

UNO-1110

TI Cortex AM3505 DIN-rail PC
with 2 x LAN, 5 x COM, 4 x USB

ADVANTECH

Enabling an Intelligent Planet

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Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from Advantech. Please contact your local supplier for ordering information.

FCC Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
 15. The power cord or plug is damaged.
 16. Liquid has penetrated into the equipment.
 17. The equipment has been exposed to moisture.
 18. The equipment does not work well, or you cannot get it to work according to the user's manual.
 19. The equipment has been dropped and damaged.
 20. The equipment has obvious signs of breakage.
21. **DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.**
22. **CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.**
23. The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

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Chapter 1

Overview

This chapter gives background information on the UNO-1110. It shows you the UNO-1110 overview and specifications.

Sections include:

- Introduction
- Features
- Hardware Specifications
- Safety Precautions
- Chassis Dimensions

1.1 Introduction

Advantech's UNO-1110 is a RISC-grade embedded platform that offers 2 LANs, 5 serial ports and 4 Digital Inputs and 2 Digital Outputs to fulfill user's I/O device expansion. For data storage, UNO-1110 also provides a two SDs for OS and data storage.

The UNO-1110 series supports Windows CE and Embedded Linux operating systems, the customer could choose required OS version and SD storage device according to application requirements.

The UNO-1110 could operate well under $-10 \sim 70^{\circ}\text{C}$, its small size and light weight could fit in industrial robust environment.

With these advantage, the UNO-1110 is suitable for communication gateway for converting communication protocol, and micro controller.

The UNO-1110 is a perfect embedded ready platform that can shorten your development time and offer a rich networking interface to fulfill your diverse requirements.

1.2 Features

- TI Cortex A8 AM3505 600 MHz Processor
- 256 MB DDR2 on board
- 1 RS-485, 4 RS-232/422/485 serial ports
- Dual 10/100 Mbps Ethernet
- 2 SD slots for OS and data storage
- 4 channel digital inputs and 2 channel digital outputs
- Four simulation DI dip switch
- 4 channel user-defined programmable LEDs
- Ready platform for WinCE.NET and Embedded Linux
- Built-in Advantech DigAnywhere agent for remote management and diagnosis. (Windows CE OS only)
- Fanless design for reliable system
- $10 \sim 30 V_{\text{DC}}$ Wide Dual Power Inputs with Reserve Power Polarity Protection
- Compact size and light weight
- $-10 \sim 70^{\circ}\text{C}$ operating temperature range
- DIN-rail and wall mounting

1.3 Hardware Specifications

General

- **Certifications:** CE, FCC Class A, CCC, UL
- **Dimensions (W*H*D):** 50 x 154 x 127 mm
- **Enclosure:** Aluminium with solid mounting hardware
- **Power Input Range:** Dual $10 \sim 30 V_{\text{DC}}$ inputs with reserve power polarity
- **Mounting:** DIN35 rail, wall
- **Power Consumption:** 6 W (Typical)
- **Power Requirement:** $10 \sim 30 V_{\text{DC}}$ (e.g. $+24 V_{\text{DC}} @ 1 \text{ A}$) (Min. 24 W), AT
- **Weight:** 450g

System Hardware

- **CPU:** TI Cortex A8 AM3505 600 MHz
- **Memory:** 256 MB DDR2
- **VGA:** THS8136 controller, DB-15 VGA Connector
- **Indicators:** Power, Serial (Tx, Rx), SD, 4 x DI, 2 x DO, 4 Programmable LEDs
- **Storage:** 2 SD slots
- **Others:** : Real Time Clock, Watch Dog Timer

System Software

- **OS:** WinCE .NET 6.0 / Embedded Linux
- **Remote Display:** DiagAnywhere Utility (Windows CE only)

Communication

- **Serial Ports:**
 - 1 x RS-485, 4 x RS-232/422/485 (COM1 ~ COM5)
 - Automatic RS-485 data flow control
- **Serial Port Speed:**
 - RS-232: 300 ~ 115.2 kbps
 - RS-422/485: 300 ~ 115.2 kbps
- **LAN:** 2 x 10/100 Base-T RJ-45 ports

Digital I/O (UNO-1110 only)

- **Digital In:**
 - 4 Digital Input
 - Dry Contact:
 - Logic level 0: Open
 - Logic level 1: Close
- **Digital Out:**
 - 2 Digital Output
 - Open Collect to 30V
 - 200mA max Load
 - Power Dissipation 450mW

Environment

- **Operating Temperature:** -10 ~ 70°C (14° ~ 158°F)
- **Safety Cert. Temperature:** 60°C
- **Storage Temperature:** -20° ~ 80°C (-4° ~ 176°F)
- **Operating Humidity:** 20 ~ 95% (non-condensing)
- **Storage Humidity:** 0 ~ 95% (non-condensing)

1.4 Chassis Dimensions

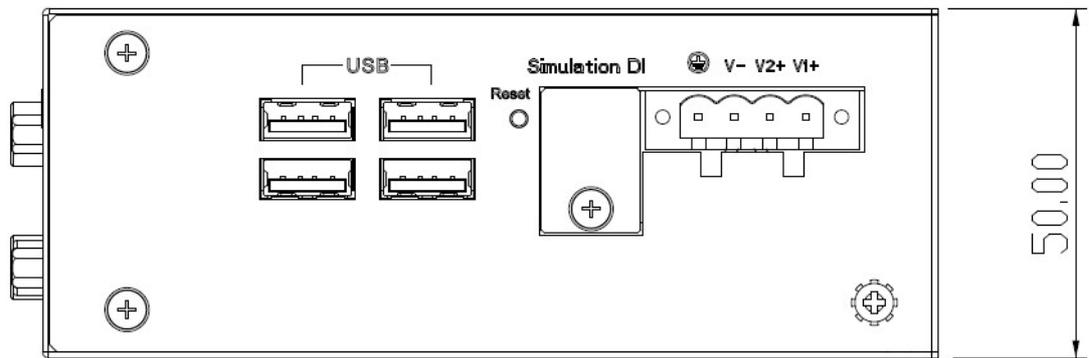


Figure 1.1 UNO-1110 Top View Dimensions

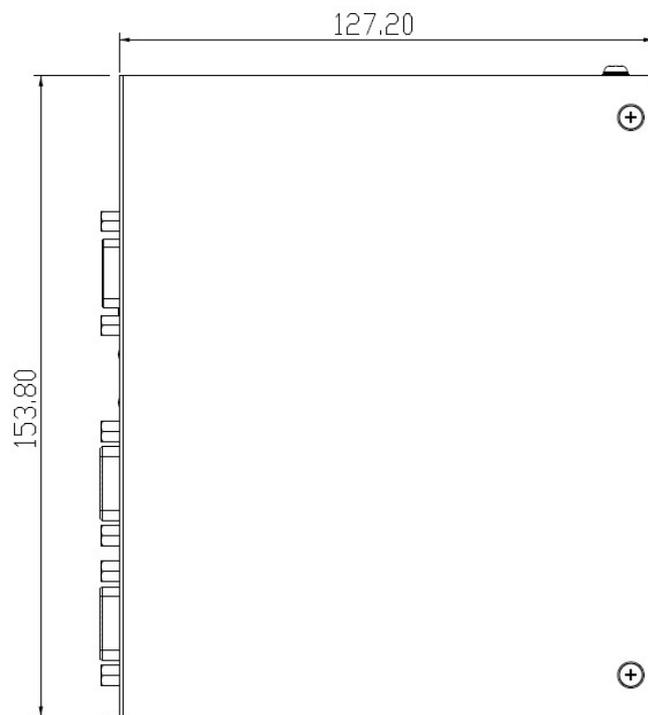


Figure 1.2 UNO-1110 Side View Dimensions

Chapter 2

Installation

In this chapter, you will be given an overview of the UNO-1110 hardware installation procedures.

Sections include:

- Overview
- LED
- Network Connections
- Serial Connections
- Power Connections
- Digital Input/Output
- CompactFlash
- Mounting

2.1 Overview

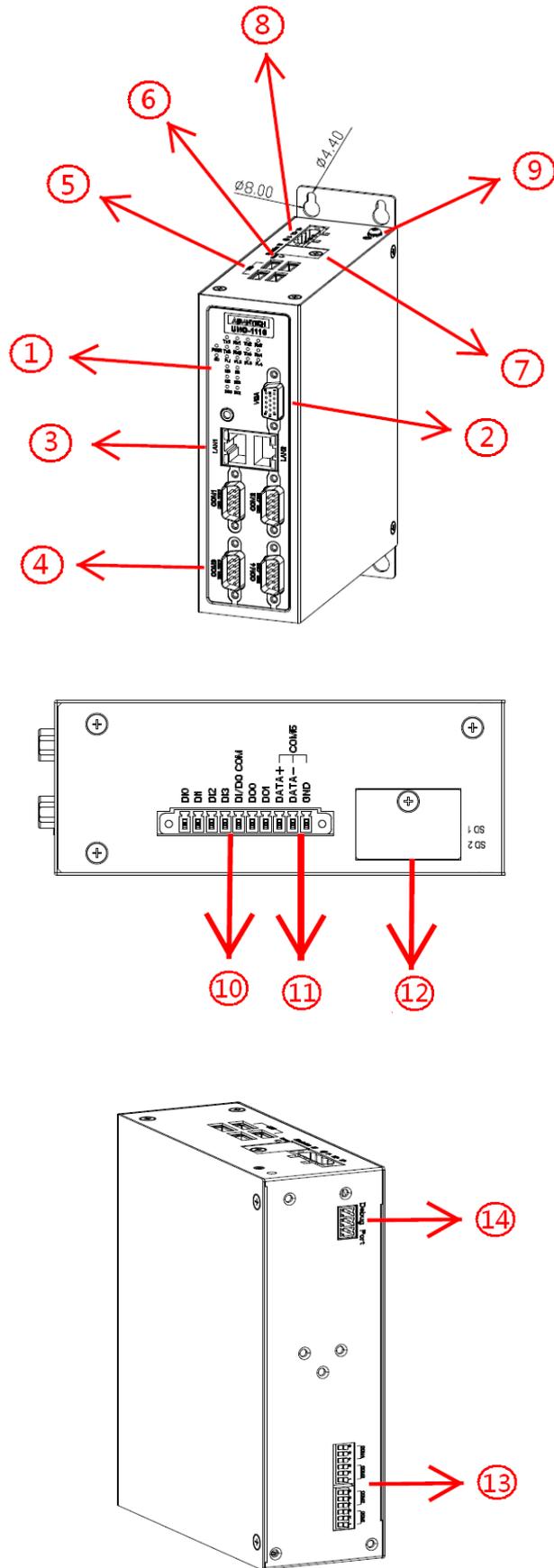


Figure 2.1 UNO-1110 I/O Overview

Table 2.1: UNO-1110 I/O Overview

Item	Description
1	LED Indicators
2	VGA
3	Ethernet Ports
4	Serial Ports
5	USB Ports
6	Reset Button
7	Simulation DI
8	Power Inputs
9	Chassis Grounding
10	Digital I/O
11	RS-485
12	SD Slots
13	COM Port Setting DIP Switch
14	Debug Port

2.2 LED Indicators

LEDs to display the power, SD, Ethernet, Serial, Programmable LED and Digital I/O status are located on the front panel of UNO-1110, and each of them has its own specific meaning, as shown in the table below.

Table 2.2: UNO-1110 LED Indicator Definitions

LED	Color	Status	Description
PWR	Red	On	System power is on
		Off	System power is off
SD	Green	Flash	Data is transmitting/receiving
Tx1 ~ Tx4	Yellow	Flash	Serial port COM1 - COM4 is transmitting data
Rx1 ~ Rx4	Green	Flash	Serial port COM1 - COM4 is receiving data
PL1 ~ PL4	Green	On	User Programmable LED on
		Off	User Programmable LED off
DI0 ~ DI3	Green/ Yellow	On	Input High
		Off	Input Low
DO0 ~ DO1	Green/ Yellow	On	Set False
		Off	Set True
LAN Link	Green	On	Connected to network
		Off	Not connected to network
		Flash	Data is transmitting / receiving
LAN Speed	Yellow	On	Link to 100 Mbps network
		Off	Link to 10 Mbps network

2.3 Network Connections

The UNO-1110 is equipped with a SMSC LAN8720AI (LAN1) & a DAVICOM DM9000BI (LAN2) Ethernet LAN controller that provide standard RJ-45 jack with 10/100 Mbps.

LED indicators on the front side to show its Link (Green LED) and Active (Yellow LED) status.

Table 2.3: Ethernet RJ-45 Connector Pin Assigns

Pin	10/100Base-T Signal Name
1	XMT+
2	XMT-
3	RCV+
4	NC
5	NC
6	RCV-
7	NC
8	NC

2.4 Serial Connections

2.4.1 Serial Mode and Terminator Resistor Selection

UNO-1110 provides 5 serial Com ports, COM1 - COM4 provide RS-232/422/485, and COM5 provides RS-485. The default settings of COM1 - COM4 are RS-232. Users could change COM1 - COM4 Port serial types to RS-422 or RS-485 by SW3/SW4 DIP switch selection located on rear side of the UNO-1110 system.

You can enable RS-422/485 terminator resistors if necessary to match impedance. Especially in fields with electric noise, enabling terminal resistors is helpful to stabilize communications. Make sure that both sides of the RS-422 or RS-485 communication ports are installed on BUS.

Users could change COM1 - COM4 serial port type and RS-422/485 terminator resistor settings by SW3/Serial Port Setting DIP switch located on rear side of the UNO-1110 system according to the table below.

Table 2.4: COM1 - COM4 Serial Port Setting

COM1/COM3 DIP Switch	COM2/COM4 DIP Switch	Serial Mode	Receiver Termination Mode
		RS-232 Standard Mode	N/A
		RS-485 Auto Flow Mode	120 Ohms Terminator Resistor
		RS-485 Auto Flow Mode	No Termination
		RS-422 Master	120 Ohms Terminator Resistor
		RS-422 Master	No Termination

Refer to the figure and table below for COM1 - COM4 pin assignment.

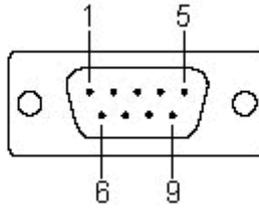


Table 2.5: COM1 - COM4 Pin Assignments

Pin	RS-232	RS-422	RS-485
1	DCD	TxD-	Data-
2	RxD	TxD+	Data+
3	TxD	RxD+	-
4	DTR	RxD-	-
5	GND	GND	GND
6	DSR	-	-
7	RTS	-	-
8	CTS	-	-
9	RI	-	-

Refer to figure below for COM5.

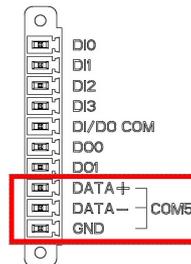


Figure 2.2 COM5 RS-485 Pin Assignments

2.5 Power Connections

UNO-1110 supports +10 ~ 30 V_{DC} power inputs. A detailed power pin description is shown below.

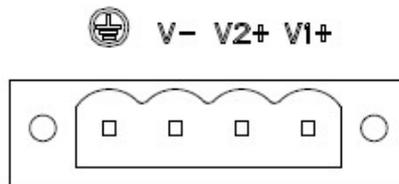


Figure 2.3 Power Pin Assignments

Table 2.6: Power Pin Assignments

Pin	Description
V1+	+ VDC 1
V2+	+ VDC 2
V-	PGND
	Chassis Grounding

2.6 Digital Input/Output

There are four digital inputs and two digital outputs on UNO-1110.

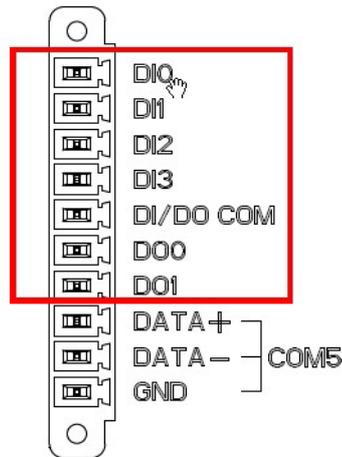


Figure 2.4 Digital I/O Pin Assignments

Figure 2.5 shows the digital input connection.

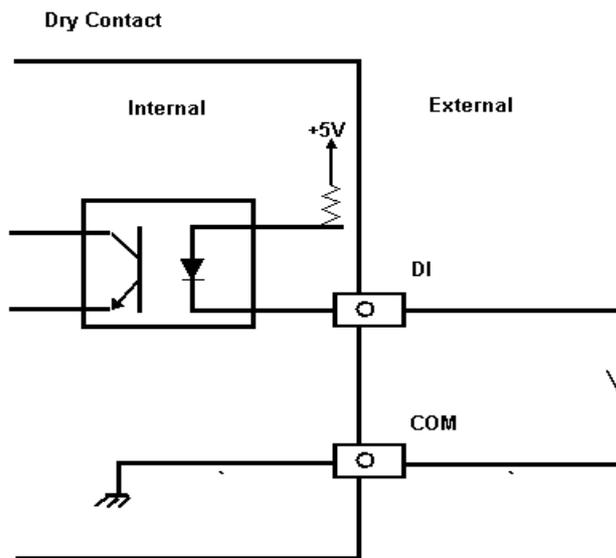


Figure 2.5 Digital Input Connection (Dry Contact)

UNO-1110 also provides two digital outputs connection, please refer below figure shows how to connect digital output function. (The default DO status is high)

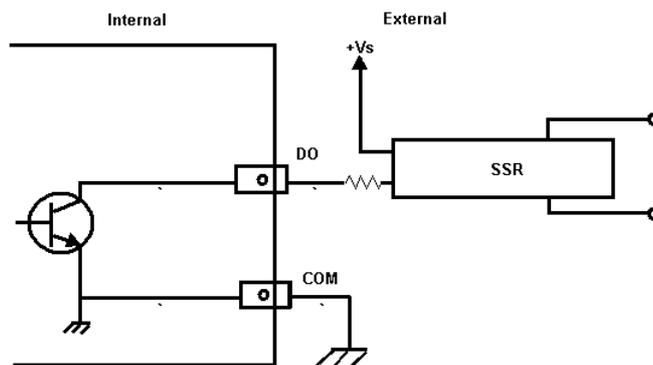


Figure 2.6 Digital Output Connections

2.7 Simulation DI

UNO-1110 provides four simulation DI lines via DIP switch setting located on the top side of UNO-1110.

