

EMB-ARM02

User Manual

Version 1.0



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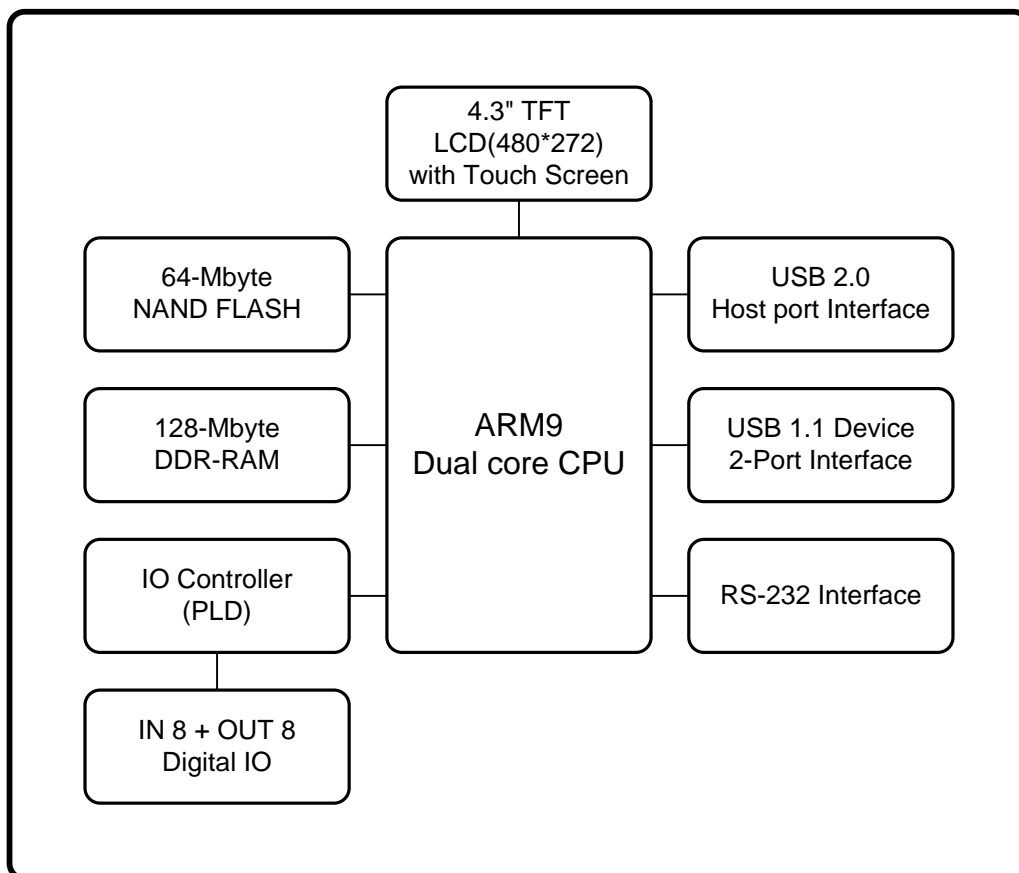
1. EMB-ARM02 Introduction

This document describes the Embedded Single Board Computer (SBC) EMB-ARM02 with WINDOWS CE OS based on ARM9 processor.

1-1 Features

- Dual 32bit CPU Processor
- 128-Mbyte DDR-RAM
- 64-Mbyte NAND Flash Memory
- 480 * RGB * 272 TFT LCD Interface with Touch Screen
- USB 2.0 Host + USB 1.1 Device Interface
- RS-232 Debug Port
- 8-bit IN/OUT Digital IO

