1. MDA-Win8086 SYSTEM CONFIGURATION

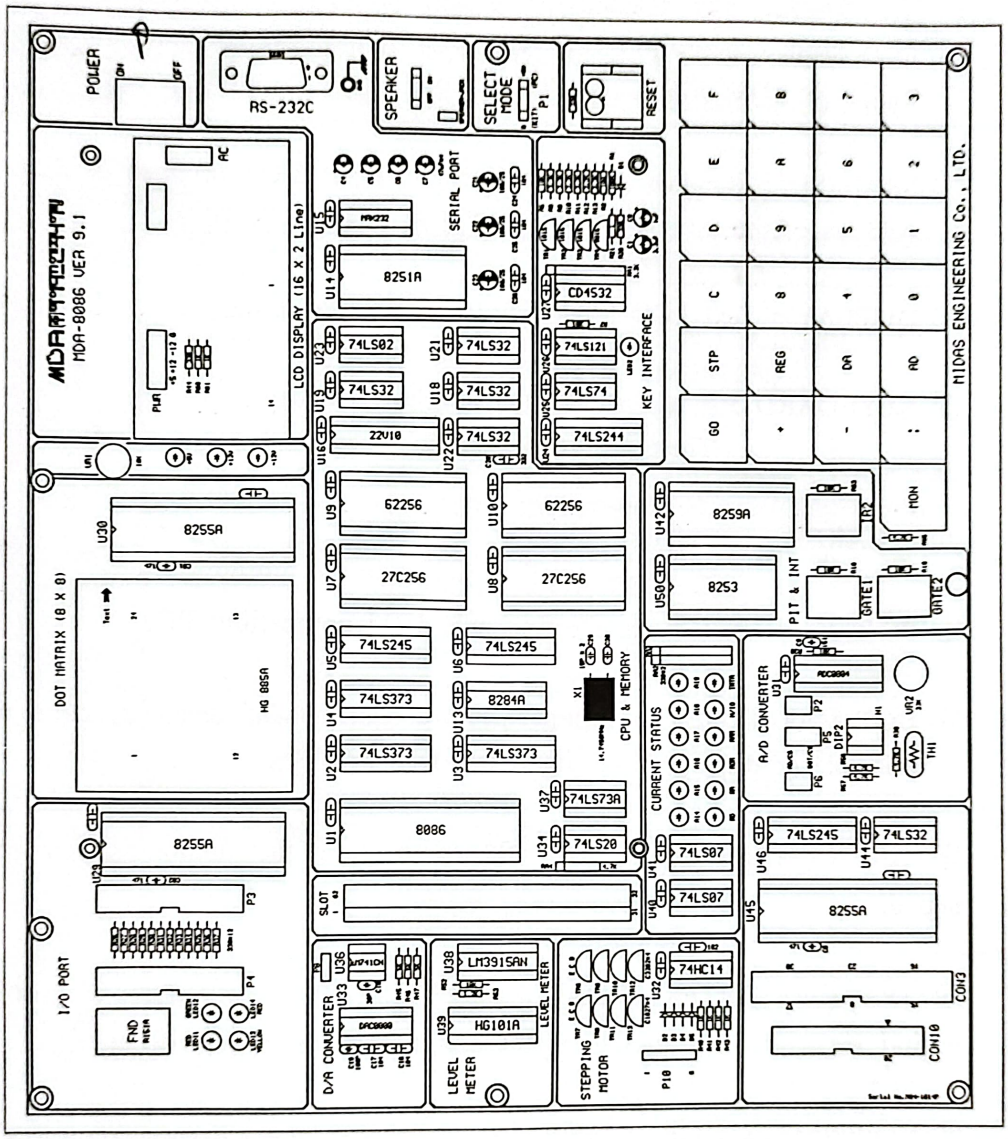


FIGURE 1. MDA-Win8086 SYSTEM CONFIGURATION

1. MDA-Win8086 SYSTEM CONFIGURATION

☞ The function of IC's at Figure 1.

① CPU(Central processing unit) : Using Intel 8086, Using 14.7456㎒.

② ROM(Read Only Memory) : It has program to control user's key input, LCD display, user's program. 64K Byte, it has data communication program. Range of ROM Address is F0000H~FFFFFH.

③ SRAM(Static Random Access Memory) : Input user's program & data. Address of memory is 00000H~0FFFFH, totally 64K Byte.

④ DISPLAY : Text LCD Module, 16(Characters)×2(Lines)

⑤ KEYBOARD : It is used to input machine language.
There are 16 hexadecimal keys and 8 function keys.

⑥ SPEAKER : Sound test.

⑦ RS-232C : Serial communication with IBM compatible PC.

⑧ DOT MATRIX LED : To understand & test the dot matrix structure and principle of display. It is interfaced to 8255A(PPI).