Simulation DI is user-friendly design for users to setup different system parameters / configuration according to DIP switch setting.

Table 2.7: Simulation DI Setting

DIP Switch	Logic
ON	0
OFF	1

2.8 USB Connector

The USB interface supports Plug and Play, which enables you to connect or disconnect a device whenever you want, without turning off the computer.

The UNO-1110 provides four connectors of USB interfaces, which gives complete Plug & Play and hot swapping for up to 127 external devices. The USB interface complies with USB EHCI, Rev. 2.0 compliant.

Note! If use high power USB device, it is better plug-in device before system turn-ON.



Table 2.8: USB Connector Pin Assignments

Pin	Signal Name	Cable Color
1	VCC	Red
2	DATA-	White
3	DATA+	Green
4	GND	Black

2.9 VGA

The UNO-1110 provides a VGA 16bit converter (THS8136) for a high resolution VGA interface. CRT Mode: 1024 x 768 @ 60Hz, 800 x 600 @ 60Hz, 640 x 480 @ 60Hz.

Table 2.9: VGA Adaptor Cable Pin Assignments

Pin	Signal Name	Pin	Signal Name
1	RED	9	NC
2	GREEN	10	GND
3	BLUE	11	NC
4	NC	12	NC
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	NC
8	GND		

2.10 Reset Button

Press the “Reset” button to activate the reset function.

2.11 SD Slots

UNO-1110 provides two SD slots for OS (SD 1) and data storage (SD 2).

It is fully compliant with SD command / response sets as defined in the SD Memory Card Specifications, V2.0 including high capacity SDHC cards up to 32GB.

The procedure for installing a SD card into the UNO-1110 is detailed below, please follow these steps carefully

1. Make sure system power is off.
2. Remove the power cord.
3. Remove SD slot protection cover on the bottom side of UNO-1110.
4. Plug a SD card into a SD card slot.



2.12 Debug Port

Debug port is reserved for engineers to proceed hardware debug and / or console access.

Debug Port

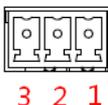


Table 2.10: Debug Port Pin Assignments

Pin	Description
1	TxD
2	RxD
3	GND

2.13 Mounting

UNO-1110 supports two different mounting methods: Wall & DIN-rail.

2.13.1 Wall Mounting

UNO-1110 can be wall mounted by using appropriate screws according to hole dimension shown below.

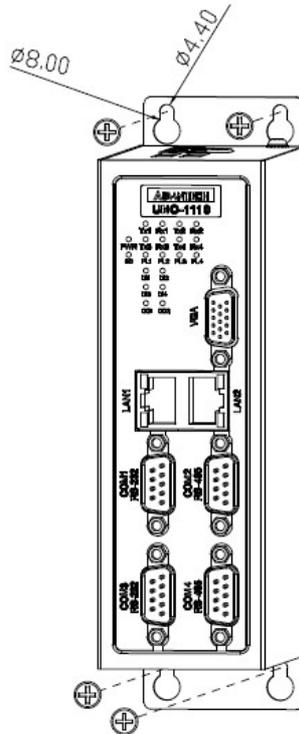


Figure 2.7 Wallmount Kit Hole Dimensions

Then, screw the whole device to the wall.

2.13.2 DIN-rail Mounting

UNO-1110 can be DIN-rail mounted by using the included DIN-rail mounting kit.

First, use the screws included in the package to combine the UNO-1110 and DIN-rail mounting kit.

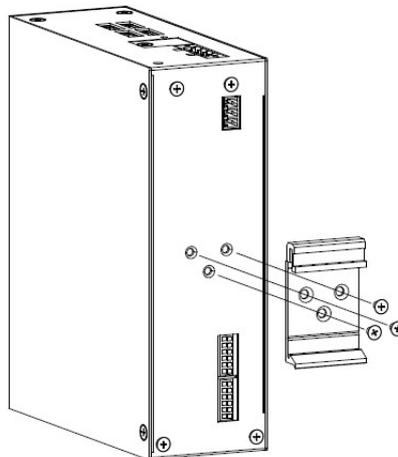


Figure 2.8 Combine the DIN-rail Mounting Kit

Then, hang the UNO-1110 to the DIN-rail with angle of inclination.

Chapter 3

Advanced Applications

This Chapter will provide detailed explanations of the UNO-1110's Advanced Applications

Sections include:

- Networking
- ActiveSync Connection
- Remote Access Configuration
- Autorun Configuration
- Application Development Procedure
- Saving Your Settings
- Create SD Card for booting
- Updating Image and Bootloader
- Network Administration User Guide

3.1 Networking

This section shows how to re-configure the IP of the UNO-1110 to meet your network configuration. The procedure is listed below step by step.

1. Press Start in the task bar of Windows and select “Setting” / “Networking and Dial-up connections”.

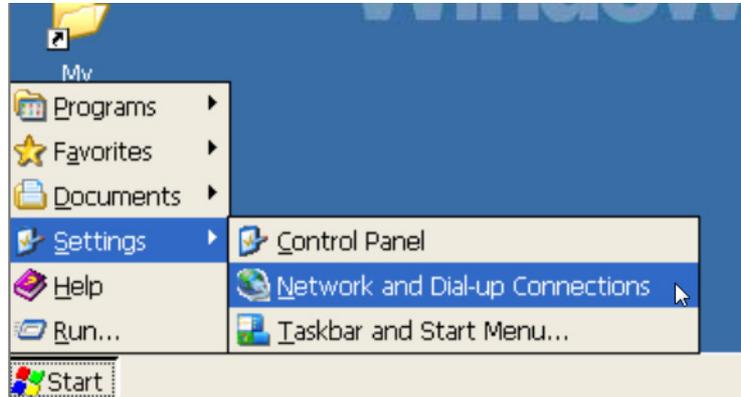


Figure 3.1 Network and Dial-up Connections

2. A window that shows all available connections will pop up. Double click the icon that has the connection you want to configure. For example, double click DM9CE1 icon to configure.



Figure 3.2 Selected Connection

3. Select the “IP Address” tab.
The default IP address for EMAC1 is: 10.0.0.1 / DM9CE1 is: 10.0.0.2 and the default Subnet mask is:255.255.255.0. So you can set your computer IP address to 10.0.0.3 and set the Subnet mask to 255.255.255.0.

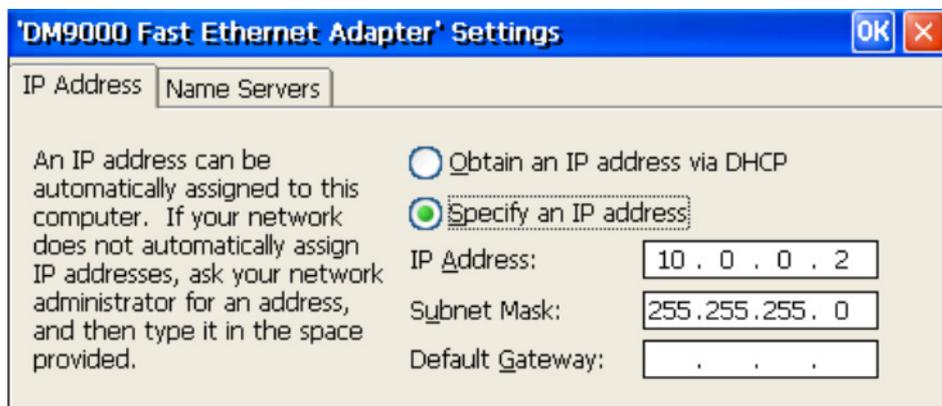


Figure 3.3 Setting IP Address

3.2 ActiveSync Connection

- Using a null-modem cable connect UNO-1110 COM1 with one of COM port on your computer
- Install Microsoft ActiveSync software on your computer and make the serial port you want connect with UNO-1110 available for ActiveSync (see ActiveSync help for details).

ActiveSync Connection

The tool is used for the application program on-line programming/debug requirement. User has to install the Microsoft ActiveSync program in configuration computer first. For the detail operating procedure of ActiveSync, please follow the steps by steps operating guide.

Step 1: Setting Up ActiveSync in a Configuration Computer

1. Install Microsoft ActiveSync 4.5 for Windows XP/ Windows Mobile Device Center 6.1 for Windows 7
2. Please connect the ActiveSync cable (Null Modem cable, Advantech part no. : 1703093000) to COM1 of UNO-1110 and the COM port of configuration computer for ActiveSync communication.

Step 2: Configure COM1 of UNO-1110

1. Press Start of task bar of window system and select “Settings” / “Network and Dial-up Connections”.

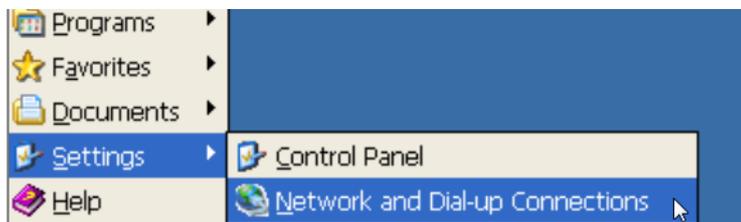


Figure 3.4 Network and Dial-up Connections

2. A window that shows all available connections will pop up. Click the properties of ActiveSync icon that has the connection you want to configure.

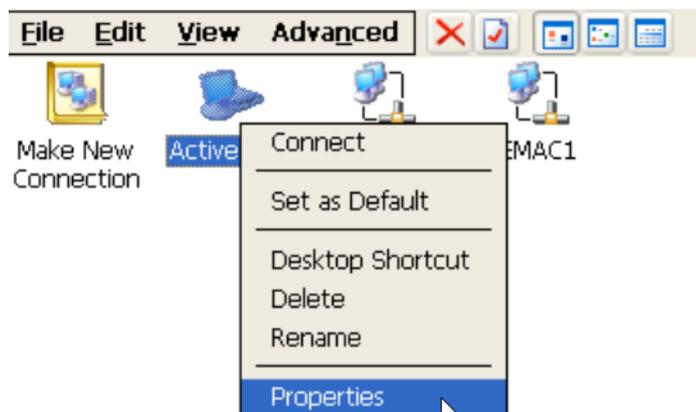


Figure 3.5 Selected Connection

3. Select the com port that you want to connect in UNO-1110.



Figure 3.6 Select a device

4. Select "Configure" that you can select the connection setting in UNO-1110. The default of Baud Rate is 57600.

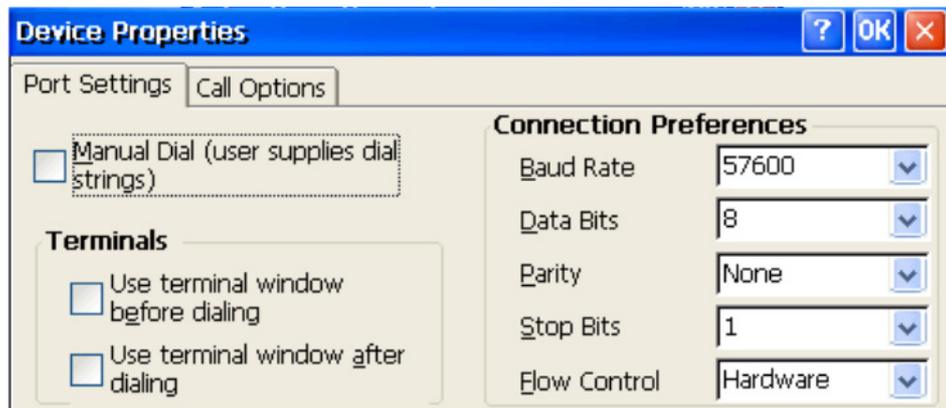


Figure 3.7 Device properties

Step 3: Setting Up the Communication Environment of the Host.

1. Double click the icon of ActiveSync.

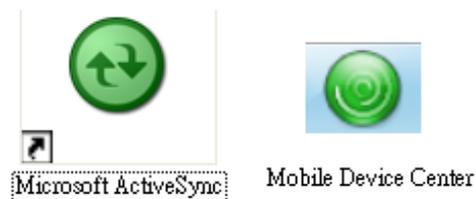


Figure 3.8 Icon of ActiveSync / Mobile Device Center

2. Select "Connection Settings".

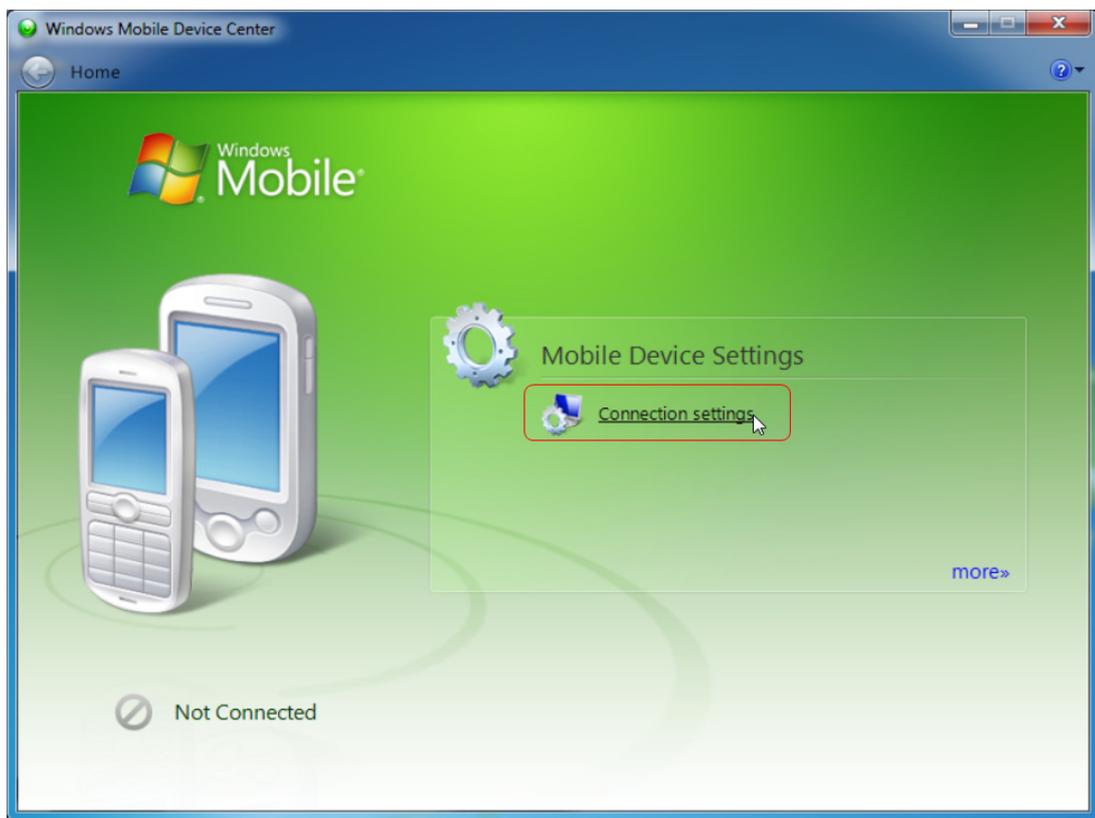
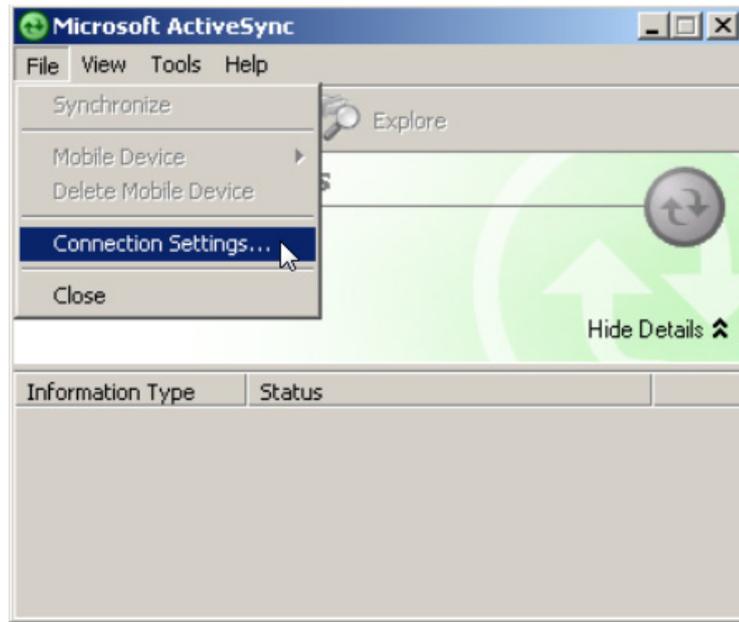