1-2 Internal Block Diagram

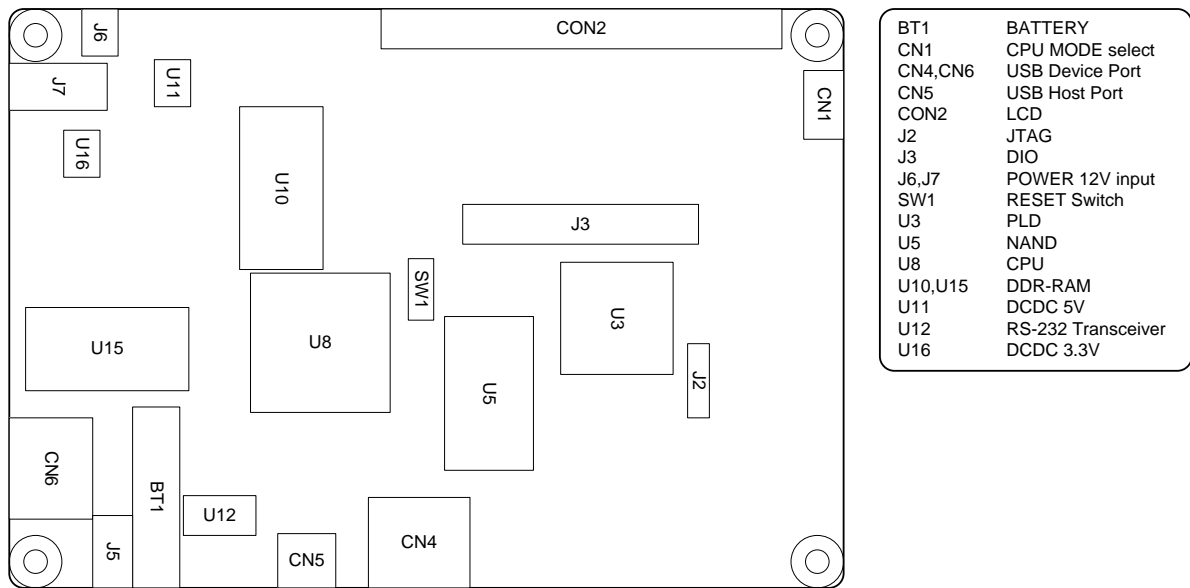


[Figure 1-1. Internal Block Diagram]

2. Connectors and Switches

The location of the main parts of the EMB-ARM02 board is as shown in [Figure 2-1]. This section describes the functions of connectors and switches.

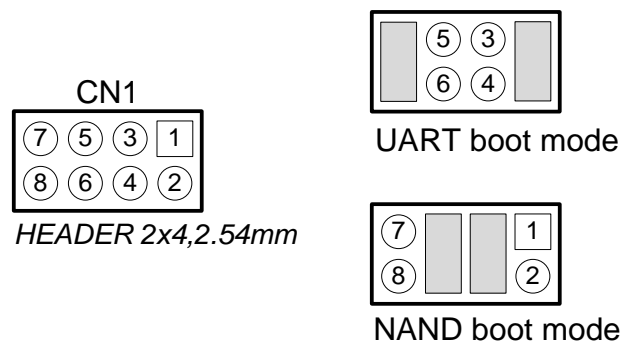
2-1 Layout



[Figure 2-1. Main Parts Layout]

2-2 Boot Mode Switch (CN1)

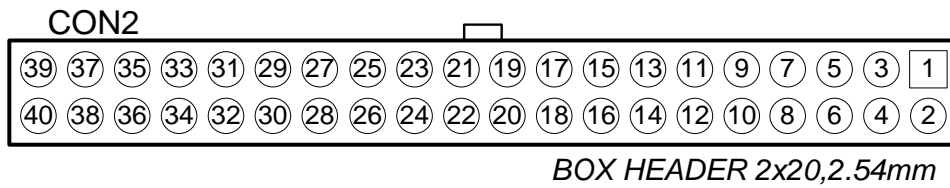
It is the UART/NAND boot select switch of the CUP. If the boot loader does not exist or is updated, select NAND (NORMAL) boot for normal OS boot through UART or boot loader stored in NAND memory.



