

**EB-3800**  
**Mini Firewall Chassis**  
Ver 2.0

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# **Chapter 1 Product Information**

## **1.1 General Information**

The EB-3800 takes advantages of ISS-102 embedded board. It is an IBM PC/AT compatible computer specially designed to meet the applications for firewall; also, it is a best solution for embedded system developing application.

## **1.2 Product Specifications**

- Designed for ISS-102 embedded Board.
- 2\*20 character LCD module.
- Four LED to Indicate power, Alarm, LAN and HDD status.
- **One 2.5" HDD Drive Bay**
- Dimensions: 146mmx 42.4mmx 222.4mm. (WxHxD)
- Weight : 0.9kg

- **Power**

EB-3800 is equipped with a terminal block, connect to power source. It requires +5VDC & +12VDC power input.

- **LCD Display**

The 2\*20 character LCD module provides customer a programmable display for system time, alarm message, IP address, ..etc.

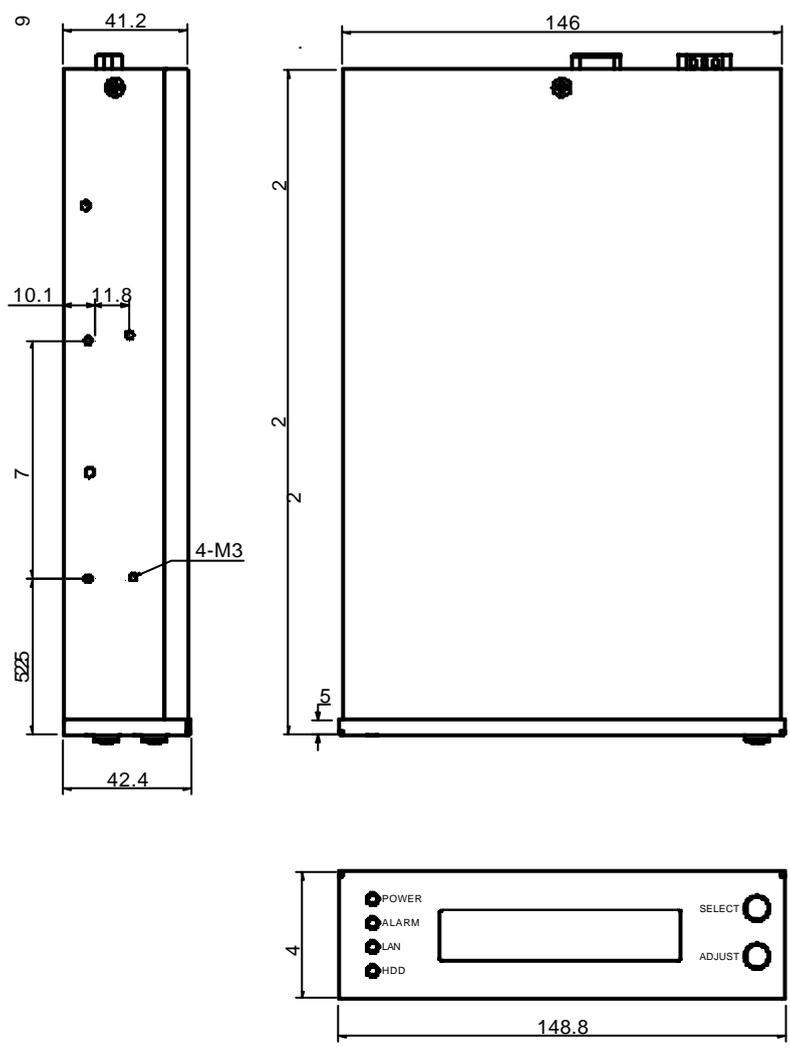
- **Environmental specifications**

Operating Temperature	:	0 ~ 50
Relative Humidity	:	10-95% @40 , non-condensing
Vibration	:	5 to 17 Hz, 0.1" double-amplitude displacement, 17 to 500 Hz, 1.5 G peak to peak.
Shock	:	10 G Peak acceleration (11 msec. duration)
Safety	:	meet UL/CSA/TUV
EMI	:	meet FCC/EN

### 1.3 Dimensions

The dimension of EB-3800 is 146mmx 42.4mmx 222.4mm. (WxHxD).  
The figure below had shown.