Figure 3.9 Selected Connection Settings

3. Configure the connection settings as below.

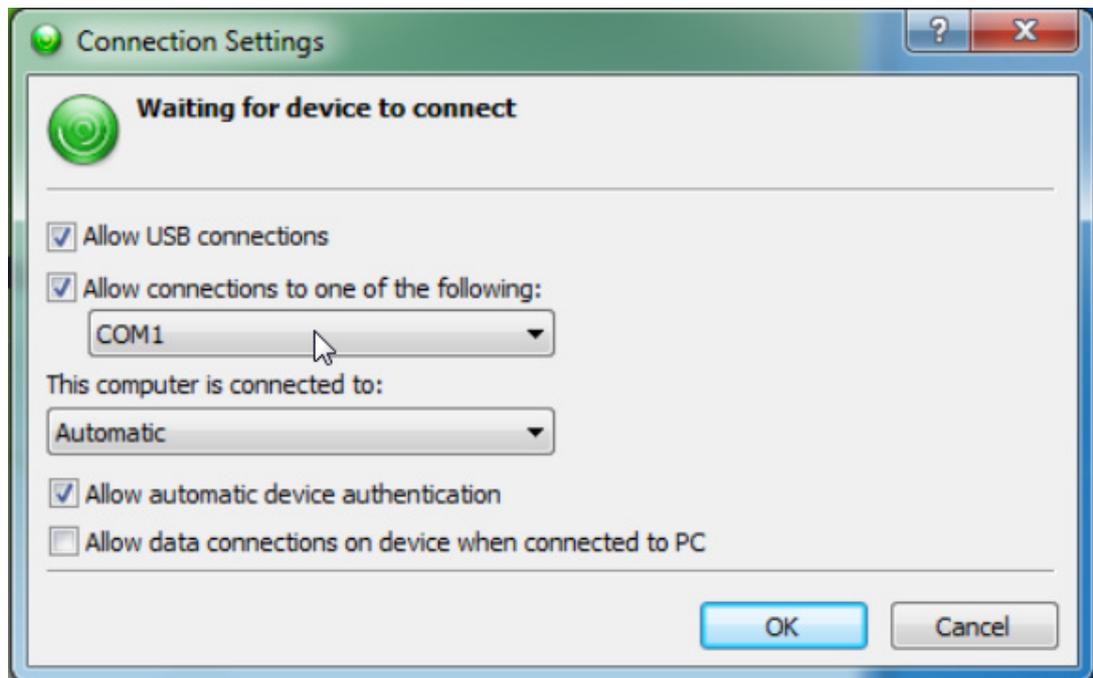
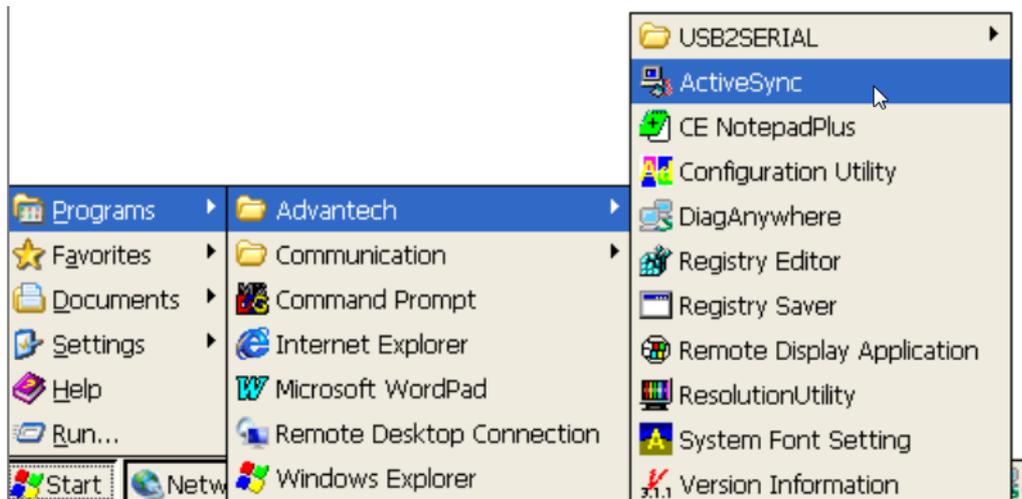


Figure 3.10 Allow connections to COM

Step 4: Connect the UNO-1110

1. Press Start of task bar of window system and select “Programs” / “Advantech” / “ActiveSync” in UNO-1110

**Figure 3.11 Connect ActiveSync**

2. If the connection between UNO-1110 and the host has been established, you will see below message in UNO-1110.

**Figure 3.12 ActiveSync Status**

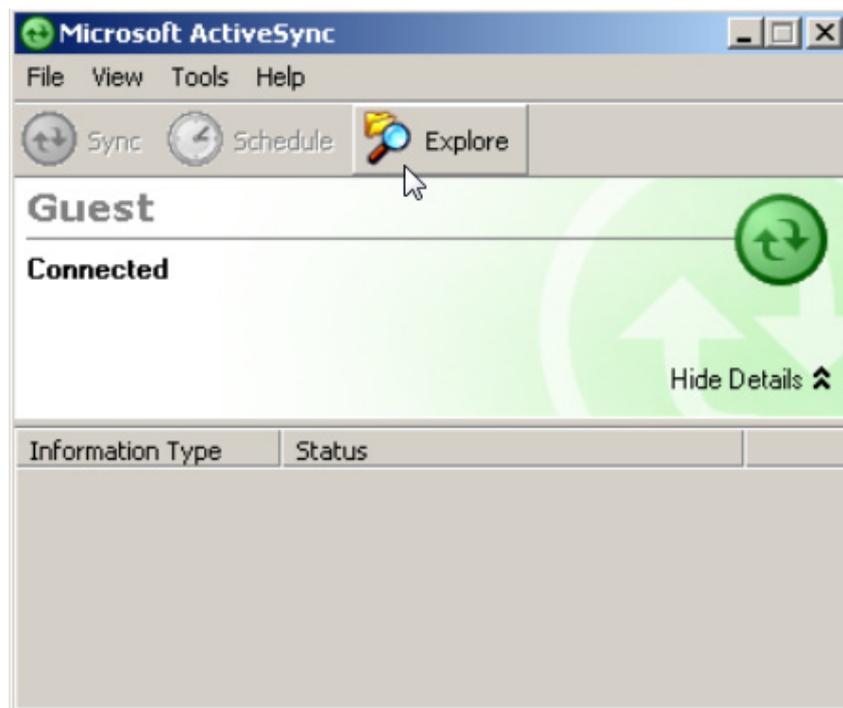
3. If the connection between UNO-1110 and the host has been established, you will see below message in the Windows XP.



Figure 3.13 Set up a Partnership

Select **No**, then press **Next** button.

After the new partnership setting, it will show the below dialog window in the host.



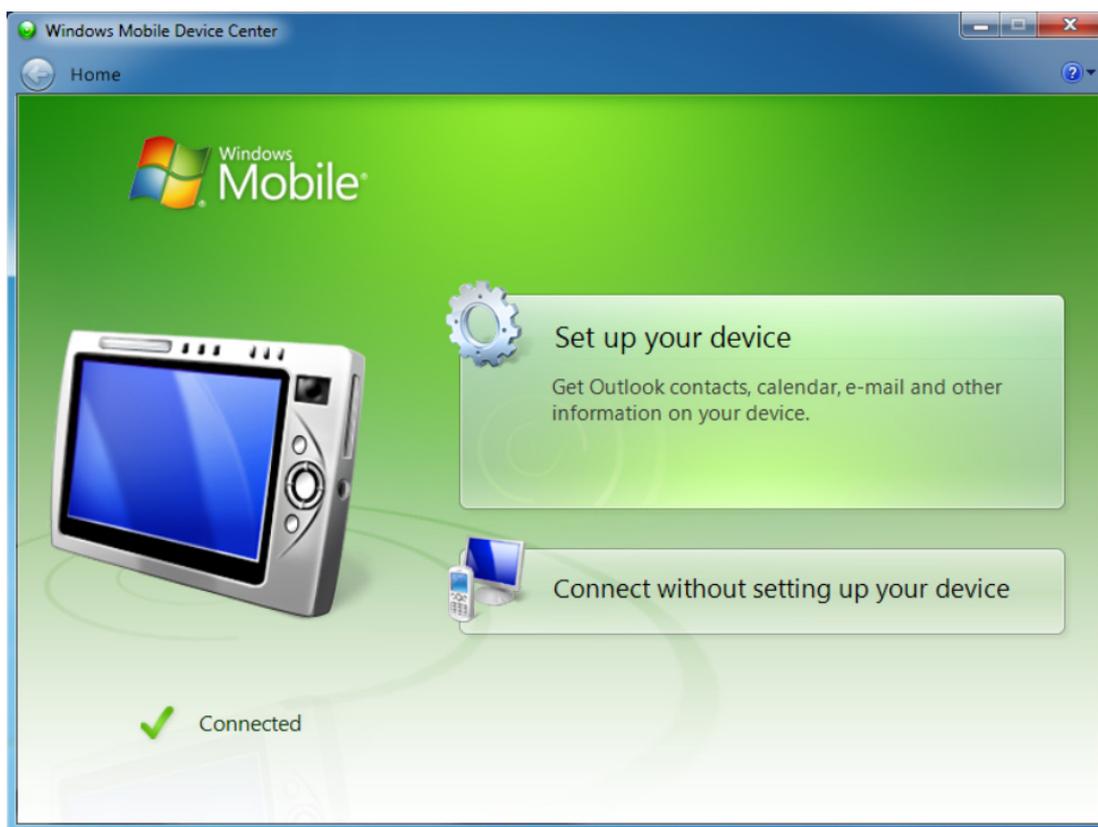
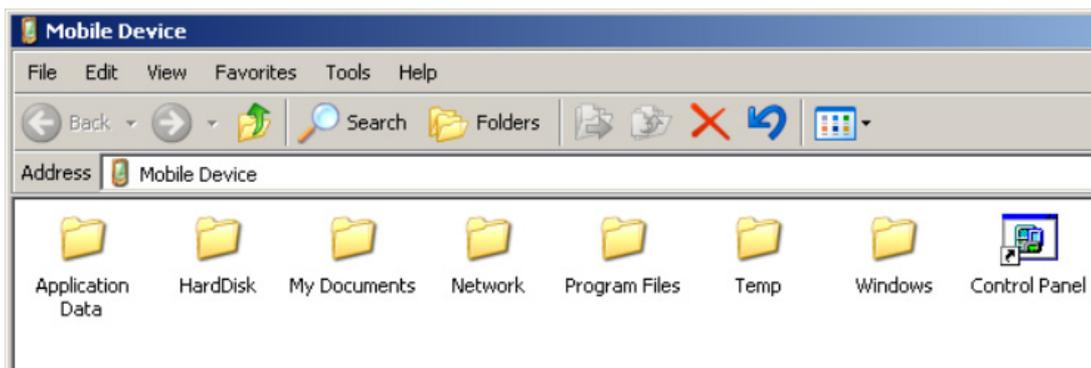


Figure 3.14 Connected Dialog

4. Press “Explore” in Microsoft ActiveSync window in Windows XP or Press “Connect without setting up your device” / “File Management” in Windows 7, it will pop up the Mobile Device window to display the file resources and information of UNO-1110 as below:

For example, if you click the icon “Mobile Device” in Windows XP or “UNO-1110” in Windows 7, you will see the content of storage in UNO-1110.



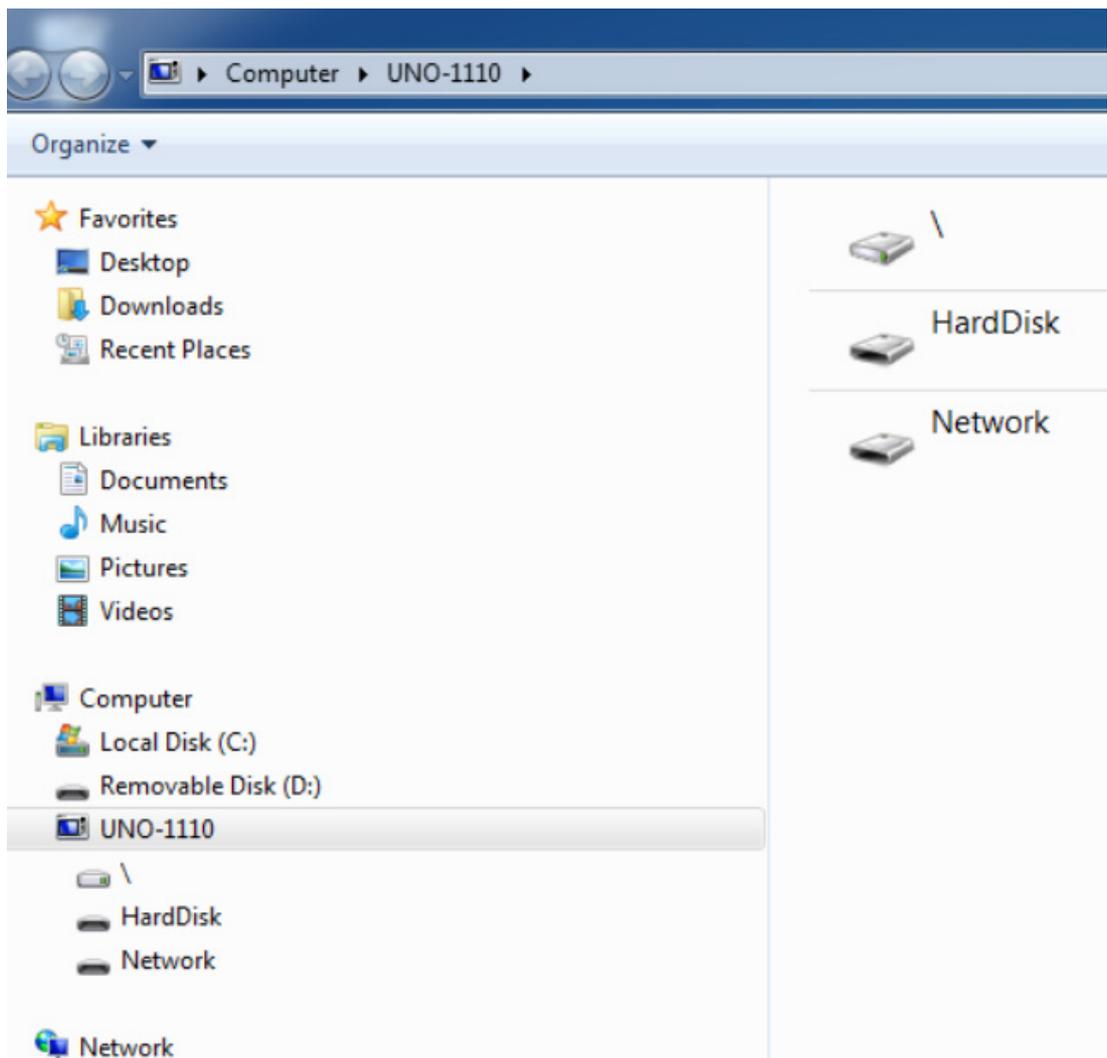


Figure 3.15 Content of UNO-1110

3.3 Remote Access Server Configuration

UNO-1110 provides “Remote Access Services” which offers the possibilities for remote network and user to have TCP/IP access local mail servers, access to database, web servers or other Intranet services.

The following description introduces how to set the dial-up and dial-in configuration.

Dial-up Configuration

1. Press start of task bar of window system and select “Settings” / “Networking and Dial-up Connections”.

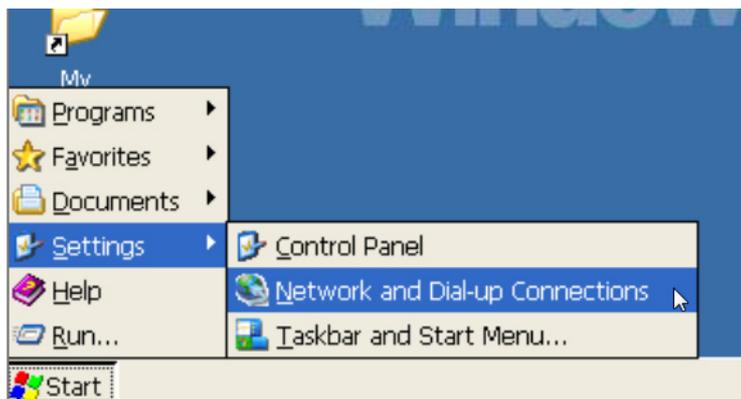


Figure 3.16 Network and Dial-up Connections

2. Double click “Make New Connection” and then a dialog window will pop out.



Figure 3.17 Selected Make New Connection

3. Select Dial-Up Connection and press Next >.



Figure 3.18 Make New Connection

4. Setup the device according to the specification of the modem and press Next >.

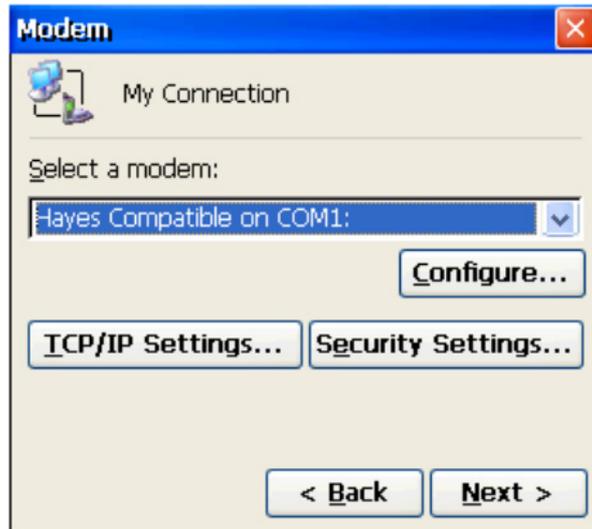


Figure 3.19 Selected a Modem

5. Enter the telephone number in the "Phone Number" window. Press Finish button to complete the dial-up configuration.



Figure 3.20 Enter the Telephone Number

6. Press start of task bar of window system and select “Setting” / “Networking and Dial-up connections”. Double click the new connection that you made previously (it is My Connection in this case), and it will pop out the “Dial-Up Connection” dialog window. Enter your user name / password and then press Dial Properties.