[Figure 2-2. Boot Mode Selection]

2-3 LCD Interface (CON2)

It is a connector for TFT LCD connection.



[Table 1. TFT LCD Interface Connector]

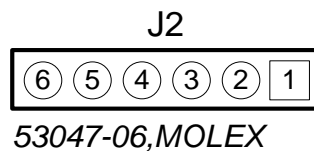
Pin No.	Pin Name	Description	Remark
1		Reserved	
2	VCC_LCD	POWER	Power, 3.3V
3	LCD_R0	RED signal data bus(LSB)	
4	LCD_R1	RED signal data bus	
5	LCD_R2	RED signal data bus	
6	LCD_R3	RED signal data bus	
7	LCD_R4	RED signal data bus	
8	LCD_R5	RED signal data bus	
9	LCD_R6	RED signal data bus	
10	LCD_R7	RED signal data bus(MSB)	
11	LCD_G0	GREEN signal data bus(LSB)	
12	LCD_G1	GREEN signal data bus	
13	LCD_G2	GREEN signal data bus	
14	LCD_G3	GREEN signal data bus	
15	LCD_G4	GREEN signal data bus	
16	LCD_G5	GREEN signal data bus	
17	LCD_G6	GREEN signal data bus	
18	LCD_G7	GREEN signal data bus(MSB)	
19	LCD_B0	BLUE signal data bus(LSB)	
20	LCD_B1	BLUE signal data bus	
21	LCD_B2	BLUE signal data bus	
22	LCD_B3	BLUE signal data bus	
23	LCD_B4	BLUE signal data bus	
24	LCD_B5	BLUE signal data bus	
25	LCD_B6	BLUE signal data bus	
26	LCD_B7	BLUE signal data bus(MSB)	

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Pin No.	Pin Name	Description	Remark
27	LCD_PCI	Display on/off mode control	
28	LCD_CLK	Dot clock signal	
29	LCD_VSYNC	Vertical synchronous signal	
30	LCD_HSYNC	Horizontal synchronous signal	
31		Reserved	
32	LCD_DE	Data enable signal	
33	X_M	Touch panel signal(X-Right)	
34	X_P	Touch panel signal(X-Left)	
35	Y_M	Touch panel signal(Y-Bottom)	
36	Y_P	Touch panel signal(Y-Top)	
37	GND	Ground	Power
38	LED_CATHODE	Cathode for LED	Power
39	LED_ANODE	Anode for LED	Power
40	GND	Ground	Power

2-4 JTAG (J2)

It is a connector for programming PLD(U3).

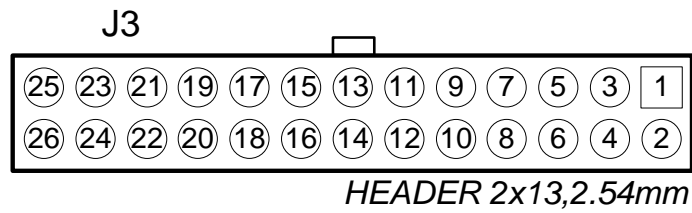


[Table 2. JTAG Interface Connector]

Pin No.	Pin Name	Description	Remark
1	VCC	Reserved	Power, 3.3V
2	GND	Ground	Power
3	TCK	Test Clock	
4	TDO	Test Data Output	
5	TDI	Test Data Input	
6	TMS	Test Mode Select	

2-5 Digital IO (J3)

3.3V TTL/CMOS support Digital Input/Output connector for user input/output.