2

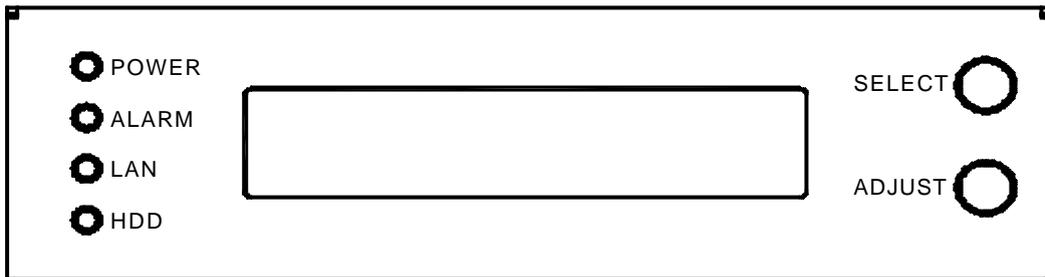


# Chapter 2 System Setup

The following sections of this chapter will help your installation and maintenance.

## 2.1 Front Panel

There are two buttons on the front panel to adjust time and date for the LCD display module. And there are four LEDs accessible show the status of HDD, LAN, Alarm and Power.



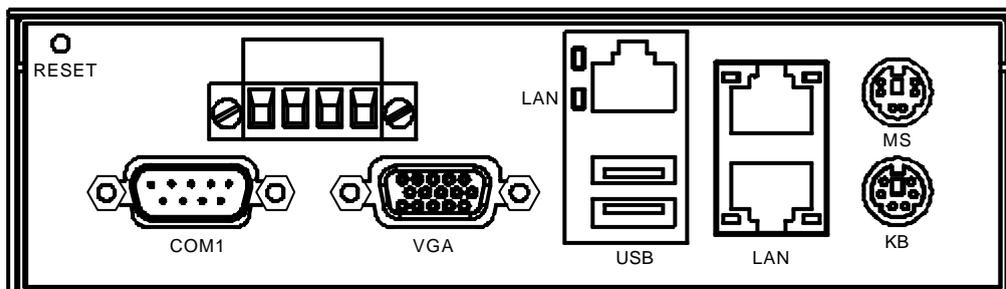
**Without Alarm function.**

### Time setting:

1. Press “ Select” until the cursor appears,
2. Press “ Adjust” to set the time,
3. Press “ Select” to move cursor to the column you want set.

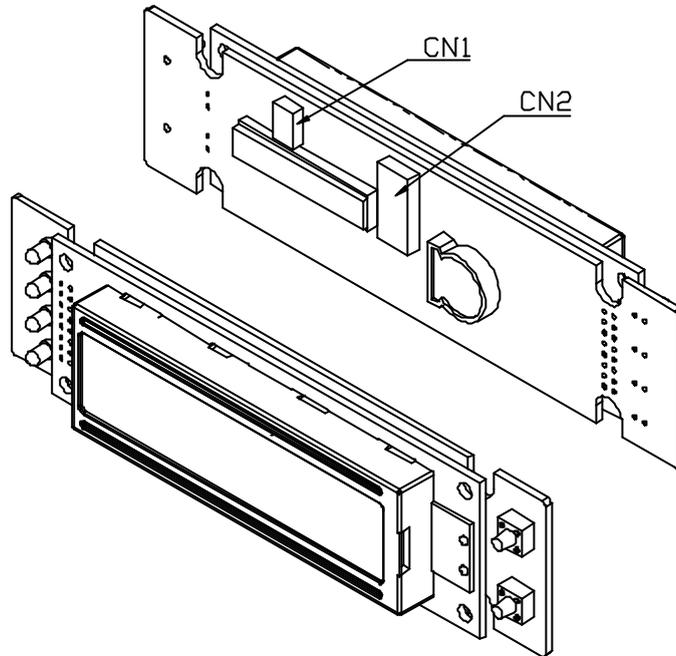
## 2.2 Rear Panel

The following figure shows rear panel of EB-3800.



## 2.3 A78 LCD display module

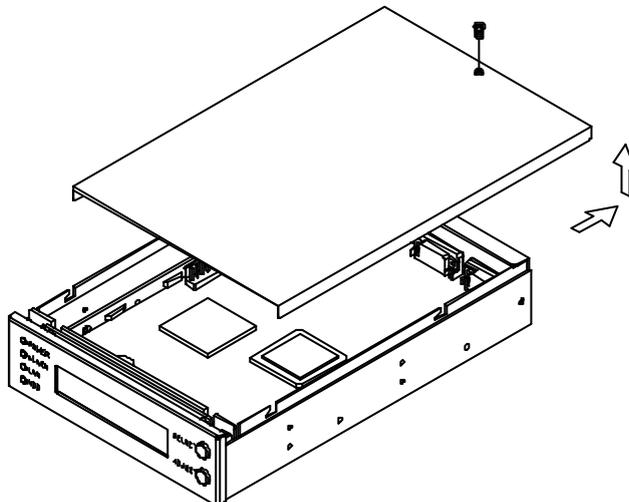
The A78 is a 2\*20 character LCD module. It provides customer programmable display for system time, IP address, ..etc.



