EMB-ARM02

User Manual

Version 1.0

DAQ SYSTEM
Measurement & Automation

Contents

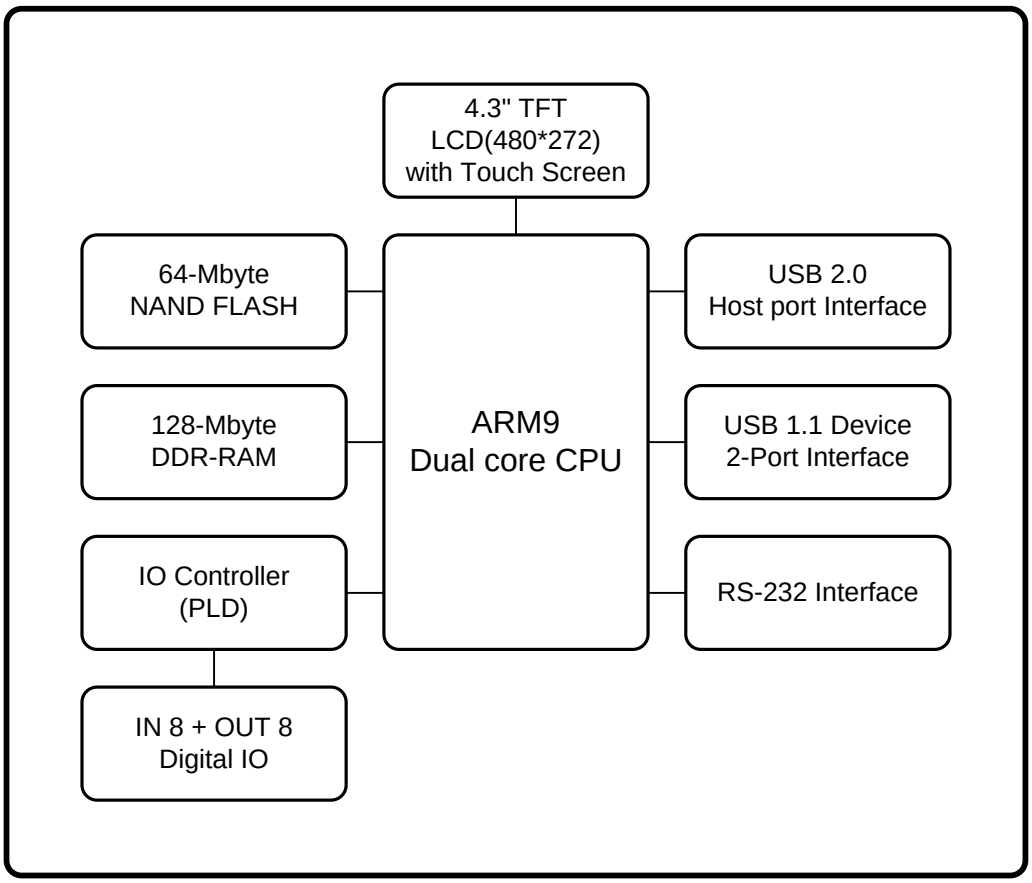
1. EMB-ARM02 Introduction

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

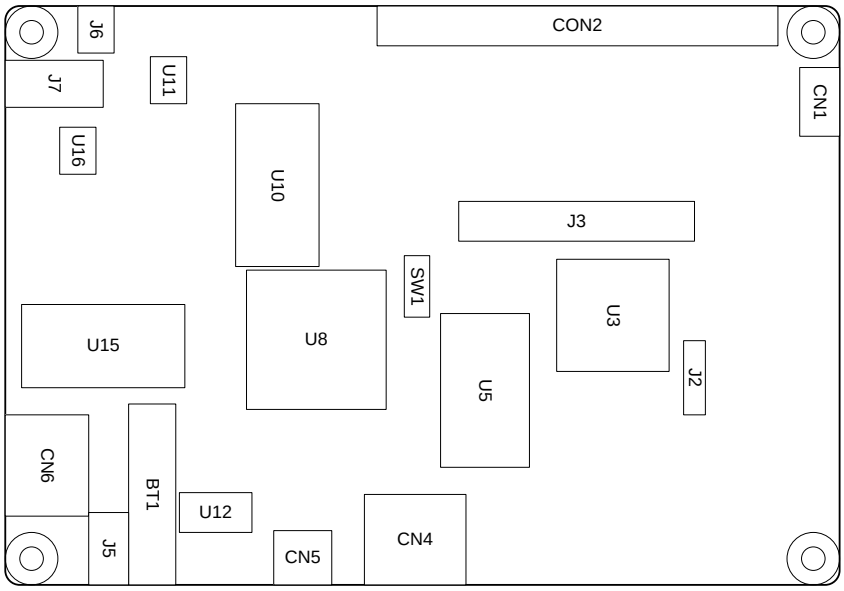


[Figure 1-1. Internal Block Diagram]

