10 PIN ET BUS I/O
- 14 PIN LCD PORT CHARACTER TYPE
- I/O PIN : 32 + 2 DEDICATED SERIAL
- POWER SUPPLY ON BOARD as DC SWITCHING by using IC LM2575-5 INPUT 7-12VDC
- PCB size 6.2 x 8.1 cm. standard ET-BASE SIZE
- ET-BASE STAMP P40 consists of ...

1. Board ET-BASE STAMP P40
2. CD-ROM User's Manual and Program for running on WINDOWS 98/ME/XP/2000
3. CABLE DOWNLOAD ET-RS232 5 PIN TO DB 9 PIN  
(can use POWER SUPPLY version 10VDC/850MA OPTION)



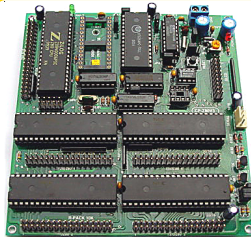


**CP-Z80 V1 (P-CP-A-00074)**

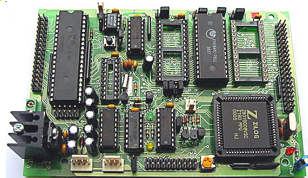
- CPU Z80B CMOS/RUN 4 MHz
- 8 K RAM ON BOARD
- 8K / 32 K EPROM MONITOR
- 40 PIN Z80 BUS
- 24 BIT I/O 82C55 PORT 34 PIN
- 20 PIN LCD
- POWER DC +5 VDC
- PCB SIZE 9 x 6 CM.
- DEVELOP PROGRAM WITH ET-EPROM EMULATOR 8/32 OR ET-BOARD V3.5/V4.0/V5.0/V6.0



• CP-Z80 V1.0 INCLUDES; BOARD AND UAER MANUAL

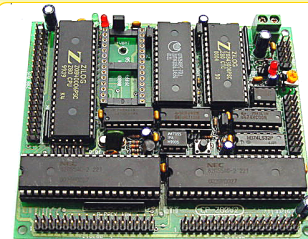
**CP-Z80 V3 (P-CP-A-00003)****CP-Z80 V3 PLUS (P-CP-A-00004)**

- CPU Z80B CMOS/RUN 4 MHz
- 8 K / 32 K RAM ON BOARD 8K (6264)
- 8K / 32 K EPROM MONITOR (2764/27256)
- 96 BIT I/O 8255 PORT 34 PIN x 4
- DS1232 (POWER ON RESET/WATCHDOG) EEPROM
- 20 PIN LCD PORT (CLCD, GLCD MODULE)
- RTC 6264 (CP-Z80V3 PLUS), 40 PIN Z80
- PCB SIZE 12 x 13.5 CM., POWER DC +5VDC
- DEVELOP PROGRAM WITH ET-EPROM EMULATOR 8/32 OR ET-BOARD V3.5/V4.0/V5.0/V6.0
- CP-Z80 V3.0 AND CP-Z80 V3 PLUS INCLUDE; BOARD AND USER MANUAL

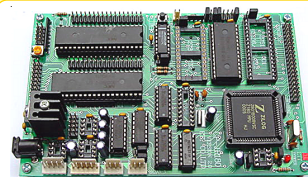
**CP-jr180 (P-CP-A-00006)****CP-jr180 PLUS (P-CP-A-00007)**

- CPU Z80180 CMOS/RUN 6.144 MHz
- 32K/64K EPROM MONITOR (27256/27512)
- 24 BIT I/O 8255 PORT 34 PIN ET x 1
- 20 PIN LCD/POWER ON RESET/WATCH DOG
- RS232 PORT 2-CH. (Z80180), 40 PIN Z80 BUS
- PCB SIZE 9 x 12 CM.
- POWER 7805 POWER DC 7-12VDC
- WRITING AND DEVELOP PROGRAM WITH ET-DEBUGGER JR 180 OR ET-EPROM EMULATOR

• CP-JR180, CP-JR180 PLUS INCLUDE; BOARD AND USER MANUAL

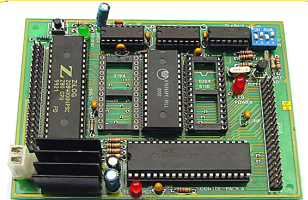
**CP-Z80 V2 (P-CP-A-00002)**

- CPU Z80B CMOS/RUN 4 MHz
- 8 K / 32 K RAM ON BOARD 8K (6264)
- 8K / 32 K EPROM MONITOR (2764/27256)
- 48 BIT I/O 8255 PORT 34 PIN x 4
- Z80ACTC/WATCH DOG/POWER ON RESET
- 20 PIN LCD PORT
- PCB SIZE 11 x 9.6 CM.
- 40 PIN Z80 BUS, POWER DC +5 VDC
- DEVELOP PROGRAM WITH ET-EPROM EMULATOR 8/32 OR ET-BOARD V3.5/V4.0/V5.0/V6.0
- CP-Z80 V2.0 INCLUDES; BOARD AND USER MANUAL

**CP-jr180 V2 (P-CP-A-00008)**

- CPU Z80180-8 CMOS RUN 6.144 MHz (XTAL 12.288 MHz)
- 32 K RAM ON BOARD(62256)
- 32 / 64 K ROM (27256 /27512)
- 512 K ROM/RAM (27515/271001/62256/62128/62512)
- 48 BIT I/O PORT 8255 34 PIN ET-BUS x 2

- 20 PIN LCD ET-BUS (CLCD, GLCD)
- 10 PIN KEYBOARD (MATRIX 4 x 4 0, 10 PIN SDP8)
- RS232 PORT 2-CHANNEL
- RTC 6242 (OPTION)
- WATCH DOG & POWER ON RESET & BACK UP (MAX 691)
- A-TO-D 12 BIT 2-CHANNEL LTC1298 (OPTION)
- 7805 POWER SUPPLY ONBOARD
- WRITING AND DEVELOP PROGRAM WITH ET-DEBUGGER JR 180 OR ET-EPROM EMULATOR
- CP-JR180 V2.0 INCLUDES; BOARD,CD-ROM, USER MANUAL
- RS422/485 (OPTION)
- MINI SPEAKER ON BOARD
- PCB SIZE 10 x 16 CM.

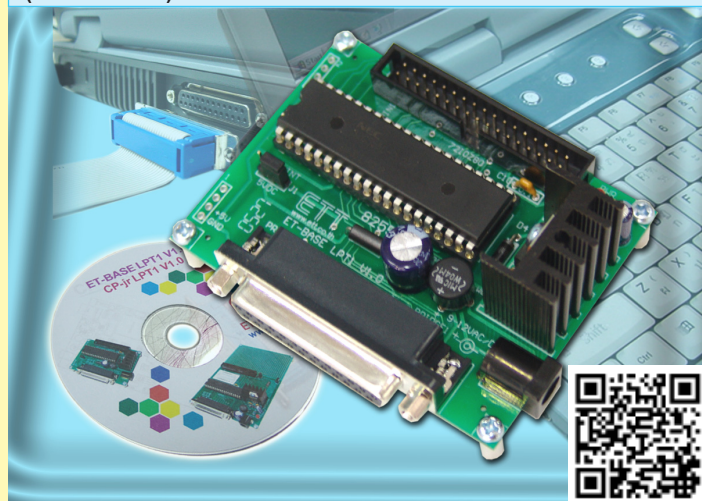
**CP-Z80CPA (P-CP-A-00005)**

- CPU Z80A/RUN 3.579 MHz
- 8 K RAM ON BOARD (6264)
- 8 K EPROM MONITOR (2764, 2732)
- 8 K RAM EXPANSION (6116, 6264)
- 24 BIT I/O 8255 PORT 40 PIN
- 40 PIN Z80 BUS
- 7805 ON BOARD POWER 7-12VDC
- PCB SIZE 12 X 8.5 CM.
- DEVELOP PROGRAM WITH ET-EPROM EMULATOR OR ET-BOARD V3.5/V4.0/V5.0/V6.0

• Z80-CPA INCLUDES; BOARD AND USER MANUAL

**ET-BASE LPT1 V1.0**

(P-ET-A-00248)

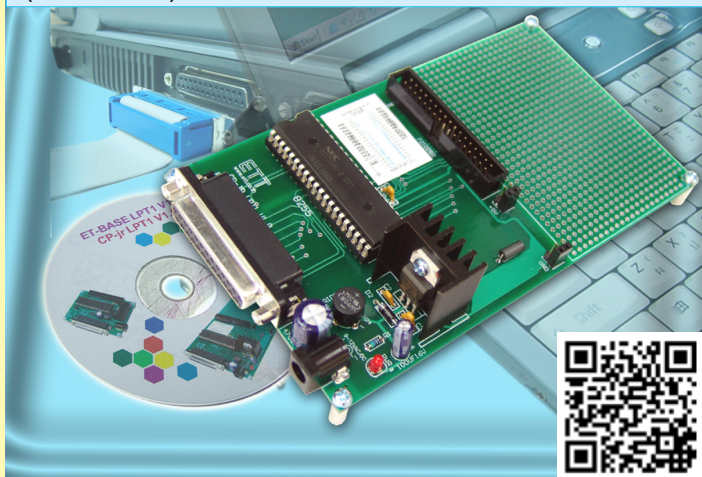


Board I/O that uses IC No.8255 has 3 PORT or 24 BIT to be interfaced with computer PC through Connector PRINTER PORT 25 PIN (not be interfaced through CONVERTER USB TO PARALLEL), so it make us interface Board with computer PC easier. It is suitable for using computer PC to be controller or test writing simple program to control through computer PC.

- 1 PORT IC 8255, 3 PORT FOR (24 BIT) INPUT/OUTPUT TTL
- 1 CONNECTOR 34 PIN HEADER BOX for interfacing with ETT BOARD'S COMPONENTS such as RELAY BOARD (ET-REL8, ET-INOUT24), SSRAC (ET-SSRAC 4, ET-SSRAC, ET-SSRAC V2)
- CONNECTOR DB 25 PIN FEMALE for interfacing PAIR CABLE with PRINTER PORT of computer PC
- POWER SUPPLY 7805 ON BOARD using with POWER SUPPLY DC/AC 9 - 12V (OPTION)
- PCB SIZE 6.2 x 8.1 cm.
- CAN BE USED WITH BOARD ET-BASIC I/O V1
- ET-BASE LPT V.0 consists of
  1. BOARD ET-BASE LPT1 V1.0
  2. CD-ROM User's Manual and EXAMPLE of written VISUAL BASIC PROGRAM
  3. CABLE 25 PIN HEADER

**CP-jrLPT1 V1.0**

(P-CP-A-00076)



It is a Board that has the same specifications as version ET-BASE LPT V.0 but there is additional PCB (Prototype Working Area).

- PCB SIZE 15.3 x 9 cm.
- PCB (Prototype Working Area) SIZE 8.5 x 6 cm.
- CP-jrLPT1 V1.0 consists of
  1. BOARD CP-jrLPT1 V1.0
  2. CD-ROM User's manual and EXAMPLE of written VISUAL BASIC PROGRAM
  3. CABLE 25 PIN HEADER





# ET-GSM REMOTE I/O (P-ET-A-00484)

**new**

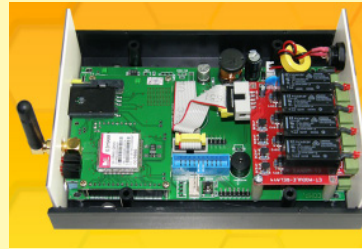
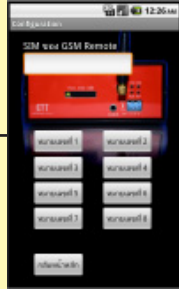
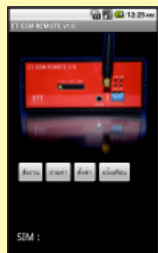
Support all facilitators in Thailand in the GSM  
System: 850MHz / 900MHz / 1800MHz and 1900MHz.



This ET-GSM REMOTE I/O is the device to receive INPUT, OUTPUT through cell phone and home phone. This ET-GSM REMOTE I/O uses MODULE of cell phone to operate, so it is more convenient to install and carry to anywhere; moreover, it is compatible with all facilitators in Thailand in the GSM systems: 850MHz/ 900MHz/ 1800MHz and 1900MHz.

- Has 4-CH INPUT in the format of DC 12 VDC INPUT and 1 INPUT in the format of INPUT AC220V
- Has 4-CH OUTPUT in the format of Contact RELAY NO, NC, COM

Moreover, it provides Thai answering system that calls back to user; so, it is suitable to communication to command ON/OFF devices at home or factory; detect operation of devices; and, check if it is in the state of power shortage or blackout because it makes machines damaged. It can call back or send SMS to the preferable telephone number.



- Has 1-CH INPUT as OPTO ISOLATION to receive Signal AC 220V; it is used to check if there is Signal 220VAC, and including connector.



- Has 4-CH OUTPUT as 5 AMP Contact RELAY and it externally provides Connector NO, NC, COM, and including connector.



- Has 4-CH INPUT as OPTO ISOLATION to receive Signal DC INPUT 12VDC; there is Connector +12V, +IN, COM, and including connector.

Command through Program of OS ANDROID from cell phone.

Check operating state of machines from home.

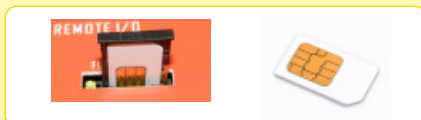
Because power of cold storage is blackout, it sends SMS to notify owner

Send SMS to notify the owner when electric appliances at home are turned on.

RESET the system from long distance

Turn ON/OFF electric appliances via telephone

- Use MODULE of cell phone from SIMCOM Company to support all facilitators in Thailand in the GSM System: 850MHz/ 900MHz/ 1800MHz and 1900MHz
- Use Microcontroller ARM Cortex-M3 32 BIT to command and control the operating system
- Has Thai answering system, it responds, receives commands and confirm the operation all the time
- Has 4-CH OUTPUT as 5 AMP Contact RELAY that externally provides NO, NC, COM with Connector 3 PIN PLUG-IN TERMINAL BLOCK; it is more convenient. Moreover, it includes LED to shows the operating states (if using with LOAD that is higher than 5 AMP, it recommends to interface Magnetic Contactor and Breaker additionally).
- Has 4-CH INPUT as OPTO ISOLATION to receive Signal DC INPUT 12VDC. There is Connector +12V, +IN, COM to support Signal in the format of INPUT CONTACT (RELAY or SW), DC INPUT SOURCE, PNP SENSOR, and CONTACT INPUT. Moreover, it provides Connector 3 PIN PLUG-IN TERMINAL BLOCK with LED to display the operating state, so it is more convenient.
- Has 1-CH INPUT as OPTO ISOLATION to receive Signal AC 220V, it check if there is Signal 220VAC. Moreover, it provides Connector 2 PIN PLUG-IN TERMINAL BLOCK and LED to display the operating state.



- Has SIM SOCKET as FULL SIZE SIM CARD (is not compatible with MINI or MICRO SIM CARD)
- Has 4 LED to display the operating state; and, 4 DIP SW to setup the operation
- Has 1 CONNECTOR AUDIO JACK 2.5 mm. to externally interface audio
- Has POWER SUPPLY as DC JACK 2.5 mm. 12VDC (it also provides POWER SUPPLY ADAPTER in the package)
- Box size: 17.3 x 11.6 x 5.4 cm. (L x W x D) and 0.45 kg in weight.

- Can receive command to operate in the format of sending SMS or dialing Key DTMF or commanding via the ANDROID System on cell phone
- Can setup a maximum of 8 telephone numbers for ET-GSM REMOTE I/O to receive a call and message to command the operation through home phone and cell phone. It does not receive any exceeding telephone number.
- Can setup a maximum of 8 cell phone numbers to send warning SMS when it detects any conditional warning; for example, it sends SMS instantly when any electric appliances is blackout.
- Can setup a maximum of 8 conditional warnings from 5 INPUT; moreover, it can setup condition of OUTPUT to auto run when it found any conditional warning.
- Can command all 4-CH of OUTPUT RELAY to run and check the operation of INPUT by sending SMS or dialing Key DTMF
- Has simple modes to setup values, numbers, and conditions by user
- There are 2 models of ET-GSM REMOTE I/O; firstly, the model that has antenna L-TYPE is "ET-GSM REMOTE I/O (P-ET-A-00484)"; and secondly, the model that has external antenna with 3 meters in length is "ET-GSM REMOTE I/O-A (P-ET-A-00485)"



The model "ET-GSM REMOTE I/O" uses the ANTENNA L-TYPE.



The model "ET-GSM REMOTE I/O-A" uses THE EXTERNAL ANTENNA.

ET-GSM REMOTE I/O includes...

1. Board and box "ET-GSM REMOTE I/O"
2. CD-ROM User's Manual and Program
3. DC ADAPTER POWER SUPPLY 12V 1.3A
4. Antenna (choose according to the specific model)



### ET-BASE GSM SIM900

(P-ET-A-00488)



#### Specifications of Module SIM900

- Support Frequency in the ranges of GSM/GPRS 850/900/1800/1900 MHz
- Support GPRS MULTI-SLOT CLASS10 and GPRS MOBILE STATION CLASS B
- Support AT Command (GSM 07.07/07.05 and additional commands from SIMCOM)
- Support Signal in the format of VOICE, SMS, FAX, PROTOCOL, TCP/IP
- Support SIM APPLICATION TOOLKIT
- Run in the range of 3.2V-4.8V
- Be compatible with SIM CARD 1.8V and 3V

ET-BASE GSM SIM900 is a board from ETT that is suitable to learn and develop the Communication System through mobile phone by using Module from SIMCOM Company; it supports the Communication System of GSM/GPRS under the Frequency of 850/900/1800/1900 MHz. It uses AT COMMAND to command operation through RS232 Serial PORT.

#### Specifications of Board ET-BASE GSM SIM900

- Has Circuit to convert LOGIC TTL 3V to 5V; it can directly connect with Microcontroller LOGIC 5V to receive command if it does not be connected through Circuit LINE DRIVER RS232
- Has Circuit LINE DRIVER RS232 to receive command through other PORT RS232 directly (1200 – 115200 BPS)
- Has SW.ON/OFF to enable/disable operation of Module internal board
- Has SOCKET SIM (FULL SIZE SIM); it supports SIM CARD with Circuit ESD to protect SIM from damaged
- Has 2 Circuits REGULATE; board is compatible with POWER DC in the range of 5V-12VDC
- Use Circuit IC 4.2V/3A to supply to Module SIM900, it has much enough for GSM 2 WATT
- Has Circuit REGULATE 2.8V/150mA to supply to circuit that converts Signal Level of LOGIC
- Has LED to display operating status on board; LED VBAT, LED NET, LED STATUS
- Has Connector RJ11 for interfacing HEAD SET of home phone
- Has 4 PIN ETT for PORT RS232
- Has 10 PIN IDE of ETT for PORT RS232 in the format of TTL
- Has 2 types of Power Supply 5V-12VDC that are Connector DC JACK 2.5 mm. (Anode-OUT, Cathode-IN) and 2 PIN (in case of using general mobile phone that is not 2 WATT). It suggests to use DC ADAPTER ET-SWITCHING ADAPTER 5V 2A TYPE J or TYPE B

• Board size: 8.1 x 6.1 cm.

• ET-BASE GSM SIM900 Kit consists of...

1. Board with Module SIM900
2. Antenna L-TYPE
3. Cable 4 PIN RS232
4. Cable Pair 10 PIN
5. Cable ET-RS232 DB9 PIN
6. CD-ROM; Manual and Example Programs



### ET-MINI MT8870 (P-ET-A-00440)



It is addition board that is designed to support the operation of ET-GSM SIM300, ET-GSM SIM900B or other GSM Boards that have socket for HANDSET. It can be modified to receive data from pressing key of incoming telephone call.

It checks Signal DTMF by using IC No.MT8870 that decodes the signal as 4BIT BCD to control applications.

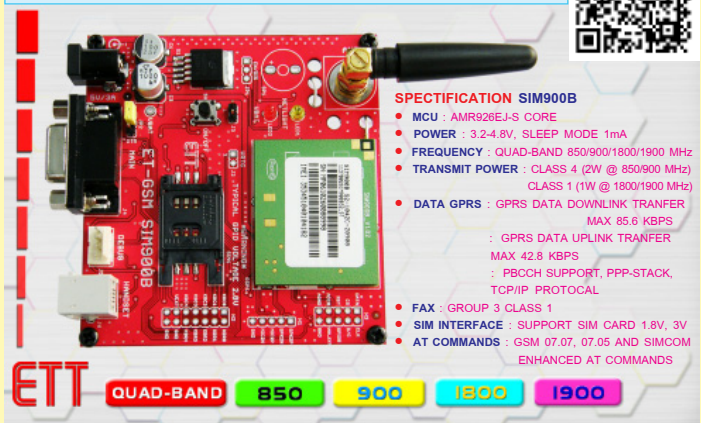
- Use IC DTMF No.MT8870
- RJ11 to interface with Module GSM
- LED to display operating status of PWM, STD, Q4, Q3, Q2, Q1
- Connector 10PIN HEADER MALE and FEMALE
- Cable RJ11 Header with 14cm. length
- CD-ROM manual



\* การต่อใช้งานกับ ET-GSMSIM

### ET-GSM SIM900B

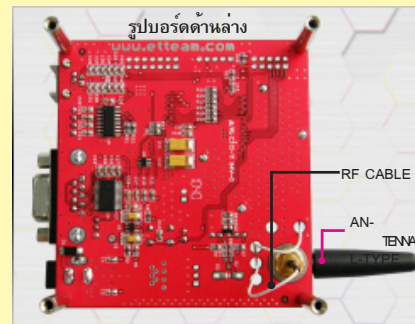
(P-ET-A-00435)



#### SPECIFICATION SIM900B

- MCU : AMR926EJ-S CORE
- POWER : 3.2-4.8V, SLEEP MODE 1mA
- FREQUENCY : QUAD-BAND 850/900/1800/1900 MHz
- TRANSMIT POWER : CLASS 4 (2W @ 850/900 MHz) CLASS 1 (1W @ 1800/1900 MHz)
- DATA GPRS : GPRS DATA DOWNLINK TRANSFER MAX 85.6 KBPS  
: GPRS DATA UPLINK TRANSFER MAX 42.8 KBPS  
: PBCH SUPPORT, PPP-STACK, TCP/IP PROTOCOL
- FAX : GROUP 3 CLASS 1
- SIM INTERFACE : SUPPORT SIM CARD 1.8V, 3V
- AT COMMANDS : GSM 07.07, 07.05 AND SIMCOM ENHANCED AT COMMANDS

ET - GSM SIM900B is a board of phone module that uses SIM900B from SIMCOM. It supports QUAD-BAND Frequencies; 850/ 900/ 1800/ 1900MHz and service systems of TRUE, DTAC, AIS. It communicates and commands the phone module through PORT RS232 in the format of AT COMMAND. There is Connector DATA, POWER SUPPLY, Connector RS232 as DB 9PIN for general use and 4PIN for DEBUG. It can be applied to many ways; for example, it sends SMS to notify driver to protect car from stolen, top up money for cell phone, send data from GPS System of car.



• ET-GSM SIM900B consists of...

1. Board Module SIM900B
2. Cable RS232 9PIN Header to connect with PC
3. CD-ROM User's Manual and Example Programs
4. ANTENNA L-TYPE
5. RF CABLE



#### Specifications of Board ET-GSM SIM900B

- Have SW to ON/OFF the operation of Module internal board
- Have SOCKET SIM to support SIM CARD and Circuit ESD to protect SIM from damaged
- Have 2 Circuit REGULATES to use with +5VDC DC ADAPTER
  - Use Circuit 4.2V/3A IC REGULATE to supply enough energy to Module SIM900B to use with 2 WATT GSM900 without problem
  - Have Circuit 2.8V/150mA REGULATE to supply energy to Circuit Logic Converter
- Have LINE DRIVER to convert signal from SIM900B to RS232, including cable for DEBUG
- Have LED to display operating status of module, NETWORK connection, status of POWER ON/POWER OFF
- Have Connector RJ11 HAND SET(microphone and headphones of telephone) to talk, call and receive
- Have other connecting points such as KEY BOARD, DISPLAY, GPIO, PWM, ADC
- Use 5V-12VDC POWER SUPPLY (current depends on distance of 2 stations to send-receive data and Service System), we recommend to use ET-SWITCHING ADAPTER 5V/2A TYPE J for general use.
- PCB size: 8.00 X 8.50 cm

<p>- SIM900B GSM MODULE (A-IC-M-00021)</p>	<p>- CC-CZD-SAJ-3M (ANTENNA 1.5 M CABLE 5MA) (A-IC-M-00013)</p>	<p>- CC-BW-G-SAJ (ANTENNA L-TYPE) (A-IC-M-00011)</p>
<p>- ET-SWITCHING ADAPTER 5V 2A TYPE J (A-AP-A-00094)</p>		
<p>INPUT : AC INPUT 220VAC 50/60Hz 0.5A</p> <p>OUTPUT : DC 5V/2.0A (10W)</p>		



**ET-REMOTE AUDIO**

(P-ET-A-00491)



ET REMOTE AUDIO ... is readymade board that can play audio message that is recorded in the memory of board. It can command the operation through PORT RS232 and it can arrange the audio file of words to make sentence and speak out easily; for example, amount of number, money, quantity, day and time, or say Thank You. Remember, it only speaks out in Thai. It can be applied for

- timer to tell day, month and year
- price to tell amount of money for what is sold
- ticket queue
- parking fee to tell amount of money that paid for service

**Specifications ET-REMOTE AUDIO**

- Command the operation through PORT RS232 9PIN DB FEMALE
- Record audio file by SAMPLE RATE 8KHz, sound is high quality
- Setup BAUDRATE by DIP SW from 1200 to 115200 BPS.
- Provide 290 words recorded in the memory; for example, digits from 0 to million, A to Z, Kor-Kai to Hor-Nok-Hook (Thai alphabet), 77 Provinces in Thailand, colors, system of measurement, and other sound
- Command to setup the number order of audio file directly; for example, "Sawaddeekha" (Hello in Thai), "Yin-dee-ton-rub-kha" (Welcome in Thai).
- Can receive data that is both numeric and letter directly, and speak out; for example, "A-B-C-Nueng-Song-Sam" (one-two-three in Thai)
- Can receive numeric data and speak out the amount; for example, "Sam pan-nueng roi-ha sip-song" (Three thousand-one hundred-fifty-two in Thai).
- Can receive numeric data and speak out the amount of money
- Can receive timing data and speak out the time; for example, "wae-la-sip-song-na-li-ka-yee-sip-ha-na-tee-sam-sip-padd-wi-na-tee" (Twelve twenty-five and thirty-eight seconds in Thai).
- Has 2 channels of Connector Power Supply 5-12VDC for supplying to board as follows;
  - JACK DC 2.5mm. (It is compatible with ET-SWITCHING ADAPTER 12V 0.5A TYPE J)
  - Connector DB9 PIN of PORT RS232 through PIN 9 and PIN 5

- Has Connector DB9 PIN FEMALE by using Signal RS232 TX, RX, GND
  - Box size; 7.5 x 2.5 x 5 cm.
  - ET-REMOTE AUDIO consists of ...
1. Board and Box "ET-REMOTE AUDIO"
  2. Cable ET-CABLE RS232 9 PIN M in order to interface from ET-REMOTE AUDIO to Connector 4 PIN RS232 of ETT Board CONTROL directly.
  3. CD-ROM Program and Manual



**ET-SWITCHING ADAPTER**

12V 1A TYPE J

(A-AP-A-00098)



INPUT: 220VAC, 50/60Hz

OUTPUT: 12VDC 1A

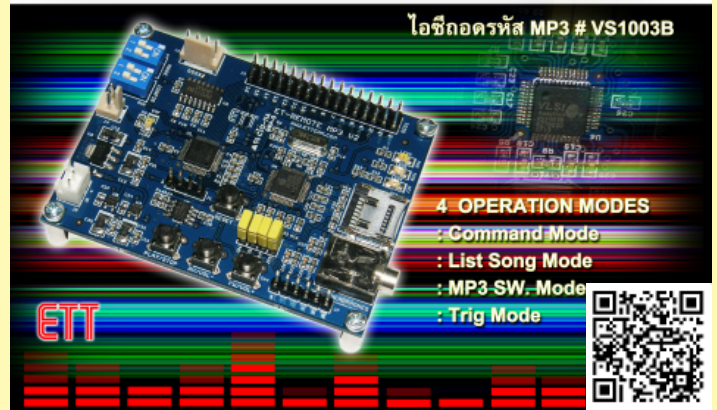
**SERIAL CABLE DB-9 M/F 1 M**

(A-CB-A-00022)



**ET-REMOTE MP3 V2**

(P-ET-A-00471)



The latest Board MP3 Decoder that is cheap at the price. It receives Commands through RS232 PORT to control to play files from MEMORY CARD 'SD-MICRO' in the format of MP3 or WAV. It uses the device No.VS1003B from VLSI to be MP3 Decoder; this IC MP3 Decoder has high-quality sound, so it is suitable for applying for advertisement, exhibition, or museum.

**Specification of ET-REMOTE MP3 V2**

- Use CPU No.STM8S105 and VS1003B Decoder
- Has SOCKET on board for inserting SD CARD #SD-MICRO
- There are **4 operation modes**;
  - **COMMAND MODE**: It controls to play files by Command from RS232 PORT.
  - **LIST SONG MODE**: It calls to see list of song file and order of file in SD-MICRO.
  - **MP3 SW MODE**: It controls the operation by SW. on board.
  - **TRIG MODE**: It uses external OUTPUT to TRIG and choose files. There are 16 INPUTs, or it is interfaced to be 16 SW. for TRIG to choose 16 files.

• Every time it ends any file, it gives OUTPUT LOGIC 0 through CONNECTOR and it is sent in the format of COMMAND EOF through RS232 for COMMAND

- MODE.
- Only supports file MP3 or WAV; it cannot RECORD.
  - Support MICRO-SD from 2GB to 16GB in the format of FLASH 16 and 32.
  - Set 4 BAUDRATE; 4800, 9600, 57600, and 115200
  - Use DC 5V with Connector TYPE B (it is compatible with POWER SUPPLY from ETT version 'ET-SWITCHING ADAPTER 5V 2A TYPE B)
  - Use sound OUTPUT in the format of HEAD-PHONE JACK STEREO
  - PCB size: 8.00 x 6.10 cm.
  - ET-REMOTE MP3 V2 Set consists of...

1. Board ET-REMOTE MP3 V2
2. CD-ROM User's Manual
3. Cable ET-RS232 DB9 PIN
4. Cable 4 PIN RS232



**ET-GPS START KIT V2**

(P-ET-A-00481)

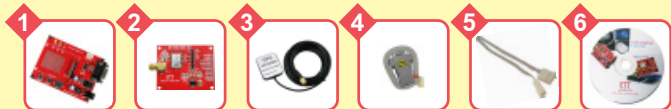


**ET-GPS START KIT V2** is instant board that is used to receive Signal GPS for positioning the preferable location on the earth from satellite that moves around the earth. This instant board consists of Board START KIT, ET-MINI GPS and GPS ANTENNA; it is more convenient to interface with Control Boards for various applications such as positioning location on the earth or be used as the standard values for systems that require high accuracy.

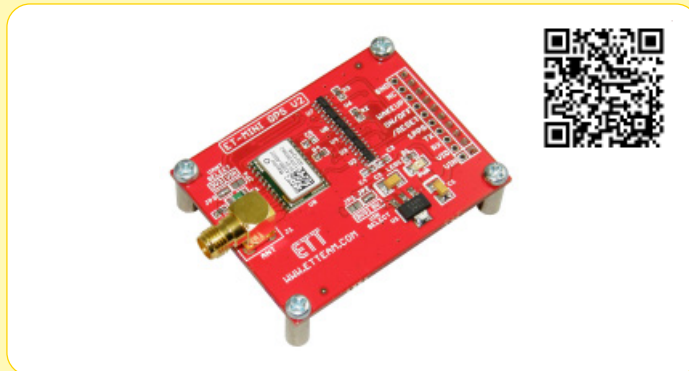
**ET-GPS START KIT V2** in the part of GPS MODULE, it uses the wellknown CHIPSET model SiRF Star IV that has high sensitivity to receive signal from satellite; so, it can detect signal from satellite quickly.