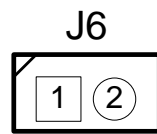


[Table 3. Digital IO Interface Connector]

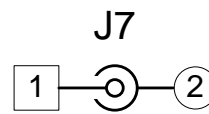
Pin No.	Pin Name	Description	Remark
1	DI[0]	Digital Input(LSB)	
2	DI[1]	Digital Input	
3	DI[2]	Digital Input	
4	DI[3]	Digital Input	
5	DI[4]	Digital Input	
6	DI[5]	Digital Input	
7	DI[6]	Digital Input	
8	DI[7]	Digital Input(MSB)	
9	DO[0]	Digital Output(LSB)	
10	DO[1]	Digital Output	
11	DO[2]	Digital Output	
12	DO[3]	Digital Output	
13	DO[4]	Digital Output	
14	DO[5]	Digital Output	
15	DO[6]	Digital Output	
16	DO[7]	Digital Output(MSB)	
17		Reserved	
18		Reserved	
19		Reserved	
20	VCC	POWER	Power, 3.3V
21		Reserved	
22		Reserved	
23		Reserved	
24	GND	Ground	Power
25		Reserved	
26	GND	Ground	Power

2-6 Power Input (J6, J7)

This is the DC power connector that supplies the board.



5267-02, MOLEX



DC JACK

[Table 4. Power Input Connector]

Pin No.	Pin Name	Description	Remark
1	VCC_12V	12V DC INPUT	Power, 12V
2	GND	Ground	Power

2-7 RESET Switch (SW1)

This is the hardware reset switch on the board.

2-8 USB Device Port (CN4,CN6)

USB device interface port. The CPU can be used as a USB host by connecting a keyboard, mouse, memory stick, etc.

2-9 USB Host Port (CN5)

USB host interface port. As a USB device, the CPU can download images from a PC and access files through ActiveSync connection.

3. BSP Build

BSP (Board Support Package) for device support in WINDOWS CE 5.0 operating system is provided as an installation package ("MP2530F_TEST_SDK.msi"). For this, "Windows CE 5.0" must be installed on the development PC, and the build environment can be obtained through Internet search. Please use this to build.

4. OS Update

The image created by the update of the provided BSP must be reinstalled in NAND flash memory to be applied to the platform. Refer to Chapter 22 of the document "WinCE5.0 BSP Build Guide for MP2530F.pdf".