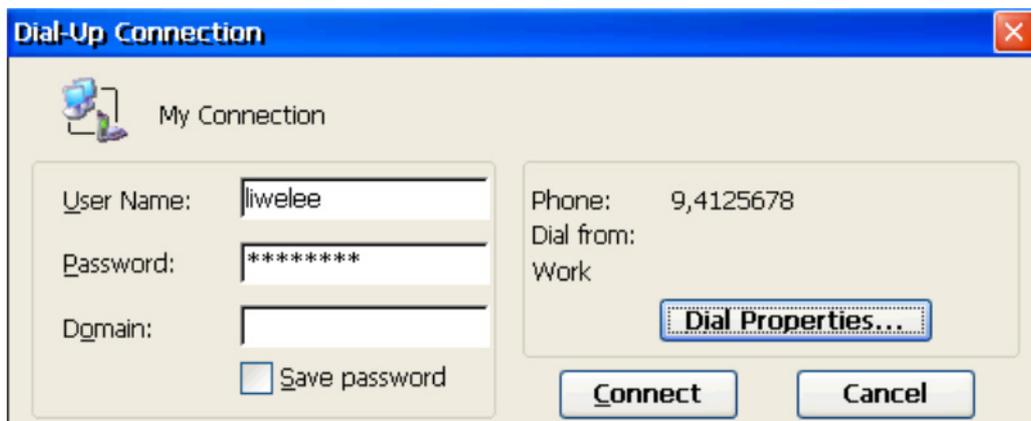


Figure 3.21 Dial-up Connection

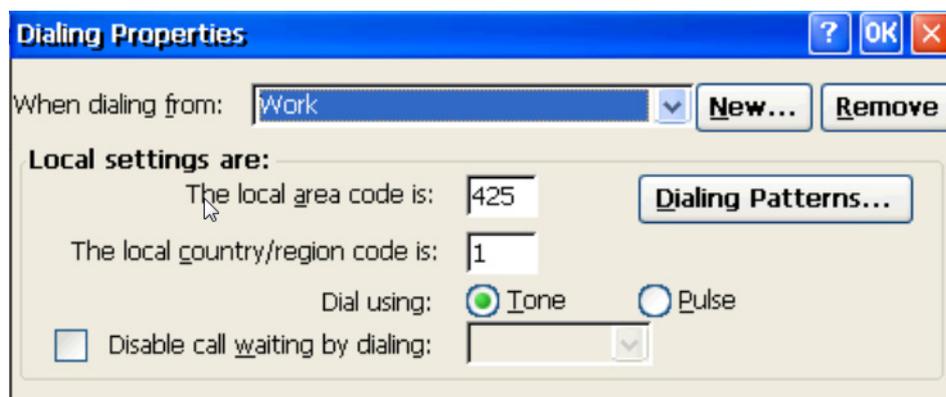


Figure 3.22 Dialing Properties

7. Press Dialing Patterns button in the Dialing Properties window.
Edit the dialing pattern for each type of call to change how the phone is dialed.

Note! Country/Region Code, please enter "E" or "e"



Area Code, please enter "F" or "f"

Number, please enter "G" or "g"

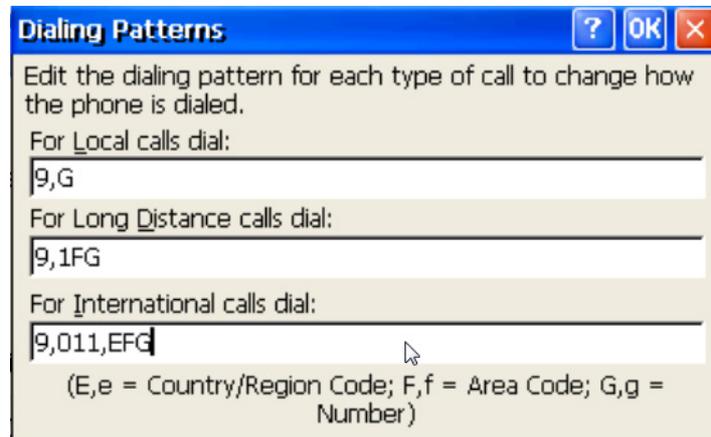


Figure 3.23 Dialing Patterns

8. Double click My Connection and press Connection button to build a PPP connection.

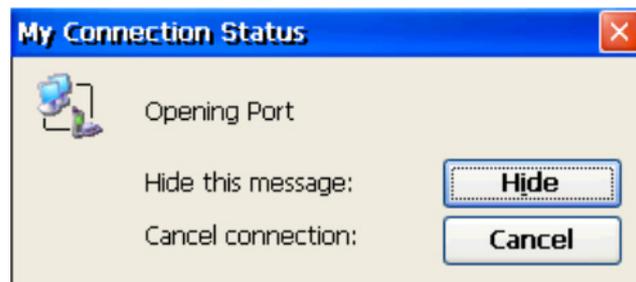


Figure 3.24 Status of My Connection

Dial-in Configuration

1. Press start of task bar of window system and select “Setting” / “Control Panel”.

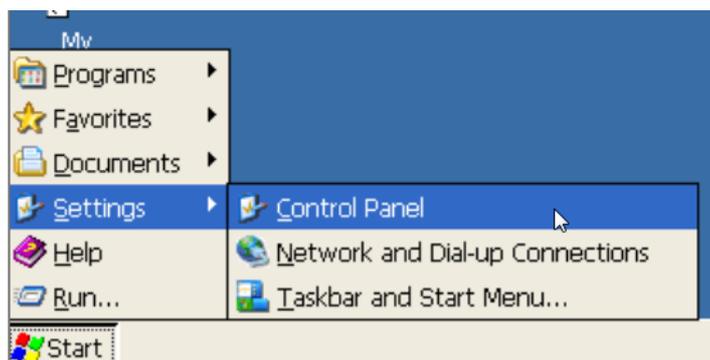


Figure 3.25 Selected Control Panel

2. Double click the RAS Server icon from Control Panel.



Figure 3.26 Selected RAS Server

3. Select the “General” tab under “Advantech RAS Server Configuration”. Select “Enable RAS”, “Use Static IP Address” and enter a specified IP in Static IP Address blank.

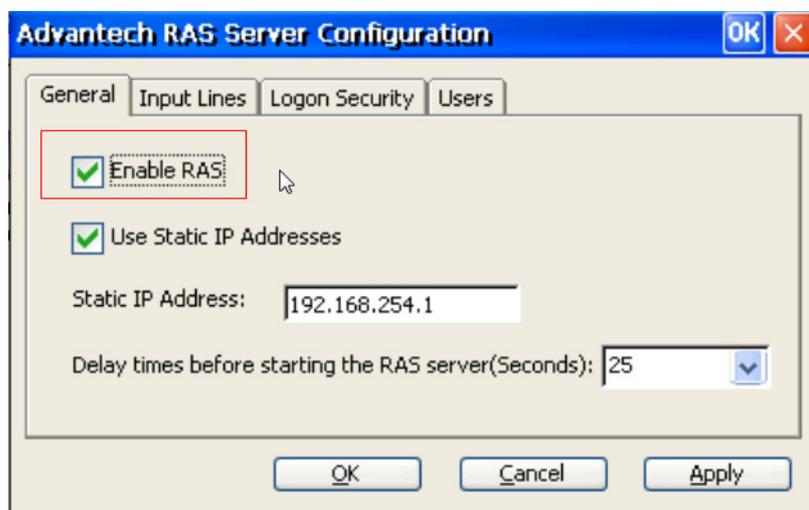


Figure 3.27 Advantech RAS Server Configuration (General)

4. Select the “Input Lines” tab under “Advantech RAS Server Configuration”. Click Add button to setup the input line according to the available RAS device.

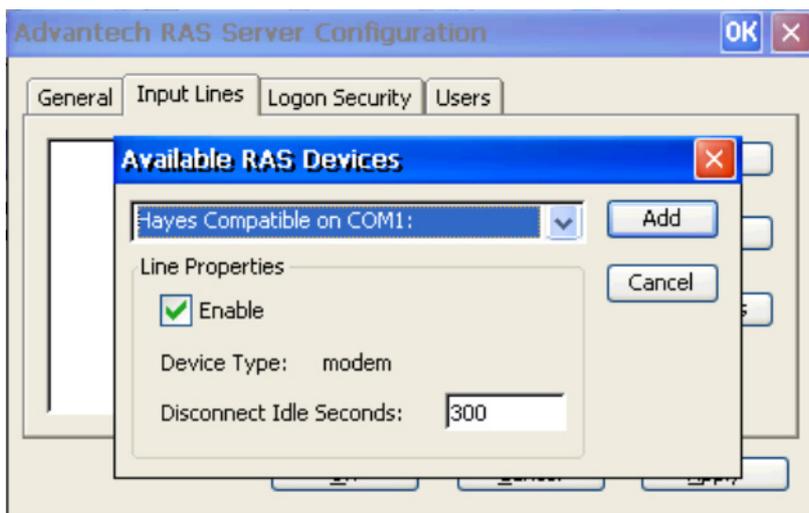


Figure 3.28 Advantech RAS Devices

5. Select the “Logon Security” tab under “Advantech RAS Server Configuration”. Select security protocol if necessary.



Figure 3.29 Advantech RAS Server Configuration (Logon Security)

6. Select the “Users” tab under “to add a new account for remote access services.

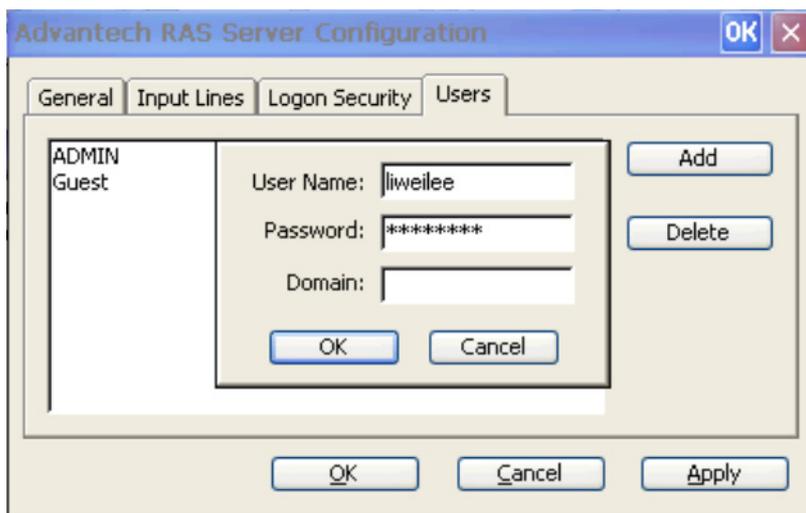


Figure 3.30 Advantech RAS Server Configuration (Users)

7. After all settings are completed, press OK button and then it will pop up the RasConfig dialog window. Press Yes button to save registry setting to storage card.



Figure 3.31 Save Registry Setting

RAS configuration procedure is completed and you can access UNO-1110 via remote device.

3.4 Auto-run Configuration

This document introduces how to execute applications automatically when you boot UNO-1110 up.

Auto-run Configuration Procedure

1. Press start of task bar of window system and select “Programs” / “Advantech” / “Configuration Utility”.



Figure 3.32 Selected Configuration Utility

2. Go to the “Misc” page in Configuration Utility.

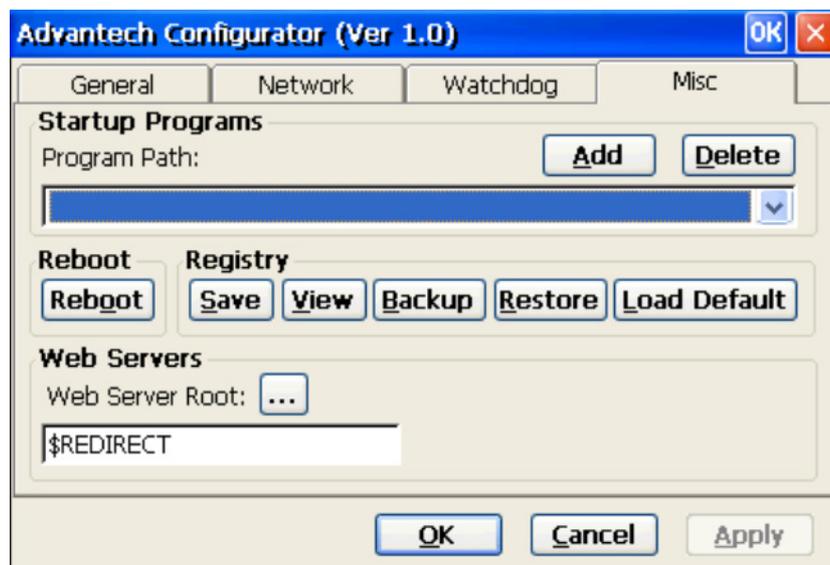


Figure 3.33 Advantech Configurator (Misc)

- Click on the “Add” button to set the program for Auto-Run action. Click on the “Program Path” button for selecting the program for Auto-Run setting.

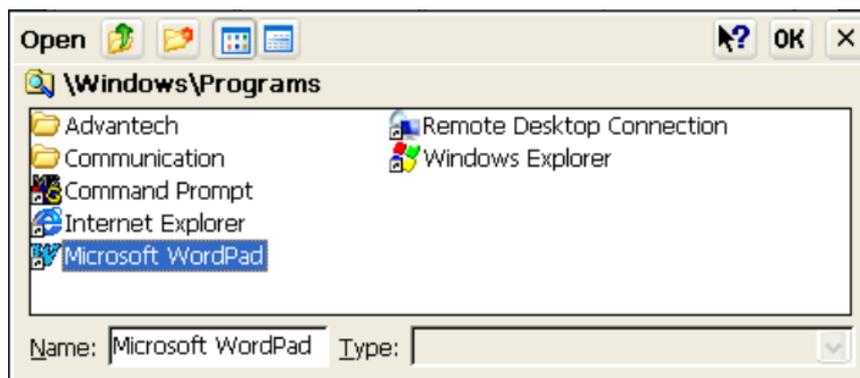


Figure 3.34 Select the Program

Please choose the program then press “OK”.

- The program and its path we choose will show the below dialog window.

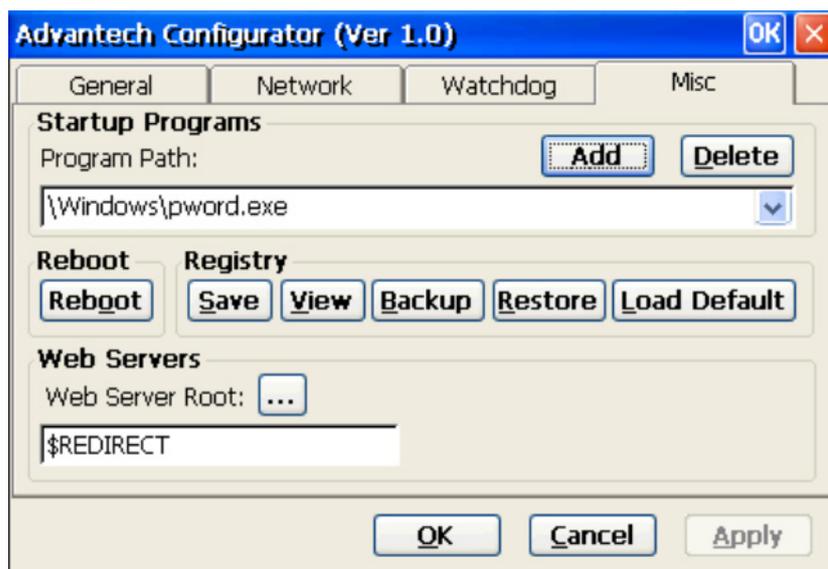


Figure 3.35 Add Program Success

The Configuration Utility will add the selected program in Auto-Run requirement. Please press “OK” to finish the configuration.

3.5 Application Development Procedure

UNO-1110 provides Software Development Kit (SDK) and a built-in runtime library; you can use your existing Windows-based programming skills to develop applications easily and rapidly through those tools. This document introduces how to develop custom application step by step.