**Specifications of ET-GPS START KIT V2**

- In the part of ET-MINI GPS V2 on board, it uses MODULE GPS model A2200-A from MAESTRO Company that uses CHIPSET SiRF Star IV
  - Support 48-CH GPS; so, it can detect signal from satellite quickly
  - Update Rate: 1 Hz/ 5 Hz Supported
  - Support Protocol NMEA0183 VER 3.0
  - 3 LED to display state of 1PPS, WAKEUP, PWR
  - 2 SW RESET, ON/OFF
  - Provide GPS ANTENNA GPS-GAA1575A as ACTIVE ANTENNA as MAGNETIC MOUNT with 5 meters in length
  - RS232 Communication 4800 bps, 8 DATA, NO PARITY, 1 STOP BIT (Default value)
  - RS232 Connecting point of DB9 PIN FEMALE and Connector 4 PIN WAFER (2.54 mm.) according to ETT Standard to interface with computer or Controller Boards
  - POWER SUPPLY 7-12V for board in the format of MAIL JACK 2.5mm. It is compatible with both AC and DC (be compatible with ET-SWITCHING ADAPTER 12V 0.5A TYPE J (OPTION) )
  - PCB size: 9.15 x 6.85 cm.
  - **ET-GPS START KIT V2** includes...
1. Board ET-GPS START KIT
  2. Board ET-MINI GPS V2
  3. GPS ANTENNA
  4. Cable RS232 4 PIN
  5. Cable RS232 4 PIN Header
  6. CD-ROM User's Manual and Additional Program

**ET-MINI GPS V2**

(P-ET-A-00480)



This Board ET-MINI GPS V2 only has MODULE GPS and IC REGULATORS, IC LEVEL SHIFTER; it is suitable for customer who requires making MODULE GPS to assemble board by self; or, customer who requires interfacing Board GPS for testing by self.

**Specifications of ET-MINI GPS V2**

- Use MODULE GPS model A2200-A from MAESTRO Company that uses CHIPSET SiRF Star IV
  - Support 48-CH GPS
  - CAPABLE OF SBASE (WAAS, EGNOS, MSAS, GAGAN)
  - Time to First Fix: Hot Start <1s: Warm Start <35s: Cold Start <35s
  - Sensitivity Tracking: -163 dBm
  - Position Accuracy (horizontal): <2.5m CEP (autonomous)
  - Use UART Communication (TTL LEVEL) 4800 bps, 8 DATA BIT, NO PARITY, 1 STOP BIT (Default value) (Switchable 1,200 to 115.2k)
  - Has Circuit LEVEL SHIFTER to interface with Circuit that has LOGIC 1.8V-5V
  - Has 10 PIN HEADER to interface with external device
  - Connector ACTIVE ANTENNA as SMA RIGHT ANGLE FEMALE
  - POWER SUPPLY interfaces with DC 3.3V or 5V
  - PCB size: 4.40 x 5.60 cm.
  - **ET-MINI GPS V2** includes...
1. Board MINI GPS
  2. CD-ROM User's Manual and additional Program

**GPS ANTENNA**

(A-IC-M-00027)



This is an antenna is 5 meters in length for GPS device in the format of ACTIVE ANTENNA 3.3V as MAGNETIC MOUNT. The connector is SMA MALE.

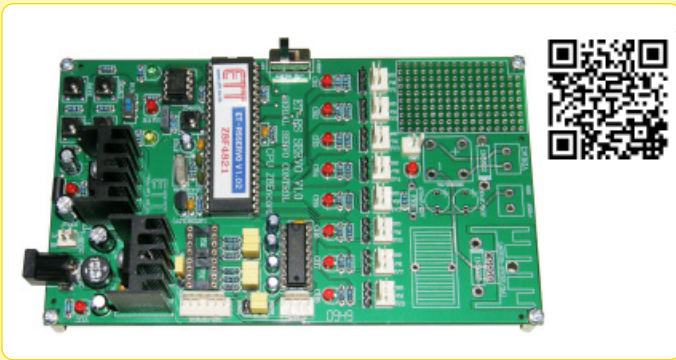
**ANTENNA SPECIFICATION**

<b>CENTER FREQUENCY</b>	: 1575.42 MHz +/- 3 MHz
<b>IMPEDENCE</b>	: 50 OHM
<b>PEAK GAIN</b>	: > 3 dBic
<b>LNA GAIN</b>	: 27 dB
<b>DC VOLTAGE</b>	: 3.3 V +/- 0.5 V
<b>DC CURRENT</b>	: 15 mA MAX
<b>WEIGHT</b>	: < 100 GRAM
<b>SIZE</b>	: 47 x 34 x 14 mm.
<b>CABLE</b>	: 3 M
<b>CONNECTOR</b>	: SMA MALE STRAIGHT
<b>MOUNTING</b>	: MAGNETIC BASE

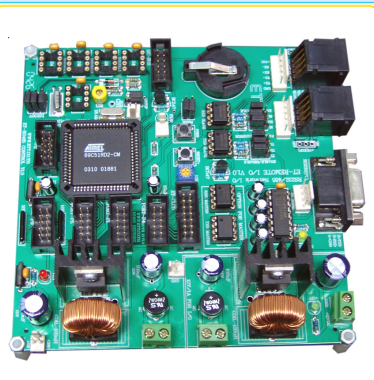


**ET-RS SERVO V1 (P-ET-A-00167)**

It is processed controller board to control SERVO easily, be able to develop robotic system quickly and be able to connect with ETT's controller boards or COMPUTER PC through PORT RS232.



- BE ABLE TO CONTROL 8-CH. SERVO MOTOR PER 1 BOARD
  - SEND/RECEIVE DATA THROUGH PORT RS232, RS422, RS485 SPEED 9600 OR BE ABLE TO ORDER THROUGH MANUAL SW ON BOARD
  - MCU Z8ENCORE NO.Z8F4801
  - DISPLAY LCD AND POSITION OF ROTATION THROUGH PORT RS232
  - BE ABLE TO ORDER SERVO AS STEP OF ROTATION 1 STEP PER 10<sup>2</sup>s AND BE ABLE TO SET AS 50-250 STEP
  - BE ABLE TO SAVE VALUE OF MIN AND MAX OF SERVO IN EACH CHANNEL ON BOARD
  - BE ABLE TO SAVE STEP OF ROTATION AND DELAY TIME INTO EEPROM IN EACH CHANNEL ON BOARD AUTOMATICALLY AND RUN INDEPENDENTLY
  - BE ABLE TO FIND CENTER POSITION OF SERVO, CALIBRATE TO FIND MIN AND MAX SERVO
  - BE ABLE TO SET ID OF BOARD WITH RS485 AND BE ABLE TO USE 16 ET-RS SERVO V1 BOARDS IN THE SAME TIME
  - ET-RSS V1.0, PROCESSED PROGRAM FOR CONTROL THROUGH COMPUTER PC
  - SWITCHING LM2576 5V3A POWER SUPPLY ON BOARD (OPTION)
  - PCB SIZE 15.3 x 9 CM., DC JACK SUPPLY INPUT 9-12V AC/DC
  - **ET-RS SERVO V1 INCLUDES;**
1. ET-RS SERVO V1 BOARD
  2. ET-RS232 DB 9 PIN CABLE
  3. 4 PIN RS232 CABLE
  4. CD-ROM

**ET-REMOTE I/O V1 (P-ET-A-00173)**

It is Input/Output board in RS232/RS485 System, especially Monitor Program support instructions to use. Users send instruction code in ASCII COMMAND into board, be able to develop Input/Output in Network well.

- BE ABLE TO CONNECT IN REMOTE I/O THROUGH PORT RS232 WITH INSTRUCTIONS ASCII COMMAND AND THERE'S 10 SET OF THEM IN VERSION 1 SUCH AS IN, OUT, BIOSCOPE, AND ETC.
- BE ABLE TO CONNECT IN REMOTE NETWORK I/O THROUGH PORT RS485 (OPTION 3-CH.IC 75176 OR MAX3088)AND BE ABLE CONECT FOR 32 POINT TO 256 POINT NETWORK WITH 1 INSTRUCTIONS AND BE ABLE TO SET FOR 256 POSITION OF SUB-NETWORK
- 2-CH.POWER SUPPLY; 5V/1AMP AND 12V/1AMP FOR I/O, POWER SUPPLY 5V AND 12V FOR SWITCHING
- 40 BIT I/O INPUT/OUTPUT CONNECTING VIA 5-CH. 10 PIN ET-BUS AND BE ABLE TO CONNECT WITH I/O OF ETT THAT HAS 10 PIN ET-BUS PORT SUCH AS ET-OPTO ACIN4, ET-OPTO RELAY4

Continue ...

- CPU MCS51 ATMAEL T89C51RD2 PLCC 68 PIN RUN 36.864 MHz WITH MONITOR V1.0 ET-REMOTE I/O PROGRAM
  - 4-CH.I2C BUS EEPROM NO.24XX (OPTION)
  - I2C BUS RTC NO. DS1307 OR PCF8583 (OPTION)
  - 14 PIN LCD BUS ETT BE ABLE TO CONNECT CHARACTER LCD
  - RS232 ON BOARD, RS485 (IC 75176, MAX3088 OPTION)
  - PCB SIZE 12.7 x 12.7 CM.
  - **ET-REMOTE I/O V1 INCLUDES;**
1. ET-REMOTE I/O BOARD
  2. USER MANUAL
  3. CD-ROM
  4. ET-RS232 DB 9 PIN CABLE

**ET-RS8255 (P-ET-A-00089)****72 BIT I/O PORT, A/D 4CH 12 BIT, D/A 4CH 10 BIT**

It is controller board run on Computer PC through RS232 or RS422, users put right instructions into program and board will be run automatically. It is suitable for users who know less Microcontroller but can write program on PC. Users who can write program with C, C++, Pascal, QBasic, Visual Basic, Delphi Language can use them and it is controlled through Terminal Procomm Plus, Hyper Terminal Program without writing program. So, users need to understand user manual well because program will be run automatically through Computer PC. For example, 72 Bit Input / Output TTL, be able to read 12 Bit A TO D Input as 4 channel (4096 level)and 10 Bit D TO A Output as 4 channel (1024 level). User can adapt with other project work such as save data into computer PC or control ON/OFF of computer PC by connecting with ETT's 34 PIN ET BUS I/O board; 8-CH.RELAY (ET-REL8) or 8-CH.220 VAC (ET-SSRAC).

**SPECIFICATIONS**

- CPU :** MCS51 with Program Monitor (AT89S8252 RUN 18.432 Mhz)
- Digital Input/Output :** 72 Bit Input / Output TTL (PORT IC 8255 X 3)
- Analog Input :** 4 Channel 12 Bit ADC IC #ADS7841 (Option)
- Analog Output :** 4 Channel 10 Bit DAC IC #LTC1661 (Option)
- User memory eeprom data :** 256 Byte EEPROM In CPU
- Communication :** RS232 หรือ RS422 Baud rate 9600 หรือ 19200
- Command Set :** 11 คำสั่ง ASCII COMMAND
- Output Bit :** 1 Mini Speaker , 1 Led Operate
- Connector :** 34 Pin x 3 ET BUS I/O:10 Pin x 1 A/D:10 Pin x 1 D/A  
5 Pin x 1 RS232 : 6 Pin RS422/485
- Supply Voltage :** 220V AC Transformer+ Regulate 5VDC On Board
- Dimensions :** 98 X 260 X 44 mm.

**Method** to writing controller program: Users may write program with high language that has instructions of Input/Output with Port RS232 or using Components that is able to use RS232. Programs in ET-RS8255's CD-ROM are written with Delphi 3.0 Language, run on Windows95 and use Component "ComPort". Both example and component in CD-ROM are easy for user in case of known in other language such as QBASIC, C, Pascal.

**ET-RS8255 INCLUDES;**

1. ET-RS8255 BOARD
2. USER MANUAL
3. CD-ROM
4. ET-DOWNLOAD STAMP/RD2 CABLE
5. AC LINE 220VAC WIRE



**ET-USB FLASH DRIVE (P-ET-A-00344)**

**ET-USB FLASH DRIVE**

CHIP FTDI # VNCIL-1A USB HOST CONTROLLER



ET-USB FLASH DRIVE is device that is designed to interface with FLASH DRIVE USB; so, user can use command to read file, write file, erase file, create file and etc through PORT RS232. Additionally, it can be interfaced with computer PC or Board Microcontrollers to adapt it into many applications such as storing data of GPS, Weather Detection, DATA LOGGER and etc.

- Use IC of FTDI No.VNC1L-1A USB HOST CONTROLLER
- Can communicate with FAT12, FAT16, or FAT32 FLASH DRIVE USB
- Support 8 Characters Filename and 3 Characters File Surname
- Control reading and writing FLASH DRIVE by sending COMMAND to control through PORT RS232
- Can create, read, write, erase file or DIRECTORY and can rename filename or DIRECTORY name
- Select 2 types of sending command; ASCII or HEX
- BAUD RATE uses DEFAULT 9600, N, 8, 1 and can adjust values in the range of 300 -115200
- Select signal TX, RX, GND only, or FLOW CONTROL by signal RTS, CTS
- PORT RS232 DB 9 PIN FEMALE
- USB TYPE A to interface with FLASH DRIVE USB
- POWER SUPPLY DC 9 - 12 VDC
- BLACK BOX SIZE 7.5 x 2.5 x 5 cm.
- **ET-USB FLASH DRIVE** consists of ET-USB FLASH DRIVE, CD-ROM User's Manual, DC POWER SUPPLY 10 VDC/850mA, DB 9 PIN MALE, CONVER DB 9 PIN



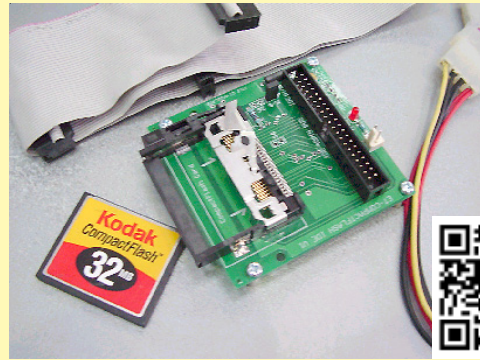
**ET-CFIDE V1 (P-ET-A-00135)**

ET-CompactFlash IDE V1.0 is designe d to connect CompactFlash Card with Computer PC through IDE Interface. CompactFlash Card is in True IDE Mode, so it's only hard disk in computer PC. Users can replace hard disk or CD-ROM in other project work. Connecting ET-CompactFlash IDE V1.0 Board with Computer PC uses 40 CH Pair Cable of hard disk.

Users can set ET-CompactFlash IDE V1.0 Board as Master or Slave because IDE disk Drive Connector Blank on 1 CH Main Board be able to connect 2 ET-CompactFlash IDE V1.0 Boards but users need to set one is Master and one is Slave.

**USING ET-CFIDE V1.0**

- PUT CompactFlash CARD INTO ET-CompactFlash IDE V1.0 BOARD
- CONNECT 40 PIN PAIR CABLE FROM ET-CompactFlash IDE V1.0 BOARD WITH IDE DISK DRIVE CONNECTOR ON MAIN BOARD OF COMPUTER
- USE +5V AND GND POWER SUPPLY ON COMPUTER TO BOARD THROUGH CONNECTOR CABLE
- START COMPUTER AND WIIL SEE ET-CompactFlash IDE V1.0 ON WINDOWS AS NORMAL HARD DISK



- ET-CFIDE V1.0 SYSTEM IS DESIGNED TO USE WITH CompactFlash CARD AND USES MAXIMUM 100mA +5V/25C POWER SUPPLY.

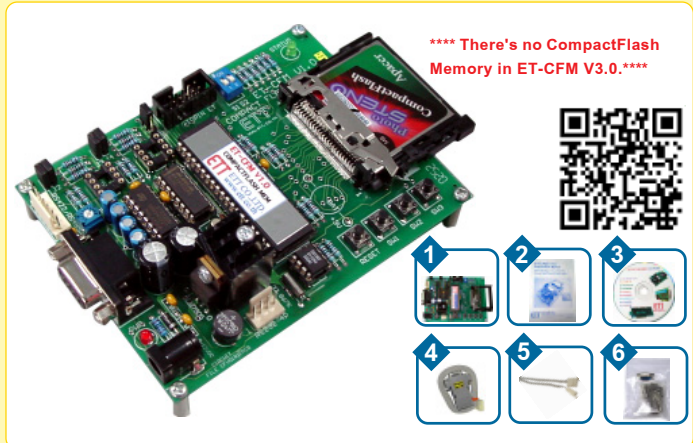
**ET-CompactFlash IDE INCLUDES;**

- ET-CompactFlash WITH CONNECTOR CompactFlash
- 1 CH 40 PIN PAIR CABLE CONNECT WITH COMPUTER PC
- 1 CH POWER SUPPLY CABLE CONNECT WITH COMPUTER PC PORT



**ET-CFM V3 (P-ET-A-00110)**

ET-CFM V3.0 is designed to connect with Microcontroller Board for writing and reading data with CompactFlash MEMORY in standard file. Be able to run on DOS or WINDOWS and adapt to keep information in other project works. It sends data into ET-CFM Board to keep in Memory through PORT RS232. CompactFlash is the cheapest memory per memory size, so it is used in GPS System, Data Loggers, Thermometer.



\*\*\*\* There's no CompactFlash Memory in ET-CFM V3.0.\*\*\*\*

- BE ABLE TO USE CompactFlash IN MANY SIZE SUCH AS 32MB, 64MB,128MB, 256MB, OR 1 GB
- MAXIMUM 4 GB CompactFlash MEMORY
- SAVE DATA AS STANDARD SYSTEM FILE FAT 16 AND BE ABLE TO USE WITH OS SYSTEM OF WINDOWS
- CONNECT DATA TO CompactFlash THROUGH PORT RS232, RS422 (OPTION) AND SET THE CONNECTION VALUE AS 9600,19200,38400, AND 57600 BIT PER SECOND
- BASIC INSTRUCTIONS CONNECTING WITH CompactFlash SUCH AS READ, WRITE, RESET, TIME RTC, DISK EMPTY
- RTC WITH BATTERY BACKUP
- DB 9 PIN AND 4 PIN ETT PORT RS232, 6 PIN ETT RS422
- POWER SUPPLY DC 9-12 VDC (DC ADAPTE 10VDC FROM ETT PRICE)
- BOARD SIZE 11.7 x 9 CM.
- **ET-CFM V3.0 INCLUDES;** .

1. ET-CFM V1.0 BOARD
2. USER MANUAL
3. CD-ROM
4. ET-RS232 DB 9 PIN CABLE
5. 4 PIN RS232 CABLE HEADER
6. DB 9 PIN MALE, COVER 9 PIN



**ET-WiFLY GSX**

(P-ET-A-00448)

**ET-WiFLY GSX**

TCP/IP, DHCP, UDP, DNS, ARP, ICMP



ET-WiFLY GSX is the device to convert data from RS232 Communication into Wireless LAN. The complete set consists of Board, Module WiFly and antennae, so it is unnecessary to purchase any Option. Moreover, it reduces difficulty in communicating data between Wireless LAN and RS232 PORT because user does not waste time to learn or write any program by self. It can be modified and adapted for various applications; for example, it can interface machine with Wireless LAN; it can interface Controller Boards with Wireless LAN; it can interface Board Microcontroller with computers or Smartphone and etc.

**Specifications of ET-WiFLY GSX**

- Use Module WiFly # RN-131C from ROVING NETWORKS Company
- Use Frequency range of 2.4GHz according to the standard of IEEE 802.11 b/g
- Support the communication types; TCP/IP, DHCP, UDP, DNS, ARP, ICMP
- Use antennae as CERAMIC CHIP ON BOARD and has CONNECTOR U.FL to interface with external antennae
- TRANSMISSION RATE (OVER THE AIR)
  - : 1-11Mbps FOR 802.11 b
  - : 6-54Mbps FOR 802.11 g
- RECEIVE SENSITIVITY : -85 dBm
- OUTPUT LEVEL (CLASS 1): +18 dBm
- Support Adhoc Mode (PEER TO PEER)
- Has security system for communicating data as WEP-128, WPA-PSK(TRIP), WPA2-PSK(AES)
- Has universal standard of MAC ADDRESS internal module
- Can set CONFIGURATION through WiFi by TELNET or RS232 PORT
- Has 4 LEDs to display operating statuses and status of POWER SUPPLY
- Can set BAUDRATE for RS232 Port in the range of 2400, 4800, 96000, ..., 460800, 921600 bps
- Has RS232 SERIAL PORT DB 9PIN FEMALE
- Use DC JACK 2.5 mm., 7-12VDC (500mA) to be POWER SUPPLY (it can use version WET-SWITCHING ADAPTER 12V 0.5A TYPE J (OPTION) excluded in the package)
- Plastic Box size of ET-WiFLY GSX is 7.5 x 2.5 x 5 cm.
- ET-WiFLY GSX set consists of...
  1. Board with box ET-WiFLY GSX
  2. Cable DB 9PIN "SERIAL CABLE DB-9 M/F"
  3. CD-Rim Program and User's Manual



**ET-XPORT V1 (P-ET-A-00275)**

**ET-XPORT V1**

RS232 TO LAN TCP/IP  
Ethernet 10/100MBIT



**Module XPORT LANTRONIC**

CPU 186 256KB ZERO WAIT STATE SRAM  
512KB FLASH / 16KB BOOT ROM  
WITH RIJNDEAL ENCRYPTION  
EMBEDDED WEB SERVER  
10/100MBIT ETHERNET-AUTO-SENSING

ET-XPORT V1 is device for transforming data that is connected between PROTOCOL of TCP/IP and RS232 PORT. One side must be interfaced with PORT RS232 of Board Control and other one side must be communicated through LAN ETHERNET system TCP/IP PROTOCOL. Function of ET-XPORT is DATA PROTOCOL CONVERTER. It makes user more convenient because it reduces the difficulty of usage and connective components though LAN system. So, we can apply it to be NETWORK connection through LAN system for sending Alarm E-Mail, RS232 connection through LAN system for data detection.

**SPECIFICATIONS**

- USING MODULE XPORT FROM LANTRONIX CO., LTD. BECAUSE ITS SPECIFICATIONS IS BETTER THAN OTHER MODULES
  - MODULE XPORT USES CPU FAMILY 186, 256KB ZERO WAIT STATE SRAM, 512KB FLASH, 16KB BOOTROM, WITH RIJNDEAL ENCRYPTION
  - EMBEDDED WEB SERVER, 10/100MBIT ETHERNET-AUTO-SENSING
  - BAUDRTAE CAN BE COMMUNICATED FROM 300 TO 921600 BPS
  - RS232 SERIAL PORT DB 9 PIN FEMALE
  - RJ45 PORT ETHERNET LAN WITH LED TO DISPLAY STSTATUS OF COMMUNICATION DATA
  - 3 INPUT OPTO-ISOLATE 5VDC-24VDC TO INTERFACE WITH EXTERNAL DEVICE AND TO KNOW THE STATUS THROUGH ETHERNET
  - 4 LED FOR DISPLAY THE STATUS OPERATION OF INPUT AND POWER SUPPLY
  - CAN SET CONFIGURATION THROUGH WEB BROWSER OR TELNET OR RS232
  - USING PASSWORD PROTECTION WITH ENCRYPTION SYSTEM FOR SENDING/RECEIVING DATA PROTECTION
  - CAN SUPPORT TCP/IP PROTOCOL COMMUNICATIONS SUCHA AS
    - ARP, UDP, TCP, ICMP, TELNET, TFTP, AUTO IP, DHCP, HTTP, SNMP FOR NETWORK TYPE
    - TCP, UDP TELNET FOR RS232 COMMUNICATION TYPE
    - USER DATA GRAM PROTOCOL (UDP)
    - SMTP FOR SENDING/RECEIVING E-MAIL
  - INTERNAL STANDARD OF MAC ADDRESS OR ETHERNET ADDRESS
  - POWER SUPPLY 5V-12VDC
  - BOX SIZE: 7.5 x 2.5 x 5 CM., 4 PIN INPUT PLUGGABLE TYPE TERMINAL BLOCK
- ET-XPORT V1 INCLUDES...
  1. BOARD ET-XPORT V1 WITH BOX
  2. CD-ROM OF THAI USER MANUAL'S PROGRAM
  3. CABLE RJ45 ETHERNET LAN (PEAR TO PEAR),
  4. POWER SUPPLY ET-SWITCHING ADAPTER 5V 1.2A TYPE J



**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.FT231XS from FTDI Company and IC No.MAX3242, 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

### ET-USB TO USB ISOLATION

(P-ET-A-00446)



ET-USB TO USB ISOLATION is a device to protect USB PORT of computer from damaged, especially notebook. It solves the problems of different Signal GND or abnormal current that may leak into USB PORT and make the devices serious damaged.



ET-USB TO USB ISOLATION uses iCoupler Technology to separate signal and GND of USB on the side of IN and OUT.

**Specifications of ET-USB TO USB ISOLATION**

- Support the standard of USB 2.0 (LOW & FULL SPEED) 1.5-12 Mbps
- 2.5KV ISOLATED by using iCoupler Technology No.ADUM4160 and ADUM5000 from ANALOG DEVICES Company
- Has Circuit ESD Protector No.USBLC6-2 for both sides of USB PORT
- Use Power Supply from PORT USB directly, it is unnecessary to inter face with any external Power Supply
- Can supply 100mA Current from Connector USB on the side of ISOLATION
- Has external Connector 5VDC, it is used in case of supplying power for external device that uses current higher than 100mA (OPTION "ET-SWITCHING ADAPTER 5V 2A TYPE B" )
- Use USB PORT Connector TYPE B on the side of IN and Connector TYPE A on the side of OUT
- Has 3 LEDs to display operating status of IN, OUT, EXT PWR
- Not install any Driver, so it is compatible with all operating systems: Windows, Linux, Mac OS X
- Plastic box size of ET-USB TO USB ISOLATION is 7.5 x 2.5 x 5 cm.

• ET-USB TO USB ISOLATION consists of...

1. Board and box ET-USB TO USB ISOLATION
2. USB CABLE A TO B TYPE
3. CD-ROM Program and User's Manual



### ET-USB TO RS232 ISOLATION

(P-ET-A-00447)



ET-USB TO RS232 ISOLATION is the device like ET-USB TO USB ISOLATION but it only is different in the part of converting signal. In this case, it converts signal from USB PORT ISOLATION into RS232 PORT ISOLATION instead. It separates system of USB from RS232.



**Specifications of ET-USB TO RS232 ISOLATION**

- Support the standard of USB 1.1 and USB 2.0; it is converted into RS232 PORT
- Use IC No.FTDI232RL from FTDI Company to convert signal from USB PORT ISOLATION into RS232
- Transmitting and receiving rate is in the range of 300bps to 128 kps
- Has 2.5KV ISOLATION and Circuit ESD Protector as same as ET-USB TO USB ISOLATION
- Has full pins for using RS232: TXD, RXD, DTR, DSR, CTS, RTS, DCD, RI, GND
- Use Power Supply from PORT USB directly, it is unnecessary to interface with external Power Supply
- Use Connector TYPE B with Cable USB A TO B TYPE
- Use Connector RS232 DB 9PIN MALE
- Has 3 LEDs to display operating statuses of RX, TX, and PWR
- Has Driver that supports the operating system of Windows, Linux, Mac OS X
- Plastic box size of ET-USB TO RS232 ISOLATION is 7.5 x 2.5 x 5 cm.

• ET-USB TO RS232 ISOLATION consists of...

1. Board and box ET-USB TO RS232 ISOLATION
2. USB CABLE A TO B TYPE
3. CD-ROM Program and User's Manual



### ET-USB/RS232

(P-ET-A-00200)



ET-USB/RS232 is converter of signal communication from USB PORT (UNIVERSAL SERIAL BUS) on Computer PC into PORT RS232. It is suitable for Notebook Computer and Computer PC that has only PORT USB and need to use PORT RS232 or expand PORT RS232 as COM3, COM4. This method is using PORT USB for expansion COM PORT instead of installing Card in Computer.

- CONVERTER :** USB TO RS232 DB 9 PIN MALE FULL DUPLEX WITH CODE CONTROLLER (RX, TX, DCD, DTR, RTC, CTS, DSR AND R)
- BAUD RATE :** BAUD RATE FROM 300 BPS TO 128 KBPS
- PORT :** USB CONNECTOR TYPE B  
RS232 DB 9 PIN MALE PORT
- OS :** BE ABLE TO RUN WITH USB SYSTEM ON OS WINDOWS 98/ME/2000/NT/XP PLUG AND PLAY TYPE
- LED :** LED DISPLAY TX, RX, POWER
- SIZE :** 7.5 x 2.5 x 5 CM.



Be able to use ET-USB/RS232 with ETT Board that uses Port RS232 download program into CPU and be able to replace RS232 with ET-USB/RS232 to download.

ET-USB/RS232 includes

1. ET-USB/RS232 BOX
2. USB CABLE A TO B TYPE
3. CD-ROM



### ET-USB/RS422/485

(P-ET-A-00201)



ET-USB/RS422/485 is converter of signal communication from USB PORT (UNIVERSAL SERIAL BUS) on Computer PC into PORT RS422 or RS485. It is suitable for Notebook Computer and Computer PC to connect PORT Rs422 or RS485 with industrial machine, Network or connect in long distance (1.2 km).

- CONVERTER :** USB TO RS422 (FULL DUPLEX) AND RS485 (HALF DUPLEX)
- BAUD RATE :** BAUD RATE FROM 300 BPS TO 128 KBPS
- PORT :** USB CONNECTOR TYPE B RS422/485 PLUG TYPE TERMINAL BLOCK WITH SW SELECT MODE RS422/485
- OS :** BE ABLE TO RUN WITH USB PORT ON OS WINDOWS 98/ME/2000/NT/XP PLUG AND PLAY TYPE
- LED :** LED DISPLAY TX, RX, POWER
- DISTANCE :** 4000 FEET OR 1.2 KM.
- SIZE :** 7.5 x 2.5 x 5 CM.



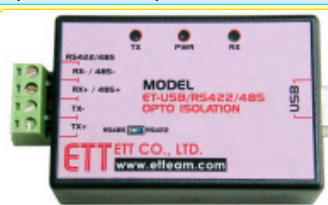
ET-USB/RS422/485 INCLUDES;

1. ET-USB/RS422/485 BOX
2. USB CABLE A TO B TYPE
3. CD-ROM



### ET-USB/RS422/485 ISOLATION

(P-ET-A-00202)



ET-USB/RS422/485 ISOLATION is converter of signal communication from USB PORT (UNIVERSAL SERIAL BUS) on Computer PC into PORT RS422 or RS485. It isolates signal communication of PC and RS422/485 with OPTO Circuit, protects short-circuit or thunderbolt to damage all circuit in system.

- CONVERTER :** USB TO RS422 (FULL DUPLEX) AND RS485 (HALF DUPLEX)
- BAUD RATE :** BAUD RATE FROM 300 BPS TO 115.2 KBPS
- ISOLATION :** ISOLATION DATA INTERFACE 1600 VRMS (1 MINUTE)  
USE IC MAX1480 AS ISOLATION CIRCUIT
- PORT :** USB CONNECTOR TYPE B  
RS422/485 PLUG TYPE TERMINAL BLOCK WITH SW SELECT MODE RS422/485
- OS :** BE ABLE TO RUN WITH USB PORT ON OS WINDOWS 98/ME/2000/NT/XP PLUG AND PLAY TYPE
- LED :** LED DISPLAY TX, RX, POWER
- DISTANCE :** 4000 FEET OR 1.2 KM.
- SIZE :** 7.5 x 2.5 x 5 CM.



ET-USB/RS422/485 ISOLATION INCLUDES;

1. ET-USB/RS422/485 ISOLATION BOX
2. USB A TO B TYPE
3. CD-ROM





**ET-USB/RS422/485 V2**

(P-ET-A-00372)



It converts signal from USB PORT into RS422/485 for using with computer PC. It is suitable for computer PC that is interfaced with PORT RS422 or RS485 and industrial devices as Network System. Moreover, it can be interfaced up to 1.2 kilometer long distance.

**Convert Signal:** USB TO RS422 (FULL DUPLEX) and RS485 (HALF DUPLEX)

**BAUD RATE :** Use Signal BAUD RATE from 300 BPS to 128 KBPS

**CONNECTOR :** USB CONNECTOR TYPE B  
RS422/485 PLUG TYPE TERMINAL BOX and SW to choose MODE between RS422 and 485

**OS :** Interface with USB PORT on OS WINDOWS 98/ME/2000/XP/VISTA; it is installed as PLUG & PLAY and use POWER SUPPLY from USB CONNECTOR

**LED STATUS :** LED TX, RX, POWER

**DISTANCE :** 4000 FEET OR 1.2 KILOMETRE

**BOX SIZE :** 7.5 X 2.5 X 5 CM.

ET-USB/RS422/485 V2.0 includes...