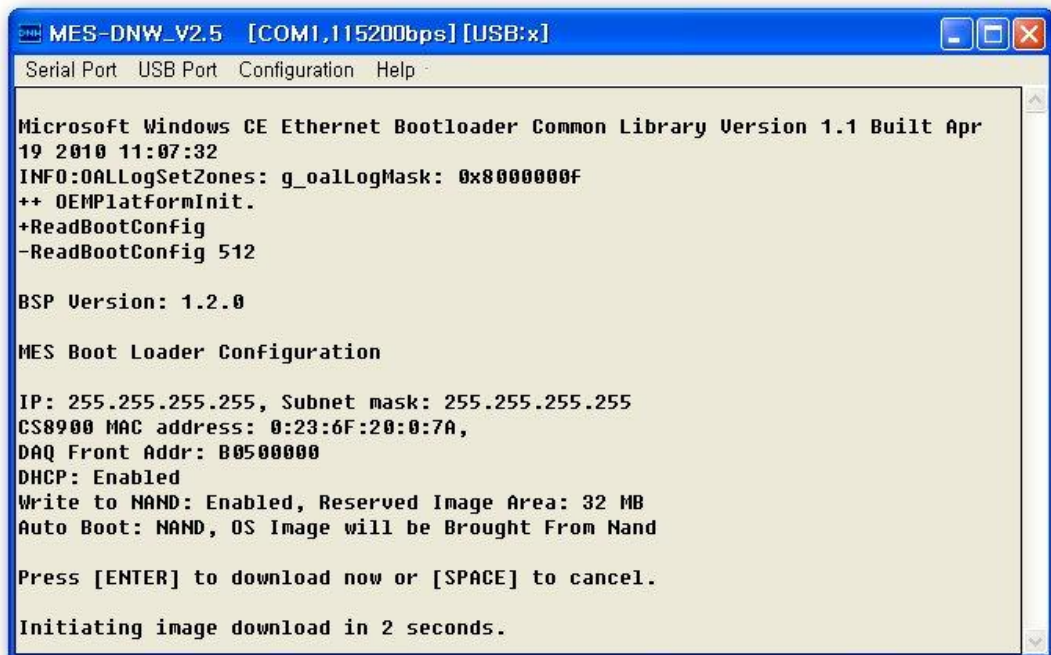
4-1 Ready to update

1. Install ActiveSync on your PC, copy and run the download program (MES-DNW_V2.5.exe).
2. Turn off the power and connect the PC to the following.
 - (1) Connection between PC side USB port and mini-B USB port (CN5)
 - (2) Connection between PC side serial COM port and RS-232 port (J5)
3. CPU mode (CN1) is "NAND boot Mode".
4. Boot the board and check the following.
 - A text message is displayed in the download program.
 - ActiveSync connection is established.
 - When the driver connection message appears, install the MagicEyes USB driver and reboot the board to check whether ActiveSync connection is established.

4-2 Update

1. Turn on the power switch to boot the board.
2. A message waiting for keyboard input appears in the download program as shown in [Figure 4-1].