3.5.1 Application Development Procedure

1. Install Microsoft Visual Studio 2005 with Service Pack 2
The Microsoft Visual Studio 2005 tool is a desktop development environment for creating applications and system components for Windows CE .NET-powered devices. This version features new capabilities such as C++ exception handling, Run Time Type Information (RTTI), and a plethora of new debugger functionalities. Before you begin to develop your application, you must install Microsoft Visual Studio 2005 first.
2. Insert UNO-1110 SD card into the USB slot in the host PC.
3. Install UNO-1110 Software Development Kit for Visual Studio 2005 from below path:
C:\Program Files\Windows CE Tools\wce600\
4. Execute Microsoft Visual Studio 2005
5. Select “File” / “New” to open a new project. Select your project type and enter the new project name / location in the window. Please note that CPU type must select Win32 (WCE ARMV4I).

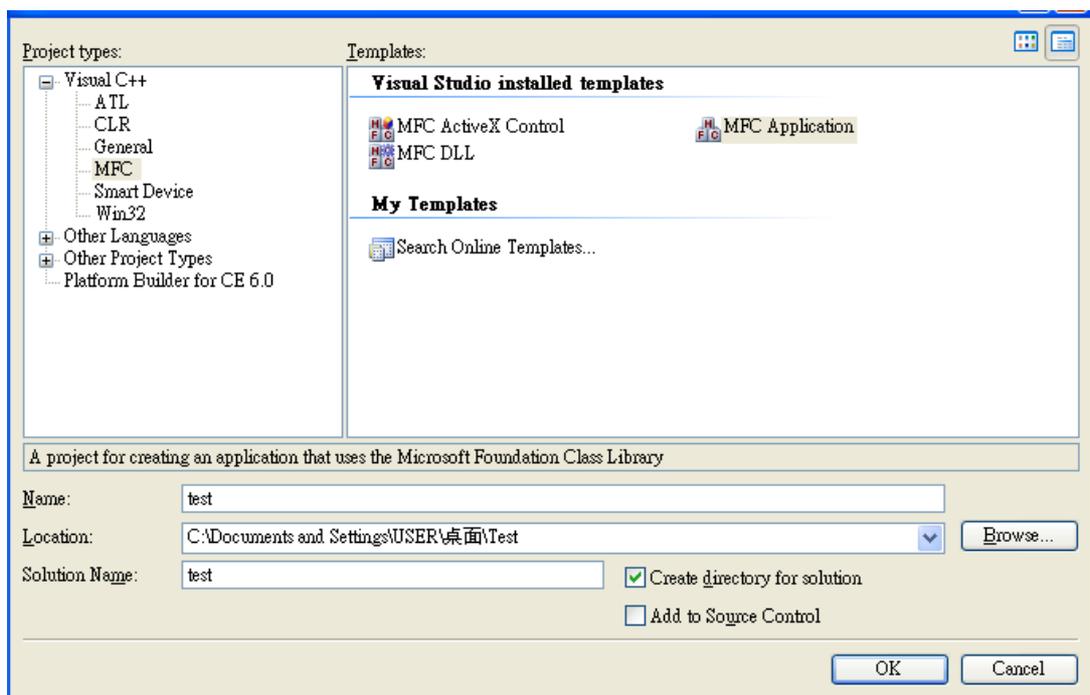


Figure 3.36 New Project of Visual Studio

6. Select “UNO-1110” in the main window of Visual Studio.

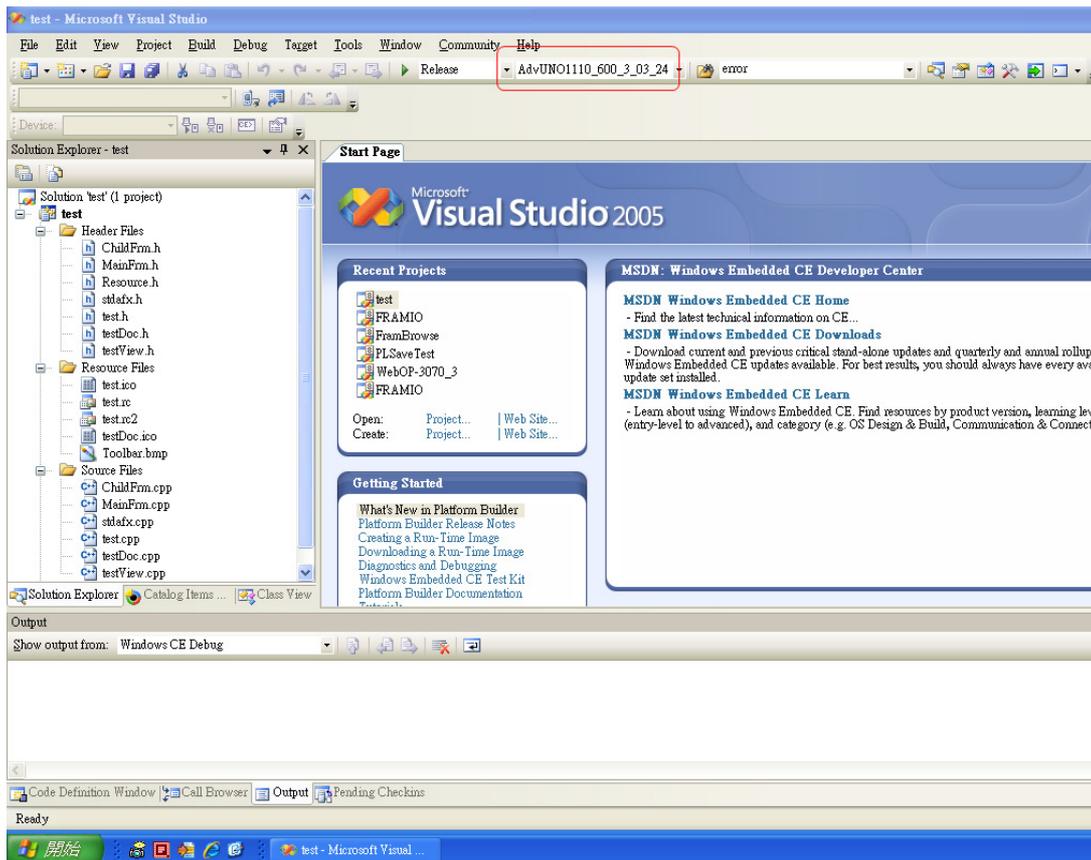


Figure 3.37 Selected SDK of UNO-1110

7. After you complete above configuration procedure, you can start to develop your application. Press “Build”/ “Build Solution” to compile your program to .exe file and download it to UNO-1110.

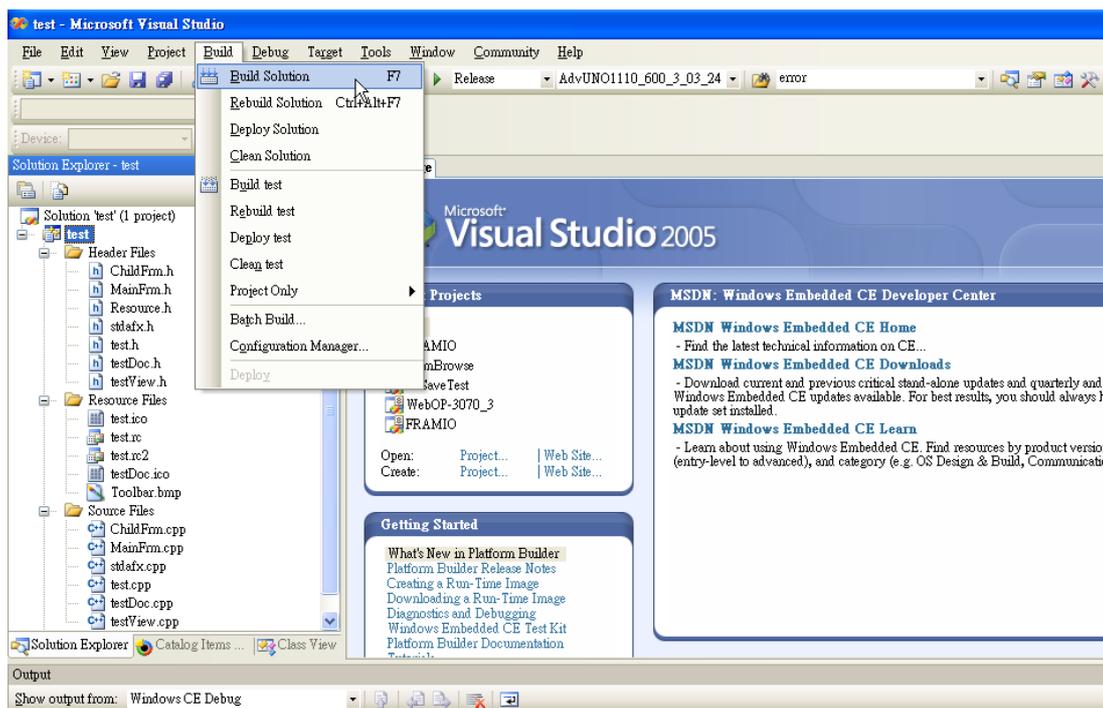


Figure 3.38 Select Build Solution

3.5.2 Watchdog Timer

There is a built-in watchdog timer in UNO-1110. Users can utilize the WDT driver with standard WIN32 API to implement the watchdog function in their applications. To use the watchdog driver, firstly user must open it via the name, "WDT1:", then use DeviceIOControl function to access the watchdog hardware. The introduction below includes the definition of DeviceIOControl and its parameters as well as an example.

How to Use the Control Code

There are 9 control codes for the operation codes in the WDT driver.

1. IOCTL_WDT_ENABLE:

Enable the Watchdog timer on your application. By default, if the Watchdog timer is enabled, the WDT driver will automatically reload the timeout counter after a specified period and your application does not need to trigger the strobe periodically for masking the timeout, unless use IOCTL_WDT_REBOOT timeout to stop this automatic strobe triggering.

lpInBuffer: unused.

nInBufferSize: unused.

lpOutBuffer: unused.

nOutBufferSize: unused.

2. IOCTL_WDT_DISABLE:

Disable the Watchdog timer on your application.

lpInBuffer: unused.

nInBufferSize: unused.

lpOutBuffer: unused.

nOutBufferSize: unused.

3. IOCTL_WDT_STROBE:

Trigger strobe signal to reload watchdog timeout counter. If your application uses IOCTL_WDT_ENABLE to enable the Watchdog first and then sends IOCTL_WDT_REBOOT to the WDT driver, your application must trigger the Watchdog once during the Watchdog timer period. If your application has not triggered at the specified period, the device will re-boot automatically.

lpInBuffer: unused.

nInBufferSize: unused.

lpOutBuffer: unused.

nOutBufferSize: unused.

4. IOCTL_WDT_GET_TIMEOUT:

Get the Watchdog timeout value.

lpInBuffer: unused.

nInBufferSize: unused.

lpOutBuffer: The DWORD pointer to your Watchdog timeout setting. The Watchdog timeout setting is just a number. 0 means 2 seconds, 1 means 5 seconds, 2 means 10 seconds, 3 means 15 seconds, 4 means 30 seconds, 5 means 45 seconds, 6 means 60 seconds, 7 means 120 seconds, 8 means 300 seconds, 9 means 600 sec-

onds, 10 means 900 seconds, others means the maximum 1140 seconds. The default setting is 5 seconds.

nOutBufferSize: unused.

5. IOCTL_WDT_SET_TIMEOUT:

Set the Watchdog timeout value.

lpInBuffer: The DWORD pointer to your Watchdog timeout setting. The Watchdog timeout setting is just a number. 0 means 2 seconds, 1 means 5 seconds, 2 means 10 seconds, 3 means 15 seconds, 4 means 30 seconds, 5 means 45 seconds, 6 means 60 seconds, 7 means 120 seconds, 8 means, 300 seconds, 9 means 600 seconds, 10 means 900 seconds, others means the maximum 1140 seconds. The default setting is 5 seconds.

nInBufferSize: unused.

lpOutBuffer: unused.

nOutBufferSize: unused.

6. IOCTL_WDT_REBOOT:

If you want your application to trigger the Watchdog by itself, please use IOCTL_WDT_REBOOT to notify the WDT driver. Otherwise, the WDT will trigger itself automatically.

lpInBuffer: unused.

nInBufferSize: unused.

lpOutBuffer: unused.

nOutBufferSize: unused.

7. IOCTL_WDT_GET_CHIPSET_TYPE:

Get the chip select type in reg.

lpInBuffer: unused.

nInBufferSize: unused.

lpOutBuffer: The DWORD pointer to the ChipsetType value in reg.

nOutBufferSize: unused.

8. IOCTL_WDT_GET_ENABLE_STATUS:

Get the status of the Watchdog timer is enable or not.

lpInBuffer: unused.

nInBufferSize: unused.

lpOutBuffer: The DWORD pointer to the status of your Watchdog timer enable setting.

nOutBufferSize: unused.

9. IOCTL_WDT_GET_REBOOT_STATUS:

Get the status of the Watchdog is triggered by itself or not

lpInBuffer: unused.

nInBufferSize: unused.

lpOutBuffer: The DWORD pointer to the status of your Watchdog re-boot setting.

nOutBufferSize: unused.

DeviceIoControl

This function sends a control code directly to a specified device driver, causing the corresponding device to perform the specified operation.

```
BOOL DeviceIoControl(  
    HANDLE hDevice,  
    DWORD dwIoControlCode,  
    LPVOID lpInBuffer,  
    DWORD nInBufferSize,  
    LPVOID lpOutBuffer,  
    DWORD nOutBufferSize,  
    LPDWORD lpBytesReturned,  
    LPOVERLAPPED lpOverlapped  
);
```

Parameters:

. hDevice

[in] Handle to the device that is to perform the operation. Call the CreateFile function to obtain a device handle.

. dwIoControlCode

[in] Specifies the control code for the operation. This value identifies the specific operation to be performed and the type of device on which the operation is to be performed. No specific values are defined for the dwIoControlCode parameter. However, the writer of a custom device driver can define IOCTL_XXXX control codes, per the CTL_CODE macro. These control codes can then be advertised, and an application can use these control codes with DeviceIoControl to perform driver specific functions.

. lpInBuffer

[in] Long pointer to a buffer that contains the data required to perform the operation. This parameter can be NULL if the dwIoControlCode parameter specifies an operation that does not require input data.

. nInBufferSize

[in] Size, in bytes, of the buffer pointed to by lpInBuffer.

. lpOutBuffer

[out] Long pointer to a buffer that receives the output data for the operation. This parameter can be NULL if the dwIoControlCode parameter specifies an operation that does not produce output data.

. nOutBufferSize

[in] Size, in bytes, of the buffer pointed to by lpOutBuffer.

. lpBytesReturned

[out] Long pointer to a variable that receives the size, in bytes, of the data stored into the buffer pointed to by lpOutBuffer. The lpBytesReturned parameter cannot be NULL. Even when an operation produces no output data, and lpOutBuffer can be NULL, the DeviceIoControl function makes use of the variable pointed to by lpBytesReturned. After such an operation, the value of the variable is without meaning.

. lpOverlapped

[in] Ignored; set to NULL.

. Return Values

Nonzero indicates success. Zero indicates failure. To get extended error information, call `GetLastError`.