**CN1,CN2 pin definition see Append B**

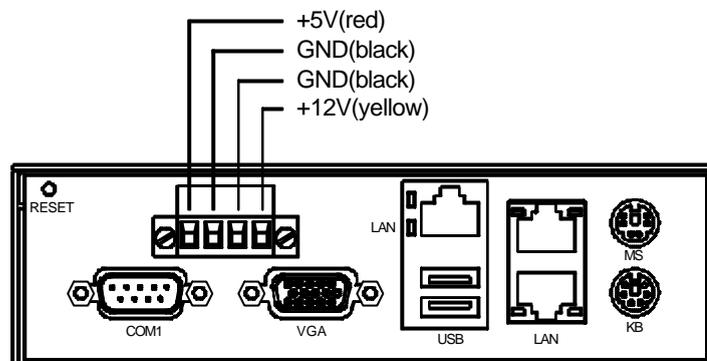
## 2.4 Removing the cover

A screw at top of the chassis mounts the cover. Please unfasten the screw first then remove the cover as below diagram shows.



## 2.5 Power Connection

To connect the power source, please refer to the following diagram.



## 2.6 Disk Drive Installing

1. Install the drives to the bracket, fix it by screws and connect flat cable & power cable to the drives
2. Place the drive back in position and lock it by screws.

**Step1**



**Step2**



# **Chapter 3 Maintenance**

There are some essential parts you need to know during the operation for the purpose of maintenance or upgrading.

**Warning: Whenever you need to take off a part for either maintenance or upgrading purpose, you should unplug the power cord first.**

There are three steps for maintenance or upgrading EB-3800.

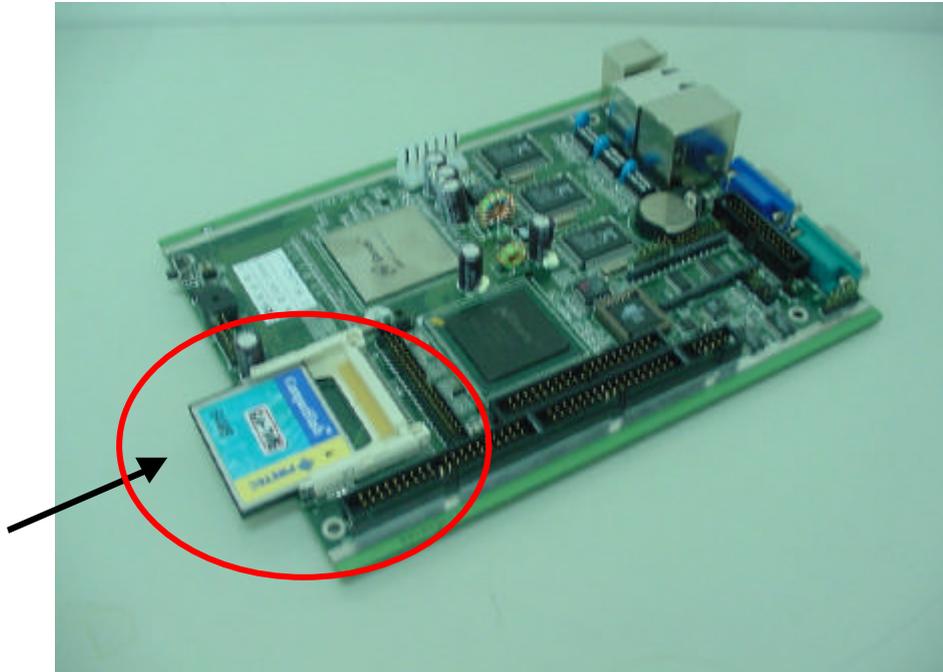
Step 1. Open the cover

Step 2. Unfasten the screws that fix the rear panel.

Step 3. Slid out ISS-102 embedded board.