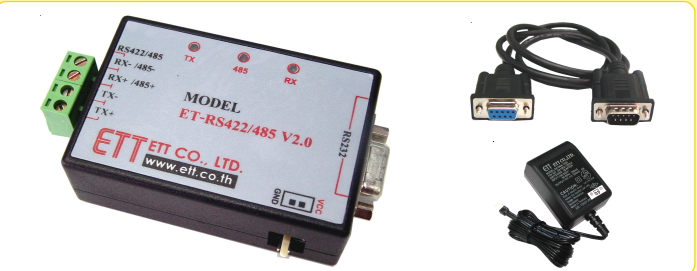
1. BOARD and BOX
2. USB CABLE A TO B TYPE
3. CD-ROM User's Manual and DRIVER



**ET-RS422/485 V2**

(P-ET-A-00203)

ET-RS422/485 V2.0 is converter signal of send/receive data from RS232 into RS422 or RS485 and converter from RS422 or RS485 into RS232. In case of connecting as RS422 or RS485 is able to connect longer than RS232 about 4000 feet or 1.2 km. and is able to connect many points (Multipoint).



**CONVERTER :** RS232C AS RS422 (FULL DUPLEX) AND RS485 (HALF DUPLEX)

**BAUD RATE :** BAUD RATE FROM 300 BPS TO 115.2 KBPS

**PORT :** RS232C DB 9 PIN FEMALE  
RS422/485 PLUG TYPE TERMINAL BLOCK

**SW MODE :** BE ABLE TO SELECT 4 MODES;  
1.RS422  
2.RS485 CONTROL SEND/RECEIVE RTS OFF  
3.RS485 CONTROL SEND/RECEIVE RTS ON  
4.RS485 AS AUTO SEND/RECEIVE

**LED :** TX, 485, RX LED

**DISTANCE :** 4000 FEET OR 1.2 KM.

**POWER SUPPLY :** DC ADAPTER 10VDC 850mA

**SIZE :** 7.5 x 2.5 x 5 CM.



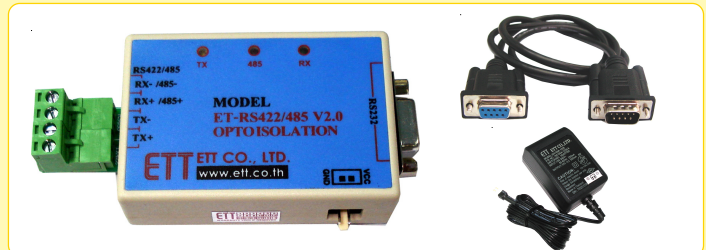
ET-RS422/485 V2.0 INCLUDES;

1. ET-RS422/485 V2.0 BOX
2. DB 9 PIN HEADER "SERIAL CABLE DB-9 M/F"
3. DC ADAPTER
4. MANUAL

**ET-RS422/485 ISOLATION V2**

(P-ET-A-00204)

ET-RS422/485 ISOLATION V2.0 is converter signal of send/receive data from RS232C into RS422 or RS485. It isolates signal with OPTO, protects short-circuit or thunderbolt to damage all circuit in system.



**CONVERTER :** RS232C AS RS422 (FULL DUPLEX) AND RS485 (HALF DUPLEX)

**BAUD RATE :** BAUD RATE FROM 300 BPS TO 115.2 KBPS

**ISOLATION :** ISOLATION DATA INTERFACE 1600 VRMS (1 MINUTE) USE IC MAX1480 AS ISOLATION CIRCUIT

**PORT :** RS232C DB 9 PIN FEMALE  
RS422/485 PLUG TYPE TERMINAL BLOCK

**SW MODE :** BE ABLE TO SELECT 4 MODES;  
1.RS422  
2.RS485 CONTROL SEND/RECEIVE RTS OFF  
3.RS485 CONTROL SEND/RECEIVE RTS ON  
4.RS485 AS AUTO SEND/RECEIVE

**LED :** TX, 485, RX LED

**DISTANCE :** 4000 FEET OR 1.2 KM.

**POWER SUPPLY :** DC ADAPTER 10VDC 850mA

**SIZE :** 7.5 x 2.5 x 5 CM.



ET-RS422/485 ISOLATION V2.0 INCLUDES;

1. ET-RS422/485 ISOLATION V2.0 BOX
2. DB 9 PIN HEADER "SERIAL CABLE DB-9M/F"
3. DC ADAPTER
4. MANUAL

**ET-USB/RS422/485 ISOLATION V2**

(P-ET-A-00373)



It converts signal from USB PORT into RS422/485 ISOLATION and it converts signal from USB PORT on the computer PC into RS422/485. It uses OPTO ISOLATION Circuit to divide signals between computer PC and RS422/485. It protects cable from unusual electricity system or thunderbolt; moreover, it reduces interrupt signal.

**Convert Signal:** USB TO RS422 (FULL DUPLEX) and RS485 (HALF DUPLEX)

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

**ISOLATION :** Use POWER SUPPLY AC/DC CONVERTER ISOLATED (1K VDC ISOLATION) with OPTOCOUPLER LOGIC No.6N137 and 6N136 to divide signals into OPTO.

**CONNECTOR :** USB CONNECTOR TYPE B  
RS422/485 PLUG TYPE TERMINAL BOX with SW to choose Mode between RS422 and 485.

**OS :** Interface with USB PORT on OS WINDOWS 98/ME/2000/XP/VISTA and it is installed as PLUG & PLAY. It uses POWER SUPPLY from USB CONNECTOR.

**LED STATUS :** LED TX, RX, POWER

**DISTANCE :** 4000 FEET or 1.2 KILOMETRE

**BOX SIZE :** 7.5 X 2.5 X 5 CM.

ET-USB/RS422/485 ISOLATION V2.0 includes...

1. Board and box
2. USB CABLE A TO B TYPE
3. CD-ROM User's Manual and DRIVER



**ET-RS422/485**  
(P-ET-A-00017)



ET-RS422/485 which is Adapter converts signal of send/receive data from RS232C into RS422 or RS485 and converter from RS422 or RS485 into RS232C. In case of connecting as RS422 or RS485 is able to connect longer than RS232 about 4000 feet or 1.2 km. and is able to connect many points (Multipoint).

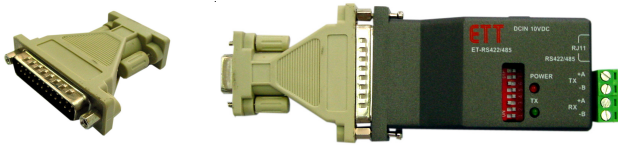


- **CONNECTOR** : RS232 25 PIN FEMALE  
: RS422/485 4 TERMINAL/RJ11
  - **DATA RATE** : 1 MB/SECOND
  - **CABLE ENGLISH** : 4000 FT MAX
  - **SIZE BOX** : 10 x 5.5 x 2.5 CM.
  - **ET-RS422/485 INCLUDES ;**
1. ET-RS422/485
  2. USER MANUAL
  3. ADAPTER 10VDC/850mA



**DB9-F TO DB25-M (A-CO-D-00023)**

- **CONNECTOR FOR CONVERT CONNECTOR DB 9 PIN INTO DB 25 PIN**



**ET-RS422/485 OPTO ISOLATION**  
(P-ET-A-00082)

ET-RS422/485 OPTO ISOLATION is converter signal of send/receive data from RS232 into RS422 or RS485 and OPTO ISOLATION. To reduce connecting for long distance, different signal level of GND and protects short-circuit or thunderbolt to damage all circuit in system.



- **CONVERTER SIGNAL OF SEND/RECEIVE FROM RS232 INTO RS422 (4 WIRES)**
  - **CONVERTER SIGNAL OF SEND/RECEIVE FROM RS232 INTO RS485 (2 WIRES)**
  - **RS485 BE SET SEN/RECEIVE DATA AS AUTO TIMER OR CONTROL WITH RTS**
  - **RS232 AS RS232 ISOLATED ISOLATION :2000V AC**
  - **RS422 AND RS485 AS ISOLATED ISOLATION :2000V AC**
  - **CONNECTING AS DEC OR DTE, LED DISPLAY TX, RX, RTS, AND CTS**
  - **SET WAITING TIME FOR TEST CTS BEFORE BE LOGIC HIGH**
  - **SEND/RECEIVE SPEED 300 BPS-115.2 KBPS**
  - **4000 FEET OR 1200 M. FOR RS422/485**
  - **POINT-TO-POINT, MULTIDROP AND SIMPLEX**
  - **BE ABLE CONNECT AS MULTIDROP OR SIMPLEX 256 POINTS (SELECT IC NO.MAX3088CPA REPLACING NO.75176 FOR SEND/RECEIVE SIGNAL)**
  - **USE MOV TO CONNECT RS422/485 PIN TO PROTECT ELECTRICITY OVERFLOW IN CIRCUIT**
  - **RS232 DB 9 FEMALE PORT**
  - **RS232 ISOLATED DB 9 PIN MALE PORT**
  - **RS422/RS485 DB 9 MALE PORT**
  - **220VAC POWER SUPPLY**
  - **SIZE 11.0 x 19.0 x 6.5 CM.**
  - **ET-RS422/485 ISOLATION INCLUDES ;**
1. ET-RS422/485 ISOLATION WITH BOX
  2. USER MANUAL
  3. DB 9 PIN WIRE CONNECTOR TO CONNECT WITH PORT RS232 INTO COMPUTER PC



**ET-RS232 ISOLATION MINI**  
(P-ET-A-00391)



**ET-RS232 ISOLATION MINI** is the mini device to interface through PORT RS232 DB 9PIN. It uses with PORT RS232 that has problem regarding different GND to protect the circuit from damaged that is occurred because of short-circuit or thunderbolt to the line system. In this case, it separates GND System from RS232 Circuit by OPTO ISOLATION Circuit to protect all circuits from damaged.

- **Be the device to interface with PORT RS232 of computer or other devices; it is Connector DB 9 PIN FEMALE and the output side is DB 9 PIN MALE. It separates signal RS232 in the format of OPTO ISOLATION.**
- **Use IC ADM3251E of ANALOG DEVICE for operation.**
- **2.5KV FULLY ISOLATED TRANSCEIVER**
- **Use with RS232 System that only uses Pin TX,RX and GND because this ET-RS232 ISOLATION MINI has ISOLATION Circuit that separates RX and TX only. If user wants to use all Signal RS232 (TX,RX,DTR, CTS,RTS,CO,DSR), user needs to use ET-RS232 OPTO ISOLATION(P-ET-A-00016)**
- **ISOLATION DATA RATE TX,RX = 0-19200 BPS**
- **The Circuit is contained in DB 9 PIN with the header size of 5.29 x 1.66 x 2.50 cm.**

**SPECIFICATIONS**

<b>INTERFACE :</b>	<b>RS232 (TX, RX, GND)</b>
<b>DATA RATE :</b>	<b>0-19200 BPS</b>
<b>ISOLATION :</b>	<b>2.5KV ISOLATED</b>
<b>POWER :</b>	<b>5VDC</b>
<b>CONNECTORS :</b>	<b>DB 9PIN FEMALE INPUT DB 9PIN MALE OUTPUT ISOLATION</b>



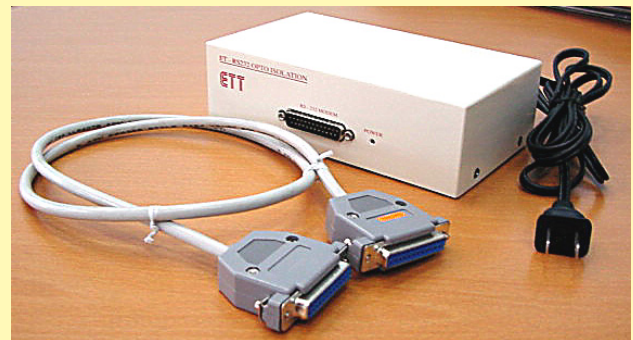
- **ET-RS232 ISOLATION MINI consists of...**

1. ET-RS232 ISOLATION MINI
2. POWER SUPPLY ET-SWITCH-INGADAPTER 5V 1.2A TYPE B
3. Document



**ET-RS232 OPTO ISOLATION**  
(P-ET-A-00016)

ET-RS232 OPTO ISOLATION ... is a equipment to solve any problem of installing PORT RS232 or Computer into Modem or accessories of RS232 connected together. To reduce different signal level of GND and protects short-circuit or thunderbolt to damage all circuit in system. It isolates INPUT Signal from OUTPUT Signal and GND with Opto Isolation including Power Supply in 2 package.



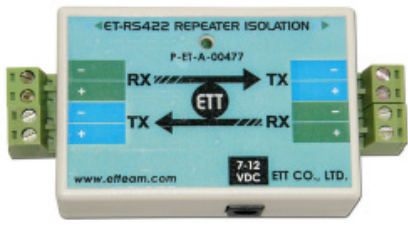
- **TOTAL ELECTRICAL ISOLATION NOISE AND VOLTAGE SPIKER ISOLATION**
- **ELIMINATER GROUND LOOPS**
- **RS232 FULL DUPLEX (TX, RX, DTR, CTS, RTS, CD, DSR)**
- **ISOLATION DATA RATE 0-19200 BPS**
- **OPTO ISOLATION INCLUDING POWER SUPPLY**
- **SIZE BOX 17.5 x 10 x 5 CM.**





**ET-RS422 REPEATER ISOLATION**

(P-ET-A-00477)



**ET-RS422 REPEATER** is a tool to repeat signal of RS422 that uses long Cable or it interfaces many devices together in the same line and it makes the signal level in the BUS system lower. ET-RS422 REPEATER is used to repeat the signal level of RS422 that is low and then boost the signal level to be more and more until it is in the standard level of RS422.

- Use LINE DRIVER No.MAX3088 to receive and repeat signal on both side of transmitter and receiver
  - Support BAUDRATE in the range of 300 BPS–115,200 BPS
  - Can repeat signal to increase longer distance for sending data up to 4,000 feet or 1,200 meter approximately
  - Use Circuit POWER SUPPLY ISOLATE to remove the problem of the different phase between GND and AC. It receives INPUT Power Supply that is AC/DC 7-12V.
  - Has 1 LED to display the status of Power Supply
  - Has DIP-SWITCH to ON/OFF Circuit that compensates IMPEDANCE of both TERMINATE(RZ) and FAIL-SAFE(RH,RL) on both sides of receiver and transmitter independently.
  - Use Connector PLUG TYPE TERMINAL BLOCK
  - Box size: 7.5 x 2.5 x 5 cm.
  - **ET-RS422 REPEATER ISOLATION** consists of ...
1. ET-RS422 REPEATER ISOLATION
  2. POWER SUPPLY DC ADAPTER 10VDC/850 mA



**ET-RF24G V2**

(P-ET-A-00336)



Send/Receive Data RS232 Wireless "ET-RF24G V2.0" is a new product that is developed from ET-RF24G V1.0; it can communicate longer distance. Moreover, its wire pole can be separated because it is more convenient to use and expand. ET-RF24G V2.0 is CONVERTER that converts signal in RS232 Wire system into send/receive data RS232 Wireless.

- Send/Receive data as GFSK (GAUSSIAN FREQUENCY SHIFT KEYING)
  - Frequency 2.4GHz - 2.52GHz
  - +20dBm OUTPUT POWER, 2.4GHz 50OHM External Wire Pole
  - BAUDRATE 1200 - 19200 BPS
  - 100 meter distance Send/Receive data or longer distance for outdoor area
  - Set 125 Channels by program to use many devices in the same area, set 256 ID CODE for receiving data, and adapt it for RF NETWORK.
  - 4 PIN RS232 PORT standard ETT to connect with ETT Boards directly by using POWER SUPPLY with ETT Board
  - 2 PIN POWER SUPPLY 5VDC - 9VDC, 40mA CURRENT for RECEIVE MODE, TRANSMIT MODE MAX 450mA (can be used with ADAPTER 5V/1.2A version ET-SWITCHING ADAPTER 5V/2A TYPE H )
  - Box Size: 2.2 x 5 x 7.5 cm.
  - Include Program SETUP to set operation values: BAUDRATE, OPERATION MODE, SET ID, SET FREQUENCY
  - Can adapt ET-RF24G V2.0 for many applications such as Robot Controller, Board Display, REMOTE RS232, DATA LOGGER Wireless
  - **ET-RF24G V2.0** consists of
1. ET-RF24G V2.0 and wire pole,
  2. ET-RS232 DB 9 PIN CABLE
  3. 4 PIN RS232 CABLE
  4. CD-ROM WITH MANUAL IN THAI AS PDF FILE AND PROGRAM SET UP.



**ET-RF24G V1.0**

(P-ET-A-00184)



**ET-RF24G V1.0** is ready-made SIGNAL CONVERTER to transform signal from RS232 with wire into RS232 wireless with RF 2.4 GHz. ETT designs ready-made MODULE to send signal RF TRW-2.4G with small board controller and it is able to send 50 m - 280 m distance.

- HIGH SPEED SEND/RECEIVE DATA WITH GFSK (GAUSSIAN FREQUENCY SHIFT KEYING) MAXIMUM 1 M BPS, 250 K BPS. THERE'S SENDER AND RECEIVER IN ONE AND ALTERNATE SEND/RECEIVE.
  - Run 2.4GHz - 2.524GHz
  - OUTPUT POWER 10mW, with signal pole inside
  - BE ABLE TO SET PROGRAM 125 CHANNEL, SO BE ABLE TO USE MANY ET-RF24G IN THE SAME AREA. BE ABLE TO SET ID CODE OF SEND/RECEIVE FROM 256 POSITIONS/CHANNEL AND BE ABLE TO ADAPT AS RF NETWORK
  - SEND/RECEIVE SIGNAL FOR 250M DISTANCE(250 K BPS), 150M (1 M BPS) OPEN AREA AND 50M FOR INSIDE
  - PORT RS232 4 PIN STANDARD ETT BE ABLE TO CONNECT WITH ETT BOARDS DIRECTLY AND USE POWER WITH ETT BORDS FOR PROVIDING ELECTRICITY INTO ET-RF24G OR CONNECT WITH PORT DB 9 PIN BECAUSE THERE'S WIRE CONNETOR DB 9 PIN IN PACKAGE
  - POWER SUPPLY 5VD-9VDC CURRENT MAX 30mA PORT 4 PIN AND 2 PIN (BE ABLE TO USE DC ADAPTER ACH-4E OR USB A TO 2 PIN VCC TYPE FOR PROVIDING ELECTRICITY INTO ET-RF24G AS OPTION)
  - BOX SIZE 2.2 x 5 x 7.5 CM. WEIGHT 0.05KG.
  - SETUP PROGRAM FROM ETT THAT USERS CAN CHANGE AND SET EASILY SUCH AS SETTING BAUDRATE 200-19200 BPS, MODE (RECEIVE ONLY, TRANSMIT ONLY, AUTO), RF POWER GAIN, SET RX ID, TX ID, SET FREQUENCY CHANNEL
  - ET-RF24G IS ABLE TO ADAPT IN MANY PROJECT WORKS SUCH AS REMOTE CONTROL, CONTROL ROBOT FOR LONG DISTANCE, BILL BOARD WITHOUT INSTALLING AN ELECTRI WIRE, DATA LOGGER, RS232 OPTO ISOLATION, BE ABLE TO ADAPT AS FULL DUPLEX BY USING 2 ET-RF24G/ SIDE
  - **ET-RF24G V1 INCLUDES;**
1. ET-RF24G V1 WITH BOX
  2. ET-RS232 DB 9 PIN CABLE
  3. 4 PIN RS232 CABLE
  4. CD-ROM WITH MANUAL IN THAI AS PDF FILE AND PROGRAM SET UP.



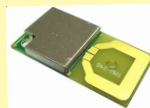
**ET-SWITCHING ADAPTER 5V 2A TYPE H**

(A-AP-A-00094)

INPUT : AC INPUT 220VAC  
OUTPUT : 5VDC 2A  
JACK 2.54 mm. HOUSING TYPE 2 PIN



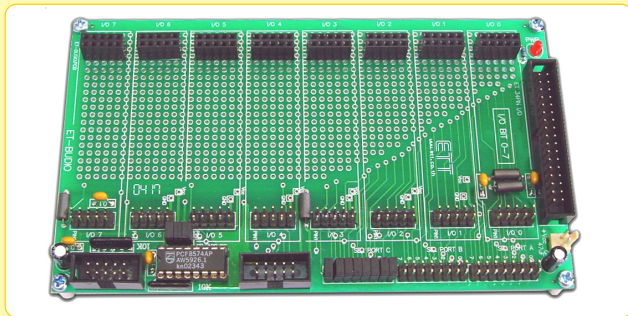
**TRW-2.4G MODULE (A-IC-M-00001)**



It is ready-made Module Transceiver for send/receive data in serial type with 2.4GHz. Be able to adapt with signal pole inside and uses 280M. distance(data speed 250kbps) 150M.distance(data speed 1 M bps) in open area.

# ET-BUSIO ชุด I/O เอนกประสงค์ ที่คุณเลือก I/O ต่างๆ ได้เอง

## ET-BUSIO (P-ET-A-00155)

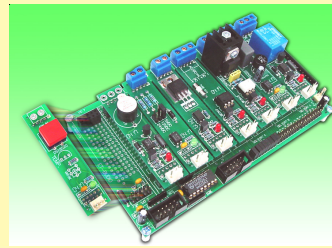


ET-BUSIO is base board of INPUT/OUTPUT and users may select I/O MODULE to connect with ET-BUSIO board and is able to expand 8 CHANNEL INPUT/OUTPUT I/O MODULE. For example; users may connect OUTPUT RELAY 6 CHANNEL as DC INPUT 1 CHANNEL and as BUZZER 1 CHANNEL.

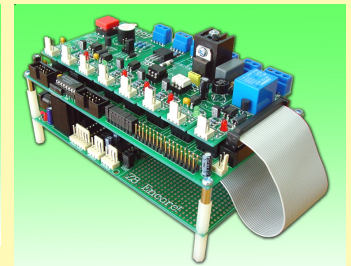
**There's I/O MODULE to select as :**

- [SSRAC](#)
- [RELAY](#)
- [SW](#)
- [PHOTO](#)
- [ACIN](#)
- [BUZZER](#)
- [DCOUNT](#)
- [DCIN](#)
- [PCB](#)

- ET-BUSIO AS BASE BOARD OF I/O MODULE
- BE EXPANSION 8 CHANNEL INPUT/OUTPUT I/O MODULE
- BE ABLE TO CONNECT WITH ETT BOARD THROUGH 34 PIN ET I/O BUS, 10 PIN ET BUS OR 10 PIN I2C BUS OF ETT (USE IC PCF8574 AS OPTION IN CAS OF USE 10 PIN I2C BUS)
- CONNECT THROUGH 34 PIN ET I/O BUS FOR 3 BOARDS PER 1 PORT 34 PIN BY SELECT JUMPER I/O AS A, B, OR C
- CONNECT THROUGH 10 PIN ET BUS FOR 1 BOARD
- CONNECT THROUGH 10 PIN I2C BUS OF ETT FOR 8 BOARDS BY SELECT JUMPER A0, A1, A2
- PCB SIZE 15.3 x 9 CM. WITH PROTOTYPE WORKING AREA
- ET-BUSIO INCLUDES; ET-BUSIO BOARD, 1 OF 34 PIN PAIR CABLE, 1 OF 10 PIN PAIR CABLE, MANUAL



CONNECTING BETWEEN ET-BUS I/O WITH I/O MODULE AND BE ABLE TO EXPAND 8 CHANNEL INPUT/OUTPUT I/O MODULE



CONNECTING BETWEEN ET-BUS I/O WITH I/O MODULE INTO ETT CONTROLLER BOARD THROUGH PORT 34 PIN ET I/O BUS, 10 PIN ET BUS OR 10 PIN I2C BUS



## I/O MODULE

It is INPUT/OUTPUT Board uses with ET-BUSIO. There's various styles of INPUT/OUTPUT with 1 channel to select for suitable project work and I/O MODULE is designed as 3 PIN for connect with Port 3 PIN in ET-ROBOT.

### ET-BUSIO-SSRAC (P-ET-A-00160)



Its function is 1 CHANNEL SOLID STATE RELAY for ON/OFF AC 110V Power Supply or 220V. It run as ZERO CROSSING and INPUT/OUTPUT is isolated by OPTO ISOLATION. Use with Current 6 A 400 V.

### ET-BUSIO-PHOTO RELAY (P-ET-A-00162)



Its function is Relay of PHOTO MOS RELAY and is able to use DC or AC Power Supply. INPUT/OUTPUT is isolated by OPTO ISOLATION and uses PHOTO MOS RELAY No. AQV210E. Be able to use Power Supply maximum 130mA with FUSE 100mA on board.

### ET-BUSIO-DCOUT (P-ET-A-00158)



Its function is OUTPUT DC by using Power Transistor No.2SC1061 and INPUT/OUTPUT is isolated by OPTO ISOLATION. Use DC Power Supply maximum 50V/3A and OPEN COLLECTOR Operation.

### ET-BUSIO-DCIN (P-ET-A-00157)



Its function is INPUT signal into board by using Power Supply DC 5VDC, 12VDC, 24VDC, selecting Jumper on board and is isolated by OPTO ISOLATION.

### ET-BUSIO-ACIN (P-ET-A-00159)



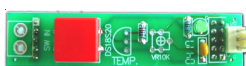
Its function is INPUT signal into board by using AC 220V Input Power Supply and is isolated by OPTO ISOLATION.

### ET-BUSIO - RELAY (P-ET-A-00163)



Its function is OUTPUT by using Relay as SW. Use AC or DC Power Supply and is isolated by OPTO ISOLATION with Port of NO, NC, COM. It uses Relay 5V COIL CONTACT size 5A/250VAC.

### ET-BUSIO-SW (P-ET-A-00161)



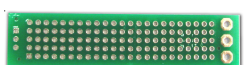
Its function is INPUT signal into board with press SW by using TACT SW with pressing SW button and LED Display. PCB is able to change into VR INPUT or DS1820 Temperature.

### ET-BUSIO-BUZZER (P-ET-A-00156)



It is Sound Generator OUTPUT with mini Buzzer and Transistor. It is isolated by OPTO ISOLATION.

### ET-BUSIO - PCB (A-PC-E-00237)

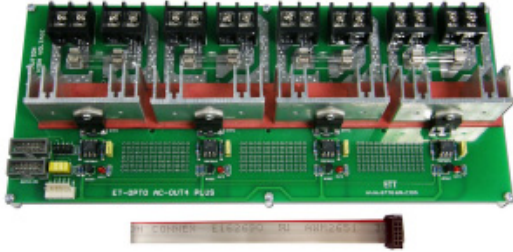


It is PCB size 7 x 15 mm. is designed to use with ET-BUSIO.



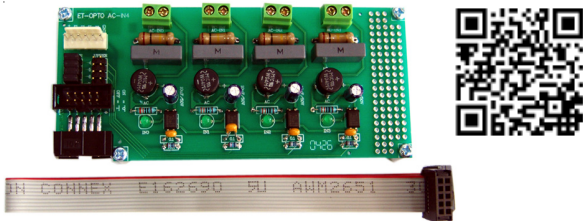
**I/O 4 SET** is INPUT/OUTPUT Board. It uses with ETT Board in 10 PIN ET-BUS and CRIMP TERMINAL WAFER 6 PIN or in case of only PORT 34 PIN ET-BUS I/O, it is able to use CONVER 34 PIN TO 10 PIN(ET-CONV 34 TO 10) with I/O. There's Jumper in I/O 4 to select BIT, so be able to connect I/O 4 2 boards / 1 PORT 10 PIN ET-BUS. It is easy to connect between board because it is in the same size - PCB size 12.7 x 5.6cm.

### ET-OPTO AC-OUT4 PLUS (P-ET-A-00458)



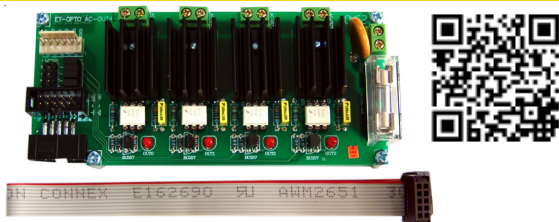
This board is used as OUTPUT ON/OFF for AC POWER SUPPLY. It is compatible with 220VAC/25A 4-CH INPUT and OUTPUT. Each channel is separated independently with separate 30A FUSE. It uses TRIAC device and Circuit ZERO CROSSING to reduce Signal Interrupt while ON/OFF. Connector INPUT/OUTPUT AC LOAD is TERMINAL BLOCK 2PIN BARRIER STYLE (11.1mm). 2 of Connector 10PIN ET-BUS to control Signal ON/OFF (TTL 0-5V), including JUMPER to choose BIT; so, it can interface 2 boards together for 1 Connector 10PIN ET-BUS. 4-CH OUTPUT 220VAC; there is 25A per 1 channel with separate 30A FUSE. Board size with HEAT SINK (L x H x D) is 27.80 x 12.00 x 5.00 cm. Provide 10PIN PAIR Cable and user's manual in the package

### ET-OPTO AC-IN4 (P-ET-A-00172)



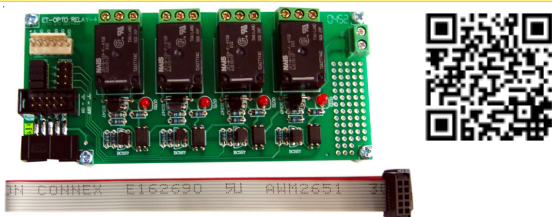
• Its function is INPUT AC 220V and is isolated by OPTO ISOLATION. It uses to test Ac Power Supply with 4 channel INPUT and 10 PIN Pair Cable.

### ET-OPTO AC-OUT4 (P-ET-A-00169)



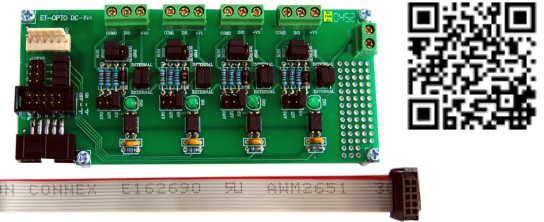
• Its function is OUTPUT AC and uses Power Supply 220VAC/6A 4 channel. It uses TRIAC and Zero Crossing Circuit to reduce interrupt signal of ON/OFF with Fuse in circuit.

### ET-OPTO RELAY4 (P-ET-A-00168)



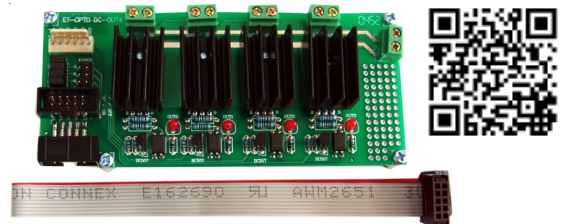
• Its functions is OUTPUT Relay Contact and is able to use both AC and DC. It uses 12VDC to run Relay Contact 10A/250VAC. There's PORT NO and NC with 4 channel OUTPUT and is isolate by OPTO ISOLATION.

### ET-OPTO DC-IN4 (P-ET-A-00171)



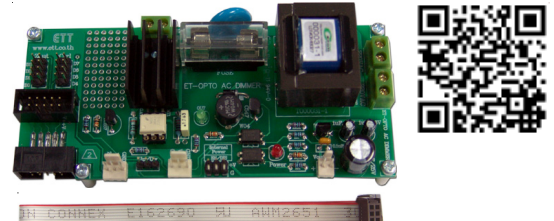
• Its function is INPUT DC and is isolated by OPTO ISOLATION. Be able to select 3 Modes level; 5V, 12V, 24V with Jumper 4 channel and 10 PIN Pair Cable.

### ET-OPTO DC-OUT4 (P-ET-A-00170)



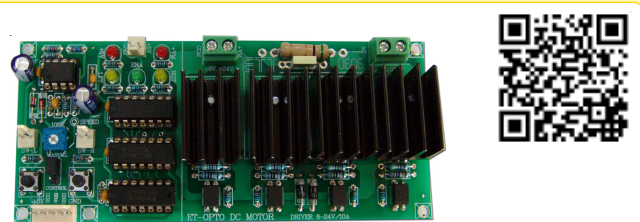
• Its function is OUTPUT DC and is isolated by OPTO ISOLATION. It uses TR OUT PUT NO.2SC1061, Power Supply 12VDC/3A 4 channel with 10 PIN Pair Cable.