If the message does not appear, it is necessary to check the RS-232 cable connection between the board and the PC, and check the RS-232 port input/output of the PC.



```
MES-DNW_V2.5 [COM1,115200bps] [USB:x]
Serial Port  USB Port  Configuration  Help

Microsoft Windows CE Ethernet Bootloader Common Library Version 1.1 Built Apr
19 2010 11:07:32
INFO:OALLogSetZones: g_oalLogMask: 0x8000000f
++ OEMPlatformInit.
+ReadBootConfig
-ReadBootConfig 512

BSP Version: 1.2.0

MES Boot Loader Configuration

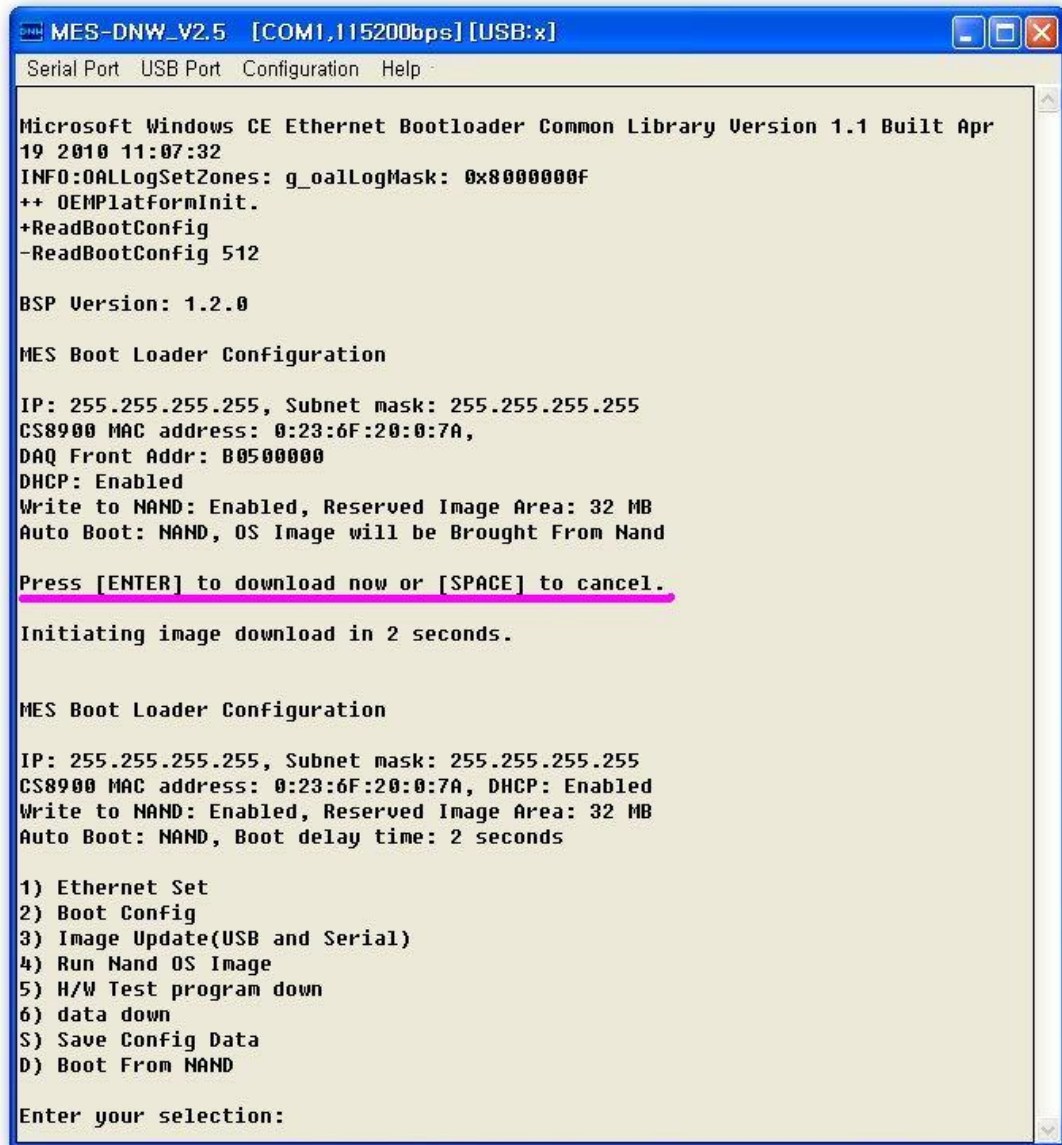
IP: 255.255.255.255, Subnet mask: 255.255.255.255
CS8900 MAC address: 0:23:6F:20:0:7A,
DAQ Front Addr: B0500000
DHCP: Enabled
Write to NAND: Enabled, Reserved Image Area: 32 MB
Auto Boot: NAND, OS Image will be Brought From Nand

Press [ENTER] to download now or [SPACE] to cancel.

Initiating image download in 2 seconds.
```