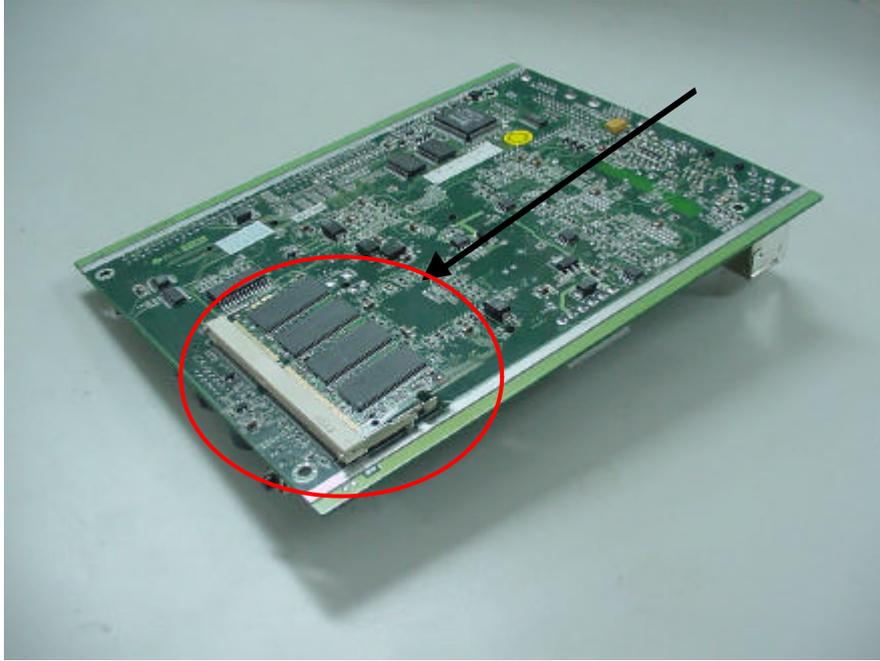
## **3.1 Compact flash module installation**

EB-3800 is equipped with ISS-102, which supports a compact flash type II socket for IDE HDD simulation.

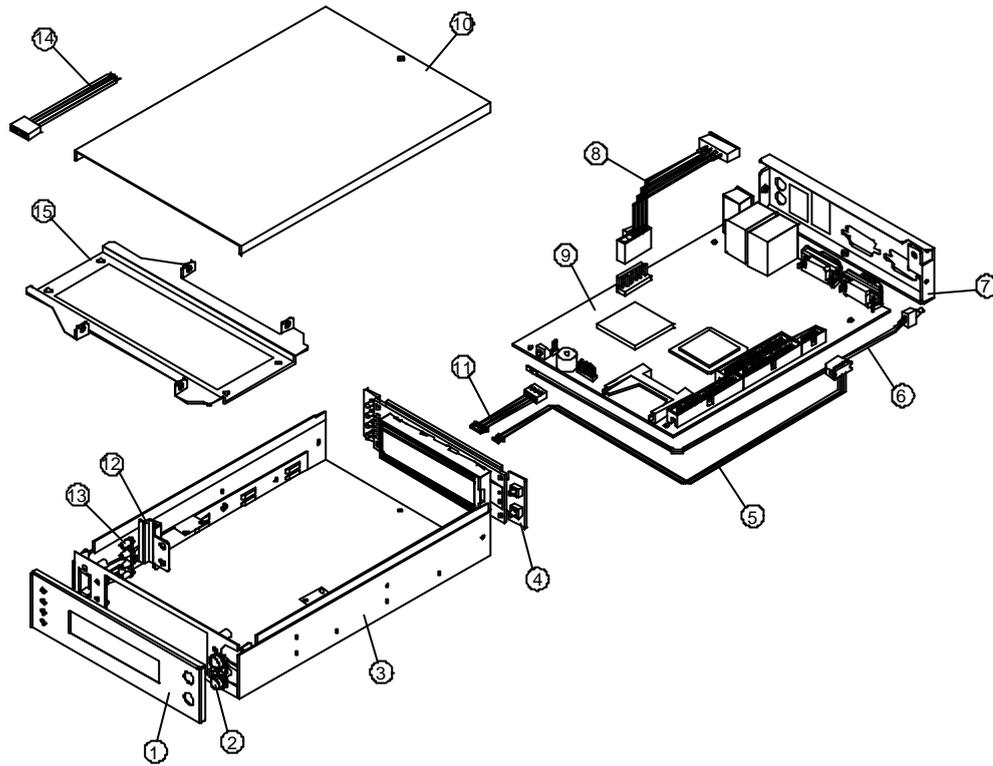


### 3.2 DRAM module installation

ISS-102 supports a 144-pin SO-DIMM socket. Based on your requirement it can support to up 128MB size.