### ET-OPTO AC DIMMER (P-ET-A-00309)



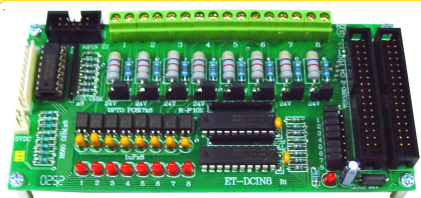
Its function is OUTPUT and can be used with AC 220V 6A 4 CHANNEL, so it can control AC Power to be in the preferable OUTPUT Voltage level. In this case, it uses principle to control phase of 220V Power Supply and then configures it to run in the preferable phase angles. It interfaces with Board Controller through Connector 10PIN ET or 2 of Connector 3 PIN WAFER.

### ET-OPTO DC MOTOR (P-ET-A-00276)



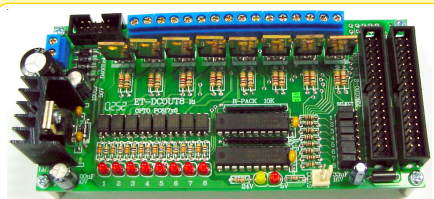
ET-OPTO DC MOTOR is board for using independently or interfacing with Board Microcontrollers. It controls operation of DC MOTOR to turn LEFT/RIGHT, and SPEED controller of DC MOTOR can be used with high current.

- 4 POWER MOSFET N-CHANNEL No. RFP50N06 60V/50A
- 5 PIN WAFER 2.54 MM.INTERACES FROM EXTERNAL BOARD DIR1, DIR2, DIRA
- Internal circuit can be used independently with out using board control because there's 2 SW. for tuning Left/Right, VR. for adjusting speed or pulse logic from micro for controlling by self when set jumper through control.
- Can be interfaced with DC MOTOR not greater than 24VDC and current not greater than 5AMP(Can be used higher than these, in case of moving circuit Mosfet to external and then interfaced cable directly)
- Power Supply for 5VDC 2 PIN WAFER 2.54 mm.
- PCB SIZE 12.7 x 5.6 CM.
- **ET-OPTO DC MOTOR INCLUDES...** BOARD ET-OPTO DC MOTOR, USER MANUAL, 1 CONNECTOR HOUSING 5 PIN, 3 CONNECTORS HOUSING 2 PIN.

**ET-DCIN8 (P-ET-A-00027)**

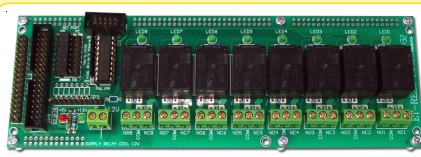
ET - DCIN 8 ... is board for INPUT signal of DC by using OPTO ISOLATOR.

- 8 BIT INPUT BY USING IC OPTO ISOLATOR (PC817)
- BE ABLE TO SET INPUT SIGNAL AS INPUT 24 VDC OR INPUT 5 VDC
- LED DISPLAY INPUT
- 34 PIN I/O PORT x 2, 10 PIN ET BUS
- IC ULN2003 OUTPUT PORT 7 BIT OPEN COLLECTOR HIGH CURRENT (500 mA)
- PCB SIZE 13.8 x 6.5 CM
- ET-DCIN 8 INCLUDES; BOARD, USER MANUAL

**ET-DCOUT8 (P-ET-A-00028)**

ET - DCOUT8 ...  
ET-DCOUT 8 is board for OUTPUT signal of DC by using OPTO ISOLATOR.

- 8 BIT OUTPUT BY USING IC OPTO WITH POWER TRANSISTOR (3A MAX)
- LED DISPLAY OUTPUT
- 34 PIN I/O PORT x 2, 10 PIN ET BUS
- 24 VAC (7824) POWER SUPPLY ON BOARD
- PCB SIZE 13.8 x 6.5 CM
- ET-DCOUT 8 INCLUDES; BOARD, USER MANUAL

**ET-REL8 (P-ET-A-00030)**

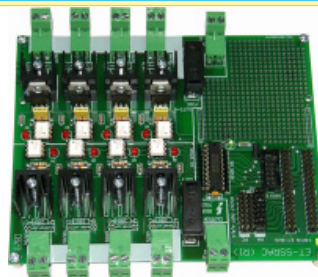
ET-REL8...is 8-CH. Output Relay Board with 2 CH. Contact (NO, NC). Board is designed to connect with I/O PORT 34 PIN (ET-BUS) standard ETT

- OUTPUT RELAY 8 CH (COM,NO, NC)
- CONTACT CAPACITY 10A 24VDC
- COIL VOLTAGE 12 VDC,30 mA
- BE ABLE TO SET POWER 12 VDC OF COIL RELAY FROM EXTERNAL OR 34 PIN PORT (IN CASE OF USING ET-PC8255)
- 34 PIN AND 10 PIN ET PORT FOR ETT'S BOARDS
- BE ABLE TO SET PORT A, B, C, AND BE ABLE TO SET 3-CH. ET-REL8 BOARD PER 1-CH.34 PIN PORT
- PCB SIZE 5.5 x 20.5 CM : POWER SUPPLY +5VDC, +12 VDC

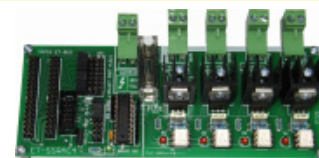
**ET-72IOZ80 PLUS (P-ET-A-00039)**

ET-72IOZ80 is ETT's Board Expansion and there's BUS 40 PIN CPU of ETT such as ET-BOARD V3.5, ET-8032, CP-Z80, CP-32 and etc. There's many I/O Port for using in board.

- ET-72IOZ80 IS CONTAINED 3-CH.8255, SO THERE'S 9 PORT OR 72 BIT ON BOARD
- BE ABLE TO SELECT 3 MODES OF RESET IC 8255; CPU RESET LOW, RESET HI, AND POWER ON RESET
- 3-CH.34 PIN OUTPUT STANDARD ETT WITH R-PULL UP DCC I/O PORT BE ABLE TO CONNECT WITH INPUT PORT EASILY, 2-CH. 10PIN ET AND OPEN COLLECTOR 10 PIN, USES IC ULN2008 ON BOARD
- BE ABLE TO SELECT 8 POSITION OF DECODE PORT WITH 2-CH.40 PIN BUS
- PCB SIZE 7.5 x 17.5 CM
- ET-72IOZ80 INCLUDES; ET-72IOZ80 BOARD, USER MANUAL

**ET-SSRAC 8 CH (P-ET-A-00140)****ET-SSRAC 4 CH (P-ET-A-00139)**

ET-SSRAC 8 CH

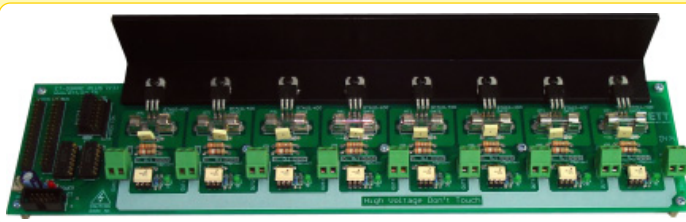


ET-SSRAC 4 CH



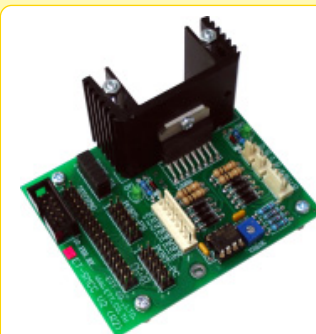
ET - SSRAC/ET-SSRAC4 ... is board expansion of ETT's Board for control power 8 Output 220VAC for ET-SSRAC AND and 4 Output for ET-SSRAC4. 6 AMP per each OUTPUT for control ON/OFF circuit such as electronic circuit, ON/OFF Timer and etc.

- ET-SSRAC/ET-SSRAC4 IS OPTO ISOLATION TRIAC DRIVER OUTPUT SEPARATE BOARD FROM 220VAC AND ZERO CROSSING ON/OFF FOR REDUCE INTERRUPTION OF ON/OFF AC LINE
- 8 OUTPUT INDEPENDENTLY 220VAC 6 AMP/CH FOR ET-SSRAC
- 4 OUTPUT INDEPENDENTLY 220VAC 6 AMP/CH FOR ET-SSRAC4
- BE ABLE TO CONNECT WITH I/O PORT 34 PIN, I/O PORT 40 PIN OR 10 PIN ET STANDARD ETT SUCH AS ET-BOARD, CP-Z80 V1
- PCB SIZE 12.5 x 15.5 CM FOR ET-SSRAC  
PCB SIZE 6 x 15.5 CM FOR ET-SSRAC4

**ET-SSRAC V2 (P-ET-A-00079)**

ET-SSRAC V2 ... is SOLID STATE RELAY OUTPUT Board control ON/OFF 220 VAC 8 OUTPUT. It is able to use 10 AMP per OUTPUT and be able to connect with Microcontroller Board of ETT with BUS standard ETT 34 PIN I/O and user can select to connect with PORT A, B, or C.

- BOARD IS OPTO ISOLATION TRIAC DRIVER OUTPUT ET-SSRAC/ET-SSRAC4 IS OPTO ISOLATION TRIAC DRIVER OUTPUT SEPARATE BOARD FROM 220VAC AND ZERO CROSSING ON/OFF FOR REDUCE INTERRUPTION OF ON/OFF LOAD AC KINE 220 VAC
- 8 OUTPUT INDEPENDENTLY 220 VAC 10AMP/CH, WITH HEAT SINK AND FUSE IN EACH OUTPUT
- BE ABLE TO CONNECT WITH BUS I/O STANDARD ETT 34 PIN I/O PIN ET
- PCB SIZE 7.8 x 34.5 x 4.2 CM.

**ET-SMCC V2 (P-ET-A-00034)**

ET-SMCC V2.0 is a control board of 2-CH. Stepping Motor or 4 CH. Motor (1-CH. Bipolar Stepping Motor) and be able to connect with 2-CH. DC Motor.

- IC NO. L298N OF SGS-THOMSON
- CHANNEL CONTROL 2 CHANNEL (1 BIPOLAR STEPPING OR 2 DC MOTOR)
- STEPPING FREQUENCY 40 KHz MAX

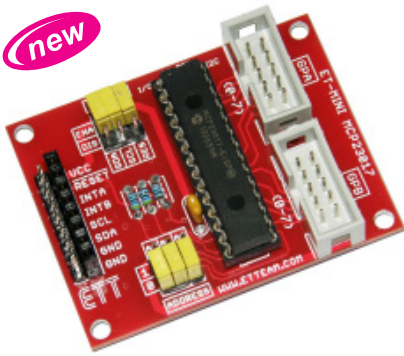
- OUTPUT DRIVER CURRENT PHASE 4 AMP/50 VDC
- POWER SUPPLY LOGIC BOARD +5V VDC 20 mA
- PCB SIZE 5.5 X 6.5 CM
- ET-SMCC V2.0 INCLUDES; BOARD, USER MANUAL





**ET-MINI I/O BOARD SET**

**ET-MINI MCP23017 (P-ET-A-00501)**



This Board expands amount of PORT I/O for MCU, it is 16 BIT I/O and it can be connected with MCU that uses 1.8V-5.5V.

- Use IC 28 PIN DIP No. MCP23017 from MICROCHIP Divide I/O PORT 16 BIT into 8BIT 2 PORT for I2C INTERFACE
- Can SET 8 ADDRESS for MCP23017 in the same BUS



- Use CLOCK for I2C INTERFACE at 100KHz, 400KHz, 1.7MHz; use Power Supply in the range of 1.8V-5.5V; and can connect with MCU 3.3V
- Can set any occurrence of INTERRUPT from PORT
- Signal on the side of LOGIC uses Connector PIN HEADER 1x8 MALE and 1x8 FEMALE
- Has 2 of I/O PORT IDE 10 PIN HEADER BLOCK
- ET-MINI MCP23017 includes...

1. Board ET-MINI MCP23017
2. CD-ROM User's Manual and Example Program



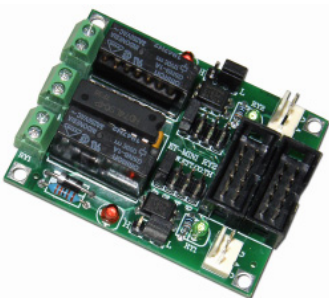
**ET-MINI POWER RELAY (P-ET-A-00503)**



This POWER RELAY 1 OUTPUT has NO RELAY Contact with the maximum Current of 30A/240VAC, 30A/30VDC, and DC COIL RELAY 12VDC; it can be connected with Board 3.3V or 5V.

- Use Power Supply in the part of TTL 3.3 – 5VDC, Power Supply for RELAY 12VDC/100mA
- Control the operation of RELAY by LOGIC TTL 3.3 – 5VDC
- Command the operation of RELAY to run at LOGIC " 0 " or LOGIC " 1 " by SET JUMPER
- Has 2 types of connection for Connector OUTPUT of NO RELAY and customer and choose the preferable one. Firstly, it connects through TERMINAL BLOCK 2 PIN BARRIER STYLE (11.1 mm.); and secondly, it directly connects through RELAY by using Ring Terminal/ Forked Spade Terminal (16-14 AWG)
- PCB size is 4.3 x 5.6 cm. (3.2 cm. in height)

**ET-MINI RELAY2 (P-ET-A-00360)**

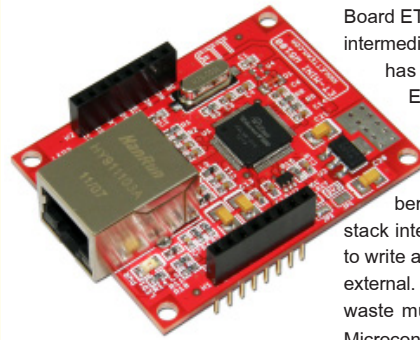


It is MINI Board version from ETT that uses 2 mini LOW POWER RELAY Circuits on board.

- Use 2 mini RELAY 12VDC, 1 CONTACT, 3A/250VDC
- Connect INPUT TTL to be 2 I/O 10 PIN ET Connectors, be able to select Bit by Jumper and 2 sets of 3 PIN INPUT Connector (WAFER 3 PIN 2.54 mm.)

- 2 Output RELAY Contact that are 2 PIN TERMINAL type
- 5VDC Power Supply and 12 VDC Power Supply for Coil RELAY

**ET-MINI W5100 (P-ET-A-00478)**



Board ET-MINI W5100 is designed to be intermediate between Microcontroller that has no any PORT Ethernet and Ethernet Network. This board uses Chip Ethernet Controller No.W5100 from WIZnet. The strong point of this Chip number is to have Hardwired TCP/IP stack internal Chip; so, it is unnecessary to write any Software TCP/IP Stack from external. It is easier to use and it does not waste much resource of the connected Microcontroller.



- It interfaces with Board in the format of SPI BUS; it can be connected with Board Controllers. In the picture, it connects with Board ET-BASE AVR EASY328.

**Specifications of ET-MINI W5100**

- Use Chip No.W5100(80 PIN LQFP TYPE) from WIZnet to be IC Ethernet Controller that has Hardwired TCP/IP internal Chip
- Support the connection of TCP/IP Protocols TCP, UDP, ICMP, IPv4 ARP, IGMP, PPPoE, Ethernet
- Support the connection of 10BaseT/100BaseTX
- Use SPI BUS to interface with board, so it can be connected with Board Controllers
- Be compatible with both 3.3V and 5V Power Supply; it can choose the Power Supply level by set JUMPER.

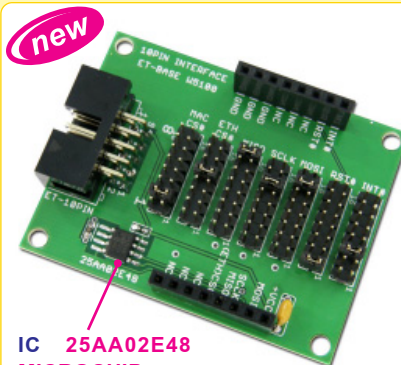
- Can be used with Board ET-BASE AVR EASY88/168/328 directly

- PCB SIZE: 4.6 x 5.6 cm
- ET-MINI W5100 consists of ...

1. Board ET-MINI W5100
2. CD-ROM User's Manual and Example Program



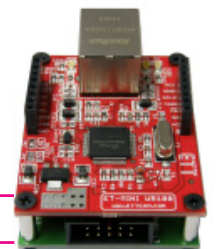
**ET-BASE W5100 (P-ET-A-00492)**



Board ET-BASE W5100 is an intermediate between Board ET-MINI W5100 and Board Microcontrollers from ETT that use the standard 10PIN Connector of ETT.

**IC 25AA02E48 MICROCHIP**

**EXAMPLE : ET-MINI W5100 CONNECT ET-BASE W5100**



**Specifications of Board ET-BASE W5100**

- Design to interface with Board ET-MINI W5100 in order to connect with Connector 10PIN of ETT
- Has 8 JUMPERS, it can choose to connect with 8 PIN of Connector 10PIN independently. It can choose any PIN to interface with any PIN of board independently.
- Provide IC 25AA02E48 of MICROCHIPS on Board, it is 256 BYTE IC SPI SERIAL EEPROM; include UNIQUE numeric code to be code reference of MAC ADDRESS for TCP/IP, it can be used either for EUI-48 (standard of IPV4) and EUI-64 (standard of IPV6)
- Has 2 of Connector 8PIN FEMALE to interface with ET-MINI W5100
- Has Connector 10PIN ETT to interface with ETT Boards
- Board size: 4.4 x 5.6 mm.
- Use Power Supply from Connector 10PIN that can be either to be 3.3V or 5V (it has to set Jumper on Board ET-MINI W5100 to choose the correct power supply for board).

ET-BASE W5100 10PIN consists of...

1. Board ET-BASE W5100 10PIN
2. CD-ROM Manual and Example



**ET-MINI MP3 V2**

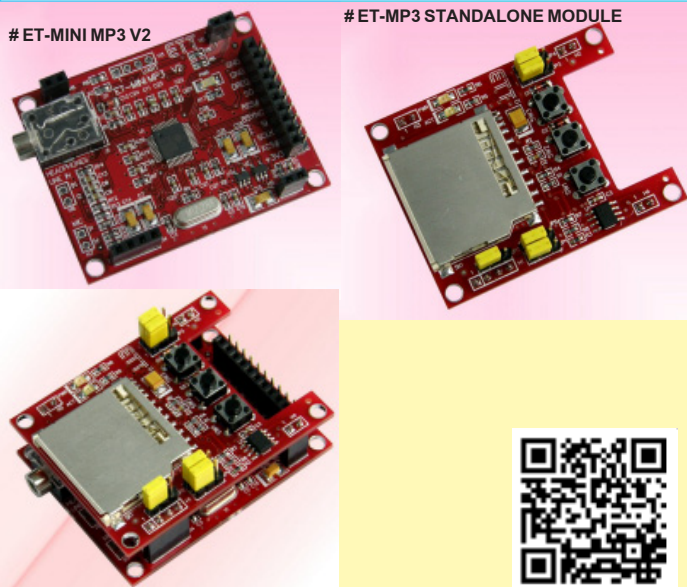
(P-ET-A-00413)

**ET-MP3 STANDALONE MODULE**

(P-ET-A-00415)

# ET-MINI MP3 V2

# ET-MP3 STANDALONE MODULE



ET-MINI MP3 and ET-MP3 STAND ALONE MODULE are the File MP3 Decoder and SOCKET SD CARD that can be directly interfaced together to be MP3 Player; in this case it is unnecessary to interface with any Micro System. ET-MINI MP3 V2 is File MP3/WMA/MIDI Decoder to convert file into audio. The second version uses IC No.VS1003B from VLSI (it is the original from VLSI, not COPY), it is the high quality IC MP3 Decoder; moreover, it is easier to use. There are ANALOG OUTPUT and STEREO Audio.

**Specifications of ET-MINI MP3 V2**

- Use IC No.VS1003B from VLSI to be File MP3 Decoder
- Can decode File MP3 that has been encoded as MPEG 1.0 & 2.0 Audio layer III (CBR+VBR+ARB), including WMA 4.0/4.1/7/8/9 all profiles (5-384kbit/s); WAV (PCM+IMA ADPCM); General MINI/SP-MIDI files
- Can encode audio signal by microphone to be the standard ADPCM
- Support Streaming Data for File MP3 or WAVE
- Has commands to adjust audio; Base Control and Treble Control
- Run by Signal Clock 12.288MHz and internal PLL
- Has high quality circuit to convert data into DAC audio, including Circuit Stereo Amplifier. It can interface Audio Out with amplifier or earphone set that has 30Ohm Impedance directly. The Connector Audio Out of board is Jack Stereo that can interface with earphone set or amplifier of computer PC directly.
- Run by DC 3V-3.3V, including LED to display operating status of POWER
- Support interfacing signals with Microcontroller through SPI Serial Port
- Can modify the operation of board to be STAND ALONE MP3 Player, without using any Microcontroller to control the operation (read further details from Application Note of VLSI)
- Board size is 4.3 x 5.6 cm.

**ET-MP3 STANDALONE MODULE**

This board is designed to be additional board for supporting the operation of Board ET-MINI MP3 V2 to play File MP3 from SD Card directly, and it is unnecessary to interface with any Micro System. It only inserts this Module on Board ET-MINI MP3 V2; supplies 3V-3.3V Power Supply into the board; and finally, you can play File MP3 instantly.

**Specifications of Board ET-MP3 STANDALONE MODULE**

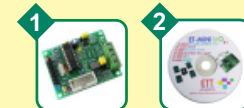
- SOCKET SD CARD for inserting SD CARD
- Use SPI EEPROM 25LC640 for storing BOOT IMAGE; in this case, ETT has already programmed BOOT IMAGE to be MP3 Player.
- Can change the format of control mode to another modes by programming new BOOT IMAGE
- 2 LED POWER and ACT. It interfaces POWER SUPPLY from ET-MINI MP3 V2.
- Board size is 4.3 x 5.6 cm.

**ET-MINI SPI CAN CONTROL V1.0**

(P-ET-A-00441)



- ET-MINI SPI CAN CONTROL V1.0 consists of...
  1. Board ET-MINI SPI CAN CONTROL V1.0
  2. CD-ROM User's Manual and Program



ET-MINI SPI CAN CONTROL V1... is Board CAN Controller with CAN DRIVER to interface with external Board through SPI. It uses CAN Controller No.MCP2515 from MICROCHIPS Company and CAN DRIVER No.SN65HVD232D from TEXAS INSTRUMENT Company. It can support in communicating with CAN System under the standard of CAN 2.0B. It can support the CAN Communication that is Standard FRAME, EXTEND FRAME, and REMOTE FRAME. This Board ET-MINI SPI CAN is suitable to improve and develop the old system; it increases the capability of communicating through CAN System. However, we do not suggest user to use with MCU that has already had the Module CAN insides.

**Specifications of Board ET-MINI SPI CAN CONTROL V1.0**

- Use CAN CONTROLLER No.MCP2515 from MICROCHIPS Company
- Use CAN DRIVER No.SN65HVD232D from TEXAS INSTRUMENTS Company
- Interface with external MICROCONTROLLER through SPI LOGIC that is both 5V and 3.3V with the maximum high speed of 10MHz
- Support the standard of CAN 2.0B, CAN ISO-11898 (STANDARD PHYSICAL LAYER)
- Has 4 LEDs to display status of Power Supply, RX, TX, INT
- Has Circuit R TERMINATION that is both END NODE (120 OHM) and STUB NODE (2.6K OHM)
- Distance of CAN BUS is 62.5KB/S (1000 meter), 1MB/S (30 meter)
- Use Connector PIN HEADER 1x8 MALE and 1x8 FEMALE with 2.54mm. PITCH and IDE 10PIN HEADER BLOCK on the side of LOGIC
- Use TERMINAL 4PIN (+VEXT,CANH,CANL,GND) on the side of CAN BUS
- Use Power Supply +3.3 to 5VDC
- Has Circuit REGULATE No.LM1117-3.3 (SOT-223) or LM1117 5.0 (SOT-223) (OPTION)
- PCB size: 4.4 x 5.6 mm.

**ET-CAN DRIVER (P-ET-A-00434)**

ET-CAN DRIVER is Board CAN Transceivers for CAN BUS Communication by using IC CAN TRANSCEIVERS No.SN65HVD232D from TEXAS INSTRUMENTS Company. It supports CAN Communication according to the standard of ISO-11898.

It is used to convert Electric Signal of CAN LOGIC into DIFFERENTIAL CAN BUS ( $\pm 2.5V$ ). Board ET-CAN DRIVER interfaces with MCU that has Circuit CAN Controller insides or interfaces with Chip CAN Controller.

**Specifications of Board ET-CAN DRIVER**

- Use CAN TRANSCEIVERS No.SN65HVD232D
- Support the connection with CAN CONTROLLER LOGIC that is both 5V and 3.3V
- Support standard of CAN ISO-11898
- Has Circuit R TERMINATION internal board that is both END CODE (120 OHM) and STUB NODE (2.6K OHM)
- Support BUS speed at 62.5KB/S(1000 meter) - 1MB/S(30 meter)
- Has 4PIN HEADER with 2.54 PITCH; it is the connecting point on the side of logic
- Has DB 9PIN MALE; it is the connecting point for Signal CAN BUS, it arranges pins according to the restrictions of J1939, CAN-CIA
- Be compatible with 3-6 VDC Power Supply
- PCB size: 1.6 x 1.8 cm.
- Board ET-CAN DRIVER consists of...

1. Board ET-CAN DRIVER
2. CD-ROM User's Manual and Program

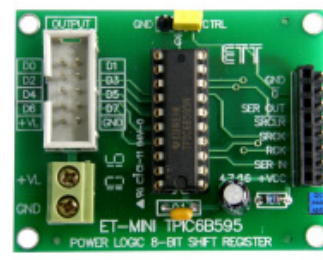


**ET-MINI RTC DS3232**

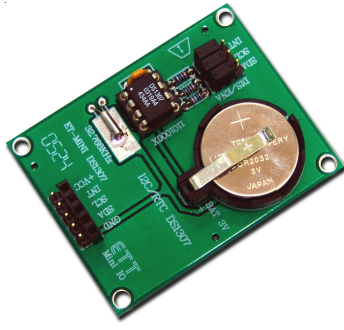
(P-ET-A-00460)



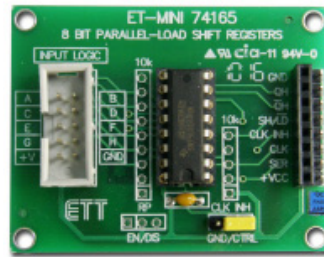
It is Circuit RTC in the format of I2C BUS that has CRYSTAL OSC inside; so, it is highly accurate to run other than RTC versions. It uses RTC No.DS3232; runs by 3V-5V, has 236 BYTE Internal RAM; with BATTERY 3V for Backup. It uses Connector 8PIN INPUT MALE and FEMALE.

**ET-MINI TPIC6B595 (P-ET-A-00420)**

This is 8BIT POWER SHIFT REGISTER that is SERIAL-IN,PARALLEL-OUT for SPI Interface. It receives incoming data as serial type and it sends out data through OUTPUT as parallel type. OUTPUT in each bit is OPEN DRAIN type that supports the maximum Load Current at 500mA and the maximum Load Voltage at 50V/Connector V-OUT is TERMINAL 2PIN Type; Connector OUTPUT is 10PIN BLOCK type; Connector INPUT 8PIN HEADER MALE and FEMALE.

**ET-MINI DS1307 (P-ET-A-00238)**

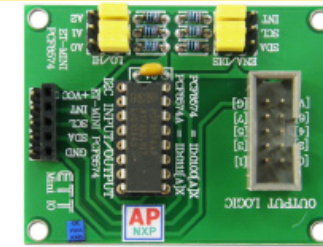
It is experiment of I<sup>2</sup>C BUS as RTC Circuit No. DS1307 size 8 PIN with Battery 3V for backup data in Port RTC, PORT INPUT 5 PIN MALE and FEMALE.

**ET-MINI 74165 (P-ET-A-00419)**

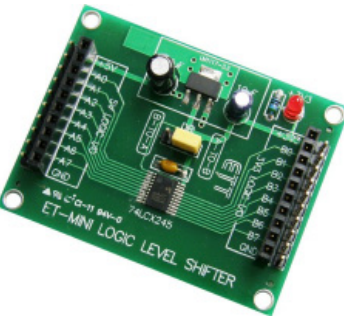
This is 8BIT SHIFT REGISTER PARALLEL-TO-SERIAL DATA CONVERSION that is PARALLEL-IN,SERIAL-OUT for SPI Interface. It receives incoming data as parallel type and it sends out data through OUTPUT as serial type. It supports the maximum CLOCK Frequency at 35 MHz. This board uses IC No.74LS165. Pin DATA IN is 10 PIN BLOCK Type; and PIN OUTPUT is 8PIN HEADER MALE and FEMALE.

**ET-MINI PCF8583 (P-ET-A-00240)**

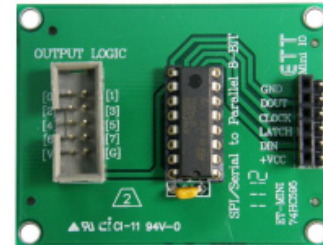
It is circuit of I<sup>2</sup>C BUS in RTC Type No.PCF8583 from PHILIPS CO, LTD.with Battery 3 V for Backup data in RTC and TACT SW. It makes RTC as Counter and Port INPUT signal as 5 PIN MALE/FEMALE.

**ET-MINI PCF8574 (P-ET-A-00239)**

It is experiment of I2C BUS in 8 Bit PORT circuit. Use IC No. PCF8574 with Jumper and select position of IC in I2C BUS System. Port INPUT 5 PIN MALE and FEMALE, PORT I/O 10 PIN BLOCK ETT.

**ET-MINI LOGIC LEVEL (P-ET-A-00297)**

It is Board circuit to connect signal Logic between 5V components and 3.3 V (or 3V) components and uses IC 74CX245 to be medium of connection. Moreover, there is circuit REGULATOR 3.3V on Board.

**ET-MINI 74HC595 (P-ET-A-00241)**

It is Circuit of TTL IC in Serial to Parallel Type and uses NO.74HC595 1 channel with 8 Bit OUTPUT Port 6 PIN MALE and Port 10 PIN BLOCK ETT FEMALE.

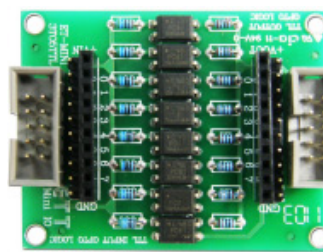
**ET-MINI MCP4922 DAC 12 BIT**

(P-ET-A-00305)

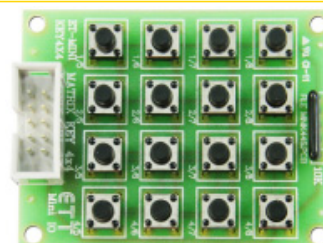


It is one of ET-MINI BOARD that is Circuit D TO A 12 BIT 2 CH and use IC No.MCP4922 from MICROCHIP.

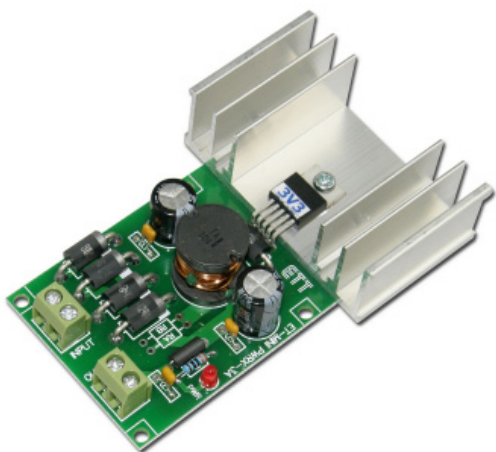
- Use IC D TO A No.MCP4922 DIP TYPE 14 PIN
- 12 BIT OUTPUT 2 CHANNEL
- Can set Reference Voltage from VR that can be adjusted value from 0 to +VCC.
- SPI Interface and can be used with POWER SUPPLY range from 2.7 to 5.5V.

**ET-MINI 3 TO 5 TTL (P-ET-A-00237)**

It converts signal 3V into 5V 8 channel. It uses to connect between circuit or CPU that is signal 3V and can't connect with circuit 5V directly. It converts as OPTO ISOLATION and uses PC817 8 channel, PORT INPUT and OUTPUT 10 PIN BLOCK MALE.