⑨ A/D CONVERTER : ADC0804 to convert the analog signal to digital signal.

⑩ D/A CONVERTER : DAC0800 (8-bits D/A converter) to convert the digital signal to the analog signal and to control the level meter.

⑪ STEPPING MOTOR INTERFACE : Stepping motor driver circuit is designed.

⑫ POWER : AC 110~220V, DC +5V 3A, +12V 1A, -12V 0.5A SMPS.

X> MDA-Win8086 ADDRESS MAP

① Memory map

ADDRESS	MEMORY	DESCRIPTION
00000H ~ 0FFFFH	RAM	PROGRAM & DATA MEMORY
F0000H ~ FFFFFH	ROM	MONITOR ROM
10000H ~ EFFFFH	USER'S RANGE	

② I/O address map

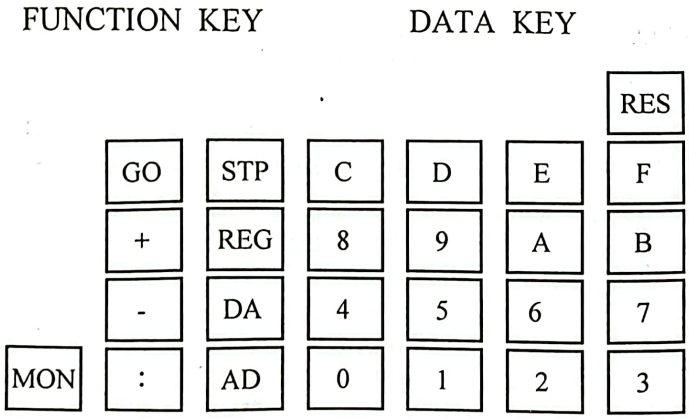
ADDRESS	I/O PORT	DESCRIPTION
00H ~ 07H	LCD & KEYBOARD	LCD Display 00H : INSTRUCTION REGISTER 02H : STATUS REGISTER 04H : DATA REGISTER KEYBOARD 01H : KEYBOARD REGISTER (Only read) 01H : KEYBOARD FLAG (Only write)
08H ~ 0FH	8251 / 8253	8251(Using to data communication) 08H : DATA REGISTER 0AH : INSTRUCTION / STATUS REGISTER 8253(TIMER/COUNTER) 09H : TIMER 0 REGISTER 0BH : TIMER 1 REGISTER 0DH : TIMER 2 REGISTER 0FH : CONTROL REGISTER
10H ~ 17H	8259/SPEAKER	8259(Interrupt controller) 10H : COMMAND REGISTER 12H : DATA REGISTER SPEAKER → 11H : SPEAKER
18H ~ 1FH	8255A-CS1/ 8255A-CS2	8255A-CS1(DOT & ADC INTERFACE) 18H : A PORT DATA REGISTER 1AH : B PORT DATA REGISTER 1CH : C PORT CONTROL REGISTER 8255-CS2(LED & STEPPING MOTOR) 19H : A PORT DATA REGISTER 1BH : B PORT DATA REGISTER 1DH : C PORT CONTROL REGISTER 1FH : CONTROL REGISTER
20H ~ 2FH	I/O EXTEND CONNECTOR	
30H ~ FFH	USER'S RANGE	

2. OPERATION INTRODUCTION

2-1. FUNCTION OF KEYS

MDA-Win8086 has high performance 64K-byte monitor program. It is designed for easy function. After power is on , the monitor program begins to work. In addition to all the key function the monitor has a memory checking routine.

The following is a simple description of the key functions.



RES	system reset
AD	set memory address
DA	Update segment & Offset. and input data to memory
:	Offset.
+	Segment & Offset +1 increment. Register display increment.
-	Segment & Offset -1 increment. Register display decrement.

STP	execute user's program, a single step
GO	go to user's program or execute monitor functions
MON	Immediately break user's program and Non makable interrupt.
REG	Register Display.

2-2. BASIC OPERATION

Upon power-up, following message will be displayed on a LCD.

MDA8086 Kit V9.5 WWW.MIDASENG.COM

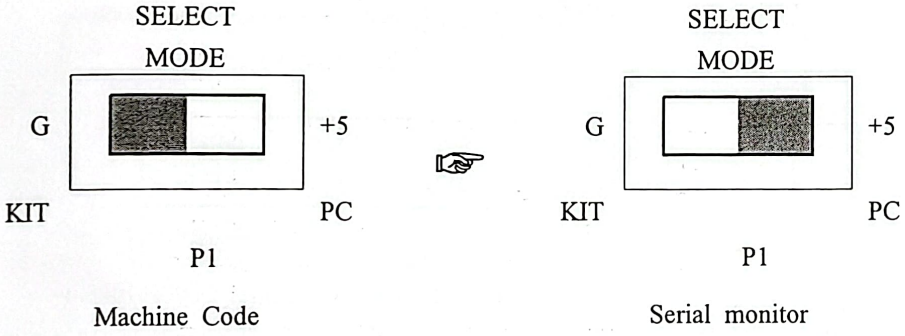
Figure 1-1.