## Appendix A Exploded Diagram of EB-3800



### EB-3800 Parts List:

Item	Part No	Description	QTY.
1	41001-010022	Panel	1
2	43007-001006	Switch Cap	1
3	41006-018122	Base	1
4	131A78A-00-010	A78A LCD Module	1
5	32100-046700	WIRE CABLE A78A ->COM1	1
6	32100-038402	WIRE CABLE <RESET>	1
7	41003-006122	Rear Panel	1
8	32100-046600	WIRE CABLE <POWER>	1
9	ISS-102R-300	ISS-102 Embedded Board	1
10	41008-013122	Cover	1
11	32100-046800	WIRE CABLE A78A->ISS102	1
12	41014-016400	Bracket	1
13	43007-001100	Lamp Guide	1
14	32100-046900	WIRE CABLE <POWER>	1
15	41011-018600	Disk Bracket	1

# Appendix B A78 LCD Display Module

## INTRODUCTION

A78 is a two lines with 20 characters LCD Module, designed specially for system easy and quickly display text message over it, A78 is very easily to be installed because it only use 2 wire RS232 interface to communicate with your system and 2 wires for +5V power supply and ground, following ICP Peripheral Communication Protocol (Note A), A78 will have versatile functions for your program, meanwhile, A78 provide you a on board battery backup real time clock default display on the right corner and provide system reading, the clock could be manual adjustment by two buttons or by system via software, A78 also provide you 4 programmable LEDs and two readable buttons for system easily to access information with outside.

## Implementation

A78 include two components

- a. One A78 board itself and
- b. One UART Cable

The connection schematic please reference Fig 1, complete the connection and then on the power, you should see the LCD default display the timer on the corner like

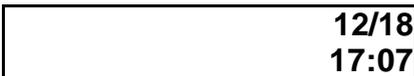
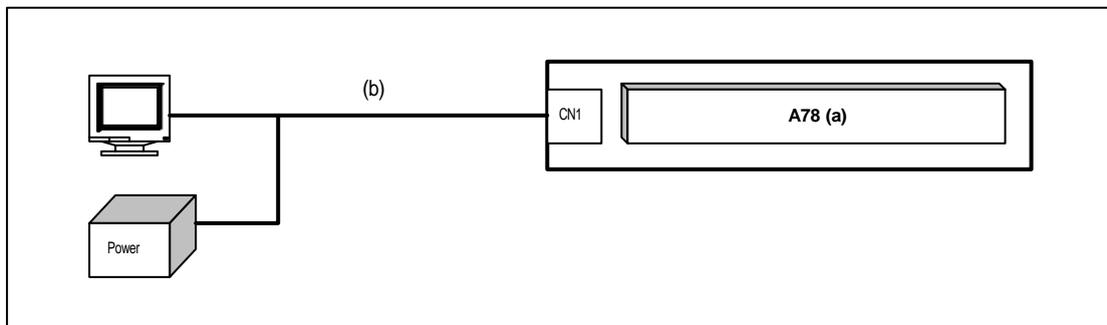


Fig 1



## Pin Definition

CN1	1	+5V	Power	5V power in
	2	Rx	In	RS232 Input
	3	Tx	Out	RS232 Data Out
	4	GND	Power	Ground

\*\*The RS232 use 1200 Baud Rate and 8 bit, 1 stop bit, none parity check,  $\pm$  12V Signal.

P.S. if you want A78 working on 5V signal transaction (UART), please refer Appendix B to modify A78.

## How to Display Message on LCD

A78 could display most the characters that character on keyboard you can find, following the steps described below, you could easily to display any text message on the LCD.

*Send to A78: 0x4D 0x28*

Where 0x28 means 'Stop LCD Self Regular Display', this is an option command which could stop the LCD display the clock on the left corner..

*Send to A78: 0x4D 0x0D*

Where 0x0D means 'Clear LCD'

*Send to A78: 0x4D 0x0C 0x00 0x03 0x49 0x43 0x50*

Where 0x0C is the command of 'Display Character on LCD', the 0x00 order the characters will display on line0 (first line on LCD), and 0x03 means there will three characters will be displayed, and finally the string '0x49 0x43 0x50' are the 'ICP' in ASCII codes.

After this setting, you will see that the LCD stop display, second display be cleared, third find ' ICP' is display on the right corner of LCD like



Later, if you like to stop this display and like to return the used display, send this command

*Send to A78: 0x4D 0x29*

Where 0x29 means the ' Start LCD Self Regular Display' , and then LCD release the display from system and start the default display (clock) as before.

