

MICROPROCESSOR TRAINER

MDA-EMS196



■ FEATURE

1. MDA-EMS196 Integration Development Environment Program.

- Display the 80C196KC internal architecture.
- Edit, Assemble, Compile, Download, and program running of source file.
- C-language, Assembly language source code debugging function.
- Code memory disassemble function.
- 80C196KC Register file, memory dump and editing function.
- Program scroll display function.
- Pop-up menu display.
- Program stop function by "ESC" key.
- 28C256(EEPROM) writing function.
- Use to keyboard and mouse.

2. Led display to current system bus status.

3. Various command function.

4. Keyboard of various function.

5. I/O Port experiment of C-Language.

6. High Speed In-Output experiment.

7. Include with driver circuit for step motor.

8. Experiments use to micro controller test unit.

9. Experiments Ready/Verify/Write/Erase of 28C256(EEPROM)

10. Volt meter, Temperature, and Photo sensor experiment by A/D Converter.

11. DC motor speed control by PWM of 80C196KC.

12. Hardware timer and frequency counter experiment by Timer 1, 2

13. Multi Processor Data communication by RS-232C/422.

14. Various Interrupt experiment by PTS

15. External experiment for user.

16. +5V, +12V, -12V S.M.P.S(Free Voltage) Power.(110V/220V)

17. Wood case.

■ Technical Specification

PC Operation Program	MDA-EMS196 Integration Development Environment Program.
CPU	80C196KC
Main RAM	64KB(62256 x2)
Monitor ROM	128KB(27256 x 2)
Display Unit	LCD(16 x 2 Line)
I/O Port	CPU I/O Port
Serial Port 1	RS-232C(8251 x1)
Serial Port 2	RS-232C(8251 x1)/RS-422(CPU Serial Port)
System Clock	10MHz
MDA-EMS196 Integration Development Environment Program.	Display the 80C196KC internal architecture Edit, Assemble, Compile, Download and program running of source file C-language, Assembly language source code debugging function. Program the trace, Break function Code memory disassemble function 80C196KC Register file, Memory dump and editing functions Program scroll display function Pop-up menu display Program stop function by "ESC" key. 28C256(EEPROM) writing function Use to keyboard and mouse



Micro controller test Unit	Bread Board x 1	CPU(80C196KC) x 1
	Textool(28pin) x 1	OSC(10 MHz) x 1
	Test LED x 8	Test switch x 8
	Reset switch x 1	CPU port connector x 2
	EEPROM(28C256) x 1	
EEPROM Progr	ADC : ADC 0804, DAC : DAC0800	
Speaker	Speaker x 1	
Step Motor Interface	Driver T.R x 4	
Expansion connector	System bus 34pin x 1, CPU I/O pin 34pin x 1	
	External Interface 30pin x 1	
Micro controller	8751, 89C51 Read/Write/Verify, 89C51 Erase	
Programmer		
Textool	40 pin x 1	
Power	110V/220V	
Board size(mm)	310 x 265	
Wood case(mm)	100(H) x 300(D) x 430(W) ± 10(mm)	

Integration Development Environment Program



MDA-EMS196 of Program
MDA-EMS196 Integration
Development Environment
Program

Program Memory Window

Special function Resister
Window

Resistor File Window

Main & Sub Menu Window

- To leave the Main & Sub-Menu, press the "ESC" key. Pressing the "ESC" key at any other Main & Sub-Menu, previous active window is returned.
- To open the Help Screen at any point while you're working in the MDA-EMS196 IDE, press the "F1" key.
- To select another Main & Sub-Menu, you move the cursor using one of the following method : Use the ←,→ key, Use the mouse, When the cursor is at any window, press the "Alt" key combinations to F, R, D, W, H(the red character in the Main Menu).
- To execute the Sub-Menu, you move the cursor using one of the following method. : Use the ↑, ↓, "Home", "End" key and press the "Enter" key, Use the mouse.

File Name Window.

- The current work file is displayed. If you change the work file, use the **Work(W)-Open file(O)**.

The program memory window.

- The disassemble code for the program you are working on is displayed here along with a address, machine language, mnemonic code at left of each line. The yellow line at the left of the program memory window is current cursor, and is used to select a line of code for some action. The bar at the left of the program memory window is the current PC location. To change the bar, use the PC of the SFR window. The window may be scrolled up and down the vertical size of the window.
- Use the ↑,↓ key to move the cursor; the display will scroll when you reach the END statement of the source file.
- Press the "Page-Up", "Page-Down" key to page through the program window.
- Use the mouse to scroll the window : Select the ▲, ▼ part & Click the mouse left button.
- If you set the breakpoint, follow the steps below : Move the cursor to the wanted line, press the "Enter" key. The selected line is changed the red color, so a breakpoint set. Again, move the cursor to the red color line, press the "Enter" key, so the breakpoint clear.