Or

Serial monitor ! WWW.MIDASENG.COM

Figure 1-2.

To select the Machine Code and Serial monitor mode with P1 switch.



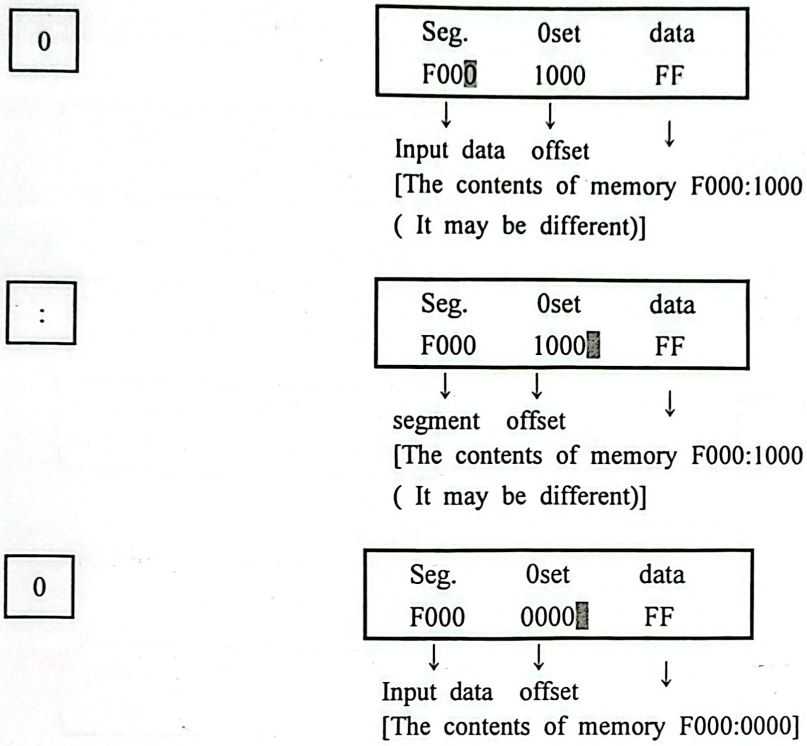
※ RES System Reset Key

Whenever RES is pressed, the display will read either FIGURE 1-1 or FIGURE 1-2.

※ [AD] , [:] . HEXA-DIGIT KEY : Substitute to segment & offset address

EXAMPLE 1) Check the contents in memory.

KEY	LCD
AD	Seg. 0set data 0000 1000 FF ↓ ↓ ↓ Input data offset [The contents of memory 0000:1000 (It may be different)]
F	Seg. 0set data 000F 1000 FF ↓ ↓ ↓ Input data offset [The contents of memory 000F:1000 (It may be different)]
0	Seg. 0set data 00F0 1000 FF ↓ ↓ ↓ Input data offset [The contents of memory 00F0:1000 (It may be different)]
0	Seg. 0set data 0F00 1000 FF ↓ ↓ ↓ Input data offset [The contents of memory 0F00:1000 (It may be different)]



※ AD , + , -

KEY : Increment and decrement to segment & offset address.

When the power is on or press the RES key, following message will be displayed on LCD.

```
MDE8086 Kit V9.5
Midas 2109-5964/5
```

When the AD key is pressed,

KEY	LCD
AD	Seg. 0set data 0000 1000 FF ↓ ↓ ↓ Input data offset [The contents of memory 0000:1000 (It may be different)]
+	Seg. 0set data 0001 1000 FF ↓ ↓ segment +1 increment [The contents of memory 0001:1000 (It may be different)]
+	Seg. 0set data 0002 1000 FF ↓ ↓ segment +1 increment [The contents of memory 0002:1000(It may be different)]
-	Seg. 0set data 0001 1000 FF ↓ ↓ segment -1 increment [The contents of memory 0001:1000 (It may be different)]

※ AD, :,

HEXA-DIGIT KEY : Update to memory contents.

EXAMPLE 2) Let's store the following like to 01000H ~ 01003H contents.