Examples

```
#define IOCTL_WDT_ENABLE CTL_CODE(FILE_DEVICE_UNKNOWN, 0x900,
METHOD_BUFFERED, FILE_ANY_ACCESS)
#define IOCTL_WDT_DISABLE CTL_CODE(FILE_DEVICE_UNKNOWN, 0x901,
METHOD_BUFFERED, FILE_ANY_ACCESS)
#define IOCTL_WDT_STROBE CTL_CODE(FILE_DEVICE_UNKNOWN, 0x902,
METHOD_BUFFERED, FILE_ANY_ACCESS)
#define IOCTL_WDT_GET_TIMEOUT CTL_CODE(FILE_DEVICE_UNKNOWN,
0x903, METHOD_BUFFERED, FILE_ANY_ACCESS)
#define IOCTL_WDT_SET_TIMEOUT CTL_CODE(FILE_DEVICE_UNKNOWN,
0x904, METHOD_BUFFERED, FILE_ANY_ACCESS)
#define IOCTL_WDT_REBOOT
CTL_CODE(FILE_DEVICE_UNKNOWN, 0x905, METHOD_BUFFERED,
FILE_ANY_ACCESS)
#define IOCTL_WDT_GET_CHIPSET_TYPE
CTL_CODE(FILE_DEVICE_UNKNOWN, 0x906, METHOD_BUFFERED,
FILE_ANY_ACCESS)
#define IOCTL_WDT_GET_ENABLE_STATUS
CTL_CODE(FILE_DEVICE_UNKNOWN, 0x907,
METHOD_BUFFERED, FILE_ANY_ACCESS)
#define IOCTL_WDT_GET_REBOOT_STATUS
CTL_CODE(FILE_DEVICE_UNKNOWN, 0x908,
METHOD_BUFFERED, FILE_ANY_ACCESS)

HANDLE g_hWDT=NULL;
TCHAR szClassName[60];

// assign the WDT driver name
wsprintf(szClassName, TEXT("WDT1:"));
// Open the WDT driver
g_hWDT = CreateFile(szClassName, GENERIC_READ|GENERIC_WRITE,
0, NULL, OPEN_EXISTING, FILE_ATTRIBUTE_NORMAL, NULL);
if ( g_hWDT != INVALID_HANDLE_VALUE ) {
    printf("Createfile Success \r\n");
}

DWORD dwTemp;
DWORD m_dwChipsetType;
UINT m_nTimerSpanIndex;
UINT m_nEnableStatus;
int nIndex;
// get the chip type of watchdog timer.
```

```

DeviceIoControl(g_hWDT, IOCTL_WDT_GET_CHIPSET_TYPE, NULL, 0,
&m_dwChipsetType, 1, &dwTemp, NULL);

// get timer span index of watchdog
DeviceIoControl(g_hWDT, IOCTL_WDT_GET_TIMEOUT, NULL, 0,
&m_nTimerSpanIndex, 1, &dwTemp, NULL);

// get enable status of watchdog
DeviceIoControl(g_hWDT, IOCTL_WDT_GET_ENABLE_STATUS, NULL, 0, &m_nEnableStatus, 1, &dwTemp, NULL);

//Set Watchdog timer span index
DeviceIoControl(g_hWDT, IOCTL_WDT_SET_TIMEOUT, &nIndex, 0,
NULL, 0, NULL, NULL);

//enable watchdog timer
DeviceIoControl(g_hWDT, IOCTL_WDT_ENABLE, NULL, 0, NULL, 0,
NULL, NULL);

// Activate timeout reboot
DeviceIoControl(g_hWDT, IOCTL_WDT_REBOOT, NULL, 0, NULL, 0,
NULL, NULL);

//Refresh the watchdog timer
DeviceIoControl(g_hWDT, IOCTL_WDT_STROBE, NULL, 0, NULL, 0,
NULL, NULL);

//disable watchdog timer
DeviceIoControl(g_hWDT, IOCTL_WDT_DISABLE, NULL, 0, NULL, 0,
NULL, NULL);

CloseHandle(g_hWDT);

```

3.5.3 Simulation DI, DIO and User Programmable LED

UNO-1110 has 4 Simulation DI (Digital Input), 4 DI, 2 DO (Digital Output) and 4 User Programmable LEDs. Users can access these resources via the built-in Advantech IO Service driver named "ADV1.".The follows are the descriptions and examples of the usable DeviceIoControl codes in this driver:

How to Use the Control Code

There are 11 control codes for the operation codes in DIO and LED (driver).

1. ADV_IOCTL_READ_DI:

Read the Digital Input value.

lpInBuffer: unused.

nInBufferSize: unused.

lpOutBuffer: The BYTE pointer to the current Simulation DI (BIT4~ BIT7) or DI (BIT0~ BIT3) value. BIT0 indicates DI_0 state; BIT1 indicates DI_1 state.

nOutBufferSize: User provided output buffer size.

2. ADV_IOCTL_WRITE_DO:

Write value out the Digital Output.

lpInBuffer: The BYTE pointer to the DO value that is requesting to write out. BIT0 indicates DO_0 state; BIT1 indicates DO_1 state.

nInBufferSize: User provided input buffer size.

lpOutBuffer: unused.

nOutBufferSize: unused.

3. ADV_IOCTL_READ_DO:

Read the written Digital Output value.

lpInBuffer: unused.

nInBufferSize: unused.

lpOutBuffer: The BYTE pointer to the current DO value. BIT0 indicates DO_0 state; BIT1 indicates DO_1 state.

nOutBufferSize: User provided input buffer size.

4. ADV_IOCTL_TURN_ON_LED1:

Turn LED1 on.

lpInBuffer :unused.

nInBufferSize: unused.

lpOutBuffer: unused.

nOutBufferSize: unused.

5. ADV_IOCTL_TURN_OFF_LED1:

Turn LED1 off.

lpInBuffer: unused.

nInBufferSize: unused.

lpOutBuffer: unused.

nOutBufferSize: unused.

6. ADV_IOCTL_TURN_ON_LED2:

Turn LED2 on.

lpInBuffer :unused.

nInBufferSize: unused.

lpOutBuffer: unused.

nOutBufferSize: unused.

7. ADV_IOCTL_TURN_OFF_LED2:

Turn LED2 off.

lpInBuffer :unused.

nInBufferSize: unused.

lpOutBuffer: unused.

nOutBufferSize: unused.

8. ADV_IOCTL_TURN_ON_LED3:

Turn LED3 on.

lpInBuffer :unused.

nInBufferSize: unused.

lpOutBuffer: unused.

nOutBufferSize: unused.

9. ADV_IOCTL_TURN_OFF_LED3:

Turn LED3 off.

lpInBuffer: unused.

nInBufferSize: unused.

lpOutBuffer: unused.

nOutBufferSize: unused.

10. ADV_IOCTL_TURN_ON_LED4:

Turn LED4 on.

lpInBuffer: unused.

nInBufferSize: unused.

lpOutBuffer: unused.

nOutBufferSize: unused.

11. ADV_IOCTL_TURN_OFF_LED4:

Turn LED4 off.

lpInBuffer: unused.

nInBufferSize: unused.

lpOutBuffer: unused.

nOutBufferSize: unused.

DeviceIOControl

This function sends a control code directly to a specified device driver, causing the corresponding device to perform the specified operation.

```

BOOL DeviceIoControl(
    HANDLE hDevice,
    DWORD dwIoControlCode,
    LPVOID lpInBuffer,
    DWORD nInBufferSize,
    LPVOID lpOutBuffer,
    DWORD nOutBufferSize,
    LPDWORD lpBytesReturned,
    LPOVERLAPPED lpOverlapped
);

```

Parameters:

. hDevice

[in] Handle to the device that is to perform the operation. Call the CreateFile function to obtain a device handle.

. dwIoControlCode

[in] Specifies the control code for the operation. This value identifies the specific operation to be performed and the type of device on which the operation is to be performed. No specific values are defined for the dwIoControlCode parameter. However, the writer of a custom device driver can define IOCTL_XXXX control codes, per the CTL_CODE macro. These control codes can then be advertised, and an application can use these control codes with DeviceIoControl to perform driver specific functions.

. lpInBuffer

[in] Long pointer to a buffer that contains the data required to perform the operation. This parameter can be NULL if the dwIoControlCode parameter specifies an operation that does not require input data.

. nInBufferSize

[in] Size, in bytes, of the buffer pointed to by lpInBuffer.

. lpOutBuffer

[out] Long pointer to a buffer that receives the output data for the operation. This parameter can be NULL if the dwIoControlCode parameter specifies an operation that does not produce output data.

. nOutBufferSize

[in] Size, in bytes, of the buffer pointed to by lpOutBuffer.

. lpBytesReturned

[out] Long pointer to a variable that receives the size, in bytes, of the data stored into the buffer pointed to by lpOutBuffer. The lpBytesReturned parameter cannot be NULL. Even when an operation produces no output data, and lpOutBuffer can be NULL, the DeviceIoControl function makes use of the variable pointed to by lpBytesReturned. After such an operation, the value of the variable is without meaning.

. lpOverlapped

[in] Ignored; set to NULL.

. Return Values

Nonzero indicates success. Zero indicates failure. To get extended error information, call GetLastError.

Examples

```
#define ADV_IOCTL_READ_DI CTL_CODE(FILE_DEVICE_UNKNOWN, 0x00,  
METHOD_BUFFERED, FILE_ANY_ACCESS)  
#define ADV_IOCTL_WRITE_DO CTL_CODE(FILE_DEVICE_UNKNOWN, 0x01,  
METHOD_BUFFERED, FILE_ANY_ACCESS)  
#define ADV_IOCTL_READ_DO CTL_CODE(FILE_DEVICE_UNKNOWN, 0x02,  
METHOD_BUFFERED, FILE_ANY_ACCESS)  
  
#define ADV_IOCTL_TURN_ON_LED1  
CTL_CODE(FILE_DEVICE_UNKNOWN, 0x03, METHOD_BUFFERED,  
FILE_ANY_ACCESS)  
#define ADV_IOCTL_TURN_OFF_LED1  
CTL_CODE(FILE_DEVICE_UNKNOWN, 0x04, METHOD_BUFFERED,  
FILE_ANY_ACCESS)  
#define ADV_IOCTL_TURN_ON_LED2  
CTL_CODE(FILE_DEVICE_UNKNOWN, 0x05, METHOD_BUFFERED,  
FILE_ANY_ACCESS)  
#define ADV_IOCTL_TURN_OFF_LED2  
CTL_CODE(FILE_DEVICE_UNKNOWN, 0x06, METHOD_BUFFERED,  
FILE_ANY_ACCESS)  
#define ADV_IOCTL_TURN_ON_LED3  
CTL_CODE(FILE_DEVICE_UNKNOWN, 0x07, METHOD_BUFFERED,  
FILE_ANY_ACCESS)  
#define ADV_IOCTL_TURN_OFF_LED3  
CTL_CODE(FILE_DEVICE_UNKNOWN, 0x08, METHOD_BUFFERED,  
FILE_ANY_ACCESS)  
#define ADV_IOCTL_TURN_ON_LED4  
CTL_CODE(FILE_DEVICE_UNKNOWN, 0x09, METHOD_BUFFERED,  
FILE_ANY_ACCESS)  
#define ADV_IOCTL_TURN_OFF_LED4  
CTL_CODE(FILE_DEVICE_UNKNOWN, 0x0A,  
METHOD_BUFFERED, FILE_ANY_ACCESS)  
  
HANDLE g_hDIO=NULL, g_hLED=NULL;  
DWORD i, dwGot, dwNumReturned;  
UCHAR io_value = 0x00;  
int index;  
  
IO Test Program (DO_0 for example)  
g_hDIO = CreateFile(TEXT("ADV1:"), GENERIC_READ|GENERIC_WRITE,  
0, NULL, OPEN_EXISTING, FILE_ATTRIBUTE_NORMAL, NULL);  
  
if (!g_hDIO)  
{  
    printf("Failed to Open handle!\r\n");  
}
```

```

    return 0;
}

//Read DI
if(!DeviceIoControl(g_hDIO,    ADV_IOCTL_READ_DI,    NULL,    0,
&io_value, sizeof(UCHAR), NULL, NULL))
{
    printf("Failed to Read DI value!\r\n");
    return 0;
}

if(io_value)
{
    if(io_value & 0x01) printf("DI_0 ON\r\n");
    else printf("DI_0 OFF\r\n");

    if(io_value & 0x02) printf("DI_1 ON\r\n");
    else printf("DI_1 OFF\r\n");

    if(io_value & 0x04) printf("DI_2 ON\r\n");
    else printf("DI_2 OFF\r\n");

    if(io_value & 0x08) printf("DI_3 ON\r\n");
    else printf("DI_3 OFF\r\n");
}
else
{
    printf("DI_0 OFF, DI_1 OFF, DI_2 OFF, DI_3 OFF \r\n")
}

index=0; //DO_0 for example

// DO_0 Set true
if(!DeviceIoControl(g_hDIO,    ADV_IOCTL_READ_DO,    NULL,    0,
&io_value, sizeof(UCHAR), NULL, NULL))
{
    printf("Failed to Read DO value! \r\n")
    return 0;
}

io_value |= (UCHAR)index+1;

if(!DeviceIoControl(g_hDIO,    ADV_IOCTL_WRITE_DO,    &io_value,
sizeof(UCHAR), NULL, 0, NULL, NULL))
{

```

```

        printf("Failed to Write DO value!\r\n")
        return 0;
    }

//DO_0 Set false
if(!DeviceIoControl(g_hDIO,    ADV_IOCTL_READ_DO,    NULL,    0,
&io_value, sizeof(UCHAR), NULL, NULL))
{
    printf("Failed to Read DO value! \r\n")
    return 0;
}

io_value &= ~(UCHAR)index+1;

if(!DeviceIoControl(g_hDIO,    ADV_IOCTL_WRITE_DO,    &io_value,
sizeof(UCHAR), NULL, 0, NULL, NULL))
{
    printf("Failed to Write DO value!\r\n")
    return 0;
}

CloseHandle(g_hDIO);

    LED Test Program (LED1 for example)
g_hLED    =    CreateFile(TEXT("ADV1:"),    GENERIC_READ    |
GENERIC_WRITE, 0, NULL, OPEN_EXISTING, FILE_ATTRIBUTE_NORMAL,
NULL);

if(INVALID_HANDLE_VALUE == g_hLED)
{
    printf("Failed to Open handle!\r\n")
    return 0;
}

nIndex =0; // LED1 for example

//LED Turn on
switch(nIndex)
{
case 0:
DeviceIoControl(g_hLED, ADV_IOCTL_TURN_ON_LED1, NULL, 0, NULL,
0, NULL, NULL);
    break;
case 1:
DeviceIoControl(g_hLED, ADV_IOCTL_TURN_ON_LED2, NULL, 0, NULL,
0, NULL, NULL);

```

```
        break;
    case 2:
        DeviceIoControl(g_hLED, ADV_IOCTL_TURN_ON_LED3, NULL, 0,
        NULL, 0, NULL, NULL);
        break;
    case 3:
        DeviceIoControl(g_hLED, ADV_IOCTL_TURN_ON_LED4, NULL, 0, NULL,
        0, NULL, NULL);
        break;
    default:
        break;
}

//LED Turn off
switch(nIndex)
{
    case 0:
        DeviceIoControl(g_hLED,  ADV_IOCTL_TURN_OFF_LED1,  NULL,
        0, NULL, 0, NULL, NULL);
        break;
    case 1:
        DeviceIoControl(g_hLED,  ADV_IOCTL_TURN_OFF_LED2,  NULL,
        0, NULL, 0, NULL, NULL);
        break;
    case 2:
        DeviceIoControl(g_hLED,  ADV_IOCTL_TURN_OFF_LED3,  NULL,
        0, NULL, 0, NULL, NULL);
        break;
    case 3:
        DeviceIoControl(g_hLED,  ADV_IOCTL_TURN_OFF_LED4,  NULL,
        0, NULL, 0, NULL, NULL);
        break;
    default:
        break;
}

CloseHandle(g_hLED);
```

3.6 Saving Your Settings

Once you made changes for UNO-1110, you may need to save Windows CE system Registry to SD card to keep your settings. See Registry Saving section for detail.

1. Press start of task bar of window system and select “Programs” / “Advantech” / “Registry Saver”.



Figure 3.39 Select Registry Saver

2. It will display message to notify you whether the Registry has been successfully saved.

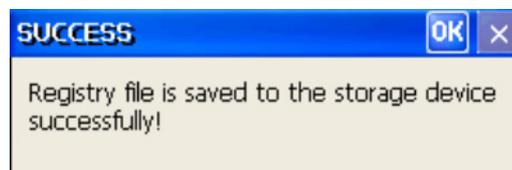
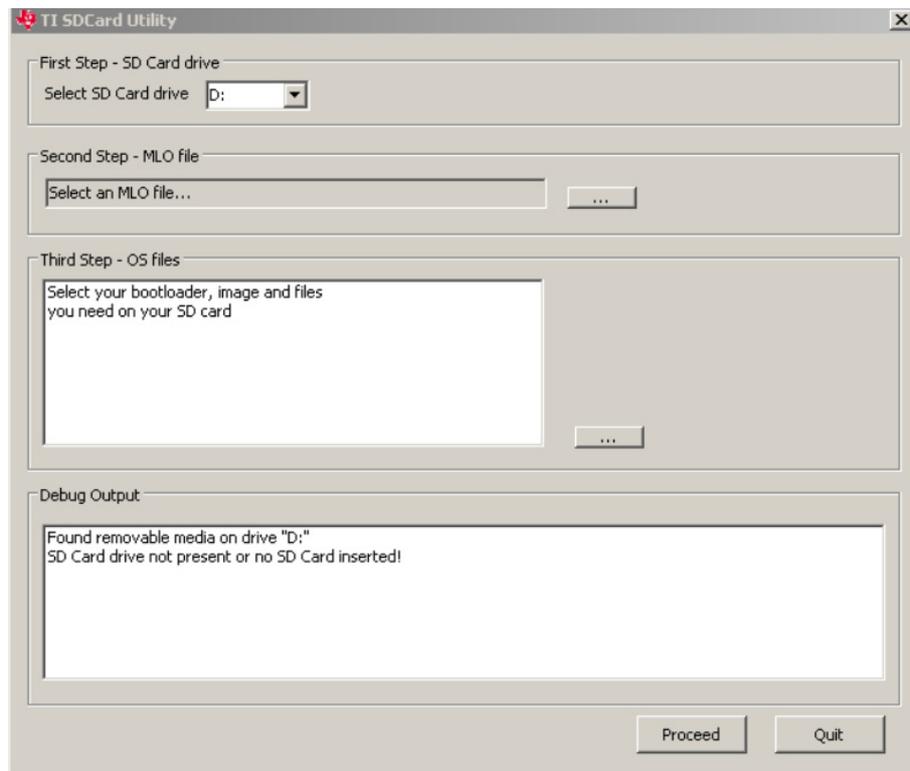