**ET-MINI KEY 4X4 (P-ET-A-00242)**

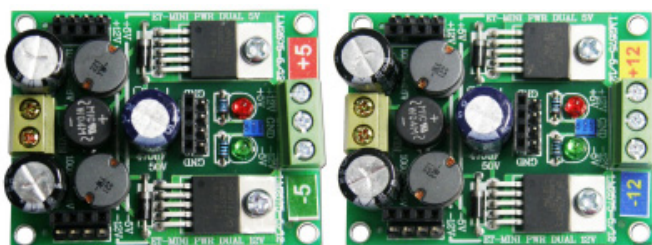
It is KEY SW size 4 x 4(16 Characters) connect in Matrix Type and uses TACT SW size 5 x 5 mm. PORT of KEY SW is de signed in 10 PIN ET BOX HEADER.

**ET-MINI PWR5-3A** (P-ET-A-00455)**ET-MINI PWR12-3A** (P-ET-A-00456)**ET-MINI PWR3.3-3A** (P-ET-A-00457)

It is POWER SUPPLY in the format of Circuit STEP-DOWN Voltage Regulator OUTPUT 3A that uses IC No.LM2576. There are 3 sizes of OUTPUT Voltage as follows;

- ET-MINI PWR5-3A gives OUTPUT 5VDC/3AMP: INPUT VOLT 9 - 35 VDC.
- ET-MINI PWR12-3A gives OUTPUT 12VDC/3AMP: INPUT VOLT 15 - 35 VDC.
- ET-MINI PWR3.3-3A gives OUTPUT 3.3VDC/3AMP: INPUT VOLT 7 - 35 VDC.

It uses Connector 2PIN TERMINAL INPUT (5mm.) and Connector 2PIN Terminal OUTPUT (5mm.). The board size with HEAT SINK (ET-MINI PWR 5-3A) gives OUTPUT 5VDC/3AMP: INPUT VOLT 9-35 VDC (WxLxD) 6.0 x 9.0 x 3.5 cm.

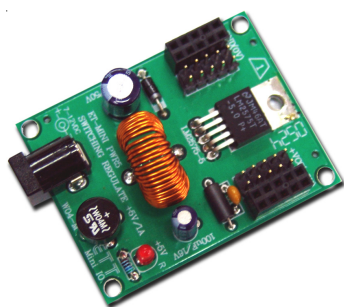
**ET-MINI PWR DUAL 5** (P-ET-A-00307)**ET-MINI PWR DUAL 12** (P-ET-A-00308)

ET-MINI PWR DUAL 5

ET-MINI PWR DUAL 12

It is POWER SUPPLY that has positive and negative power supply from OUTPUT and only positive power supply from INPUT. In this case, it uses 2 Circuit STEP-DOWN VOLTAGE REGULATORS; No.LM2575T-5 of DUAL 5 and No.LM2575T-12 of DUAL 12.

- INPUT DC POWER 7 - 24VDC
- OUTPUT +5V, -5V Common GND, 1A CURRENT in ET-MINI PWR DUAL 5
- OUTPUT +12V, -12V Common GND, 1A CURRENT in ET-MINI PWR DUAL 12
- Connector INPUT DC 2PIN PCB TERMINAL SCREW TYPE
- Connector OUTPUT DC 3PIN PCB TERMINAL SCREW TYPE
- PCB size 4.5 x 5.6 cm.

**ET-MINI PWR 5** (P-ET-A-00233)

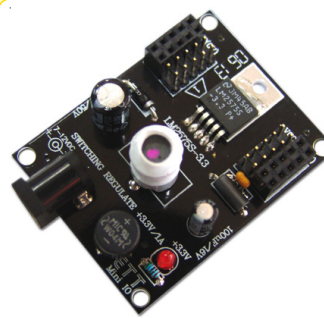
It is Power Supply in Step-Down Voltage Regulator CIRCUIT and uses IC NO.LM2575-5. Be able to receive INPUT DC Power 9-35V to OUTPUT 5VDC. Port INPUT is DC JACK size 2.5mm. and PORT OUTPUT is HEADER MALE and HEADER FEMALE.

**ET-MINI PWR ADJ** (P-ET-A-00499)

ET-MINI PWR-ADJ ... is Board DC POWER SUPPLY in the format of SWITCHING STEP DOWN REGULATOR. It can adjust OUTPUT DC by self or user can set JUMPER either to be DC OUTPUT 5V or 3.3V as preferred.

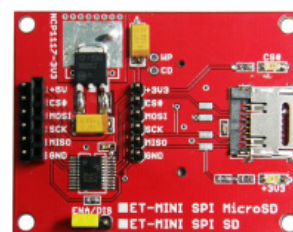
- Use IC STep Down No.LM2596SX-ADJ
- Use Current OUTPUT 2A at the maximum, receive Current INPUT 4.5 32VDC

- Set JUMPER to choose Current OUTPUT either to be 5V or 3.3V
- Can adjust Current OUTPUT as 1.23V-27VDC by VR TRIMPORT (Current INPUT should be higher than OUTPUT 2V at least).
- Connector on the side of INPUT is 2 PIN TERMINAL and DC JACK 2.5 mm.
- PCB size is 4.3 x 5.6 cm.

**ET-MINI PWR 3.3** (P-ET-A-00289)

It is POWER SUPPLY as Step-Down Voltage Regulator type that uses IC No.LM2575S-3.3.

It can receive INPUT DC POWER 5-35V; can give OUTPUT 3.3VDC. CONNECTOR INPUT is DC JACK TYPE 2.5mm; CONNECTOR OUTPUT is MALE HEADER and FEMALE HEADER.

**ET-MINI SPI MICRO SD** (P-ET-A-00431)**ET-MINI SPI SD** (P-ET-A-000432)

ET-MINI SPI MICRO SD



ET-MINI SPI SD ด้านบน



ET-MINI SPI SD ด้านล่าง

ET-MINI SPI SD and MICRO SD is a Board with SOCKET SD CARD or MICRO SD CARD, including Circuit CONVERTER to convert Logic level (74LCX245) and Circuit REGULATE 3.3V/1A. So, it can interface this board with MCU 5V directly. It uses SPI Interface for interfacing with SD CARD.

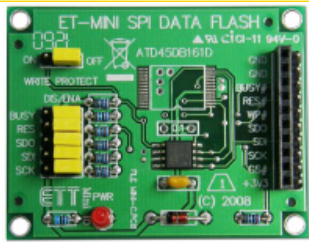
**ET-MINI SD/MMC** (P-ET-A-00298)

Board with both SD and MMC SOCKET MEMORY CARD and Signal Pins are arranged to interface with Board Microcontroller easier. Additionally, it can be used with MINI MP3.





### ET-MINI SPI DATA FLASH (P-ET-A-00306)



It is a Board of 2MBYTE FLASH Memory by using IC No.AT45DB16 from ATMEL, so it can be applied for storing data or DATA LOGGER.

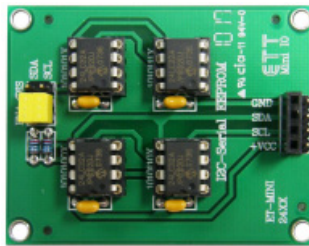
- Use IC No.AT45DB16
- 2MBYTE FLASH Memory (4096 PAGES x 528 BYTES)
- SPI Interface and using with POWER SUPPLY range from 2.5 to 3.3V
- Can be interfaced Pin Signal INPUT with Pin Signal 5V
- PCB size 4.4 x 5.6 cm. with User's Manual and Example Program in CD

### ET-MINI AUDIO OUT (P-ET-A-00296)



It is a mini amplifier with mini speaker on Board and STEREO JACK to connect with headphone or external amplifier set.

### ET-MINI 24XX (P-ET-A-00236)



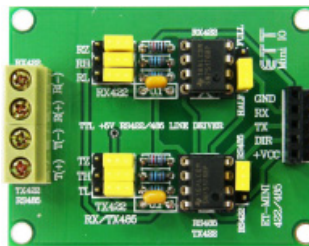
It is experiment of I2C by using 2 KBYTE IC EEPROM NO.24LC16 4 CHANNEL and be able to use in different point of I2C PORT HEADER MALE 4 PIN and FEMALE 4 PIN.

### ET-MINI SMCC V2 (P-ET-A-00442)



It is MINI Board Set to test STEPPING MOTOR that has been improved to interface with power supply to drive external STEPPING MOTOR; moreover, there is a particular Power Supply to drive Stepping Motor. It uses IC No.MC34063 and 4-Coil STEPPING MOTOR. It uses 4 of TR BC337 with LED to display the operating status and indicator to show directional rotation of Connector PIN HEADER 6 PIN.

### ET-MINI 422/485 (P-ET-A-00235)



It is experiment or connect with RS422/485 circuit by using IC 75176 x 2 and connecting in RS422 or RS485 Type with Jumper. Be able to set PORT HEADER MALE 5 PIN and FEMALE 5 PIN.

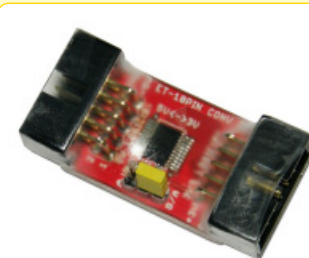
### ET-MINI DC MOTOR (P-ET-A-00232)



It is experiment of DC MOTOR Circuit with OPTO INPUT SENSOR 2 channel. It uses to test direction of rotation and speed of DC MOTOR with detected fan blade. It uses IC NO.L293D for DC MOTOR and PORT INPUT 7 PIN MALE/FEMALE.



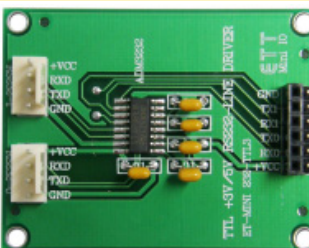
### ET-10PIN CONV 3/5M (P-ET-A-00461)



It is small board with 2 Connector 10PIN ET BUS I/O; it can be interfaced with 10PIN PAIR Cable conveniently. It is used to interface Circuit Signal LOGIC between 5V device and 3.3V device by using IC 74LVC245 to be intermediate. It can set all 8BIT jumper. It can send data from 5V to 3.3V or from 3.3V to 5V, including Circuit 3.3V REGULATOR. It is suitable for Board MCU 3.3V I/O that is interfaced with Board 5V I/O.

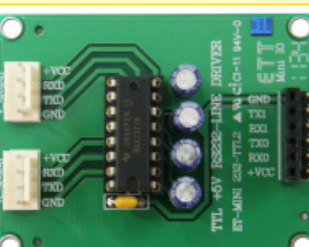
- 1.) Convert Logic Level from 5V to 3V: It has to set JUMPER to the position of B/A. Port on the side of Logic (B) has to interface with +5V(PIN9) and GND(PIN10). PIN 1-8 is used to receive external Signal Logic 5V and the signal is sent out to the side of Logic (A) at PIN 1-8 that is Logic 3V to drive LOAD 3V-3.3V or it is interfaced with Pin INPUT of MCU 3.3V.
- 2.) Convert Logic Level from 3V to 5V: It has to set JUMPER to the side of A/B. Port on the side of Logic (B) has to interface with +5V(PIN9) and GND(PIN10). PIN 1-8 is Signal OUTPUT Level 5V that is sent from the side of Logic (A) to drive LOAD 5V or it is interfaced to Pin INPUT of MCU 5V. On the side of Logic (A), PIN 1-8 is used to receive external Signal Logic 3V-3.3V to convert to 5V.

### ET-MINI 232-TTL3 (P-ET-A-00231)



It is experiment or connect with RS232 circuit. Be able to use Power Supply VCC 3V to 5VDC and be able to connect RS232 2 channel 4 PIN ETT HEADER MALE 6 PIN AND FEMALE 6 PIN. Use IC DRIVER NO.ADM3232 OR other replaceable number.

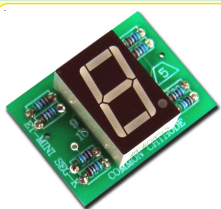
### ET-MINI 232-TTL2 (P-ET-A-00230)



It is experiment or connect between RS232 with VCC 5VDC / 2 channel RS232 4 PIN ETT PORT HEADER MALE 6 PIN and FEMALE 6 PIN uses IC DRIVER NO.MAX232.

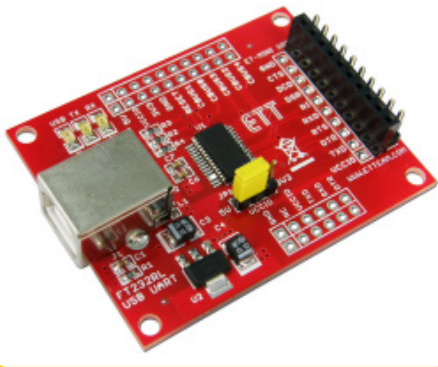
### ET-MINI SEG-K (P-ET-A-00244)

### ET-MINI SEG-A (P-ET-A-00243)



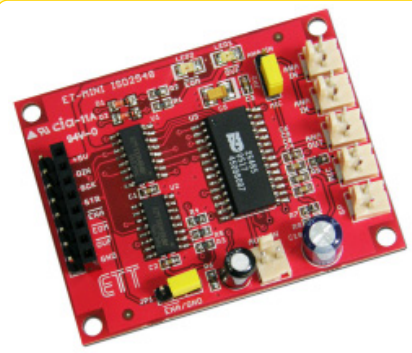
It is circuit of 7-Segment Red 1 Digit with R circuit connect with 7-Segment INPUT 10 PIN FEMALE and be able to connect with PORT I/O 10 PIN ETT directly.

- ET-MINI SEG-K USES 7-SEGMENT NO. TOS-5161A COMMON CATHODE CONNECT WITH PORT SOURCE CURRENT
- ET-MINI SEG-A USES 7-SEGMENT NO. TOS-5161B COMMON ANODE CONNECT WITH PORT SINK CURRENT

**ET-MINI USB-TTL (P-ET-A-00465)**

It is Board that converts signal from PORT USB of computer to be UART Serial in the format of Signal TTL; so, it is suitable for directly interfacing with Board Microcontrollers.

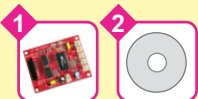
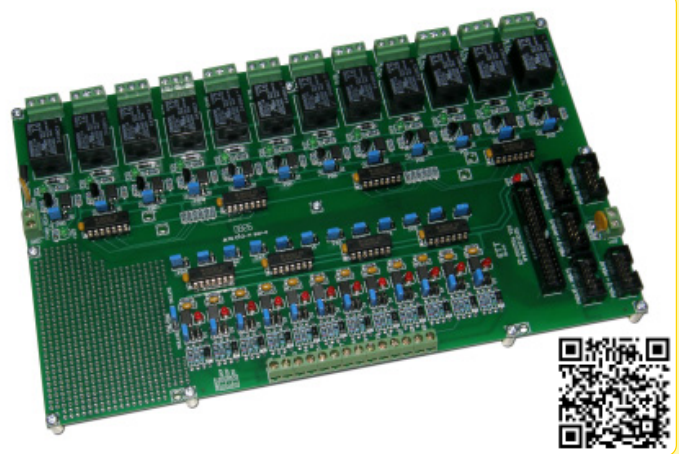
- Use IC No.FT232RL of FUTURE TECHNOLOGY DEVICES
  - Has all Connectors UART completely; TX, RX, DTR, DSR, CTS, RTS, DCD, RI
  - Use Power Supply from the connected PORT USB directly
  - Has Circuit REGULATOR 3.3V 800mA ON BOARD
  - Has 3 LEDs to display the operating status of RX, TX, USB
  - Has JUMPER to choose the signal levels to be either 3.3V or 5V
  - DRIVER supports the operation under WIN 98 SE/ ME/ 2000/ XP/ 7, LINUX, MAC OSX
  - Has Connector PORT USB TYPE B
  - Use Connector INPOUT/OUTPUT 10PIN to be PIN HEADER 2.54mm. MALE and FEMALE
  - PCB Size is 4.4 x 5.6 mm.
  - Board ET-MINI USB-TTL consists of ...
1. Board ET-MINI USB-TTL
  2. CD-ROM; User's Manual and DRIVER

**ET-MINI ISD2548 (P-ET-A-00473)**

ET-MINI ISD2548 is MINI Board that records sound and playback; it is suitable for recording sound that is not longer than 48 seconds. It controls record and playback by interfacing with MCU in the format of SERIAL DATA (SPI) through IC 74HC595 to reduce amount of Pin I/O of the connected MCU.

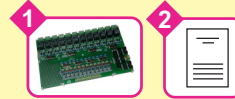
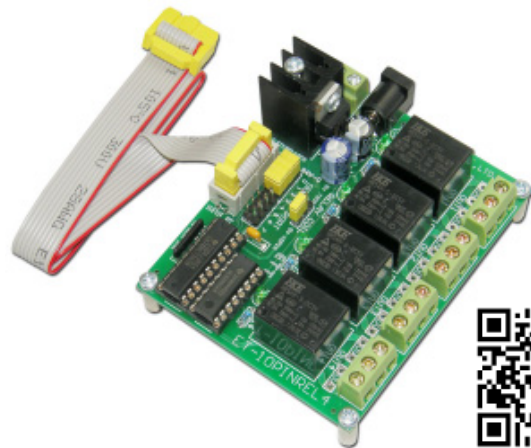
**Specifications of ET-MINI ISD2548**

- Use IC VOICE REC/PLAY 48 SEC No.ISD2548 28-SOIC
- INPUT SAMPLE RATE 5.3KHz, FILTER PASS BAND 2.3KHz (ON CHIP CLOCK SOURCE)
- Use Microcontroller to control the operation
- Has 320 MESSAGE ADDRESS; 1 ADDRESS can record sound for 150 ms (0.15 seconds)
- Sound recording is not erased when POWER OFF, so it is unnecessary to have BATTERY for BACKUP
- 100,000 times recordable and it last for 100 years.
- 5 of Connector 2 PIN 2.54mm. MALE to interface SP, MIC, ANA OUT, ANA IN(2)
- Connector PIN HEADER 1x8 MALE and FEMALE with 2.54mm Pitch to interface with MCU at Signal 5V
- Use 5VDC Power Supply
- Board size is 4.4 x 5.6 cm.
- Provide example program to use with Board ET-BASE AVR ATMEGA128, CP-JR51RE2 V1, ET-BASE PIC8722(ICD2)

**ET-INOUT24 V2.0 (P-ET-A-00368)**

It is the new Board INPUT/OUTPUT Expansion that the replaces ET-INOUT24. It change the Relay size to 10A to use with the higher current; increase the applications of INPUT OPTO for using with INPUT 5V, 12V and 24V; moreover, It increase LOGIC INPUT that is both OUTPUT RELAY and INPUT OPTO, so user can select LOGIC to run either as LOGIC LOW or as LOGIC HI.

- 12 OUTPUT RELAY 12VDC 10 AMP that has 3PIN SCREW TERMINAL BLOCK Connectors; OUTPUT, NO, NC, COM. It uses OPTO ISOLATE Circuit to separate RELAY from 5V POWER SUPPLY.
- OUTPUT RELAY can set signals for RELAY operation; in this case, LOGIC INPUT can be run in either LOGIC LOW or LOGIC HI.
- 12 INPUT OPTO ISOLATE can set Signal INPUT Levels; 5V 12V or 24V; independently separate SCREW TERMINAL BLOCK Connector; and can select Signals for INPUT operation to RUN at LOGIC INPUT either as LOGIC LOW or as LOGIC HI.
- PHOTO AREA PCB Size: 7.00 x 5.00 cm. to expand circuit.
- 1 of 34PIN I/O ET BUS Connector and 5 of 10PIN I/O ET BUS Connector.
- Board uses 12VDC Power Supply to feed RELAY and 5VDC for Board.
- Board size: 25.30 x 15.20 cm.
- ET-INOUT 24 V2.0 consists of ... Board and User's Manual.

**ET-10PIN REL4 (P-ET-A-00112)**

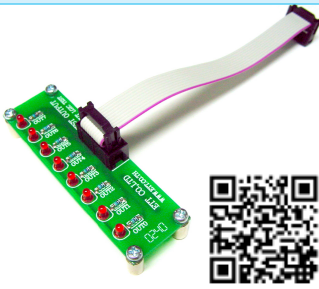
ET-10 PIN REL 4 which is 4-CH.RELAY OUTPUT is designed to connect with ETT's 10 PIN ET (or connecting with 34 PIN ET be able to use CONVER ET-CONV 34 PIN to 10 PIN).

- 4-CH.OUTPUT RELAY WITH COM, NO,NC PORT
- RELAY COIL 5 VDC, CURRENT CONTACT USES 5A/250V OR 10A/24VDC
- BE ABLE TO SELECT 4 BIT LO PORT OR 4 BIT HI WITH JUMPER FOR CONNECTING, SO BE ABLE TO CONNECT 2 ET-10PIN REL 4 PER 1-CH.10 PIN ET PORT

- +5V POWER SUPPLY OF 10PIN ET OR POWER 9-12 VDC FORM EXTERNAL TO REL4 OF BOARD BECAUSE THERE'S 7805 ON BOARD
- PCB SIZE 6.8 x 8.4 CM. WITH 10PIN WIRE CONNECTOR HEADER



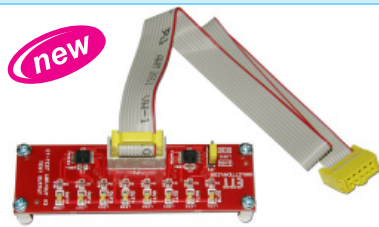
**ET-TEST 10P/OUT (P-ET-A-00101)**



It is experimental board for test Output of ETT's Ports as 10 PIN ET BUS I/O or 10 PIN I2C IN/OUT such as CP-AVR V4, CP-JR908GP32 V2, CP-PIC V4, CP-JR51AC2 V2, CP-BS2P40, CP-JRBS2P40 and etc. It uses 8-CH.LED for test and display Output.

- 8-CH. RED 3mm.LED OUTPUT
- CONNECTING WITH 10 PIN ET BUS I/O
- PCB SIZE 8.3 x 2.5 CM.
- 1-CH.10 PIN PAIR CABLE

**ET-TEST 10P/OUT V3 (P-ET-A-00486)**

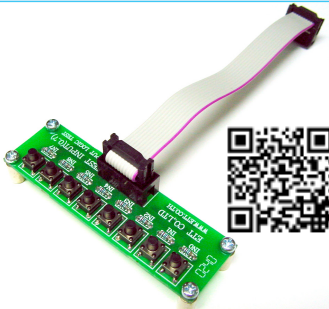


- OUTPUT uses 8 of LED SURFACE MOUNT
- Interface with Connector 10 PIN ET-BUS I/O
- Be compatible with MCU 3.3V-5V
- Setup Logic that received through INPUT to set LED OUTPUT either to be ON or OFF by Logic '0' or '1'

This is Display OUTPUT LED 8 BIT to receive Signal OUTPUT from PORT of Microcontroller (MCU) and then display data through LED; it is compatible with MCU 3.3V-5V. Moreover, it can setup LOGIC that is received through INPUT to set LED OUTPUT either to be ON or OFF by Logic '0' or '1'. It can interface with PORT of ETT Board that is Connector 10 PIN ET BUS I/O or 10 PIN I2C IN/OUT such as various versions Board ET-BASE, CP-JR ARM7 LPC2148, CP-JR ARM7 LPC2138, CP-PIC USB/4550 (ICD2). It uses LED in the format of SURFACE MOUNT in the part of OUTPUT Display.



**ET-TEST 10P/INP (P-ET-A-00102)**



It is experimental board for test Input of ETT's Ports as 10 PIN ET BUS I/O or 10 PIN I2C IN/OUT such as in board CP-AVR V4, CP-JR908GP32 V2, CP-PIC V4, CP-JR51AC2 V2, CP-BS2P40, CP-JRBS2P40, and etc. There's 8 channel Mini Switch SW Input.

- 8-CH.MINI SWITCH SW INPUT
- CONNECTING WITH 10 PIN ET BUS I/O
- PCB SIZE 8.3 x 2.5 CM
- 1-CH.10 PIN PAIR CABLE

**ET-PROJECT BOX1 S (ฟ้า) (A-BX-E-00023)**

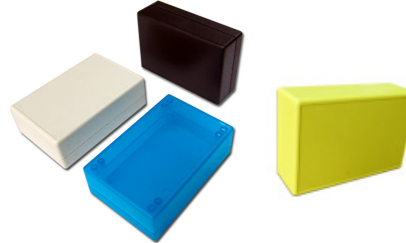
**ET-PROJECT BOX1 B (ดำ) (A-BX-E-00022)**

**ET-PROJECT BOX1 W (ครีม) (A-BX-E-00021)**

**ET-PROJECT BOX1 Y (เหลือง) (A-BX-E-00031)**

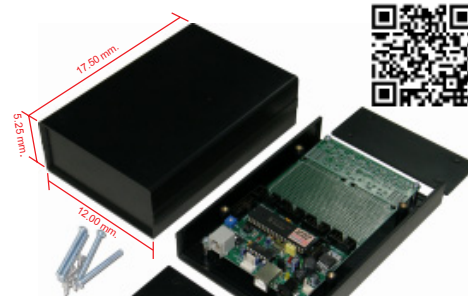
It is an all-purpose plastic box that can be cut or bored without any damaged because it is made by good plastic.

- Box size 7.5 x 2.5 x 5 cm.
- BOX1 S CLEAR BLUE COLOR
- BOX1 B BLACK COLOR
- BOX1 W CREAM COLOR
- BOX1 Y YELLOW COLOR



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

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



- Multi-purpose plastic box with good quality can be drilled without any broken
- It is suitably designed for ETT Control Boards (Size: PCB 15.3 x 9 cm.), so it can contain any board perfectly. Moreover, user can assemble board with box to be the product well.
- Box Size: 5.25 x 12.00 x 17.50 cm
- 2 Colors: B version is Black color and W version is Cream color.

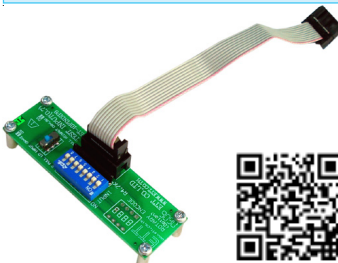
**ET-TEST 10P/ADC (P-ET-A-00103)**



It is experimental board for test A-TO-D and D-TO-A Input of ETT's Ports as 10 PIN ADC I/O such as CP-AVR V4, CP-JR908GP32 V2, CP-PIC V4, CP-JR51AC2 V2 and etc.

- 8-CH.VR TO ADJUST 10K OF INPUT ADC
- CONNECTING WITH 10 PIN ADC I/O
- PCB SIZE 8.30 x 2.5 CM
- 1-CH.10 PIN PAIR CABLE

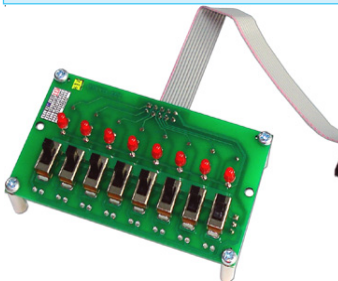
**ET-TEST 10P/DIP8 (P-ET-A-00113)**



It is experimental board for test Input of ETT's Ports as 10 PIN ADC I/O such as CP-AVR V4, CP-JR908GP32 V2, CP-PIC V4, CP-JR51AC2 V2 and etc. with 8-CH.DIP SW.

- 8-CH.DIP SW INPUT
- CONNECTING WITH 10 PIN ET BUS I/O
- PCB SIZE 8.3 x 2.5 CM
- 1-CH.10 PIN PAIR CABLE

**ET-TEST 10P/SWLED (P-ET-A-00213)**



It is experimental board for test Input of ETT's Ports as 10 PIN ET SW SLIDE with LED for test and display SW and is able to adapt as Dial of SW.

- 8-CH. 3 PIN SW SLIDE INPUT
- 8-CH. LED OUTPUT OF SW
- CONNECTING WITH 10 PIN ET BUS I/O
- PCB SIZE 8.3 x 5 CM

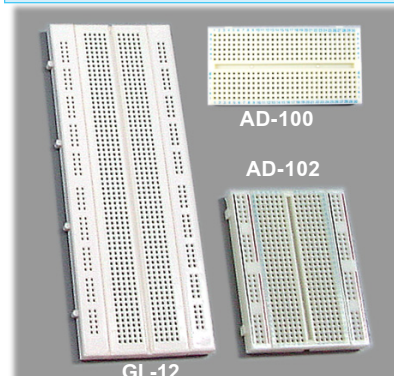
**ET-TEST 10P/OUT V2 (P-ET-A-00430)**



It is board to test OUTPUT of PORTs on board from ETT that is Connector 10PIN ET BUS I/O or 10PIN I2C IN/OUT such as Board ET-BASE, CP-AVR V4, CP-PIC V4. It uses LED to show the operating status of OUTPUT...

- OUTPUT uses 8 of yellow LED SURFACE MOUNT
- Interface with Connector 10PIN ET BUS I/O
- PCB SIZE: 4 x 2.5 CM
- 1 of 10PIN Pair Cable to interface with board

**There's 3 modes to experiment;**



- GL-12 (C-YA-A-00005)**  
Size 172 x 65 x 10m/m with 840 point
- AD-100 (C-YA-A-00046)**  
Size 81 x 42 x 9 m/m with 360 point
- AD-102 (C-YA-A-00004)**  
Size 81 x 62 x 9 m/m with 456 point

### ET-HARDWARE KIT V1

(P-ET-A-00109)

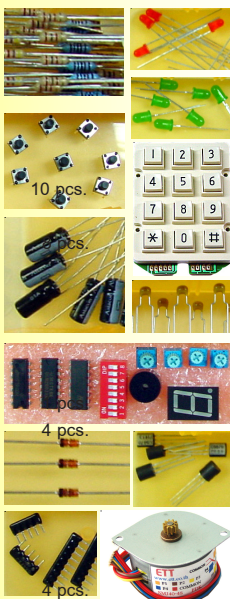
ET-HARDWARE KIT V1 ... It is necessary of new inverter for study Microcontroller CPU MCS51, PIC, AVR, 68HC of MOTOROLA, BASIC STAMP. Users can experiment with Project Board by design board or write program to control basic Electronics Circuit. There's many accessories in ET-HARDWARE KIT V1 such

as R, C, LED, 7-SEGMENT, SWITCH, STEPPING MOTOR, SPEAKER, MANUAL in Plastic Box.



ET-HARDWARE KIT V1 include ...

- |                          |                                  |        |         |
|--------------------------|----------------------------------|--------|---------|
| <input type="checkbox"/> | R 1/4W 5 %                       | 560 Ω  | 20 pcs. |
| <input type="checkbox"/> | R 1/4W 5 %                       | 10 kΩ  | 20 pcs. |
| <input type="checkbox"/> | R 1/4W 5 %                       | 1 kΩ   | 20 pcs. |
| <input type="checkbox"/> | R 1/4W 5 %                       | 4.7 kΩ | 20 pcs. |
| <input type="checkbox"/> | R 1/4W 5 %                       | 2 KΩ   | 20 pcs. |
| <input type="checkbox"/> | LED 3 mm. RED                    |        | 10 pcs. |
| <input type="checkbox"/> | LED 5 mm. GREEN                  |        |         |
| <input type="checkbox"/> | DIP SW 8 POINT                   |        | 1 pcs.  |
| <input type="checkbox"/> | TACT SW DTS 63K                  |        |         |
| <input type="checkbox"/> | LED 7-SEGMENT(TOS5161A,TOS5161B) |        | 2 pcs.  |
| <input type="checkbox"/> | 12 KEY SW TELEPHONE              |        | 1 pcs.  |
| <input type="checkbox"/> | IC ULN2003                       |        | 1 pcs.  |
| <input type="checkbox"/> | IC 74LS04                        |        | 1 pcs.  |
| <input type="checkbox"/> | IC 74HC595                       |        | 1 pcs.  |
| <input type="checkbox"/> | STEPPING MOTOR                   |        |         |
| <input type="checkbox"/> | VR 10K                           |        |         |
| <input type="checkbox"/> | C 0.1 uF MULTILAYER              |        | 8 pcs.  |
| <input type="checkbox"/> | C 10 uF 16V ELECTROLYTIC         |        | 8 pcs.  |
| <input type="checkbox"/> | MINI SPEAKER                     |        | 1 pcs.  |
| <input type="checkbox"/> | DIODE 1N4148                     |        | 8 pcs.  |
| <input type="checkbox"/> | R PACK 10K 9 PIN                 |        | 4 pcs.  |
| <input type="checkbox"/> | R PACK 4.7K 5 PIN                |        |         |
| <input type="checkbox"/> | TRANSISTOR BC547                 |        | 4 pcs.  |
| <input type="checkbox"/> | TRANSISTOR BC557                 |        | 4 pcs.  |

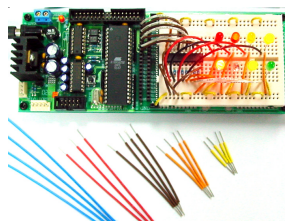


Moreover, there's ETT's books of experimental manual ET-HARDWARE KIT V1 named "Experimental Manual PIC16F877 and PIC18F458" "Experimental Manual AVR AT90S8535 and ATMEGA163" and "Work Sheets of Microcontroller Z8Encore". In other CPU such as MCS51, BASIC STAMP..., there's books for experimental manual ET-HARDWARE KIT V1.