< ADDRESS	DATA>
01000	AB
01001	CD
01002	EF
01003	34

KEY **LCD**

RES

```
MDA8086 Kit V9.5
WWW.MIDASENG.COM
```

AD

```
Seg.   0set   data
0000   1000   FF
```

segment offset

[The contents of memory 0000:1000]

DA

```
Seg.   0set   data
0000   1000   FF
```

segment offset

[The contents of memory 0000:1000 (It may be different)]

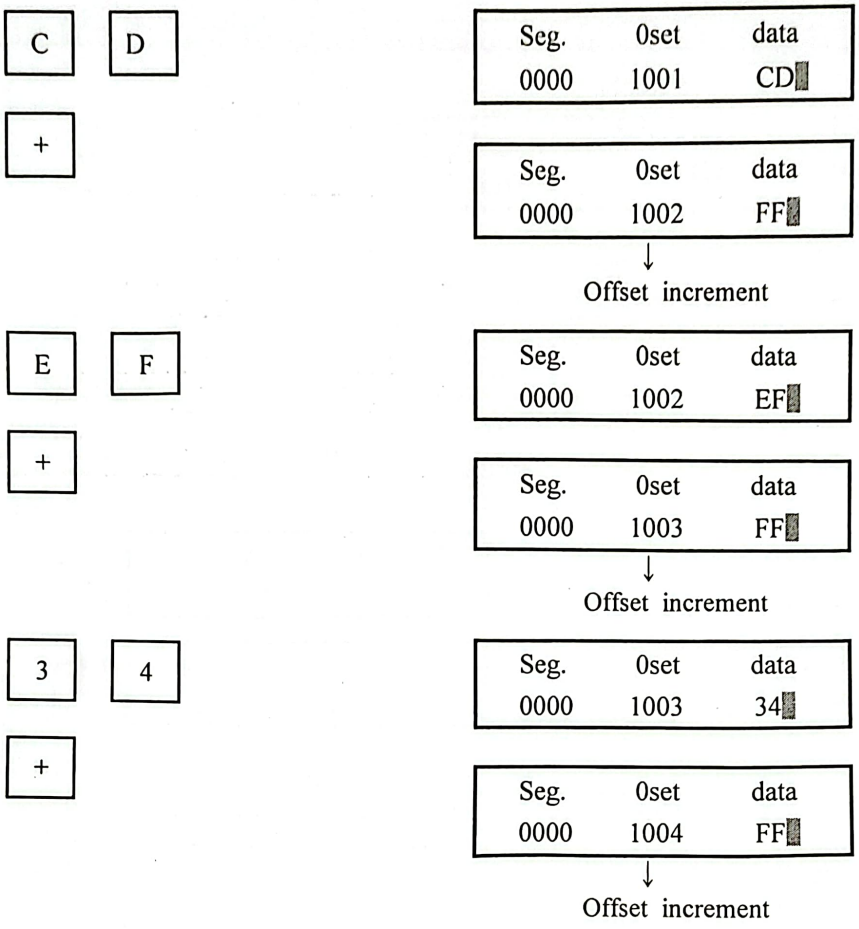
A B

```
Seg.   0set   data
0000   1000   AB
```

+

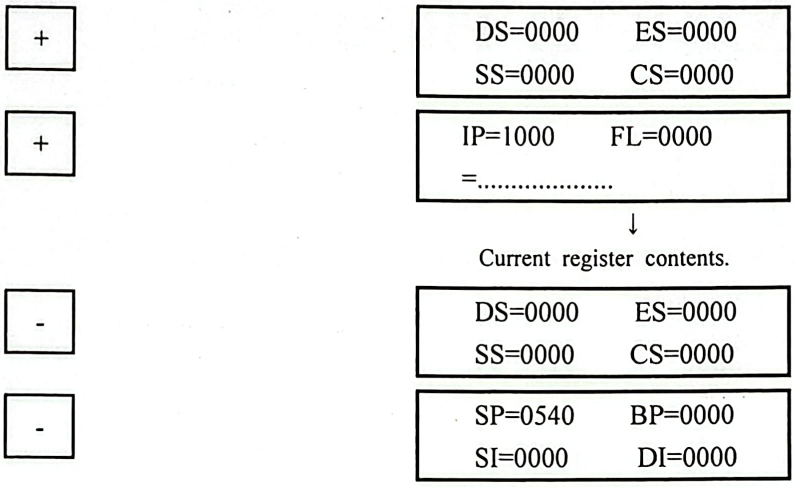
```
Seg.   0set   data
0000   1001   FF
```

Offset increment



※ REG , + , - KEY : Display to register contents.

KEY	LCD
RES	AX=0000 BX=0000 CX=0000 DX=0000 ↓ Current register contents.
+	SP=0540 BP=0000 SI=0000 DI=0000


+
DS=0000 ES=0000
SS=0000 CS=0000
+
IP=1000 FL=0000
=.....
Current register contents.
-
DS=0000 ES=0000
SS=0000 CS=0000
-
SP=0540 BP=0000
SI=0000 DI=0000