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

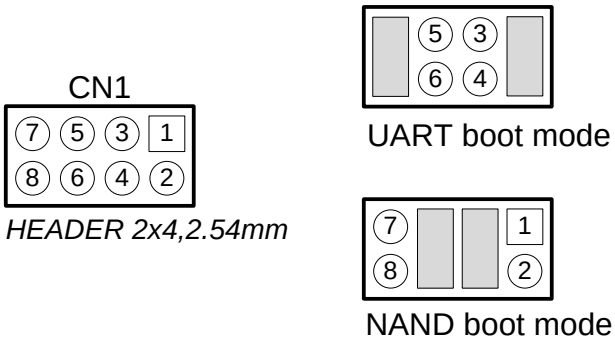


BT1	BATTERY
CN1	CPU MODE select
CN4,CN6	USB Device Port
CN5	USB Host Port
CON2	LCD
J2	JTAG
J3	DIO
J6,J7	POWER 12V input
SW1	RESET Switch
U3	PLD
U5	NAND
U8	CPU
U10,U15	DDR-RAM
U11	DCDC 5V
U12	RS-232 Transceiver
U16	DCDC 3.3V

[Figure 2-1. Main Parts Layout]

2-2 Boot Mode Switch (CN1)

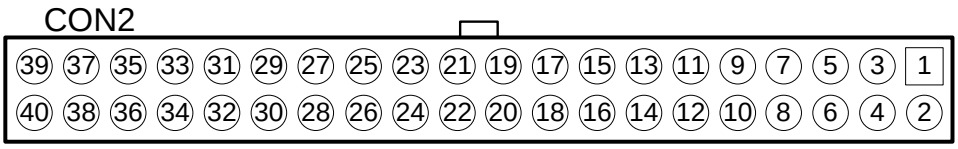
It is the UART/NAND boot select switch of the CUP. If the boot loader does not exist or is updated, select NAND (NORMAL) boot for normal OS boot through UART or boot loader stored in NAND memory.



[Figure 2-2. Boot Mode Selection]

2-3 LCD Interface (CON2)

It is a connector for TFT LCD connection.



BOX HEADER 2x20,2.54mm

[Table 1. TFT LCD Interface Connector]

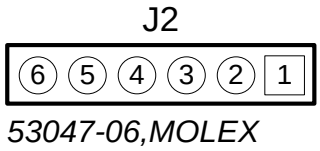
Pin No.	Pin Name	Description	Remark
1		Reserved	
2	**VCC_LCD**	POWER	Power, 3.3V
3	**LCD_R0**	RED signal data bus(LSB)	
4	**LCD_R1**	RED signal data bus	
5	**LCD_R2**	RED signal data bus	
6	**LCD_R3**	RED signal data bus	
7	**LCD_R4**	RED signal data bus	
8	**LCD_R5**	RED signal data bus	
9	**LCD_R6**	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)	

다음 장에 계속

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).

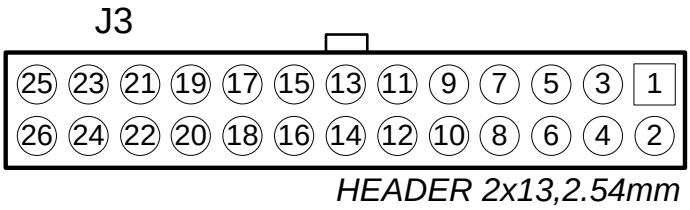


[Table 2. JTAG Interface Connector]

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.

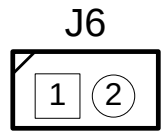


[Table 3. Digital IO Interface Connector]

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.



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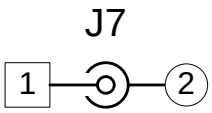


DC JACK

[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).