## **How to Adjust The Clock on LCD**

A78 has implement a real time clock on board and could provide you the year, month, day, hour, min, second information, it also equipment a backup battery to keep clock running individually over 3 year. You can adjust the clock by two ways, one by two buttons on the board and the other use software.

### **Button Adjustment**

Step 1: Press the upper Switch over 3 sec and see a blinking cursor on the LCD screen.

Step 2: Press the lower Switch to adjust to the correct time.

Step 3: Press the Upper Switch again to move the blinking cursor to the next position. Step 4: repeat Step 2 and Step 3.

Step 5: If every value is setting ok then press the upper switch again over 3 sec to leave Edit Mode, after that you can see the cursor is disappear and the timer is start running.

## By Software Adjustment

You can send this command to set up the time to clock on A78:

Send to A78: 0x4D 0x09 0x00 0x0C 0x07 0x0D 0x28 0x05

Emphasis: Where 0x4D means this command come from System, 0x09 is the command of ' Set Clock Time' , 0x00 means year 2000, 0x0C means December, 0x07 means day 7, 0x0D means PM one clock, 0x28 means 40 minutes after and 0x05 means 5 second now.

## The others command

The Peripheral Communication Protocol like Appendix A describes are comprise total about 26 command and could separate into two major groups.

### Group A: Come from system to A78

Get\_ID (0x00)

Set\_LED\_On/Off (0x02)

Get\_LED\_Status (0x03)

Get\_Switches\_Status (0x06)

Get\_Protocol\_Version (0x07) Set\_Clock\_Time (0x09)

Get\_Clock\_Time (0x0B)

Display\_Character\_On\_LCD (0x0C)

Clear\_LCD (0x0D)

Stop\_LCD\_Self\_Regular\_Display (0x28)

Start\_LCD\_self\_Regular\_Display (0x29)

Set\_LCD\_Special\_Flags (0x2B)

Get\_LCD\_Special\_Flags (0x2C)

Set\_Clock\_Adjustment\_Mode (0x35)

Get\_Clock\_Adjustment\_Mode (0x36)

Reset (0xFF)

## **Group B: Response System from A78**

Report\_ID (0x01)

Report\_LED\_Status (0x04)

Report\_Switches\_Status (0x05)

Report\_Protocol\_Version (0x08)

Report\_Clock\_Time (0x0A)

Report\_LCD\_Special\_Flags (0x2D)

Report\_Clock\_Adjustment\_Mode (0x37)

Ack (0xFA)

Nack (0xFB)

Reset\_OK (0xAA)

All detail explanations and reference examples please see Appendix A

## **The Finally Need to Know**

Regard to the MCU limited resource, please well to know:

The UART buffer equipment in A78 are only 16 bytes, so when you want system to transfer commands to A78, please remember to separate the data traffic (if over 16 bytes) into several smaller package, each package keep control under 16 byte and put some delay at intervals to prevent data over flow.

## Note A

### The ICP Peripheral Communication Protocol Version 0.01

#### 0x00

Direction	Device LCD Board
Content	Get ID
Command	0x4D 0x00
Emphasis	0x4D= M ; 0x00=Get ID
Response To	None
Example	0x4D 0x00

#### 0x01

Direction	LCD Board Device
Content	Report ID
Command	0x53 0x01 0xXX 0xYY
Emphasis	0x53= S ; 0x04=Report ID; 0xXX, 0xYY=ID;
Response To	Get ID
Example	0x53 0x01 0x00 0x4F (Board ID= 0x004E ---A078)

#### 0x02

Direction	Device LCD Board
Content	Set LED On/Off
Command	0x4D 0x02 0xXX 0xYY
Emphasis	0x4D= M ; 0x02=Set LED On/Off; 0xXXYY=LED on/off, XXYY<15:0>=LED<15:0>, 1=On, 0=off
Response To	None
Example	0x4D 0x02 0x00 0x03 (Set LED0, LED1 On)

#### 0x03

Direction	Device LCD Board
Content	Get LED Status
Command	0x4D 0x03
Emphasis	0x4D= M ; 0x03=Get LED Status
Response To	None
Example	0x4D 0x03

**0x04**

Direction	LCD Board    Device
Content	Report LED Status
Command	0x53 0x04 0xXX 0xYY
Emphasis	0x53=' S' ; 0x04=Report LED status; 0xXXYY=LED on/off XXYY<15:0>=LED<15:0>, 1=On, 0=Off
Response To	Get LED Status
Example	0x53 0x04 0x00 0x0F (LED<3:0> is On)