[Figure 4-1. Boot selection message]

3. Press the keyboard [SPACE] bar within 3 seconds after booting.
As shown in [Figure 4-2], "Boot Loader Configuration" menu appears.



```
MES-DNW_V2.5 [COM1,115200bps][USB:x]
Serial Port  USB Port  Configuration  Help

Microsoft Windows CE Ethernet Bootloader Common Library Version 1.1 Built Apr
19 2010 11:07:32
INFO:OALogSetZones: g_oalLogMask: 0x8000000F
++ OEMPlatformInit.
+ReadBootConfig
-ReadBootConfig 512

BSP Version: 1.2.0

MES Boot Loader Configuration

IP: 255.255.255.255, Subnet mask: 255.255.255.255
CS8900 MAC address: 0:23:6F:20:0:7A,
DAQ Front Addr: B0500000
DHCP: Enabled
Write to NAND: Enabled, Reserved Image Area: 32 MB
Auto Boot: NAND, OS Image will be Brought From Nand

Press [ENTER] to download now or [SPACE] to cancel.

Initiating image download in 2 seconds.

MES Boot Loader Configuration

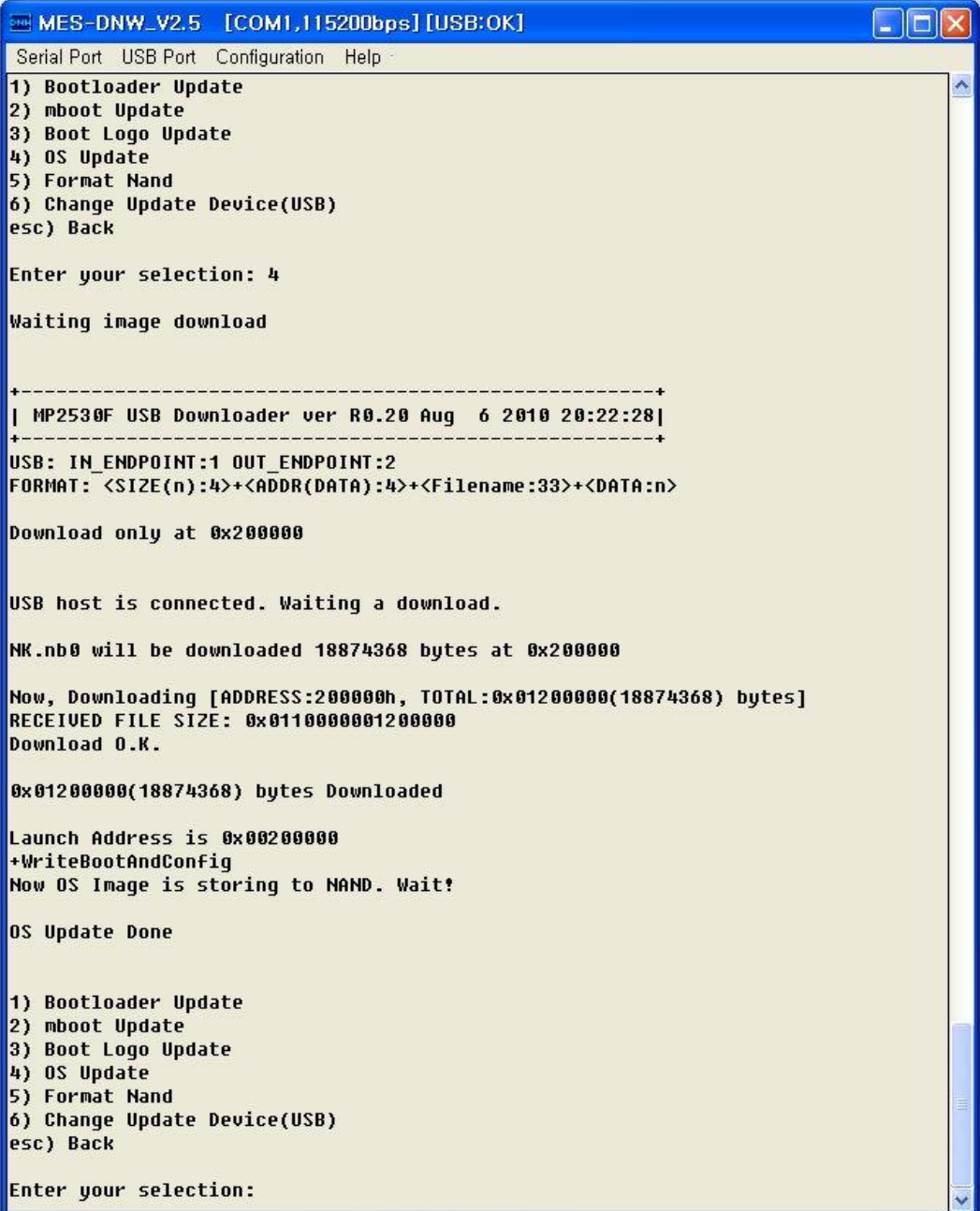
IP: 255.255.255.255, Subnet mask: 255.255.255.255
CS8900 MAC address: 0:23:6F:20:0:7A, DHCP: Enabled
Write to NAND: Enabled, Reserved Image Area: 32 MB
Auto Boot: NAND, Boot delay time: 2 seconds

1) Ethernet Set
2) Boot Config
3) Image Update(USB and Serial)
4) Run Nand OS Image
5) H/W Test program down
6) data down
S) Save Config Data
D) Boot From NAND

Enter your selection:
```

[Figure 4-2. Bootloader settings menu]

4. Enter "3" on the keyboard to execute "Image Update".
As shown in [Figure 4-3], a menu appears to select the update type.
5. Enter "4" on the keyboard to run "OS Update".
6. Execute "USB Port", "Transmit", and select "NK.nb0" file in "Open".
7. When the selection menu appears with the string "OS Update Done", the download is completed. Reboot by turning the power OFF and ON.