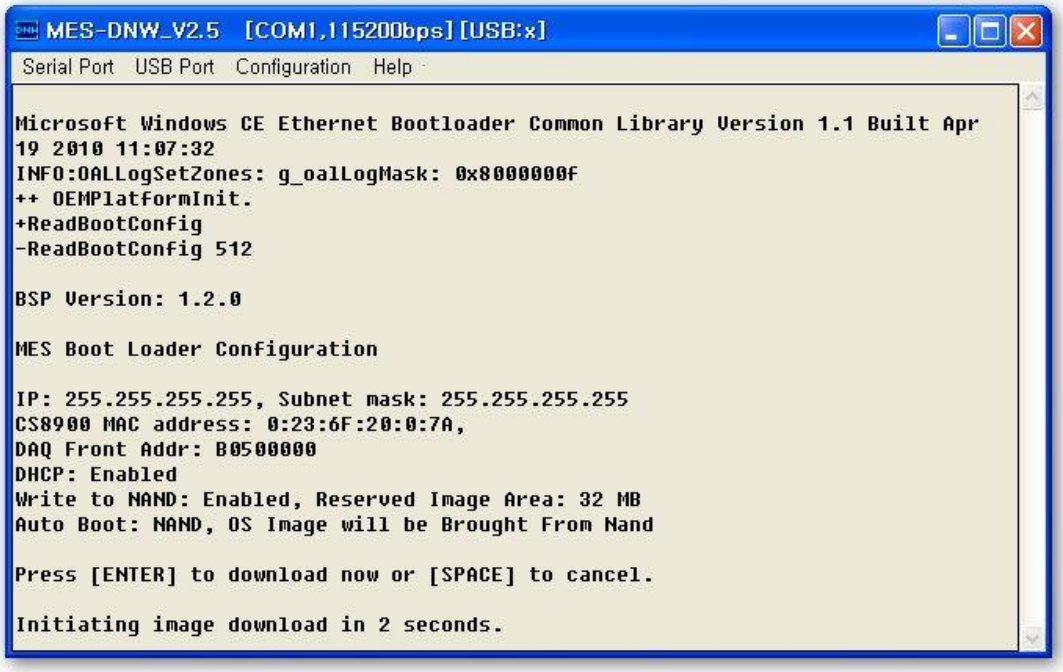
2. Turn off the power and connect the PC to the following.
   (1) Connection between PC side USB port and mini-B USB port (CN5)
   (2) Connection between PC side serial COM port and RS-232 port (J5)

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.