**0x05**

Direction	LCD Board    Device
Content	Report Switches Status
Command	0x53 0x05 0xXX 0xYY
Emphasis	0x53=' S' ; 0x05=Report Switches status; 0xXXYY=Switches on/off XXYY<15:0>=Switch<15:0>, 1=Pressed, 0=Release
Response To	Get Switches Status
Example	0x53 0x05 0x00 0x80 (Sw7 is On)

**0x06**

Direction	Device    LCD Board
Content	Get Switches Status
Command	0x4D 0x06
Emphasis	0x4D=' M' ; 0x06=Get Switches status
Response To	None
Example	0x4D 0x06

**0x07**

Direction	Device    LCD Board
Content	Get Protocol version
Command	0x4D 0x07
Emphasis	0x4D=' M' ; 0x07=Get Protocol version
Response To	None
Example	0x4D 0x07

**0x08**

Direction	LCD Board    Device
Content	Report Protocol version
Command	0x53 0x08 0xXX 0xYY
Emphasis	0x53=' S' ; 0x08=Report Protocol version; 0xXX=Class; 0xYY=version (00~FF)
Response To	Get Protocol Version
Example	0x53 0x08 0x00 0x01 (Version 01)

**0x09**

Direction	Device LCD Board
Content	Set Clock Time
Command	0x4D 0x09 0xYY 0xMM 0xDD 0xHH 0xmm 0xSS
Emphasis	0x4D= M ; 0x09=Set Clock Time; 0xYY=Year (00~99) Map to (2000 ~ 2099) 0xMM=Month (01 ~ 12) 0xDD=Day (01 ~ 31) 0xHH=Hour 24Hr Mode (00~23) 0xmm=Minute (00~59) 0xSS=Second (00~59)
Response To	None
Example	0x4D 0x09 0x00 0x0C 0x07 0x0D 0x28 0x05 (Set Time on 2000/12/07 13:40:05)

**0x0A**

Direction	LCD Board Device
Content	Report Clock Time
Command	0x53 0x0A 0xYY 0xMM 0xDD 0xHH 0xmm 0xSS
Emphasis	0x53= S ; 0x0A=Report Clock Time; 0xYY=Year (00 ~ 99) Map to (2000 ~ 2099) 0xMM=Month (01 ~ 12) 0xDD=Day (01 ~ 31) 0xHH=Hour 24Hr Mode (00~23) 0xmm=Minute (00~59) 0xSS=Second (00~59)
Response To	Get Clock Time
Example	0x53 0x0A 0x00 0x0C 0x07 0x0D 0x28 0x09 (Report Time 2000/12/07 13:40:09)

**0x0B**

Direction	Device LCD Board
Content	Get Clock Time
Command	0x4D 0x0B
Emphasis	0x4D= M ; 0x0B=Get Clock Time
Response To	None
Example	0x4D 0x0B

**0x0C**

Direction	Device LCD Board
Content	Display Character on LCD
Command	0x4D 0x0C 0x0L 0x0N 0xCC <sub>1</sub> ~ 0xCC <sub>15</sub>
Emphasis	0x4D= M ; 0x0C=Display Character On LCD; 0x0L=0x00 (Line 0), 0x0L=0x01 (Line 1); 0x0N=N Character (1~15), Total not over 15 char.; 0xCCn=ASCII Code of Character,
Response To	None
Example	0x4D 0x0C 0x01 0x03 0x49 0x43 0x50 (Line 1, 3 Character, ' ICP ')

**0x0D**

Direction	Device LCD Board
Content	Clear LCD
Command	0x4D 0x0D
Emphasis	0x4D= M ; 0x0D=Clear LCD
Response To	None
Example	0x4D 0x0D

**0x28**

Direction	Device Alm/LCD Board
Content	Stop LCD Self Regular Display
Command	0x4D 0x28
Emphasis	0x4D= M ; 0x28=Stop LCD Self Regular Display;
Response To	None
Example	0x4D 0x28 (Stop LCD Self Regular Display)

**0x29**

Direction	Device Alm/LCD Board
Content	Start LCD Self Regular Display
Command	0x4D 0x29
Emphasis	0x4D= M ; 0x29=Start LCD Self Regular Display
Response To	None
Example	0x4D 0x29 (Start LCD Self Regular Display)

**0x2B**

Direction	Device LCD Board
Content	Set LCD Special Flags
Command	0x4D 0x2B 0xXX
Emphasis	0x4D= M ; 0x2B=Set LCD Special Flags; 0xXX=Flags, X <sub>0</sub> = 1:Turn On Watch_Dog_Flag Display on LCD 0:Turn Off Watch_Dog_Flag Display on LCD X <sub>1,7</sub> Reserve
Response To	None
Example	0x4D 0x2B 0x01 : Turn On Watch_Dog_Flag Display