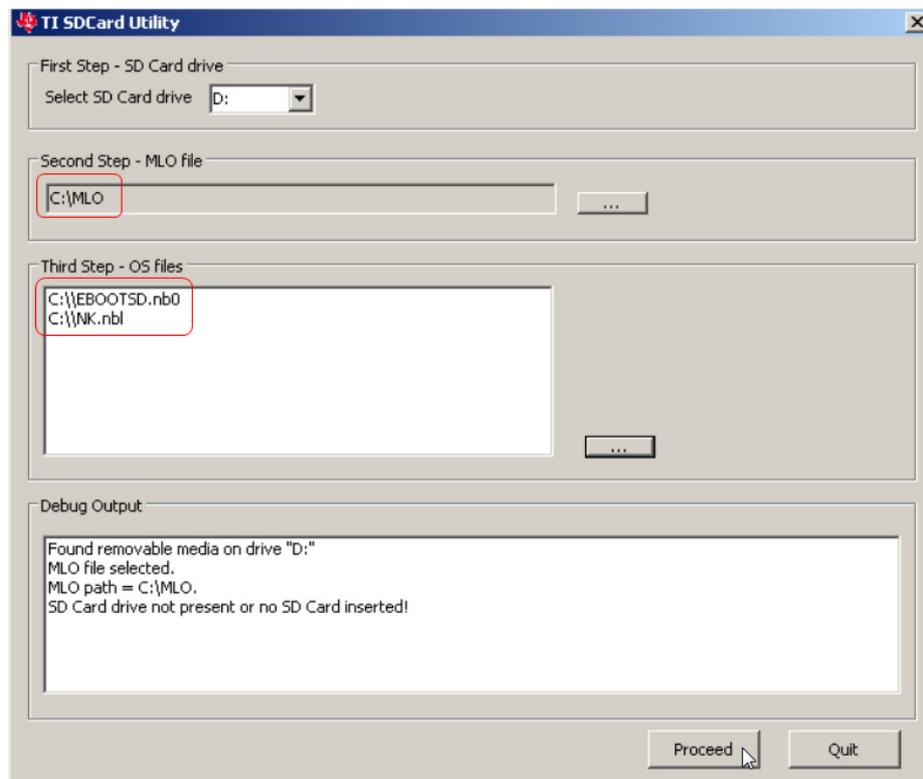
Figure 3.40 Registry is saved successfully

3.7 Create SD Card for booting

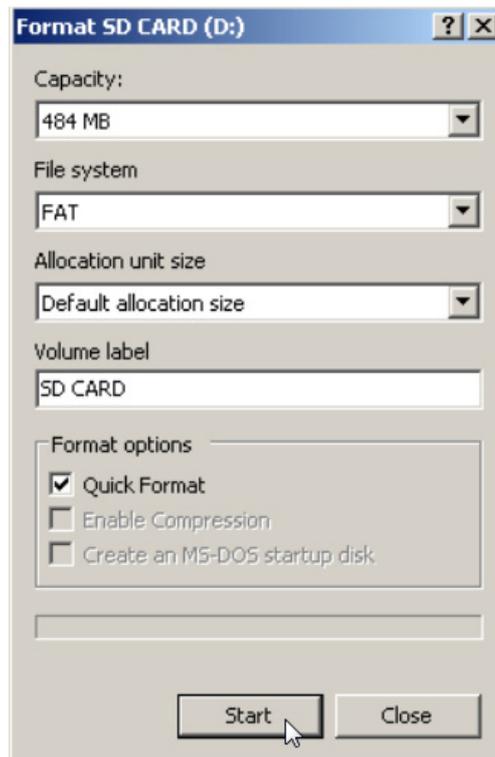
Using “TI SDCard Utility” to create SD Card for booting.



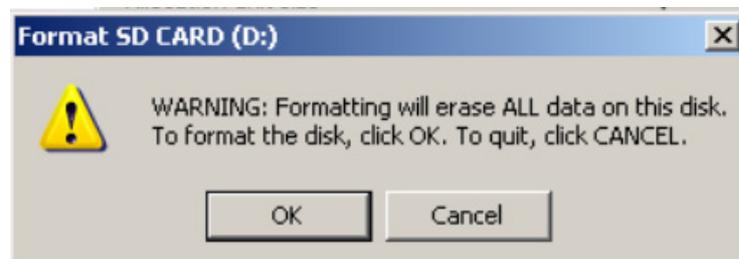
There are three steps. First, select SD Card drive which is detected if you inserted SD Card. Second, select “MLO” file. Third, select “EBOOTSD.nb0” and “NK.nbl”. And then press Proceed button.



If you want to format SD Card, press Start button; otherwise, press Close button.



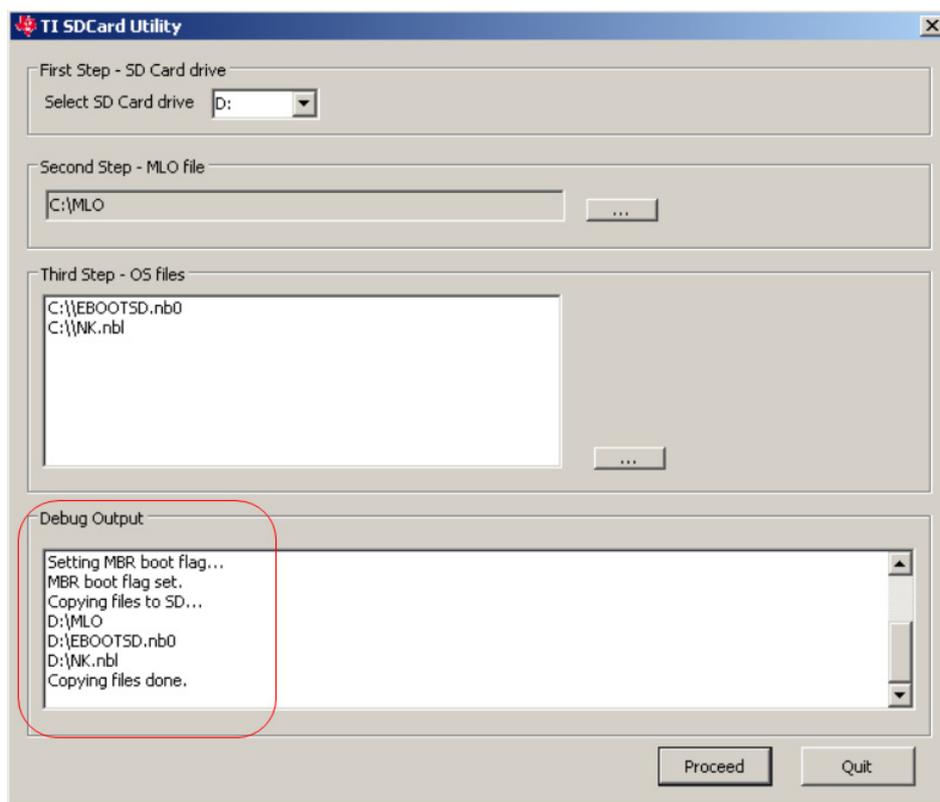
Press OK button to start format SD Card if you choice to format SD Card.



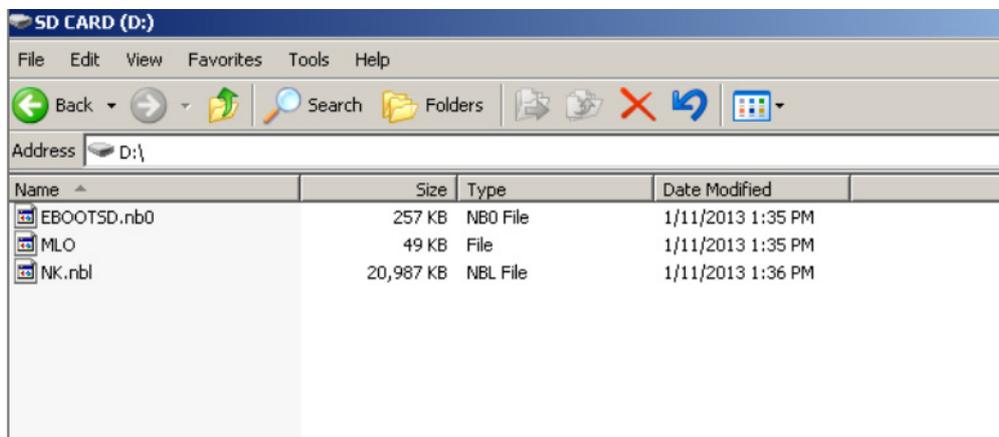
It will display message to notify you whether SD Card has been format complete if you choice to format SD Card. Press OK button and then close Format SD Card utility.



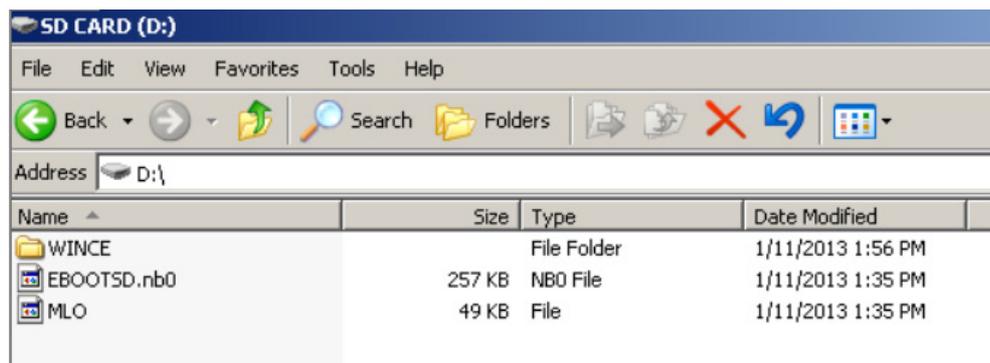
Start to copy files to SD Card automatically. It will display message to show you the debug output. And then Press Quit button



Three files (MLO, EBOOTSD.nb0, and NK.nbl) were in SD Card already.



Add new Folder and rename "WINCE", and then move "NK.nbl" into WINCE folder.



3.8 Updating Image & Bootloader

There have two ways to update the image & bootloader.

1. Update the automatically

Insert internal storage and external SD card that includes the image file (path:\MLO, EBOOTST.nb0, and NK.nbl). Connect the power connector to re-power on the UNO-1110.

The window displays as below if updating MLO or EBOOTST.nb0 success. And then you need to re-power on.

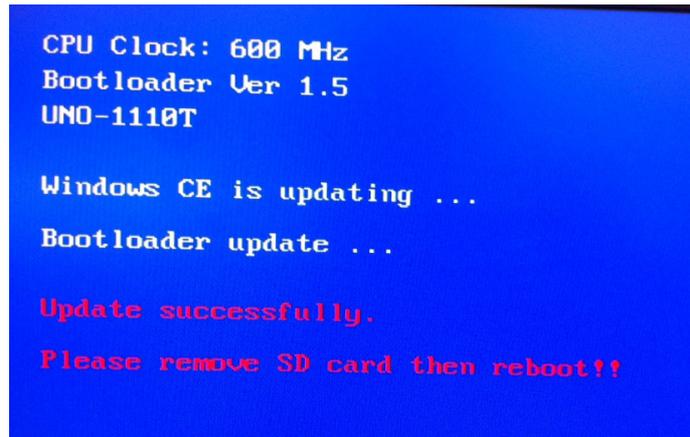


Figure 3.41 Update MLO/ EBOOTSD.nb0

The window displays as below while updating NK.nbl.

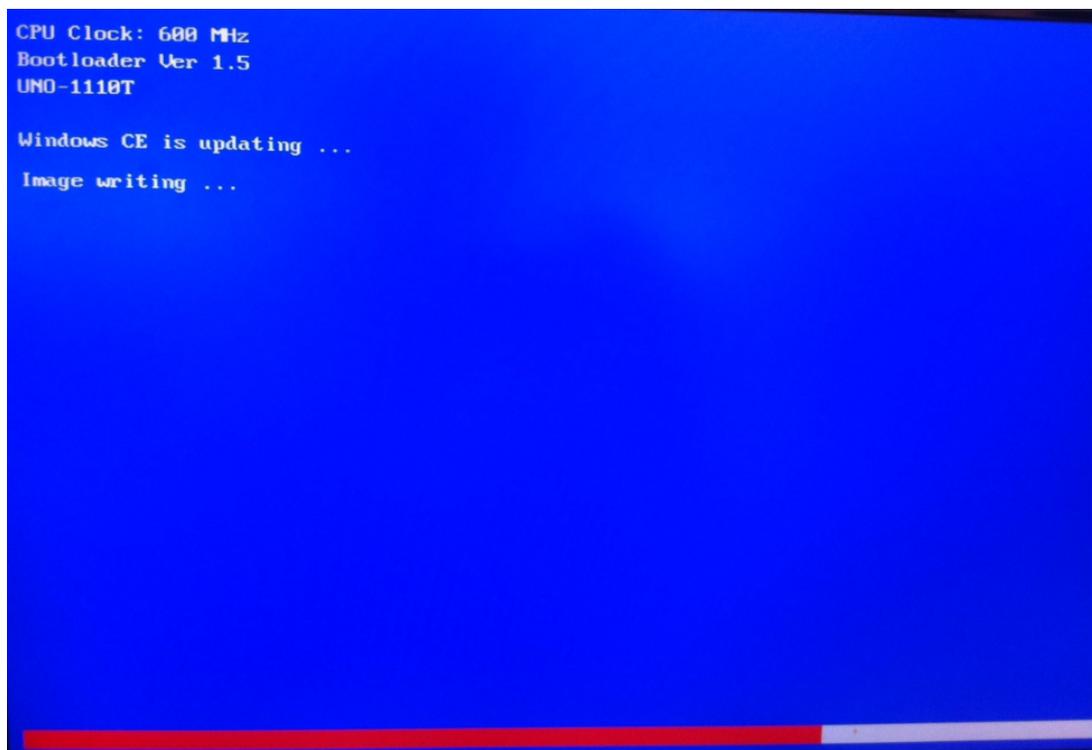


Figure 3.42 Update NK.nbl

2. Update by yourself in Windows CE

Click "My Device", you can see HardDisk (Internal storage) and Storage Card (External SD card) inside. Storage Card (External SD Card) is the image file source while HardDisk (Internal Storage) is destination.

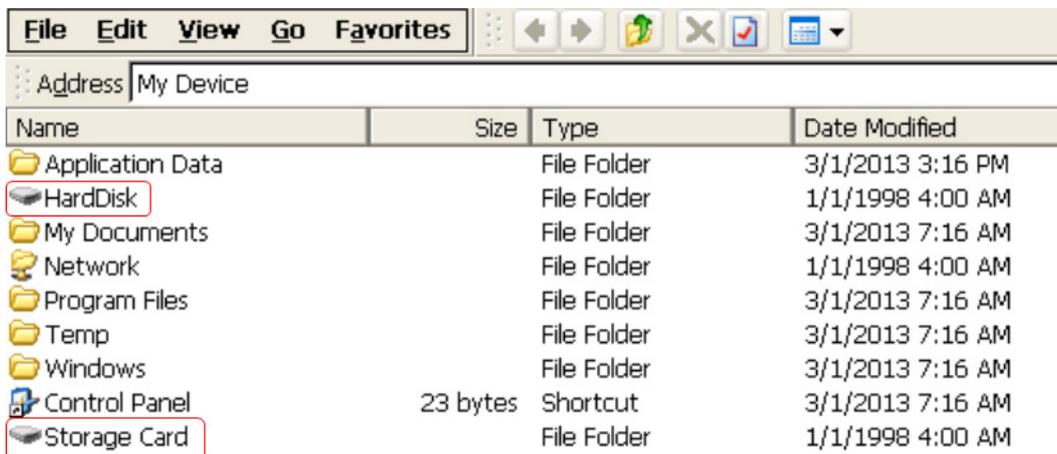
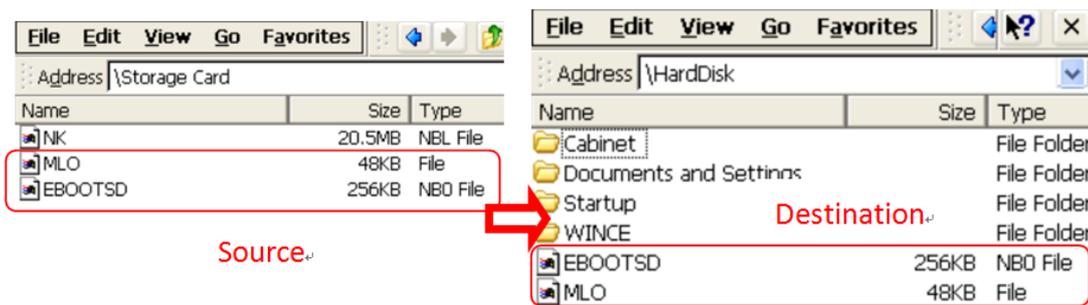


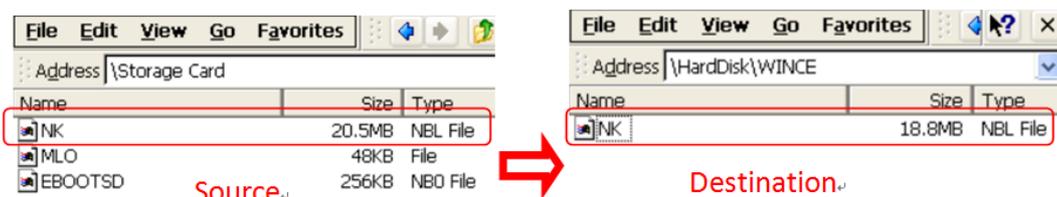
Figure 3.43 My Device in UNO-1110

There are three files needed for image and bootloader update (MLO, EBOOTST.nb0, NK.nbl). You need to copy them to an SD card before updating process.