### ET-JW BOX 300 (P-ET-A-00199)



It's suitable for ETT's accessories connected with board, Project Board, especially 22AWG Wire. It's good for Connector Port and Project Board more than Telephone Wire. It is cut by cut machine, so it doesn't break while using. There's 300 Jumper Wires 6 long-sizes per set; 3CM, 5CM, 7CM, 10CM, 15CM, 18CM long. Cut 1 cm. at header of 50 Jumper Wire. It is contained in Plastic Box which a small box inside to keep Jumper Wire in different size and be able to carry easily.



### JUMPER WIRE REFILL

There's only 6 long-size of 50 Jumper Wires per set.

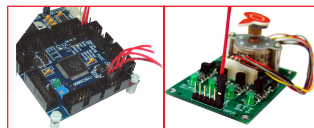
1. ET-JWR03 AS 3 CM.LONG 50 JUMPER WIRES / SET
2. ET-JWR05 AS 5 CM.LONG 50 JUMPER WIRES / SET
3. ET-JWR07 AS 7 CM.LONG 50 JUMPER WIRES / SET
4. ET-JWR10 AS 10 CM.LONG 50 JUMPER WIRES / SET
5. ET-JWR15 AS 15 CM.LONG 50 JUMPER WIRES / SET
6. ET-JWR18 AS 18 CM.LONG 50 JUMPER WIRES / SET

### ET-FF BOX 120 (P-ET-A-00249)



ET-FF BOX 120 is a kind of Jumper Wire that is produced by ETT. It is supply cable No. AWG 24 UL 107 and both side of Jumper Wire is interfaced to be Female. It can be interfaced between HEADER MALE and Boards easily. Moreover, it can be interfaced as independently or interfaced with Board TRAINING KIT of ETT that has HEADER MALE or interfaced with BOARD MINI I/O.

- There are 120 Jumper Wire in plastic box; 60 Jumper Wire for 12 cm. length and 60 Jumper Wire for 22 cm. length.



### JUMPER REFILL

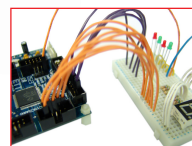
1. ET-FF WR 12 (P-ET-A-00251) is supply Jumper Wire with Connector Female (both side) and is 12 cm. length. There are 20 Jumper Wire per set.
2. ET-FF WR 12 (P-ET-A-00252) is supply Jumper Wire with Connector Female (both side) and is 12 cm. length. There are 20 Jumper Wire per set.

### ET-FM BOX 120 (P-ET-A-00250)



ET-FM BOX 120 which is a kind of single Jumper Wire No.22AWG is stiff type. One side is interfaced with Connector Female and other one side is peeled. So, it can be interfaced with HEADER MALE and other one side is interfaced with HEADER FEMALE or PROJECT BOARD. It make us can apply for various project works.

- There are 120 Jumper Wire in plastic box; 60 Jumper Wire for 12 cm. length and 60 Jumper Wire for 17 cm. length.



### JUMPER REFILL

1. ET-FM WR 12 (P-ET-A-00253) is stiff Jumper Wire with Connector Female (only one side) and is 12 cm. length. There are 20 Jumper Wires per set.
2. ET-FF WR 22 (P-ET-A-00254) is supply Jumper Wire with Connector Female (only one side) and is 22 cm. length. There are 20 Jumper Wires per set.



**ET PCB CONVER SMD SET**

**1. ET-PCB TQFP144 (A-PC-E-00458)**



It is PCB CONVER that converts PIN IC TQFP 144 PIN PITCH 0.5mm. into 4 of PIN HEADER 18 x 2 PIN.

- PCB SIZE 4.3 X 4.3 CM.

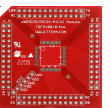
**2. ET-PCB MC TQFP100/0.5 (A-PC-E-00461)**



It is PCB CONVER to convert IC 100 PIN TQFP PITCH 0.5mm., MCU MICROCHIP into 4 of 26 PIN HEADER.

- PCB SIZE 5.1 x 5.1 cm.

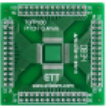
**3. ET-PCB MC TQFP100/0.4 (A-PC-E-00462)**



It is PCB CONVER to convert IC 100 PIN TQFP PITCH 0.4mm., MCU MICROCHIP into 4 of 26 PIN HEADER.

- PCB SIZE 5.1 x 5.1 cm.

**4. ET-PCB TQFP100 (A-PC-E-00439)**



ET-PCB TQFP100 is PCB CONVER and its IC PIN is TQFP 100 PIN with 0.5mm. and 0.4mm. PITCH that are in the type of 4 sets of PIN HEADER 26 PIN. There are 2 types of pitch that can be used; in this case, PCB has 2 sides; one side is pitch 0.4mm and the other one side is pitch 0.5mm.

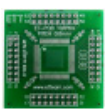
**5. ET-PCB TQFP80 (A-PC-E-00440)**



It is PCB CONVER that converts PIN IC TQFP 80PIN PITCH 0.5mm. into 4 of PIN HEADER 20PIN.

- PCB SIZE 4.3 X 4.3 CM.

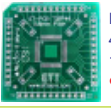
**6. ET-PCB TQFP64 (A-PC-E-00441)**



It is PCB CONVER that converts PIN IC TQFP 64PIN PITCH 0.8mm. into 4 of PIN HEADER 16PIN.

- PCB SIZE 4.3 X 4.3 CM.

**7. ET-PCB TQFP44 (A-PC-E-00457)**



It is PCB CONVER that converts PIN IC TQFP 44PIN PITCH 0.8mm. into 4 of PIN HEADER 11PIN.

- PCB SIZE 4.1 X 4.1 CM.

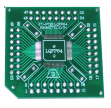
**9. ET-PCB LQFP48 (A-PC-E-00333)**



It is LQFP48 PIN PITCH 0.5 mm. IC PCB CONVER and is converted into 4-CH.PIN HEADER 12 PIN.

- PCB SIZE 3.8 x 3.8 CM.

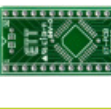
**8. ET-PCB LQFP64 (A-PC-E-00272)**



It is LQFP64 PIN PITCH 0.5 mm. IC PCB CONVER and is converted into 4-CH.PIN HEADER 16 PIN.

- PCB SIZE 3.8 x 3.8 CM.

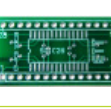
**10. ET-PCB TQFP32 (A-PC-E-00442)**



It is PCB CONVER that converts PIN IC TQFP 32PIN PITCH 0.8mm. into DIP 32PIN.

- PCB SIZE 1.9 X 4.2 CM.

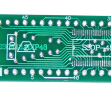
**11. ET-PCB SOIC28 (A-PC-E-00445)**



It is PCB CONVER that converts PIN IC SOIC 28PIN PITCH 1.27 mm. into DIP 28PIN (15.24mm in width).

- PCB SIZE: 2 X 3.8 CM.

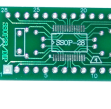
**12. ET-PCB SSOP48 (A-PC-E-00269)**



It is SSOP 48 PIN PITCH 0.65 mm. IC PCB CONVER and is converted into DIP 48 PIN (15.24 mm. Width Pin)

- PCB ZISE 2 X 6.3 cm.

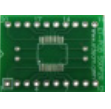
**13. ET-PCB SSOP28 (A-PC-E-00270)**



It is PCB CONVER to convert IC SSOP 28 PIN PITCH 0.65 mm. to be DIP 28 PIN (15.24 mm. width) and its

- PCB SIZE is 2 x 3.8 cm.

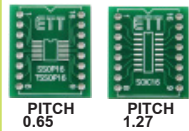
**14. ET-PCB SSOP 20 (A-PC-E-00396)**



It is PCB CONVER to convert IC SSOP 20 PIN PITCH 0.65 mm. to be DIP 20 PIN (15.24 mm. width) and its

- PCB SIZE is 2 x 2.75 cm.

**15. ET-PCB SOIC16 (A-PC-E-00527)**



It is PCB CONVER; in this case, one side of PCB converts IC SSOP16, TSSOP16 PIN into DIP 16 PIN (15.24 mm. Pitch) and other one side of PCB converts IC SOIC16 PIN into DIP 16 PIN.

PITCH 0.65 mm.

PITCH 1.27 mm.

**16. ET-PCB SSOP16 (A-PC-E-00397)**



It is PCB CONVER to convert IC SSOP 16 PIN PITCH 0.65 mm. to be DIP 16 PIN (15.24 mm. width) and its PCB SIZE is 2 x 2.3 cm.

**17. ET-PCB SSOP14 (A-PC-E-00398)**



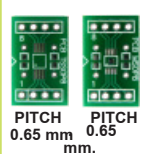
It is PCB CONVER to convert IC SSOP 14 PIN PITCH 0.65 mm. to be DIP 14 PIN (15.24 mm. width) and its PCB SIZE is 2 x 2 cm.

**18. ET-PCB SOP20 (A-PC-E-00271)**



It is SOP 20 PIN PITCH 1.27 mm. IC PCB CONVER and is converted into DIP 20 PIN (15.24 mm. Width Pin)

**19. ET-PCB TSSOP 8 (A-PC-E-00464)**



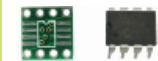
It is PCB CONVER; in this case, one side of PCB converts IC TSSOP 8 PIN into DIP 8 PIN (15.24 mm. Pitch) and other one side of PCB converts IC MSOP8 into DIP 8 PIN. It is two types in one PCB CONVER.

**20. ET-PCB SOP 8 (A-PC-E-00399)**



It is PCB CONVER to convert IC SOP 8 PIN PITCH 1.27 mm. to be DIP 8 PIN (15.24 mm. width) and its PCB SIZE is 2 x 1.2 CM.

**21. ET-PCB SOIC 8 TO DIP 8 (A-PC-E-00465)**



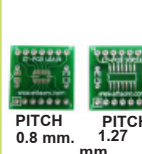
It is PCB CONVER to convert IC SOIC 8 PIN PITCH 1.27 mm. into DIP 8 PIN (7.62 mm. Pitch). It is able to connect pin and replace IC DIP 8 PIN instantly; for example, if IC DIP 8 PIN is not made any more, it is able to use IC SOIC 8 PIN in the circuit instead.

**22. ET-PCB SOT-23-6 (A-PC-E-00472)**



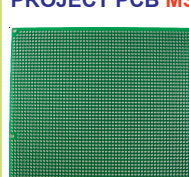
It is PCB CONVER to convert SOT-23 6 PIN PITCH 0.95 mm. into DIP 6PIN (7.62 mm. Pitch).

**23. ET-PCB LGA14 (A-PC-E-00482)**



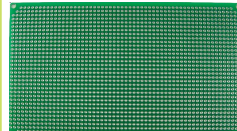
It is PCB CONVER to convert IC LGA 14PIN into DIP 14PIN (15.24mm. width) on one side and it converts SOIC 14PIN into DIP 14PIN (15.24mm. width) on another one side.

**PROJECT PCB M3 (C-YE-B-00007)**



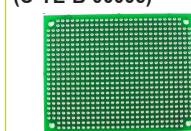
It is designed to use with ETT's Board such as CP-PIC V3, CP-AVR V3, CP-JR51AC2 V1 conveniently. User can attach Project Board with Board by using knot to connect between board and PCB.

**PROJECT PCB M4 (C-YE-B-00009)**



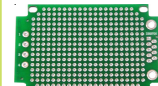
- PCB SIZE 9 x 15 cm.

**PROJECT PCB M1 (C-YE-B-00006)**



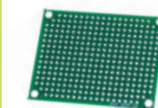
- PCB SIZE 6 x 8 cm.

**PROJECT PCB M5 (C-YE-B-00012)**



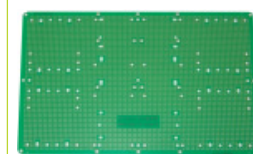
BE ABLE TO BUILD INSIDE ET-PROJECT BOX 1

**PCB MINI PCB (C-YE-B-00014)**



It is PCB PTH for interfacing additional circuits and its size is as same as ET-MINI.

**PCB-BASE STAND (A-PC-E-00339)**

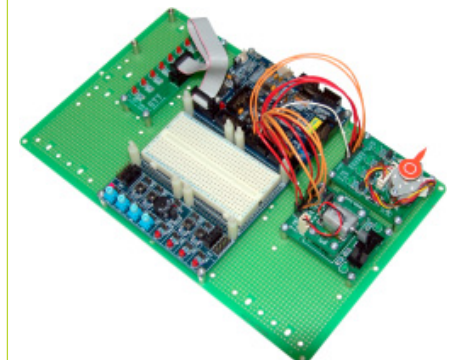


- PCB SIZE 15.5 x 24.5 cm.

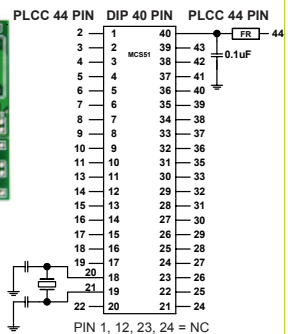
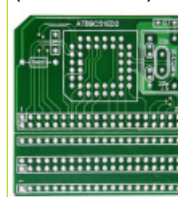
**ET-MULTI KIT BASE STAND (P-ET-A-00311)**



It is component to interface with ETT boards by using PCB-BASE STAND to be base supporter, so user can arrange test board systematically because there's a box. It is good to keep all components in the box and user can carry it to any place. It can be used with ETT Boards such as CP-JR SIZE, ET-MINI I/O BOARD, ET-10PIN TEST and etc.



**ET-PCB MCS51 PLCC 44 TO DIP 40 (A-PC-E-00503)**




Complete assembled board


ET-PCB MCS51 PLCC 44 TO DIP 40 is PCB CONVER that has been designed to use with CPU MCS51; there is both DIP 40 PIN and PLCC 44 PIN. It converts pin interface from CPU 44 PIN PLCC into CPU 40 PIN DIP; it is used when it runs out of CPU DIP 40 PIN but there is only 44 PIN PLCC. It can be used with No.P89C51, P89V51, P89LV51, AT89C51, AT89S51 and etc.

**\*\* NOTE \*\*** This product is only PCB, other devices on PCB that are assembled with this product and shown in the picture above are used to illustrate only.







**ET - CONV10D (P-ET-A-00191)**  
It is Port Connector to connect with PORT of 10 PIN (5x2) Female IDC Pair Cable and is converted into PIN HEADER 5x2 Male PORT 300 mil.



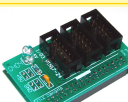
**ET - CONV10S (P-ET-A-00192)**  
It is Port Connector to connect with PORT of 10 PIN (5x2) Female IDC Pair Cable and is converted into PIN HEADER 10x1 Male PORT 1 ROW and connect with Project Board.




**ET - CONV4S (P-ET-A-00190)** It is Port Connector to connect with PORT of 4 PIN Female RS232 Cable and is converted into PIN HEADER 4x1 Male PORT 1 ROW and connect with Project Board.




**ET - CONV 10 TO 14 (P-ET-A-00116)**  
It converts 14 Pin Pair Cable from 10 Pin Pair Cable for connect between BUS 14 Pin from ETT Board and 10 Pin I/O Board such as ET-LAB3A, ET-EXP4.



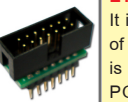
**ET - CONV 34 TO 10 M (P-ET-A-00115)**  
It is Port Connector to connect with ETT's CONVERTOR I/O 34 PIN and is converted into 10 PIN MALE I/O 3 PORT.




**ET - CONV 34 TO 10 F (P-ET-A-00115)**  
It is Port Connector to connect with ETT's CONVERTOR I/O 34 PIN and is converted into 10 PIN FEMALE I/O 3 PORT.



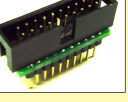
**ET - 5V BOARD (P-ET-A-00114)**  
It is 5 VDC Power Supply Board for DC 9-12 VDC In put. It is



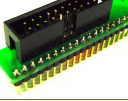
**ET - CONV14D (P-ET-A-00194)**  
It is Port Connector to connect with PORT of 14 PIN (7x2) Female IDC Pair Cable and is converted into PIN HEADER 7x2 Male PORT 300 mil. width Pin and connect with Project Board.



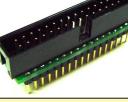
**ET - CONV14S (P-ET-A-00193)**  
It is Port Connector to connect with PORT of 14 PIN (7x2) Female IDC Pair Cable and is converted into PIN HEADER 14x1 Male PORT 1 ROW



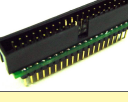
**ET - CONV20D (P-ET-A-00196)**  
It is Port Connector to connect with PORT of 20 PIN (10x2) Female IDC Pair Cable and is converted into PIN HEADER 10x2 Male PORT 300 MIL width Pin and connect with Project Board.



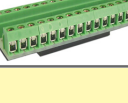
**ET - CONV20S (P-ET-A-00195)**  
It is Port Connector to connect with PORT of 20 PIN (10x2) Female IDC Pair Cable and is converted into PIN HEADER 20x1 Male PORT 1 ROW and connect with Project Board.



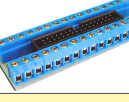
**ET - CONV34D (P-ET-A-00197)**  
It is Port Connector to connect with PORT of 34 PIN (17x2) Female IDC Pair Cable and is converted into PIN HEADER 17x2 Male PORT 300 MIL



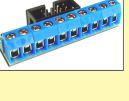
**ET - CONV40D (P-ET-A-00198)**  
It is Port Connector to connect with PORT of 40 PIN (20x2) Female IDC Pair Cable and is converted into PIN HEADER 20x2 Male PORT 300 MIL width Pin



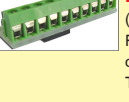
**ET-34 TO 34T F (P-ET-A-00153)**  
(34 PIN HEADER TO 34 PIN TERMINAL FEMALE)34 PIN HEADER MALE CONVER on board of ETT is converted into 34 PIN TERMINAL PORT.



**ET-34 TO 34T M (P-ET-A-00154)**  
(34 PIN HEADER TO 34 PIN TERMINAL MALE) Connect between Converter and 34 Pin Pair Cable from 34 Pin Pair Cable of ETT and is converted into 34 Pin Terminal.

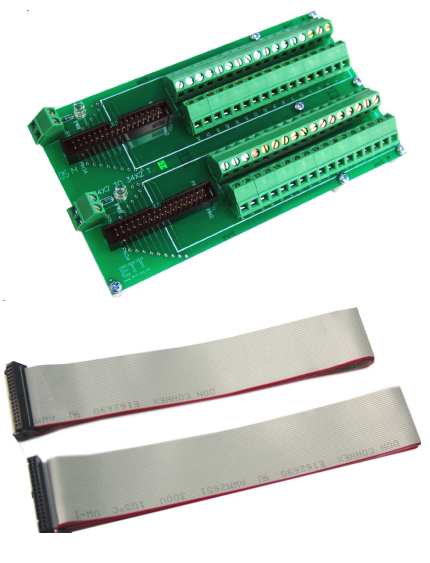


**ET-10 TO 10T M (P-ET-A-00152)**  
(10 PIN HEADER TO 10 PIN TERMINAL MALE) Connect between Converter and 10 Pin Pair Cable from 10 Pin Pair Cable of ETT and is converted into 10 Pin Terminal.



**ET-10 TO 10T F (P-ET-A-00151)**  
(10 PIN HEADER TO 10 PIN TERMINAL FEMALE)10 PIN HEADER MALE CONVER on board of ETT is converted into 10 PIN TERMINAL PORT.

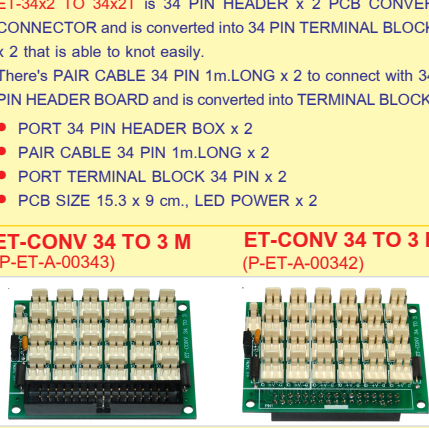
**ET-34 x 2 TO 34 x 2T (P-ET-A-00208)**



ET-34x2 TO 34x2T is 34 PIN HEADER x 2 PCB CONVERTOR CONNECTOR and is converted into 34 PIN TERMINAL BLOCK x 2 that is able to knot easily. There's PAIR CABLE 34 PIN 1m.LONG x 2 to connect with 34 PIN HEADER BOARD and is converted into TERMINAL BLOCK.

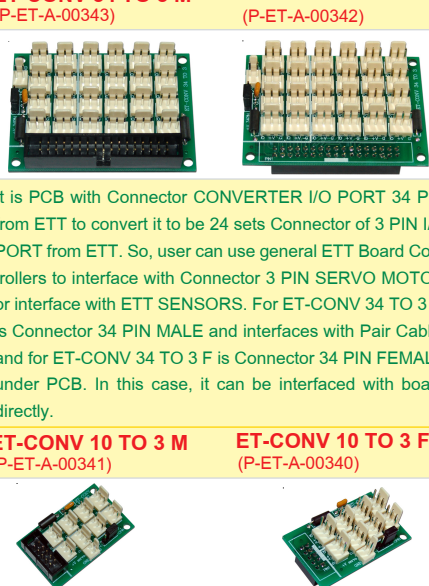
- PORT 34 PIN HEADER BOX x 2
- PAIR CABLE 34 PIN 1m.LONG x 2
- PORT TERMINAL BLOCK 34 PIN x 2
- PCB SIZE 15.3 x 9 cm., LED POWER x 2

**ET-CONV 34 TO 3 M (P-ET-A-00343)**      **ET-CONV 34 TO 3 F (P-ET-A-00342)**



It is PCB with Connector CONVERTER I/O PORT 34 PIN from ETT to convert it to be 24 sets Connector of 3 PIN I/O PORT from ETT. So, user can use general ETT Board Controllers to interface with Connector 3 PIN SERVO MOTOR or interface with ETT SENSORS. For ET-CONV 34 TO 3 M is Connector 34 PIN MALE and interfaces with Pair Cable; and for ET-CONV 34 TO 3 F is Connector 34 PIN FEMALE under PCB. In this case, it can be interfaced with board directly.

**ET-CONV 10 TO 3 M (P-ET-A-00341)**      **ET-CONV 10 TO 3 F (P-ET-A-00340)**



It is PCB with Connector CONVERTER I/O PORT 10 PIN from ETT to convert it to be 8 sets of Connector 3 PIN I/O PORT from ETT. So, user can use general ETT Board Controllers to interface with Connector 3 PIN SERVO MOTOR or interface with ETT SENSORS. For ET-CONV 10 TO 3 M is Connector 10 PIN MALE and interfaces with Pair Cable; and for ET-CONV 10 TO 3 F is Connector 34 PIN FEMALE under PCB. In this case, it can be interfaced with board directly.

**ET-CONV SPI TO LCD (P-ET-A-00385)**  
ET-CONV SPI TO LCD is CONVO to convert Connector 10PIN ET (can be OUTPUT 8 BIT), so it can be interfaced with Character LCD 14PIN or 16PIN. Moreover, this CONVER Kit can be interfaced in the format of 3-Line SPI through 74HC595 on board; in this case, it only uses 3 lines to interface with LCD.





- Has Circuit TR to ON/OFF LED BACKLIGHT.
- Board is designed to interface with LCD version MTC-16205D directly .

- PCB Size: 80.0(W) x 36.0(H) mm.
- ET-CONV SPI TO LCD Kit includes...

1. Board ET-CONV SPI TO LCD
2. Pair Cable 10PIN Header with 20 mm. in length
3. Circuit Document

**ET-CONV 10 TO LCD (P-ET-A-00386)**  
It is CONVER to convert Connector 10PIN ET (can be OUTPUT 8 BIT) to interface with Character LCD 14PIN or 16PIN if there is BACKLIGHT and VR to ON/OFF LED BACKLIGHT and VR to adjust the brightness of LCD.



1. Board ET-CONV 10 TO LCD
2. Pair Cable 10PIN Header with 20 cm. in length
3. Circuit Document

**ET-CONV 14 LCD (P-ET-A-00351)**  
It is board that is connected to ETT board through Port 14 Pin LCD; More over, it is compatible with Character LCD.



**ET-CONV 14 LCD-R (P-ET-A-00423)**  
It is board that is connected to ETT board with 14 pin pair cable through Port 14 Pin LCD; More over, it is compatible with Character LCD.



**ET-CONV DC JACK (P-ET-A-00390)**  
It is PCB Kit with devices to convert Connector from DC JACK 2.5mm and Connector 2 PIN WAFER 2.54mm. into Connector 4PIN. This Connector is interfaced with PROJECT BOARD; in this case, it is anode and cathode for devices on PROJECT BOARD, so it is easier and more convenient to use and interface.



**ET-CONV RJ45-M (P-ET-A-00438)**  
It is PCB CONVERTER to convert Connector MAGNETICS with LED for 10/100 BASE RJ45 for interfacing with LAN into Connector 14PIN HEADGER that is 2.54mm pitch and 20.32mm width. It can use with PROJECT BOARD to test operation.



**ET-CONV ICSP TO RJ11 (P-ET-A-00439)**  
It is PCB CONVERTER to convert Connector 6PIN of PICKIT2 or PICKIT3 of MICROCHIP(ICSP) into Connector RJ11 for using with ICD2, ICD3.





**ET-CONV MINI USB-B**  
(P-ET-A-00494)



**new**



This CONVER device converts Connector from USB TYPE B 5 PIN MINI to be PIN HEADER 6 PIN MALE and TERMINAL 6 PIN. The PCB size is 4.1 x 2.5 cm.

**ET-CONV MINI USB-A**  
(P-ET-A-00495)

**new**



This CONVER device converts Connector from USB TYPE A 4 PIN to PIN HEADER 5 PIN MALE and TERMINAL 5 PIN. The PCB size is 4.1 x 2.5 cm.

**ET-CONV DC JACK V2**  
(P-ET-A-00496)

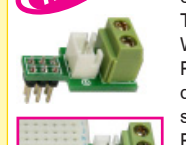
**new**



This CONVER device covers Connector from DC POWER JACK 2.5mm. to PIN HEADER 3 PIN MALE and TERMINAL 3 PIN. The PCB size is 2.3 x 2.5 cm.

**ET-CONV BB PWR**  
(P-ET-A-00497)

**new**



This CONVER device converts Connector from TERMINAL 2PIN and 2PIN WAFER 2.50mm. MALE to PIN HEADER 6PIN. It is designed to be Connector for supplying power into PROJECT BOARD. The PCB size is 1.3 x 2.5 cm.

**ET-CONV RJ45**  
(P-ET-A-00377)



It is CONVER that converts Connector RJ45 8PIN into Connector PIN HEADER Male 8PIN and Connector TERMINAL 8PIN.

**ET-CONV USB-B**  
(P-ET-A-00378)



It is CONVER that converts Connector USB TYPE B into Connector PIN HEADER Male 4PIN and TERMINAL 4PIN.

**ET-CONV DB 9 F**  
(P-ET-A-00379)



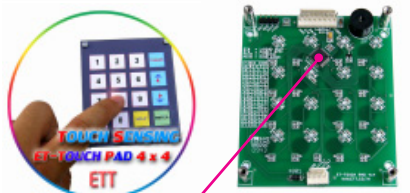
It is CONVER that converts Connector Female DB 9PIN into Connector PIN HEADER Male 10PIN (adding Connector GND DIP TYPE) and Connector TERMINAL 10PIN.

**ET-CONV DB 9 M**  
(P-ET-A-00380)



It is CONVER that converts Connector Male DB 9PIN into Connector PIN HEADER Male 10PIN (adding Connector GND DIP TYPE) and Connector TERMINAL 10PIN.

**ET-TOUCH PAD 4X4**  
(P-ET-A-00408)



It is 4X4 KEY BOARD Touch Screen that uses MCU No.STM8S105C4T6 to control the operation. It is able to connect with MCU that is 5V or 3.3V and it sends data of pressing key in the format of BCD and RS232(TTL).

- It is TOUCH SENSING KEY (Touch Screen) in the format of 16 Keys CAPACITIVE SENSING (4x4).
- It uses Power Supply 3.3VDC or 5VDC for board, so it is compatible with MCU that is 3.3V or 5V. It uses 2mA current for normal usage and 8mA current while pressing keys.
- It uses sound and 16 LED on that key to display the operating status while pressing key.
- There are 2 types of sending KEY CODE of the pressed KEY;

1. BINARY CODE (BCD 8421) through CONNECTOR 8PIN; there are 4 cables of Pin BCD, Pin ST#, Pin P#/R, Pin VCC, and Pin GND.

2. ASCII CODE through CONNECTOR 4PIN RS232 TTL (UART), BAUD RATE 9600

- 1 Special KEY that can be used as normal KEY or KEY FUN to press with other KEY, so it can be operated more than 16 KEY

- 2mm. thick transparent plastic plate to support KEY TOUCH

- Board Size 76.2 x 88.9 mm.

- ET-TOUCH PAD 4X4 consists of ...

1. Board ET-TOUCH PAD
2. 2mm. thick transparent plastic plate to support KEY



**12 KEY TELEPHONE KEYBOARD**

(A-SW-K-00017)



4 x 3 Matrix Key

- size 5.5 x 7.7 cm.

**KEYPAD 4X4 BLACK**  
(A-SW-K-00093)

**new**



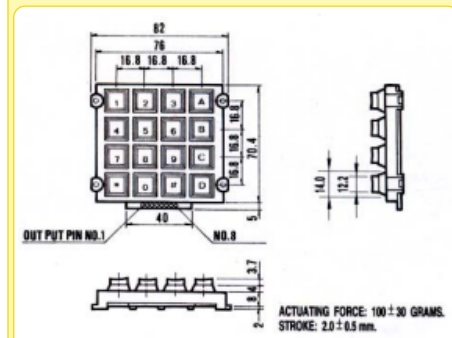
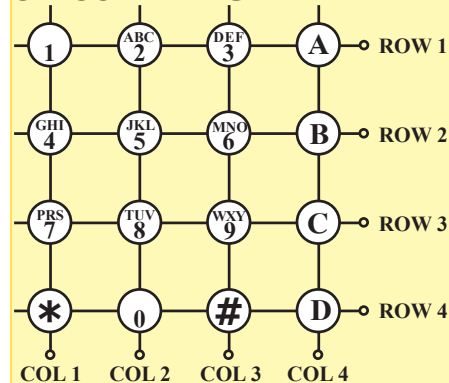
**General Specification**

- Contact rating:20mA,24VDC
- Contact resistance:200 ohm max
- Life:1,000,000 cycles per key
- Operating Temperature: -20 °C to +60 °C
- Storage Temperature: -40 °C to +65 °C

**AK-1607**

OUTPUT ARRANGEMENT	
OUTPUT PIN NO.	SYMBOL
1	ROW 2
2	ROW 3
3	COL 1
4	ROW 4
5	COL 2
6	COL 3
7	COL 4
8	ROW 1

**CIRCUIT DIAGRAM**



## ET-CNT6P3 (P-ET-A-00097)

### UNIVERSAL TARGET DISPLAY BOARD

ET-CNT6P3 is a large board suitable for large factory because it's visible for 50m. It uses in Manufacture Target Counter, Timetable Counter and etc with a large 6 Digit to display. There's accessories for support such as 16-CH. Counter (ET-MC16) users can expand their target of board in the future and it's cheaper than other products.