The screenshot shows a window titled "MES-DNW_V2.5 [COM1,115200bps] [USB:OK]". The window has a menu bar with "Serial Port", "USB Port", "Configuration", and "Help". The main area displays a list of options: "1) Bootloader Update", "2) mboot Update", "3) Boot Logo Update", "4) OS Update", "5) Format NAND", "6) Change Update Device(USB)", and "esc) Back". Below the list, it says "Enter your selection: 4" and "Waiting image download". A separator line is followed by a status line: "| MP2530F USB Downloader ver R0.20 Aug 6 2010 20:22:28 |". Below this, it shows "USB: IN_ENDPOINT:1 OUT_ENDPOINT:2" and "FORMAT: <SIZE(n):4>+<ADDR(DATA):4>+<Filename:33>+<DATA:n>". It then says "Download only at 0x200000". A message follows: "USB host is connected. Waiting a download." Then, "NK.nb0 will be downloaded 18874368 bytes at 0x200000". The next line is "Now, Downloading [ADDRESS:200000h, TOTAL:0x01200000(18874368) bytes]". Below that, it says "RECEIVED FILE SIZE: 0x0110000001200000" and "Download O.K.". The next line is "0x01200000(18874368) bytes Downloaded". Then, "Launch Address is 0x00200000" and "+WriteBootAndConfig". The next line is "Now OS Image is storing to NAND. Wait?". Finally, it says "OS Update Done". At the bottom, the same list of options is shown again, followed by "Enter your selection:".

[Figure 4-3. Run Update]

5. Application

Various applications can be executed on the board in the WINDOWS CE environment. Basically, Digital IO-related programs implemented with "Visual C++" of "Microsoft Visual Studio 2008" are provided. Based on this, the desired function is directly implemented and used.

Appendix

A-1 Repair Regulations

Thank you for purchasing DAQ SYSTEM's product. Please refer to the following regarding Customer Service stipulated by DAQ SYSTEM.

- (1) Please read the user's manual and follow the instructions before using the DAQ SYSTEM product.
- (2) When returning the product to be repaired, please send it to the head office with the symptoms of the malfunction as well.
- (3) All DAQSYSTEM products have a one-year warranty.
 - The warranty period is counted from the date the product is shipped from DAQ SYSTEM.
 - Peripherals and third-party products not manufactured by DAQ SYSTEM are covered by the manufacturer's warranty.
 - If repair is required, please contact the contact points below.
- (4) Even during the free repair warranty period, paid repairs are made in the following cases.
 - ① Failure or damage caused by not following the user's manual
 - ② Failure or damage caused by customer negligence during product transportation after purchase
 - ③ Natural phenomena such as fire, earthquake, flood, lightning, pollution, etc. or power supply exceeding the recommended range malfunction or damage
 - ④ Failures caused by inappropriate storage environment (eg, high temperature, high humidity, volatile chemicals, etc.) damaged
 - ⑤ Failure or damage due to unreasonable repair or modification
 - ⑥ Products whose serial number has been changed or intentionally removed
 - ⑦ In the event that DAQ SYSTEM determines that it is the customer's negligence for other reasons
- (5) The customer must bear the shipping cost of returning the repaired product to DAQ SYSTEM.
- (6) The manufacturer is not responsible for any problems caused by incorrect use regardless of our warranty provisions.

MEMO

Contact Point

Web sit : <https://www.daqsystem.com>

Email : postmaster@daqsystem.com