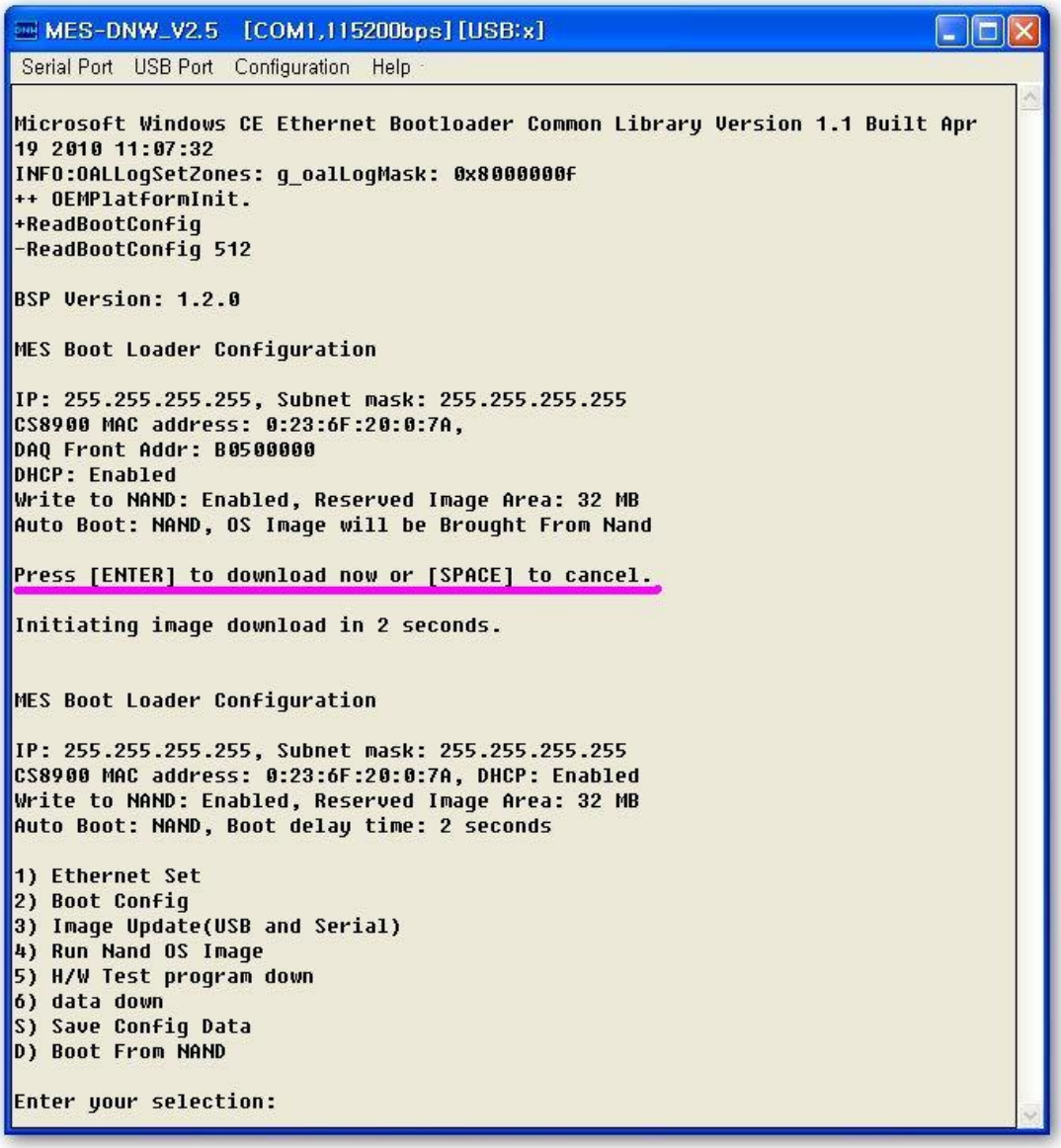
4-2 Update

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.



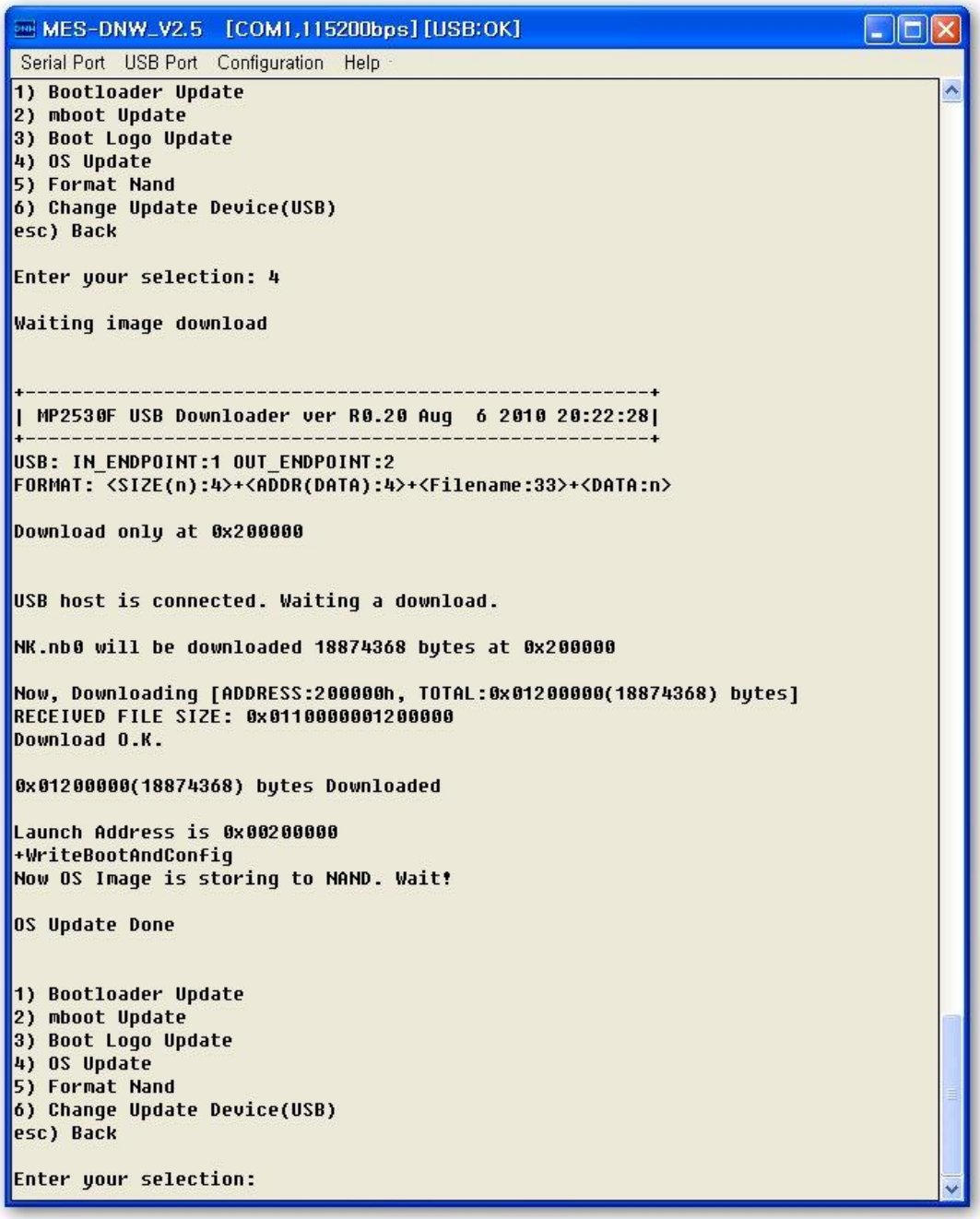
[Figure 4-1. Boot selection message]

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



[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.**



[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

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