#### Specification ET - CNT6P3

<b>Operating Voltage Supply:</b>	220VAC/50Hz
<b>No of Digit Display:</b>	6 Digit of 7 - Segment X 3
<b>Display Type:</b>	LED 7 - Segment (Dot LED 5mm. Super Bright)
<b>No of Input Signal:</b>	2 Input (1 Signal Counter & 1 Reset Counter) Optoisolation
<b>Input Signal Counter Type:</b>	Contact Switch or +12V Pulse Signal
<b>Input Reset Counter Type:</b>	Contact Switch or +12V Pulse Signal
<b>Counter Speed:</b>	10 - CPS (10Hz)
<b>No of Output Signal:</b>	2 Output (1 Counter Output & 1 Alarm Output)
<b>Output Counter Type:</b>	Open Collector (MAXIMUM VOLT AGE+24V)
<b>Output Alarm Type:</b>	Relay Contact 2A/250VAC (NO-COMMON-NC)
<b>Battery Backup Time:</b>	2 Year Data Backup
<b>Operation Mode:</b>	4 Mode Programmable Operation :Counter Mode :Terminal Display Mode (RS485) :Serial Display Mode (RS232):Display Self-Test Mode
<b>Programmable Mode Device:</b>	RS232 Keyboard Switch BOX , Computer PC With RS232 + SOFTWARE PROGRAM
<b>Display Dimension (W x L):</b>	11.5 x 52.5 cm (4.5 x 20.6 Inch)
<b>BOX Dimension (W x L x D):</b>	50.5 x 76 x 7cm (20 x 30.3 x 2.7 Inch)

- COUNT-UP PROGRAM (000000-999999)
- COUNT-DOWN PROGRAM (999999-000000)
- DIVIDE COUNTER PROGRAM
- PRESET COUNTER PROGRAM
- TARGET COUNTER PROGRAM
- INPUT COUNTER PROGRAM AS +12 V SIGNAL PULSE OR CONTACT SWITCH INPUT OR OPEN COLLECTOR RELAY AND BE ABLE TO SET DEBOUNCE PROGRAM
- SET PROGRAM WITH ALARM AND RELATE WITH TARGET COUNTER, 1-CH. RELAY OUTPUT OF ALARM AS NO, NC, AND COMMON
- BATTERY BACK UP
- ET-CNT6P3 INCLUDES;

1. Board with Metal Box
2. Key Board with Program (ET-KEY 232) and 3m. KEY Cable
3. DB 25 PIN Male Port with Cover
4. User Manual, CD-ROM



## ET-CNT6P3 PLUS

Specifications of ET-CNT6P3 PLUS is as same as ET-CNT6P3, but it is different in shape and small size

- 1.DISPLAY 4 DIGIT 3 LINES 7-SEGMENT 2.3 INCH RED LED
- 2.BOX DIMENSION (W x L x D) 36 x 40 x 10 CM.

(P-ET-A-00188)



#### ET-CNT6P3 PLUS INCLUDES;

1. BOARD WITH PLASTIC BOX
2. KEY BOARD USING WITH ET-KEY232 AND 3M KEY CABLE
3. DB 25 PIN PORT WITH COVER
4. USER ANNUAL
5. CD-ROM
6. RS232 DB 9 PIN HEADER CNT-6



- Adaptation** • Be able to expand Display more than 1 point by using with ET-CNT6P 6 Digit 1 line Display for 1.2 KM. further
- Accessories** • 16-CH.ET-MC16 MULTI COUNTER (OPTION) connecting with ET-CNT6P to expand channel Price

## ET-CNT4 P2 TARGET TIME

It's a Counter that has 4 digits with 2 rows. Number is 2.3 inch red LED 7-Segment. Green and Red LED display state operation.

(P-ET-A-00318)



- TARGET can be set to count up one by one automatically from 1 to 999 seconds
- ACTUAL displays result from counting up of incoming INPUT
- GREEN LED will be ON if ACTUAL is greater or equal to TARGET; RED LED will be ON if ACTUAL is lesser than TARGET
- BOX DEMENSION (W x L x D): 45 x 25 x 10 cm.

ET-CNT4 P2 TARGET TIME consists:

1. Board with plastic box
2. KEY BOARD (ET-KEY232) and cable
3. Connector Male DB 25PIN with COVER
4. User's Manual





# ET-COUNTER SET

ET-CNT6 (Counter Display) : ET-KEY RS232 (RS232 KEY BOARD) : ET-MC16 (Multi Counter 16 INPUT) [www.ett.co.th](http://www.ett.co.th)



## ET-CNT6 (P-ET-A-00083)



ET-CNT6 is a part of 6 Digit Display and control with Microcontroller. Display is 7-Segment size 5mm. Super-Bright LED 3.5 Inch height and is able to see 50m. further visibly. Input of counter is designed as Input Counter and Reset Counter Opto-Isolate Type. It is able to connect with Input signal as Contact and 12V Signal Pulse and is able to connect for long distance. Moreover, there's Backup Circuit for saving Counter for 2 years in case of short-circuit.

There's various functions for support Counter Operation Program. For example, Terminal Display Function, it displays Counter, Target and Difference of Target and displays related data in one board. Users can set many boards in different places but boards still display in the same data.

Moreover, there's supporting accessories for using efficiently. For example, Et-MC16 (Multi-Counter16 Input), it supports system in case of user want to use Counter Input more than 1 signal. It is able to connect 16 Input in the same time for Multi-Counter and connect with Output of Multi-Counter to go to Input of Counter. ET-KEY232 (Keyboard Rs232) is support accessory for setup Modes or Parameter values such as Preset Counter, Target Counter or Alarm.

### There's 3 Modes of ET-CNT6:

Counter Mode is a Counter program and there's various counters to select to use in a suitable project work.

- Count-Up Program : 000000-999999 or  
Count-Down Program : 999999-000000
- Divide Program for Counter such as count 1 when 12 Input
- Preset Counter Program
- Target Counter Program
- Input Signal Program : +12V Signal Pulse Input or Contact Switch Input and be able to set Debounce Program in case of using Contact Switch Input
- Alarm program

### Specification

<b>Operating Voltage Supply :</b>	220VAC/50Hz
<b>No of Digit Display :</b>	6 Digit of 7-Segment
<b>Display Type :</b>	LED 7-Segment (Dot LED 5mm. Super-Bright)
<b>No of Input Signal :</b>	2 Input (1 Signal Counter & 1 Reset Counter) Opto isolation
<b>Input Signal Counter Type :</b>	Contact Switch or 12V Pulse Signal
<b>Input Reset Counter Type :</b>	Contact Switch or 12V Pulse Signal
<b>Counter Speed :</b>	10-CPS (10Hz)
<b>No of Output Signal :</b>	2 Output (1 Counter Output & 1 Alarm Output)
<b>Output Counter Type :</b>	12V Pulse Signal
<b>Output Alarm Type :</b>	Relay Contact 2A/250VAC(NO-COMMON-NC)
<b>Battery Backup Time :</b>	2 Year Data Backup
<b>Operation Mode :</b>	3 Mode Programmable Operation :Counter Mode :Terminal Display Mode (RS485) :Serial Display Mode (RS232)
<b>Programmable Mode Device :</b>	RS232 Keyboard Switch BOX (Option)
<b>Display Dimension (W x L) :</b>	11.5 x 52.5 cm (4.5 x 20.6 Inch)
<b>BOX Dimension (W x L x D) :</b>	16 x 65 x 7 cm (6.2 x 25.5 x 2.7 Inch)

Terminal Display Mode is Network Display (RS485) to support Counter Mode Program. It displays many Actual, Target and Difference in many places. All Terminal Display comes from Main Counter, users can connect 32 Terminal Displays with 1 Counter in maximum 4000 feet further (1200m.) and it is set to display in 3 modes;

- Actual Display Program
- Target Display Program
- Difference Display Program

Serial Display Mode is RS232 Display. Data comes from RS232 and is able to display Number 0-9, Decimal Point (.), and Minus Sign (-). It displays 6 Digit and programs data of RS232 like these;

- Baudrate :9600 BPS
- Start Bit : 1 Start Bit
- Data Bit : 8 Bit
- Stop Bit : 1 Stop Bit
- Parity Bit :Non Parity

Value of Format to Display is standard ASCII Code of numbers or signs and displays not more than 6 Digit ( not include Decimal Point (.) ) and close with Enter Code (0DH). An example of this adaptation is display weight of scale or display any counter from RS232.



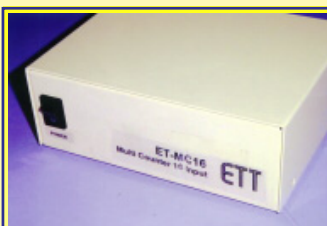
(P-ET-A-00087)

### ET - KEY 232

ET-KEY232 is 16 key Keyboard Switch with RS232 Output and connect with ET-CNT6 or adaptation in other project work that wants RS232 Input.

- 16 KEY TACT SW USES 0-9, ESC, UP, DOWN, SET/RUN, CLR, ENT
- SEND DATA THROUGH PRESS SW KEY AS ASCII CODE

- SEND DATA AS 9600 BSP, 1 START BIT, 8 BITS DATA, 1 STOP BIT, NON PARITY
- INPUT POWER SUPPLY +5VDC RJ45 PORT TYPE
- 3 M. CABLE FOR CONNECT WITH KEYBOARD
- BOX SIZE 11.5 x 11 x 3 cm. (4.5 x 4.4 x 1.2 Inch)



(P-ET-A-00086)

### ET - MC16 ( MULTICOUNTER )

It is addition accessory of Counter in ET-CNT6 and connect with INPUT. Be able to connect with 16 channel counter independently or connect ET-MC16 with ready-made COUNTER for counter expansion.

- 16 CHANNEL COUNTER BE ABLE TO SELECT CONTACT INPUT OR OPEN COLLECTOR
- BE ABLE TO SET DEBOUNCE VALUE OF CONTACT INPUT FROM 0-15 m SEC
- BE ABLE TO SEPARATE SIGNAL AND CONTROL THROUGH OPTO ISOLATION

**ET-UJC6-C / ET-UJC6-T**  
(P-ET-A-00106) (P-ET-A-00108)



**ET-UJC6-C** is a counter and display large 6 digit number be able to work many functions;

- 6 DIGIT COUNTER BE ABLE TO SET AS COUNT UP OR COUNT DOWN
- BE ABLE TO SET AS OUTPUT ON/OFF 220VAC
- DISPLAY NUMBER FROM INPUT PORT RS232 AND OTHER FUNCTIONS

**ET-UJC6-T** is a clock, stop watch, on/off clock and be able to work many functions;

- CLOCK DISPLAYS SECOND, MINUTE, HOUR
- CLOCK DISPLAYS ON/OFF ANY MACHINE BE ABLE TO SET AS SECOND, MINUTE, HOUR SUITABLE FOR FACTORY OR SCHOOL OR AS STOP WATCH FOR ANY COMPETITION

- SIZE OF **ET-UJC6-C** AND **ET-UJC6-T**

SIZE BOX: 15.5 x 64.5 CM.

SIZE DISPLAY :9 x 51 CM.



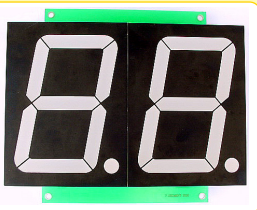
**ET-JCD4 PLUS 2** (P-ET-A-00144)



**ET-JCD4 PLUS 2** (Jumbo Counter Display) is a large counter display and is suitable for large factory because it is displayed invisibly.

- 4 DIGIT 7-SEGMENT (0-999) BE ABLE TO COUNT UP OR COUNT DOWN NUMBER 7-SEGMENT CONSISTS OF 5MM.RED LED WITH 96 CIRCLE PER 1 DIGIT WITH 3.5 INCH TALL
- INPUT COUNTER
- BATTERY BACKUP
- SIZE BOX 15 x 42 x 7 CM.

**ET-BIG 7 X2** (P-ET-A-00080)



**ET-BIG 7 x 2** is a large Red 2 Digit 7-Segment LED Display size 4 inch. It uses 3-CH.Cable to connect with ET-BIG 7 x 2.

- 1RED 2 DIGIT 7-SEGMENT NUMBER SIZE 4 x 2.5 INCH TALL
- 3-CH.SERIAL TTL PORT FOR CONTROL DISPLAY
- 34 PIN ET-BUS PORT AND 10 PIN ET-SDP8 PORT
- 2 DIGIT 7-SEGMENT LED SIZE 7 x 4.5 INCH
- POWER SUPPLY 15 VDC AND CURRENT 7-SEGMENT 280mA
- PCB SIZE 13 x 15 CM.
- MOREOVER, THERE'S CPU AT89C2051 (OPTION) 20 PIN IC FOR CONTROL DISPLAY ON BOARD AND RS232 (OPTION)

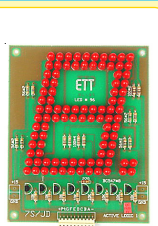
**ET-BIG 7X1** (P-ET-A-00111)



**ET-BIG 7 x 1** is a large Red 1 Digit 7-Segment LED Display size 4 inch. It uses 3-CH.Cable to connect with ET-BIG 7 x 2.

- BE ABLE TO CONNECT WITH ET-BIG 7 x 1 OR ETT'S BOARD THROUGH 10 PIN ET
- LED 7-SEGMENT SIZE 9 x 12 CM.
- POWER SUPPLY +5VDC, +12VDC AND CURRENT IN 7-SEGMENT = 180mA

**ET-7SJD** (P-ET-A-00005)



**ET-7LSD** ET-7LSD is a large 7-Segment display board and is able to see further more than 50 m. Be able to connect with Micro through 3-Ch. Cables and be able to connect many ET-7LSD board in the same time.

- NUMBER SIZE 4.5 x 7 INCH TALL
- CURRENT 200 mA
- SUPPLY +12 VDC +5VDC
- 5MM SUPER BRIGHT RED LED DISPLAY AND LINE CIRCUIT FOR CONNECT WITH CPU
- PCB SIZE 17.8 x 22.9 CM

**ET-CLOCK 4** (P-ET-A-00047)



It is a large digital clock displays 4 Digit 7-Segment large number.

- BE ABLE DISPLAY HOUR, MINUTE, AND DAY, MONTH, AND °C TEMPERATURE
- 4 DIGIT DISPLAY HOUR, MINUTE FOR 15 MINUTE AND CHANGE INTO DISPLAY DAY, MONTH FOR 15 MINUTE AND THEN CHANGE INTO DISPLAY C TEMPERATURE FOR 8 SECOND, IT WILL ALTERNATE CONTINUOUSLY
- USE MICROCONTROLLER WITH BATTERY BACKUP
- 7-SEGMENT RED SUPER BRIGHT LED SIZE 2.3 INCH

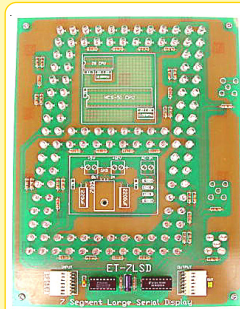
**ET-CLOCK 4 BIG** (P-ET-A-00138)



**ET - CLOCK 4 BIG ...** ET-CLOCK 4 BIG is large 4 Digit Electronic Clock. It is able more than 50 m invisible and suitable for large building or factory. It is able to connect with clock for display time around more than 1,200m with 32 points.

- 7-SEGMENT SUPER BRIGHT RED DOT LED
- 4 DIGIT NUMBER WITH POINTS DISPLAY HOUR, MINUTE
- BE ABLE TO SET ET-CLOCK 4 BIG AS MOTHER-CLOCK AND OTHER WII DISPLAY LIKE MOTHER-CLOCK, BE ABLE TO CONNECT 1,200 M FURTHER 32 POINTS
- 1 DIGIT=11.7 x 18 CM AND TOTAL DISPLAY 46.8 x 72 CM
- PLASTIC BOX SIZE 8.7 x 76 x 27.5 CM.

**ET-7LSD** (P-ET-A-00006)



**ET-7LSD** ET-7LSD is a large 7-Segment display board and is able to see further more than 50 m. Be able to connect with Micro through 3-Ch. Cables and be able to connect many ET-7LSD board in the same time.

- NUMBER SIZE 4.5 x 7 INCH TALL
- CURRENT 650mA / 12V
- SUPPLY +12 VDC +5VDC
- 5MM SUPER BRIGHT RED LED DISPLAY AND LINE CIRCUIT FOR CONNECT WITH CPU
- PCB SIZE 17.8 x 22.9 CM



**ET-DSP6 (P-ET-A-00117)**

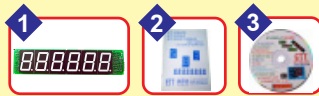


ET-DSP6...is 6 Digit Display Board with 7-Segment Red 2.3 inch tall LED. It uses 8 Bit Serial Shift to Parallel Latch with CPU AT89C2051 and example program to develop board such as Display Board, Counter Display, Price Tag Display

- CPU AT89C2051 (2KB FLASH), RUN 11.0592 MHz
- 6 DIGIT 7-SEGMENT RED LED SIZE 2.3 INCH
- RS232 PORT (MAX232 ON BOARD) AND OPTO ISOLATION TX
- RS422/485 IC 75176 (OPTION), 10 PIN ET BUS
- RTC DS1307 (OPTION), EEPROM 12C 24XX (OPTION)
- POWER ON RESET/WATCH DOG DS1232 ON BOARD
- POWER 7805 ON BOARD INPUT SUPPLY DC 9-12V
- PCB SIZE 36 x 8 CM, DISPLAY SIZE 29 x 7 CM

• ET-DSP6 INCLUDES;

1. ET-DSP6 BOARD
2. USER MANUAL
3. CD-ROM



**ET-DSP4 (P-ET-A-00051)**

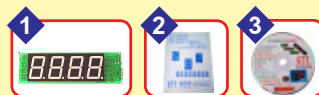


Large Display Board is used 4 Digit 7-Segment Red LED (4.7 x 7 cm.) with 8 Bit Serial Shift to Parallel Latch.

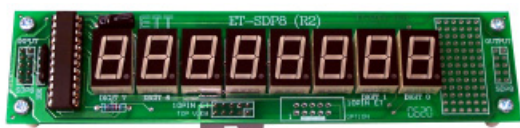
- CPU AT89C2051 (2 KB FLASH), RUN 11.059 MHz
- 4 DIGIT 7 SEGMENT RED LED 2.3 INCH TALL
- RS232 PORT (MAX232) IN RX, TX AND RS232 OPTO ISOLATION IN RX ONLY
- RS422/485 75176 (OPTION)
- RTC DS1202 (OPTION), EEPROM 93C46 (OPTION)
- 7805 ON BOARD, POWER ON RESET/WATCH DOG DS1232 ON BOARD
- POWER SUPPLY DC 9-12V
- PCB SIZE 26 x 8 CM.

• ET-DSP4 INCLUDES;

1. ET-DSP4 BOARD
2. USER MANUAL
3. CD-ROM



**ET-SDP8 (P-ET-A-00049)**

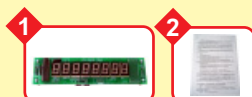


8 Digit 7-Segment LED Display Board, it uses IC MAX 7219 to Scan Display without using CPU. It's easy because it uses 3 cables to control.

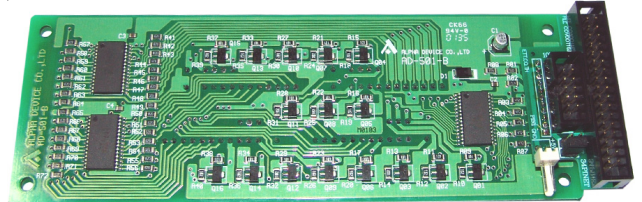
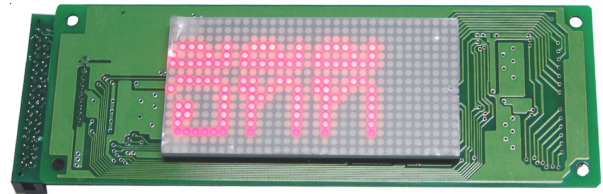
- COMMON CATHODE 7-SEGMENT LED AND 8-CH.SUPER BRIGH RED LED 0.56 INCH TALL
- BE ABLE CHANGE LED 7-SEGMENT INTO OTHER LED
- USERS ORDER BOARD FOR A TIME AND AFTER THAT BOARD WILL CONTROL DISPLAY
- 2 MODES DISPLAY; BCD AND SEGMENT
- POWER SUPPLY 5VDC
- SIZE 16.5 x 3.8 CM.

• ET-SDP8 INCLUDES;

1. ET-SDP8 BOARD
2. USER MANUAL



**ET-DISPLAY 16 X 32 V1 (P-ET-A-00228)**



ET-DISPLAY 16 X 32 V1 ET-DISPLAY 16 x 32 V1 BE ABLE TO CONNECT WITH ETT'S BOARD THROUGH PORT 34 PIN AND 10 PIN, BOARD SIZE 16 x 32 DOT (512 DOT) BE ABLE TO DISPLAY IN THAI

- IN ET-DISPLAY 16 x 32 V1 USES AD-SOI-B DISPLAY MONITOR FROM ALPHA DEVICE CO. LTD. AS RED LED SIZE 16 x 32 WITH 3-CH.IC LC7932M (16 BIT BI-DIRECTIONAL SHIFT REGISTER) TO RUN DOT MATRIX LED
- DISPLAY BOARD BE ABLE TO CONNECT WITH ETT'S BOARD SUCH AS I/O PORT 34 PIN AND 10 PIN ET BUS

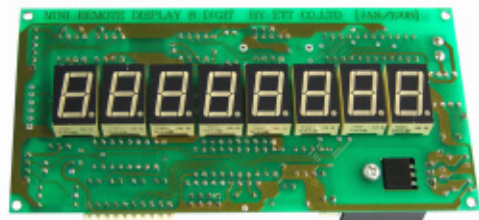
- PCB SIZE 16.5 x 5.4 CM.
- LED DISPLAY 4.1 x 8.2 CM.(RED LED SIZE 2 MM.)

• ET-DISPLAY 16 x 32 V1 INCLUDES;

1. DISPLAY 16 x 32 BOARD
2. 34 PIN PAIR CABLE HEADER
3. 10 PIN PAIR CABLE HEADER,
4. CD-ROM



**ET-REM8 (P-ET-A-00050)**



Small Display Board is used 8 Digit 7 Segment Red LED 0.56 inch tall with IC MAX7219.

- CPU AT89C2051 (2KB FLASH), RUN 11.059 MHZ
- 8 DIGIT 7 SEGMENT RED LED 0.56 INCH TALL
- RS232 PORT (MAX232) AND RS232 OPTO ISOLATION
- RS422/485 75176 (OPTION), RTC DS1202 (OPTION)
- EEPROM 93C46 (OPTION)
- 7805 ON BOARD, POWER ON RESET/WATCH DOG DS1232 (OPTION), POWER SUPPLY AC/DC 9-12V
- PCB SIZE 13.5 x 6.5 CM.

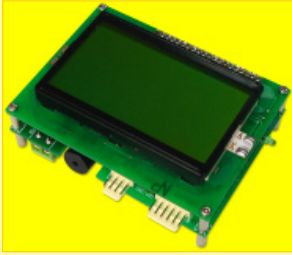
• ET-REM8 INCLUDES;

1. ET-REM8 BOARD
2. USER MANUAL
3. CD-ROM

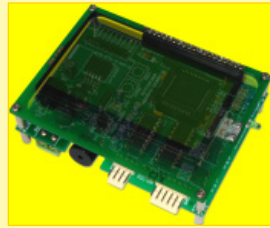


**ET-REMOTE GLCD12864 V1.0**  
(P-ET-A-00355)

**ET-REMOTE GLCD12864 V1.0 BACKLIGHT**  
(P-ET-A-00356)



ET-REMOTE GLCD12864 V1.0 is 128 x 64 DOT DISPLAY LCD with control board. Now, there are 2 versions as follows;  
 1. ET-REMOTE GLCD12864 V1.0; it is a normal LCD.  
 2. ET-REMOTE GLCD12864 V1.0 BACKLIGHT; it is a LCD that has BACKLIGHT.



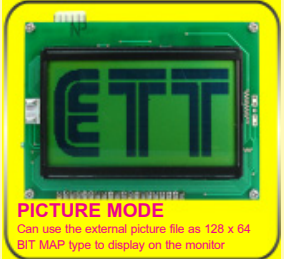
- 128 x 64 DOT DISPLAY with control board for displaying values by using ASCII CODE Command
- Can receive commands to control operation through PORT RS232, RS422 and 4-WIRE RS495
- Set Baud Rate by DIP SW in the range of 1,200 - 115,200
- Set ID into board by DIP SW in the range of 00 -FF to use NETWORK Communication by RS485
- MINI SP to generate musical notes and control ON/OFF LED BACKLIGHT
- 3 MODES; TEXT MODE, GRAPHIC MODE, and PICTURE MODE; all operation modes can be used together.



**TEXT MODE**  
Display Thai and English Font in 4 lines



**GRAPHIC MODE**  
Can command it to create pictures by self; circle, ellipse, triangle or line



**PICTURE MODE**  
Can use the external picture file as 128 x 64 BIT MAP type to display on the monitor



Can use all 3 operation modes together; GRAPHIC + TEXT + PICTURE

**TEXT MODE**

- Can display both Thai and English Font without creating FONT by self
- English Font size is 5 x 7 DOT; for Thai Font height is 7 DOT but its width depends on each character that makes each character beautiful. It uses FONT WINDOWS MS SANS, SERIF
- Display all Thai and English Font about 4 line 16 characters or more; depend on the size of Thai consonants
- Can configure any location on the monitor to display character
- Can justify message on the left, right or centre position of the line as desired.

**GRAPHIC MODE**

- There are commands to create pictures; triangle, quadrilateral, circle, ellipse and straight line in any size and position on the monitor
- Can FILL the whole picture with black color or display it as lines

**PICTURE MODE**

- Can use the external picture file that is 128 x 64 DOT BITMAP type to convert and display on the monitor

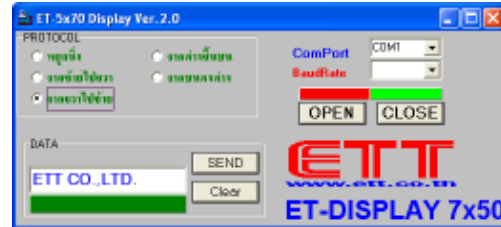
- Board size: 7 x 9.4 cm. 3.5 cm. Height and Display size: 7.2 x 4.0 cm.
- POWER ON SUPPLY BOARD as SWITCHING type uses LM2575-5 INPUT AD/DC 7-12V, CONNECTOR POWER as TERMINAL BLOCK type
- CONNECTOR 4 PIN ETT RS232 PORT MAX232, CONNECTOR 6 PIN ETT RS422/485 PORT (75176 ON BOARD)
- ET-REMOTE GLCD12864 V1.0/ V1.0 BACKLIGHT includes

1. Board with DISPLAY
2. ET-RS232 DB P PIN CABLE
3. 4 PIN RS232 CABLE
4. CD-ROM



**ET-DISPLAY 7 x 50**

(P-ET-A-00084)



ET - DISPLAY 7 x 50 ET-DISPLAY 7 x 50 is a Character Display Board with red 10 Digit 5 x 7 Dot Matrix LED and be able to arrange in size 7 x 50 and display 8 character in ENGLISH. Its memory is EEPROM and be able to write message although electricity is switched off. Users can write message into DISPLAY 7 x 50 through PORT RS232 of Computer PC and be able to run on window 95, 98

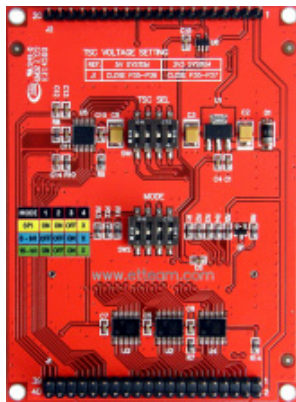
- CPU MCS51 NO. AT89S8252 RUN 18.432 MHz WITH 2 KBYTE EEPROM
- SEND/RECEIVE DATA THROUGH PORT RS232 AND BE ABLE TO CONNECT WITH COMPUTER PC OR ETT'S BOARD
- 6 MODE INSTRUCTIONS FOR DISPLAY SUCH AS RUN FROM RIGHT TO LEFT SIDE, RUN FROM LEFT TO RIGHT SIDE, RUN FROM DOWN TO UP, RUN FROM UP TO DOWN, AND IMMOVABLE DISPLAY
- BE ABLE TO RECEIVE 30 MESSAGES TO DISPLAY WITH 64 LETTERS TOTAL 1,920 LETTERS, KEEP IN 2 KBYTE EEPROM AND BE ABLE TO SAVE THEM IN EEPROM ALTHOUGH ELECTRICITY IS SWITCH OFF
- BE ABLE TO ADAPT IN MANY WORKS SUCH AS BOARD IN SHOPS, BOARD DISPLAY CONNECTING WITH COMPUTER PC AND ETC.
- THERE'S 2 USER MANUAL OF BOARD, 2 MODE PROGRAM AS SOURCE PROGRAM MONITOR, AND MESSAGES AND INSTRUCTION PROGRAM RUN ON WINDOWS 95, 98
- DISPLAY SIZE 23 x 4 CM BOX SIZE 7.5 x 4.2 x 34 CM
- ET-DISPLAY 7 x 50 INCLUDES;
  1. BOARD WITH PLASTIC BOX
  2. ADAPTER DC 10V
  3. USER MANUAL
  4. CD-ROM
  5. 9 PIN DB CABLE CONNECTING WITH COMPUTER PC THROUGH PORT RS232





**ET-TFT240320TP-3.2 REV D**

(P-ET-A-00414)



**Specifications of Board**

- It is MODULE TFT LCD that is assembled with board and circuit
- DISPLAY is MODULE TFT LCD COLOR with 240X320 PIXEL TOUCH SCREEN
- 3.2 inch wide Screen with 65536 colored Resolution (RGB is R =5 BIT, G = 6BIT, B = 5BIT)
- It uses SINGLE CHIP DRIVER No.SPFD 5408A
- There are 3 modes of INTERFACE LCD;
  1. SERIAL MODE SPI uses I/O 10PIN to communicate.
  2. PARALLEL MODE 16BIT uses I/O 27PIN to communicate.
  3. PARALLEL MODE 8BIT uses I/O 19PIN to communicate.
- There are 2 types of INTERFACE to control TOUCH SCREEN;
  1. SPI Interface through CHIP TOUCH SCREEN CONTROLLER No.ADS7846 (ON BOARD) with 12BIT Resolution
  2. Directly interface X-,X+,Y-,Y+ of LCD with Pin A TO D of MCU
- If TOUCH SCREEN is not used, user can connect only Signal I/O in the part of LCD.
- It can interface with MCU that is both Power Supply 5V and 3.3V.
- There are 2 types of CONNECTOR;
  1. PARALLEL MODE 16 & 8BIT is interfaced through PIN HEADER 2 X 20 (PITCH 2.54mm.)
  2. SPI MODE is interfaced through PIN HEADER 1X20 (PITCH 2.54mm.)
- It uses IC 74LCX245 to be BUFFER and IC AP1117-3.3 to be POWER.
- POWER SUPPLY is +5VDC.
- Size of board with LCD is 68.58x93.98mm.
- It includes example programs for using with ETT Board; in this case, there is MCU No.AVR ATMEGA128, PIC PIC18F8722, and ARM LPC2138.
- ET-TFT240320TP-3.2 REV D consists of
  1. Board with LCD
  2. CD-ROM Example Program and User's Manual



**ET-TFT240320TP-2.8**

(P-ET-A-00466)

New TFT LCD in mini size of 2.8" and economy price



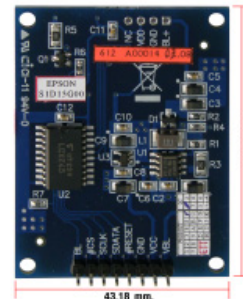
**Specifications of Board**

- Be DISPLAY MODULE TFT LCD COLOR with 40x320 PIXEL RESISTANCE TOUCH SCREEN
- Use 2.8" TFT Display
- Use SINGLE CHIP DRIVER No.HX8347-D
- 65536 Colored Resolutions (RGB = R:5BIT, G:6BIT, B:5BIT)
- Has 2 INTERFACE Modes to interface with LCD;
  1. PARALLEL MODE 16 BIT INTERFACE uses 27 Pin I/O to interface
  2. PARALLEL MODE 8 BIT INTERFCAE uses 19 Pin I/O to interface
- There are 2 INTERFACE Modes to control TOUCH SCREEN
  1. SPI INTERFACE is interfaced through CHIP TOUCH SCREEN CONTROLLER No.ADS7846 (ON BOARD) with 12BIT Resolution
  2. Directly interface with X-,X+,Y-,Y+ of LCD to Pin A TO D of MCU
- Can interface with MCU that is either 5V or 3.3V
- There are 2 sets of CONNECTOR
  1. 2 x 20PIN HEADER 2.54mm.
  2. 1 x 20PIN HEADER 2.54mm.
- Use IC 74LCX245 to be BUFFER and IC LM1117-3.3
- Use Power Supple +5VDC for Board
- PCB Size is 68.58 x 93.98 mm.
- Provide example programs for using with ETT Board; MCU No.AVR ATMEGA128, PIC PIC18F8722, ARM LPC2138
- ET-TFT240320TP-2.8 consists of ...
  1. Board with LCD
  2. CD-ROM; User's Manual and Programs

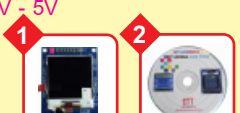


**ET-LCD6610**

(P-ET-A-00362)



- 132 x 132 DOT GRAPHIC LCD Display
- 4,096 Colors
- Internal LED BACKLIGHT
- 9 BIT SPI SERIAL INTERFACE
- Chip Processor of EPSON S1D15G10 or COMPATIBLE numbers
- Use DC POWER 3.3V - 5.5V
- Directly interface to Microcontroller with 3.3V - 5V
- LCD and PCB size: 55.88 x 43.18 mm.
- Thai User's Manual and Example Programs in CD-ROM

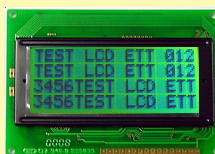




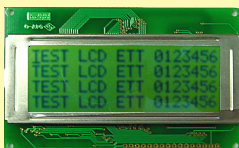
16116H (16 Characters 1 Lines)



16216H (16 Characters 2 Lines)  
16216H (16 Characters 2 Lines LED BACKLIGHTS)



16416H (16 Characters 4 Lines)  
16416H (16 Characters 4 Lines LED BACKLIGHTS)



20416H (20 Characters 4 Lines)  
20416H (20 Characters 4 Lines LED BACKLIGHTS)



20216H (20 Characters 2 Lines LED BACKLIGHTS)



LM060L (24 Characters 2 Lines)



DMC40131H (40 Characters 1 Lines LED BACKLIGHTS)



TM402CD BACKLIGHTS (40 Characters 2 Lines LED BACKLIGHTS)  
40216H (40 Characters 2 Lines)

## GRAPHIC TYPE LCD MODULE

It's Character and Graphic LCD with 128 x 64 DOT and be able to display in Thai. It is BIT Map Display with Dish of Thai Program and be able to support display Thai Code KU directly (Instruction Program of CPU Z80).