☞ *The program memory window can not be written the data.*

☞ *The user program memory region of the MDA- EMS196 kit is the 2000H~9FFFH.*

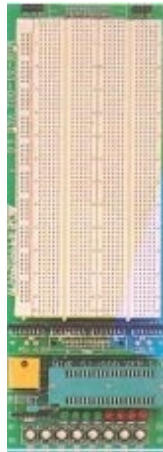
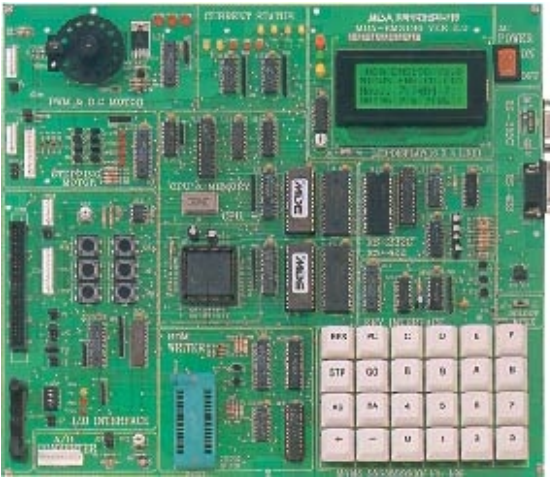
The SFR(Special function Resistor) window.

- The values displayed here are updated after a breakpoint is encountered when executing normally, after every instruction while single-step. Note that the registers are now set to their default power-on value as defined by the MDA-EMS196 IDE.
- The upper part of the SFR window : This part is displayed the PC(Program Counter), SP(Stack Pointer). Any value within the window can be altered by positioning the cursor and typing in a new value. If you alter the PC value, the color var of the program window may be change the positioning line.
- The bellow part of the SFR window : This displays the 80C196KC I/O special function registers. This window can not alter the data.

The Resistor File Window

- This displays the 80C196KC register file(20H~FFH) and upper data RAM (100H~1FFFH).
- Any value within the window can be altered by positioning the cursor and typing in a new value.
- The values displayed here are updated after a breakpoint is encountered when executing normally, after every instruction while single-step.
- Note that the registers are now set to their default power-on value as defined by the MDA-EMS196 IDE.
- If you use the "Page-Up", "Page-Down" key or the ▲, ▼ part of the mouse window, you can be shown the upper data RAM.

MDA-EMS196 Board



CPU(Central processing unit) :

The CPU use the 80C196KC with the clock 10[MHz]

ROM(Read Only Memory) :

The ROM use the EP-ROM (27C512×2). It contains the basic program to allow user to control the MDA-EMS196 kit with the keyboard, LCD display, data communication.

SRAM(Static Random Access Memory) :

The SRAM is (62256×2). The information(data) can be inserted (written) into RAM. The information can be also be read from memory or altered by user.

LCD (Liquid Crystal Display) :

The LCD display use for the data or control information display. It has the 16(Character)×4(Line).

KEYBOARD :

It is a switch consisting of sixteen labeled hexadecimal, eight function keys.

The keyboard is interfaced to system bus by the priority encoder. Control information and data is entered into system by the key.

RS-422 :

You can be communicated the any other computer or kit through the 80C196KC serial port by the RS-422 & RS-232C.

STATUS LED :

The 12 LED use to indicate the current status of the system ; the EMS196 control bus, address bus.

I/O Experiment :

It use to ON/OFF the LED, input the switch by port1 in the 80C196KC.

Timer Experiment :

You can be counted the frequency, external pulse by timer 1, 2 in the 80C196KC.

PWM Experiment :

It provides the DC motor control by PWM(Pulse Width Modulation) in the 80C196KC.

HSI/HSO Experiment :

It provides the HSI/HSO experiment by HSI(High Speed Input)/HSO(High Speed Output) unit in the 80C196KC.

STEPPING MOTOR DRIVER :

It use the stepping motor driver to control the stepping motor by the HSO within the 80C196KC.

A/D Experiment :

It provides the variable resistor, photo sensor, temperature sensor in order to exercise the A/D converter within 80C196KC.

ROM writer :

It provides the 28C256(flash memory) writer.

CON1 :

It is connected the CPU system bus.

CON2, CON3, CON4, CON6, CON8 :

It is connected the Port 1, Timer 2, PWM, HSI, HSO A/D Converter.

CON10 :

You can be interfaced the I/O port by the CON10.

Application board :

It provides the 80C196KC,TEXTTOOL in order to test the user program.

POWER :

The power spec. is the +5V(3A), +12V(1A), -12V(0.5A). You connect the AC 85~264[V] power.(110V/220V)