**0x2C**

Direction	Device LCD Board
Content	Get LCD Special Flags
Command	0x4D 0x2C
Emphasis	0x4D= M ; 0x2C=Get LCD Special Flags
Response To	None
Example	0x4D 0x2C

**0x2D**

Direction	LCD Board    Device
Content	Report LCD Special Flags
Command	0x53 0x2D 0xXX
Emphasis	0x53=' S' ; 0x2D=Report LCD Special Flags; 0xXX=Flags
Response To	Get LCD Special Flags
Example	0x53 0x2D 0x01 : Watch_Dog_Flag display is turn on now

**0x35**

Direction	Device    Alm/LCD Board
Content	Set Clock Adjustment Mode
Command	0x4D 0x35 0xNN
Emphasis	0x4D=' M' ; 0x35=Set Clock Adjustment Mode; 0xNN    =0x00, Disable Manuel Adjustment =0x01, Enable Manuel Adjustment
Response To	None
Example	0x4D 0x35 0x01 Enable Clock Manuel Adjustment

**0x36**

Direction	Device    Alm/LCD Board
Content	Get Clock Adjustment Mode
Command	0x4D 0x36
Emphasis	0x4D=' M' ; 0x36=Get Clock Adjustment Mode
Response To	None
Example	0x4D 0x36

**0x37**

Direction	Alm/LCD Board    Device
Content	Report Clock Adjustment Mode
Command	0x53 0x37 0xNN
Emphasis	0x53=' S' ; 0x37=Report Clock Adjustment Mode 0xNN    =0x00, Disable Manuel Adjustment =0x01, Enable Manuel Adjustment
Response To	Get Clock Adjustment Mode
Example	0x53 0x37 0x00 (Manuel Adjustment is disable)

**0xFA**

Direction	LCD/LED/Alarm Board    Device
Content	Ack
Command	0x53 0xFA
Emphasis	0x53=' S' ; 0xFA=Ack;
Response To	Any if feel necessary, device could silent discard this command
Example	0x53 0xFA

### 0xFB

Direction	LCD/LED/Alarm Board    Device
Content	Negative Ack
Command	0x53 0xFB 0xCC
Emphasis	0x53=' S' ; 0xFB=Negative Ack; 0xCC Command;
Response To	Ack No Support
Example	0x53 0xFB 0xF0 (NAK 0xF0 Command)

### 0xFF

Direction	Device    Alm Board
Content	Reset
Command	0x4D 0xFF
Emphasis	0x4D=' M' ; 0xFF=Reset Slave Device
Response To	None
Example	0x4D 0xFF

### 0xAA

Direction	LCD/LED/Alarm Board    Device
Content	Reset OK
Command	0x53 0xAA
Emphasis	0x53=' S' ; 0xAA=Reset OK;
Response To	Reset
Example	0x53 0xAA

## Note B

### How to modify A78 to UART (+5V Signal) or to RS232 ( $\pm 12V$ Signal)

The signal internal coming from micro processor of A78 is UART 5V level signal only, the different change major in this signal has pass a data buffer (driver) chip and some discretely components or not, move these components will let A78 perform from RS232 interface change to UART interface.

Components	U3	C8,9,10,11,12	R22,23
UART	Move	Move	Yes
RS232	Yes	Yes	Move

Where U3 is the RS232 Transceiver like LT1381CS, C8, 9, 10, 11, 12 is 0.1uF, and R22, 23 is 0 ohm or jumper.

## Note C

The ASCII Code that LCD Module has support

	!	“	#	\$	%	&	'	( )	*	+	,	-	.	/	
0x2															
0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
0x3															
0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0x4															
0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

P	Q	R	S	T	U	V	W	X	Y	Z	[	¥	]	^	
0x5															
0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
0x6															
0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

p	q	r	s	t	u	v	w	x	y	z	{		}		
0x7															
0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

\*\*Over the 0x80 are special symbols, please contact your sales to enquire the details.

# Appendix C Accessories

1. Manual
2. Power cable
3. Disk Driver
4. Screws

## Contend of Accessories kit:

	1	2
	Manual	Power cable
		
Q ty	EB-3800 manual*1 ISS-102 manual*1	1
	3	4
	Disk driver	Screws set
Pic		
Q ty	FDD*1 CD-ROM*1	M3*6 Round with washer x 10