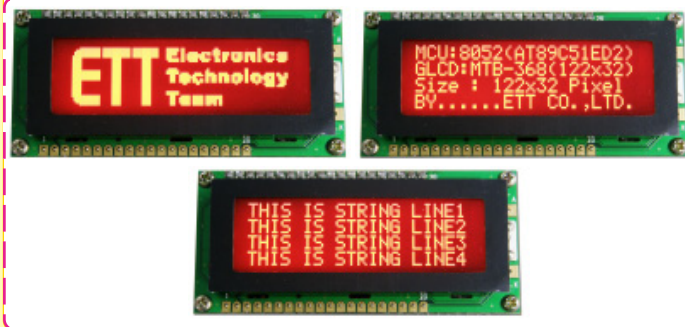


DV 128064H (128 DOT X 64 DOT)

DV 128064 LED BACKLIGHTS(128 DOT X 64 DOT)

## GLCD MTB-368 (A-LC-G-00023)

glcd mtb-368  
122 x 32 dot



- This GLCD is special OFFER product.
- It is 122 x 32 DOT GRAPHIC LCD with orange TRANSMISSIVE LED BACKLIGHT (ORANGE); it has to interface LED BACKLIGHT in order to obviously see DOT of LED
- Connector 20 PIN HEADER Straight Row, interface with 5VDC
- Use 2 IC CONTROLLERS of EPSON SED 1520
- Can display data by interfacing through PORT or BUS of MCU
- LCD size: 80.0(W) x 36.0(H) x 12.9(D) mm.
- Provide example programs and User's Manual in CD-ROM



## CERAMIC THERMOELECTRIC COOLING MODULE (PELTIER) (A-CA-R-00007)

It is cooling device that is Ceramic Thermoelectric or Peltier. When user supplies power into this Module, it feels cool on one side and feels warm on another one side. So, it has to use cooling device to make the Module cooler; in this case, it uses HEATSINK or fan or not supply power into this Module, otherwise the MODULE may be damaged.



- Qmax (Cooling Power) 89W ,127 couples Peltier cooling
- RUN 12VDC (MAX 15.8V / 10A)
- Tmax (°C) 67
- SIZE 40 x 40 x 3.3 mm. WEIGHT 25g



SWITCHING ADAPTER



- ET-SWITCHING ADAPTER 15V 3A (A-AP-A-00090)
- ET-SWITCHING ADAPTER 12V 3A (A-AP-A-00047)
- ET-SWITCHING ADAPTER 5V 3A (A-AP-A-00054)

It uses SWITCHING POWER SUPPLY and suitable for quality control project, using in project work that uses small POWER SUPPLY but high Volatge, and project works that UL / TUV/ CE/ SA/ ISO Warrantee.



**INPUT** : AC INPUT 100-240VAC with 3 PIN Male Port  
**OUTPUT**: 12V 3A in ET-SWITCHING ADAPTER 12V 3A  
 : 5V 3A in ET-SWITCHING ADAPTER 5V 3A  
**PORT CONNECTOR** : FEMALE JACK 2.5mm. PORT Inside is Cathode and Outside is Anode.  
**STANDARD WARRANTEE** : UL / TUV/ CE/ SA/ ISO  
 \* Is not include 3 PIN AC CABLE Price 35.-,so user need to purchase additionally.

- ET-SWITCHING ADAPTER 12V 1A TYPE J (A-AP-A-00098)
- ET-SWITCHING ADAPTER 12V 1A TYPE H (A-AP-A-00100)

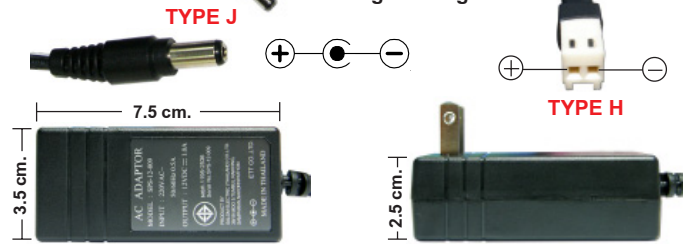
new



DC POWER SUPPLY SWITCHING  
**INPUT** : 220VAC, 50/60Hz 0.5A  
**OUTPUT** : 12VDC 1A

**TYPE J** : FEMALE JACK 2.5 mm.  
 Internal Connector is cathode and External Connector is anode.  
**TYPE H** : 2.5mm. HOUSING TYPE

Weight = 80 g.



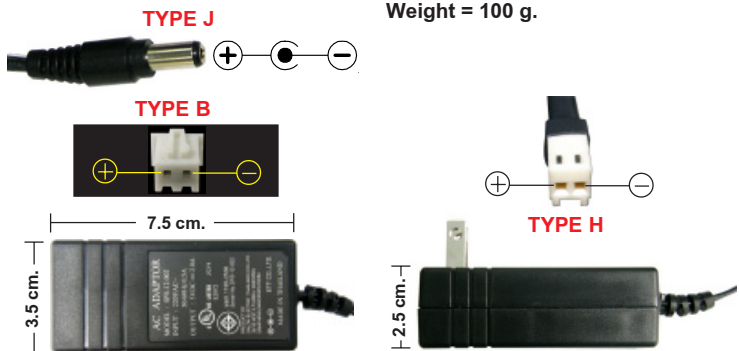
- ET-SWITCHING ADAPTER 5V 2A TYPE H (A-AP-A-00094)
- ET-SWITCHING ADAPTER 5V 2A TYPE J (A-AP-A-00093)
- ET-SWITCHING ADAPTER 5V 2A TYPE B (A-AP-A-00095)



DC POWER SUPPLY SWITCHING  
**INPUT** : AC INPUT 220VAC 50/60Hz 0.5A  
**OUTPUT** : DC 5V/2.0A (10W)

**TYPE J** : FEMALE JACK 2.5 mm.  
 Internal Connector is cathode and External Connector is anode.  
**TYPE H** : HOUSING 2.5 mm. TYPE  
**TYPE B** : HOUSING 2.50 mm. 2 PIN Header.

Weight = 100 g.



CABLE POWER 3 P AC 1.8M (A-CB-A-00002)



- ET-SWITCHING ADAPTER 12V 0.5A TYPE H (A-AP-A-00056)
- ET-SWITCHING ADAPTER 12V 0.5A TYPE J (A-AP-A-00057)



All 5 versions are POWER SUPPLY as SWITCHING types, it is suitable for various project works that needs high quality and accurate. It is also warranted by UL/TUV/CE/SA.

**INPUT** : AC INPUT 100 - 240VAC 3 PIN MALE  
**OUTPUT**: 12VDC 0.

CONNECTOR of version 12V 0.5A AND 5V 1.2A TYPE J is FEMALE JACK 2.5 mm. Internal Connector is cathode and External Connector is anode.  
 CONNECTOR of version 12V 0.5A TYPE H is 2.5mm. HOUSING TYPE.

DC ADAPTER

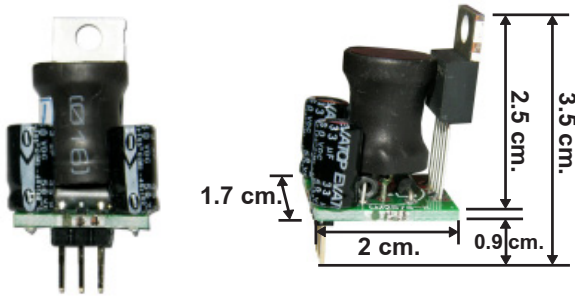
- ADAPTER 10VDC 850mA. (A-AP-A-00001)

**INPUT** 220VAC  
**OUTPUT** 10VDC/850mA



**ET-LM2575-5** (P-ET-A-00147)**ET-LM2575-12** (P-ET-A-00148)**ET-LM2575-3.3** (P-ET-A-00443)

ET-LM2575-5, ET-LM2575-12, ET-LM2575-3.3 are STEP-DOWN VOLTAGE REGULATOR CIRCUIT is designed for replacing IC LM78005 and LM7812. The good point of them are low heat

**ET-LM2575-5**

INPUT VOLTAGE : 7 - 40VDC OUTPUT : 5VDC/1A

**ET-LM2575-12**

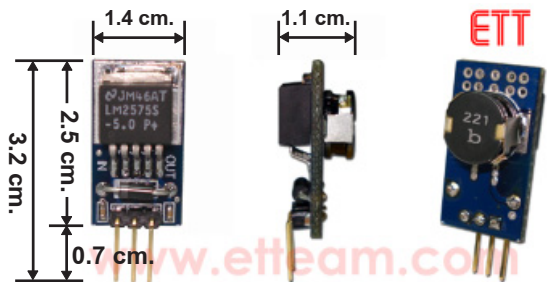
INPUT VOLTAGE : 15 - 40VDC OUTPUT : 12VDC/1A

**ET-LM2575-3.3**

INPUT VOLTAGE : 5 - 40VDC OUTPUT : 3.3VDC/1A

**ET-LM2575-5 V2** (P-ET-A-00337)**ET-LM2575-12 V2** (P-ET-A-00338)**ET-LM2575-3.3 V2** (P-ET-A-00444)

It is a small circuit STEP DOWN VOLTAGE REGULATOR (1.4 x 2.4 x 1.1 cm.); it can replace IC 7805 directly by using LM2575-X. Moreover, it can be used with INPUT VOLTAGE without any HEAT SINK. There are 2 versions: version 5V (ET-LM2575-5 V2) and version 12V (ET-LM2575-12 V2) and version 3.3V (ET-LM2575-3.3 V2)

**NEW SWITCHING ADAPTER****ET-LM2575-5 V2**

INPUT VOLTAGE : 7 - 15VDC OUTPUT : 5VDC/1A

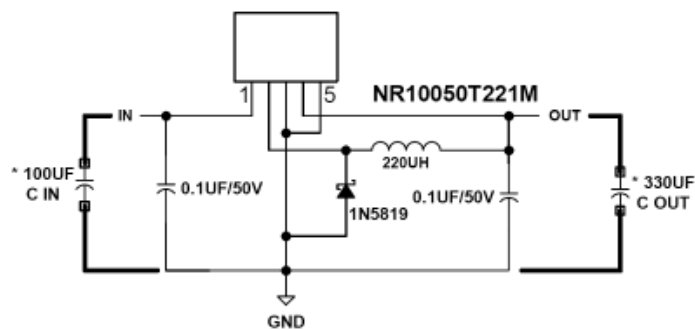
**ET-LM2575-12 V2**

INPUT VOLTAGE : 14 - 24VDC OUTPUT : 12VDC/1A

**ET-LM2575-3.3 V2**

INPUT VOLTAGE : 5 - 24VDC OUTPUT : 3.3VDC/1A

LM2575-5 OR 12 OR 3.3

**ET-POWER 5** (P-ET-A-00055)

Small +5VDC / 1A POWER SUPPLY is uses IC 7805 with 1N4001 Circuit and C 220uF Circuit. Be able to connect with AC 9 VAC and install on a large HEAT SINK. It is suitable for mini project work.

- POWER SUPPLY OUTPUT BOARD +5VDC 1000 mA MAX
- SIZE 7.5 x 4 x 4 CM.

# BL-2000K

**LASER SCANNER WITH STAND PS2 INTERFACE**

(C-YA-A-00083)

**General**

<b>Interface</b>	Keyboard Wedge PS2
<b>Supported Symbologies</b>	UPC-A/UPC-E, EA N-13, Codabar, Code 11, Code 39, Code 128, Telepen Code, RSS Code Industriel 2 of 5, MSI Plessey Code, EAN/UCC 128, IATA Code, China Postal Code

**Optical**

<b>Optical sensors</b>	Photo diode
<b>Width of Field</b>	120 mm
<b>Light source</b>	Laser diode (650 nm)
<b>Depth of Field</b>	30 ~ 250 mm (UPC/EAN PCS=90%)
<b>Resolution</b>	0.1 mm (PCS=90%)
<b>Ambient Light</b>	3000 Lux/Max (Fluorescent Light)
<b>Scanning contrast gradient</b>	=> 45%
<b>Scanning angle</b>	36° ± 2°

**Electrical**

<b>Power Supply Voltage</b>	5VDC ± 5%
<b>Working currents</b>	135 mA
<b>Standby currents</b>	65 mA
<b>Readind indicator</b>	Beeper and Led
<b>Scan Rate</b>	90 scan/sec

**Environment**

<b>Temperature in operation</b>	0° C ~ 50° C
<b>Temperature in storage</b>	-20° C ~ +60° C
<b>Humidity in operation</b>	20%RH ~85%RH
<b>Humidity in storage</b>	10%rh ~ 90%RH
<b>Safety Approval</b>	CE, FCC Class B, RoHS Approved

**Physical**

<b>Housing Material</b>	ABS plastic
<b>Cable length</b>	1.5 M
<b>Connector</b>	RJ45 Phone jack connector 10 pins
<b>Weight scanner</b>	220 g ± 5 g (with Cable)
<b>Dimensions</b>	160 mm (L) x 70 mm (W) x 80 mm (H)
<b>Shock resistance</b>	Approved by 1.5M drop test onto concrete ground





**103DU, 103DK, 103DR Barcode Reader**

BARCODE Arex Tek 103DU, 103DK, 103DR, READER is IR (Infrared Ray) ready-made Barcode Reader. It uses FUZZY LOGIC to decode barcode efficiently and is able to reduce disturbing light from external. It can read barcode in many directions such as forward, backward, or invert and is able to read barcode from surfaces that are dirty, rough or quite less invisible. Barcode is able to read standard codes such as UPC-A, UPC-E, EAN/JAN-13, EAN/JAN-8, EAN/UPC SUP., ISBN/ISSN, Code39, Code39EXY, Code25, Code128, Codabar NW7, Code93 and Code11. 103RD BARCODE READER includes; BARCODE 103RD, User Manual in Thai/English, and Disk.

**1. 103DU BARCODE SLOT READER USB (C-YA-A-00119)****2. 103DK BARCODE READER (C-YA-A-00043)****3. 103DR BARCODE READER (C-YA-A-00010)****HARDWARE SPECIFICATION**

Output Interface	: USB PORT (Type A) Model # 103DU Barcode Slot Reader USB : RS232 (Standard DB9 Female Type) Model # 103DR Barcode Reader : PS2 Model # 103DK Barcode Reader
Light Source	: Infrared 940nm.
Sensor	: Hi-density photo image sensor
Power Consumption	: 90mA/5VDC
Card Thickness	: 0-1.5mm.
Reading Speed	: 2 to 280 cm/sec.
Resolution	: 0.116mm. (4.7mil)
Programmable Multi-setting by reading setup cards.	
Barcode Response	: UPC-A,UPC-E,EAN/JAN13,EAN/JAN- 8, EAN/UPC SUP.,ISBN/ISSN,Code39 Code39EXT,Code25,Code128,Code93, Codabar/NW7 and Code11,,
Indicator	: LED Power,Buzzer Beep for Function
Body Material	: Metal diecasting housing (Colour Black)
Body Dimension	: 114.5mm x 44mm. x 36.7mm.

**CUE CAT Barcode Reader**

(C-YA-A-00033)

**USB Type**

Connecting with  
computer through  
Port USB



It is a cheap Barcode Reader in Pen design connecting with computer PC and pressing keyboard to read barcode. CUE CAT BARCODE connects with computer PC through USB PORT and runs on OS Windows ME/XP/2000 (PLUG AND PLAY)

- CONNECTING WITH COMPUTER PC THROUGH PORT USB 1.1
- RUN ON COMPUTER PC WITH OS WINDOWS ME/XP/2000 (PLUG AND PLAY)
- BE ABLE TO USE WITH MANY CODES SUCH AS UPC-A, UPC-E, EAN-13, EAN-8, 2 OF 5 INTERLEAVED CODABARE, CODE 39, CODE 128
- BE ABLE TO ADAPT IN MANY PROJECT WORKS SUCH AS POINT OF SALE UPC DATA BASE, STOCK

**MAGNETIC CARD READER**

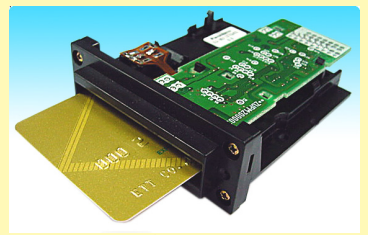
Magnetic Card Reader is reading information on Magnetic Card of ATM Card, or Credit Card. It reads on Track 2 on card with maximum 75BPI 40 letters through TTL Output Signal. In package includes; User Manual and Example program of ETT's Board. There's 2 Magnetic card Readers;

1. MCR-B02TTL
2. PANASONIC ZU-M12215451 (It inserts front of card

into Magnetic Card Reader but it is not able to read full of card. It is able to read letter not than 25 letters.



1. MCR - B02TTL  
(C-YA-A-00022)



PANASONIC 2. ZU - M12215451  
(C-YA-A-00003)



# SUPERPRO/501S (C-YA-P-00013)

ULTRA-HIGH-SPEED UNIVERSAL PROGRAMMER



Comparison between SUPERPRO/501S and SUPERPRO/3000U concerning Period of PROGRAM and VERIFY

Device	SUPERPRO/501S Program+Verify (Sec)	Compare with SP3000U
AT28C64B	0.8 (P)+0.1 (V) = 0.9 (s)	1.2 (P)+0.8 (V) = 2.0 (s)
24AA128	2.7 (P)+1.8 (V) = 4.5 (s)	5.0 (P)+4.0 (V) = 9.0 (s)
QB25F640S33B60	29.0 (P)+14.4 (V) = 43.4 (s)	55.2 (P)+41.4 (V) = 96.6 (s)
AT89C55WD	2.5 (P)+0.4 (V) = 2.9 (s)	3.3 (P)+1.0 (V) = 4.3 (s)
S25FL064A	43.9 (P)+14.7 (V) = 58.6 (s)	72.8 (P)+41.4 (V) = 114.2 (s)
PIC16F876A	10.1 (P)+0.8 (V) = 10.9 (s)	22.1 (P)+06.2 (V) = 28.3 (s)
PIC18F442	5.1 (P)+1.1 (V) = 6.2 (s)	13.6 (P)+06.7 (V) = 20.3 (s)

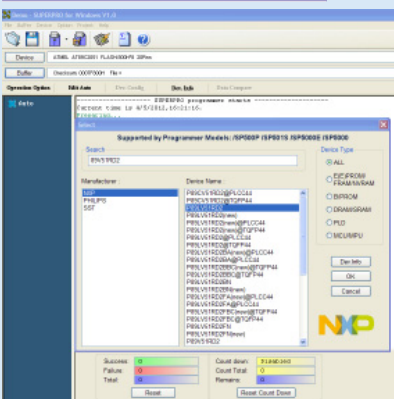
- When using STAND ALONE Mode, the Display and KEY SW are not interfaced with computer PC, but it has to interface with CompactFlash Card (OPTION).



- When using STAND ALONE Mode, user can setup password to protect the device from COPY IC.

**SUPERPRO/501S** is ULTRA-HIGH-SPEED UNIVERSAL PROGRAMMER that replaces SUPERPRO/3000U. There are 2 MODES in only one device. Firstly, it interfaces with computer PC through PORT USB; and secondly, it is STAND-ALONE MODE by loading IC data and COPY data into the device, without interfacing with any computer.

- Be compatible with 223 IC manufacturers; be compatible with 36,690 IC numbers and higher in the future
- Be used with IC devices from 1.2V to 5V with circuit that protects user from inserting IC in the reverse direction
- Be compatible with EPROM, PAGED EPROM PARALLEL AND SERIAL EEPROM, FPGA CONFIGURATION, SERIAL PROM, FLASH MEMORY (NOR AND NAND), BPROM, NVRAM, SPLD, CPLD, EPLD, FIRMWARE HUB, MICROCONTROLLER, MCU, STANDARD LOGIC
- Use TEXT TOOL 48PIN, so it is compatible with IC numbers from 8PIN to 48PIN well. Moreover, it can expand pin to use with more IC numbers such as SSOP, PLCC by using ADAPTER (ADAPTER is OPTION, not including in the set)PROGRAM HIGH-DWENSITY FLASH MEMORY can be used with COPY EPROM quickly
- Has 6 KEY KEYPAD with 20 x 4 LCD DIPLSAY with CompactFlash Memory Card Expansion
- Interface with computer through PORT USB
- When using STAND ALONE Mode, it has to interface with CompactFlash Card (OPTION) and user can setup password to protect the device from COPY. This STAND ALONE MODE is suitable for using when user has prepared data completely and it is ready to COPY many IC directly, without using with computer. So, it is suitable for using outdoor.
- Run under OS of WINDOWS 98/ ME/XP/VISTA/7
- Can UPDATE PROGRAM to use with newer IC numbers from INTERNET, visit website; [www.xeltek-cn.com](http://www.xeltek-cn.com); or read more information concerning available IC numbers from this WEB.



- Run under OS of WINDOWS 98/ ME/XP/VISTA/7

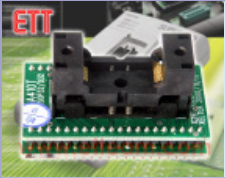
**SUPERPRO/501S** consists of ...

- SUPERPRO/501S
- CD-ROM; Program
- POWER SUPPLY AC 90V-250V/50-60 Hz
- USB Cable
- User's Manual





### ADAPTER CONVER FOR SUPERPRO



**ADP-SA410T ...** is convertor that converts IC DIP 32 PIN into TSOP 32 PIN to copy data by SUPERPRO and it's compatible with IC M29W040 in the format of TSOP.

(C-YA-A-00099)



**ADP-SA015A1T ...** is convertor that converts IC DIP 32 PIN into PLCC 32 PIN to copy data by SUPERPRO and it's compatible with IC M29W040 in the format of PLCC.

(C-YA-A-00088)



**SA245A ...** is device to change pin from DIP TYPE 44 PIN to QFP TYPE 44 PIN, so it can copy data into QFP 44 PIN IC by SUPER PRO.

(C-YA-A-00075)



**SA245A ...** is device to change pin from DIP TYPE 44 PIN to QFP TYPE 44 PIN, so it can copy data into QFP 44 PIN IC by SUPER PRO.

(C-YA-A-00021)



**SA643 ...** is device to change pin from DIP TYPE 44 PIN to TSOP TYPE 28 PIN, so it can copy data into TSOP 28 PIN IC by SUPER PRO.

(C-YA-A-00076)

\* 6,500 .-



**ADP-SA015A1T ...** is convertor that converts IC DIP 32 PIN into PLCC 32 PIN to copy data by SUPERPRO and it's compatible with IC M29W040 in the format of PLCC.

(A-SO-P-00005)



**ADP-SA410T ...** is convertor that converts IC DIP 32 PIN into TSOP 32 PIN to copy data by SUPERPRO and it's compatible with IC M29W040 in the format of TSOP.

(A-SO-P-00004)



**SA643 ...** is device to change pin from DIP TYPE 44 PIN to TSOP TYPE 28 PIN, so it can copy data into TSOP 28 PIN IC by SUPER PRO.

(P-ET-A-00136)

### SPEP PLUS (P-ET-A-00045)



**SPEP PLUS V2.0** is developed efficiently and connecting through Printer Port of Computer PC such as 286/386/486/586. Be able to write, read, data of EPROM Because it uses IC 32 pin.

- BE ABLE TO USE EPROM NO.2716, 2732, 2746, 17128, 27256, 17512, 27C16, 27C32, 27C64, 27C128, 27C256, 27C256, 27C512, 27C010, 27C020, 27C1001, 27C4001
- EEPROM NO. 2816, 2864, 28256 (5V) FLASH ROM 28F256, 28F512, 28F010, 28F020 (12V)
- SEE INFORMATION IN EPROM , KEEP DATA IN DISK AND INSTRUCTIONS
- SPEP CONNECTS WITH COMPUTER PC THROUGH PRINTER PORT WITHOUT PUTTING CARD INTO PC
- RUN ON WINDOWS 95/98/ME/XP

• **SPEP PLUS INCLUDES;**

1. SPEP PLUS BOARD
2. USER MANUAL PROGRAM
3. CD-ROM
4. DB 25 PIN CABLE
5. ADAPTER 10VDC/850mA



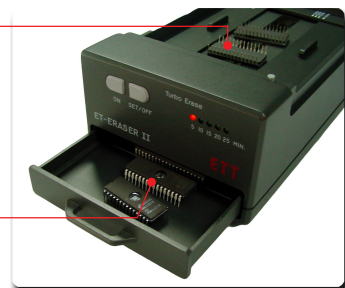
### ET-ERASER 2 (P-ET-A-00046)

There's 2 methods to clear EPROM in 1. First, be able to clear EPROM as well as normal EPROM ERASER with 10-2 minute to clear. Second, ET-ERASER 2 2 be able to clear TURBOMODE in only 5 minute.



• TURBO CLEAR AT ABOVE

• NORMAL CLEAR AT BELOW



- THERE'S 2 GAPS TO CLEAR EPROM OR CPU; NORMAL CLEAR AT BELOW AND TURBO CLEAR AT ABOVE
- TURBO MODE BE ABLE TO CLAEAR EPROM IN 5 MINUTE ONLY
- BE ABLE TO SELECT SETTING TIME AS 5, 10, 15, 20, 25 MINUTE WITH AUTO CUT
- BE ABLE TO CLEAR 28 PIN EPROM MORE THAN 25 EPROM / 1 TIME
- PLASTIC BOX SIZE 7.5 x 30 x 12 CM.
- 220VDC POWER SUPPLY

# ETT CO., LTD.

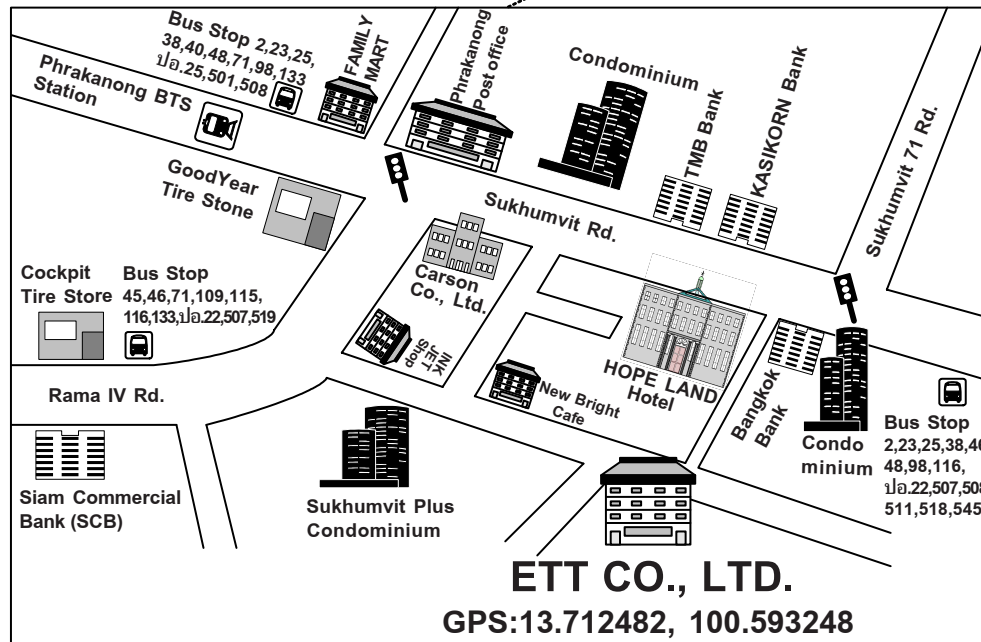
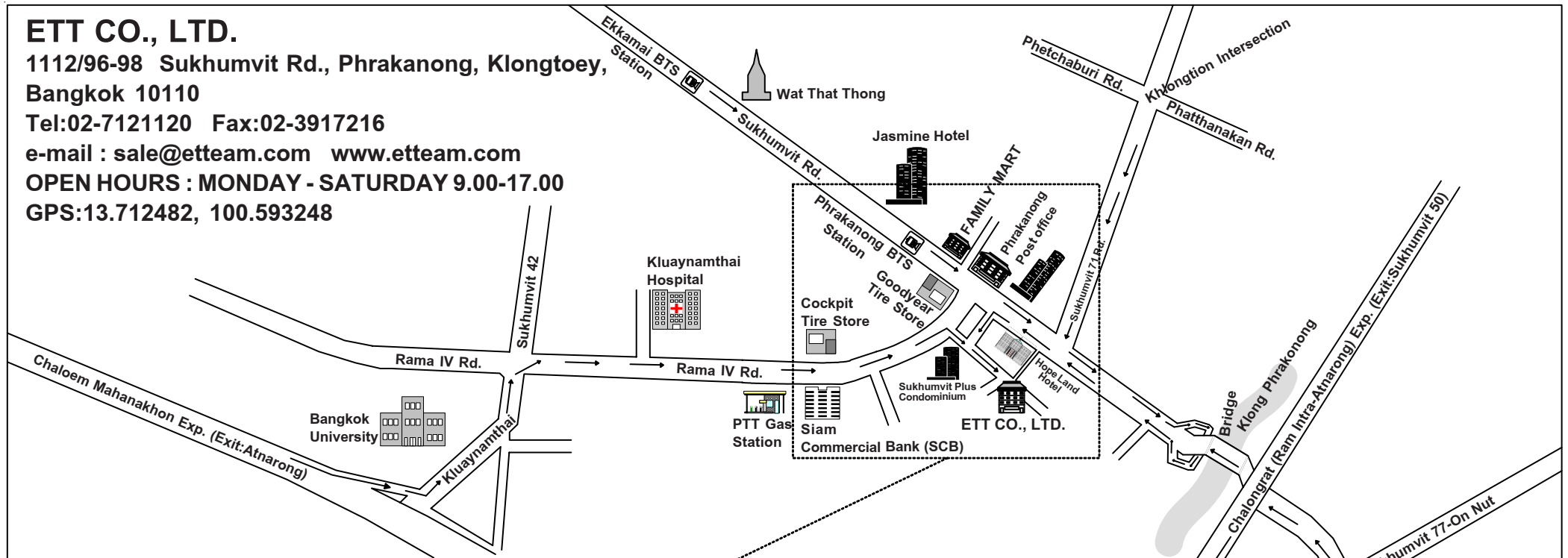
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