1. Copy new "MLO" and "EBOOTSD.nb0" files to root directory of HardDisk from Storage Card.



2. Copy new "NK.nbl" file to "WINCE" folder under HardDisk from Storage Card.



3. Delete HardDisk\Documents and Settings folder step by step
First, Press start of task bar of window system and select “Settings” / “Control Panel” / “Storage Manager”. Second, click “Properties” in SD Memory card of store info. Third, click “Dismount” and then click “Mount”. Finally, you can delete Documents and Settings directly.



Figure 3.44 Delete Documents and Settings in HardDisk

4. After a successful file update, reboot the system.

3.9 UNO-1110 Network Administration User Guide

Advantech's UNO-1110 series is a built-in Windows CE solution offering a pre-configured image with optimized onboard device drivers. WinCE is a compact, high-efficient and hard real-time operating system that is designed for embedded systems without HDD limitation.

UNO-1110 remote administration is a powerful function, which allow users connect to field-site UNO-1110 by standard browser and configure UNO-1110's network and system settings remotely.

UNO-1110 remote administration includes two major functions; network administration and system administration.

Network administration with UNO-1110 well-configured, user can connect to local network or public network (Internet).

3.9.1 Network Administration

Following steps introduces how to connect the UNO-1110 by standard browser, and configure the field-site UNO-1110's network setting remotely.

1. Execute standard browser (for instance, Internet Explorer), and enter UNO-1110 (which you would like to connect)'s IP address as below,
IP address/remoteadmin
Instance: 10.0.0.1/remoteadmin
2. System will ask you to enter password when you login UNO-1110 first time.

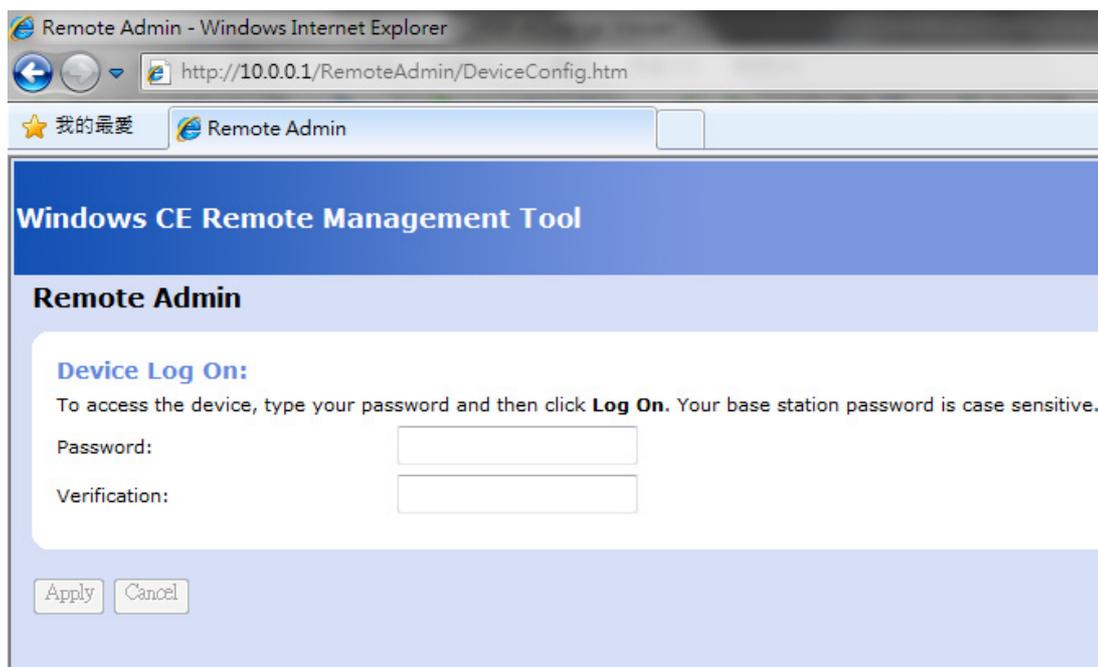


Figure 3.45 Windows CE Remote Management Tool

You could set the password in WinCE's "Setting" / "Control Panel" / "Password". You could see below picture for reference.



Figure 3.46 Password Properties in Windows CE

3. Connect to the UNO-1110 again, and the system will ask you to enter user name and password. After authorization, you will enter Windows CE networking setup page.

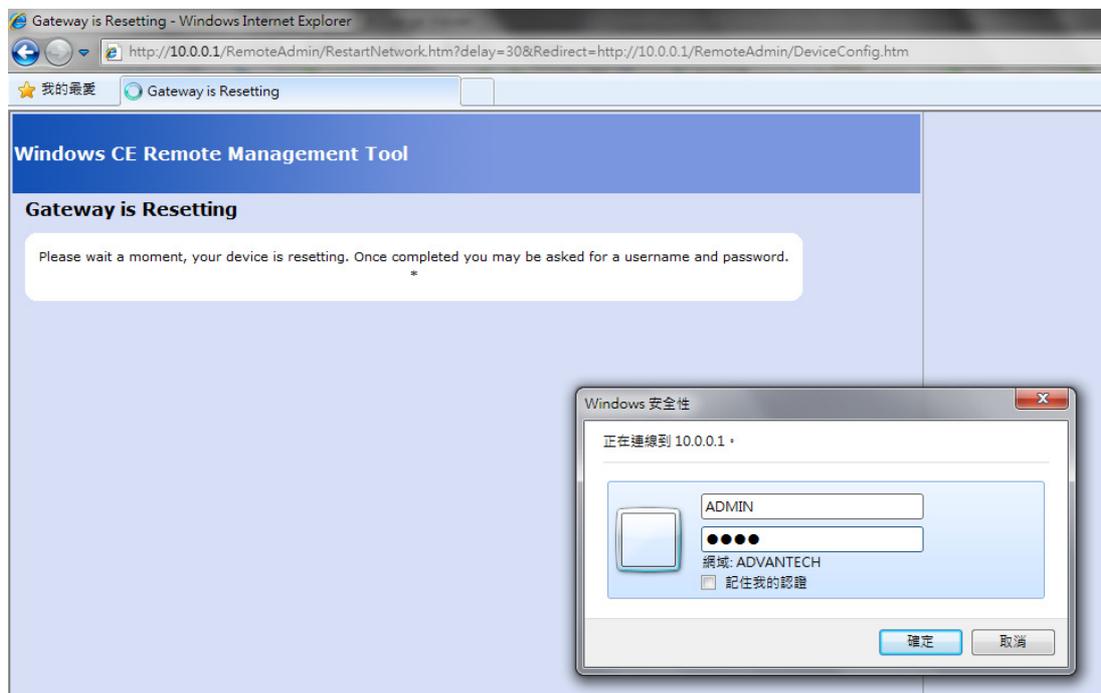


Figure 3.47 Getway Resetting

Note! The default user name is ADMIN.



3.9.2 Network Setting

Change IP information about the UNO-1110.

1. Change device name
Enter proper device name and press Apply button.

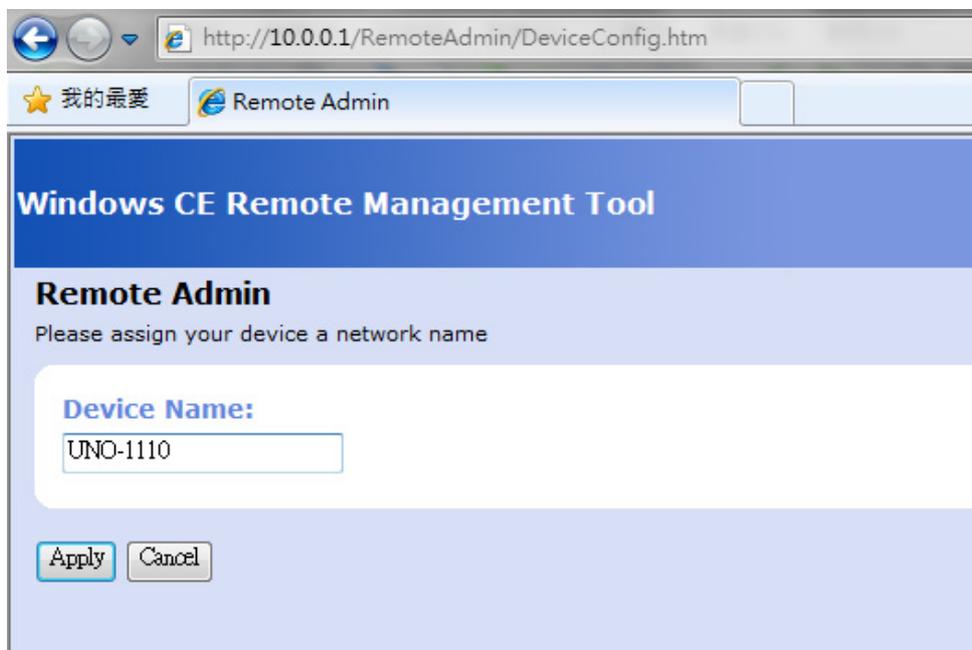


Figure 3.48 Remote Admin

Note! You also could find device name in WinCE's "Setting" / "Control Panel" / "System" 's device name tag. You could see below picture for reference.



Figure 3.49 System Properties in Windows CE

2. Waiting a few minutes until enter Windows CE Remote Management Tool.



Figure 3.50 Windows CE Remote Management

3.9.3 Add/Del Network Adapter

The Add/Del Network Adapter allows the UNO-1110 to add/remove shares.

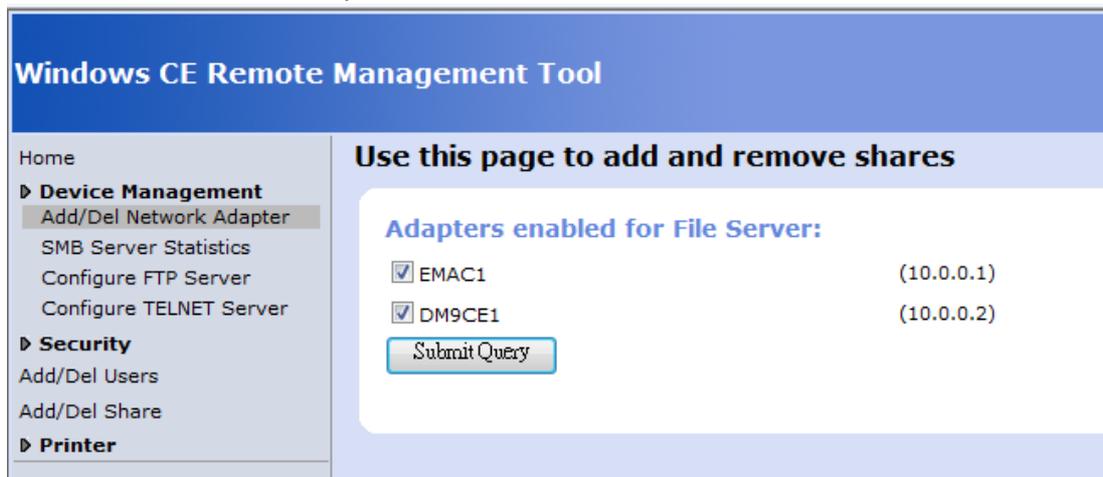


Figure 3.51 The Add/Del Network Adapter

3.9.4 SMB Server Statistics

The SMB server statistics allows the UNO-1110 to view it.



Figure 3.52 The SMB Server Statistics

3.9.5 Configure FTP Server

The FTP server accepts ftp connections and allows the UNO-1110 to be configured remotely.

Basic Configuration

You can set following items in Basic Configuration field.

- FTP Server Enabled- Will the FTP server accept incoming connections?
- Require Authentication- Will the FTP server prompt for user name and password?
- Allow Anonymous Users- Allow users without an account on the server to login to the server?
- Allow Anonymous Uploads- Allow anonymous users to upload and change files?
- Allow Anonymous User to Virtual Roots- Allow anonymous users to view and access files in virtual roots?
- Default Directory- The default directory that anonymous FTP users will log in to.

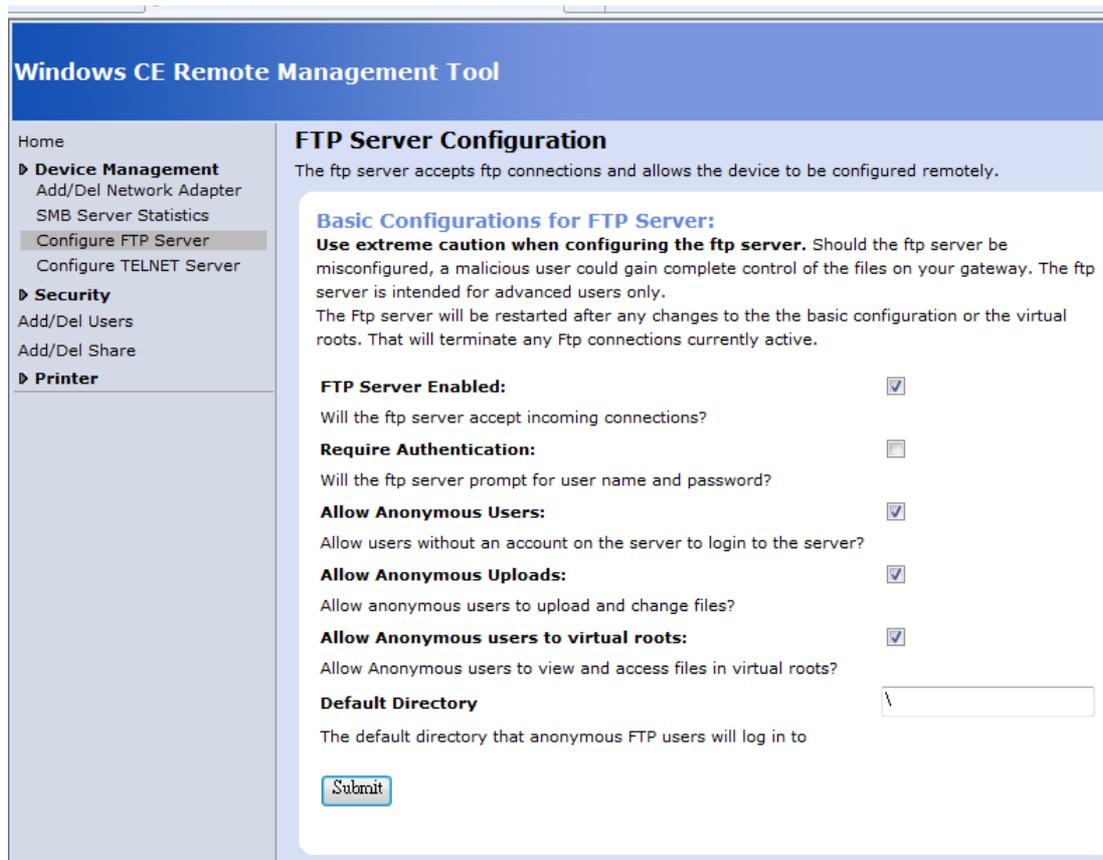


Figure 3.53 The FTP Server

FTP Server Virtual Roots

You can add/delete virtual roots to the FTP server. Virtual roots allow you map a physical directory to and directory with a different name.

FTP Server Virtual Roots:

Use this section to add/delete virtual roots to the FTP server. Virtual roots allow you to map a physical directory to an directory with a different name.

If the user has permissions to see virtual roots, these roots will appear as folders under the user's home directory.

The virtual directory name cannot contain of the following characters: <>:"/| The directory path cannot contain any character from the previous list as well, but may include the backslash

<p>Virtual Directory Name</p> <p>The name of the directory to display under the users home directory</p> <input type="text"/>	<p>Directory Path</p> <p>Path to the physical directory</p> <input type="text"/>	<input type="button" value="Add"/>
--	---	------------------------------------

Figure 3.54 The FTP Server Virtual Roots

FTP Users

Use FTP Users section to control access to the FTP server for each user.

You can configure a separate home directory for each user by appending the user's name to home directory. Denying read permission to a user, denies complete access to the FTP server for that user.

FTP Users:

Use this section to control access to the FTP server for each user. To add new users go to the Add Users page. You can configure a separate home directory for each user by appending the user's name to home directory. Denying read permission to a user, denies complete access to the ftp server for that user.

UserName	Home Directory	Allow Read	Allow Write	Allow Virtual Roots	Allow Hidden Files
The login name of the user	The path to user's home directory	Allow the user to login and download files from the server	Allow the user to upload and change files on the server	Allow the user to view virtual roots	Allow the user to view hidden and system files on the server
ADMIN	<input type="text" value="Temp\"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="button" value="Submit"/>					

Figure 3.55 FTP Users

3.9.6 Telnet Server

The telnet server accepts telnet connections and allows the UNO-1110 to be configured remotely.

Telnet Server Configuration

- Server Enabled- Will the telnet server accept incoming connections?
- Require Authentication- Will the telnet server prompt for user name and password?

Telnet Server Users

Choose which users can access the telnet server.

The screenshot shows the 'Windows CE Remote Management Tool' interface. On the left is a navigation menu with categories: Home, Device Management (Add/Del Network Adapter, SMB Server Statistics, Configure FTP Server, Configure TELNET Server), Security (Add/Del Users, Add/Del Share), and Printer. The main content area is titled 'TELNET Server Configuration' and contains the following text: 'The telnet server accepts telnet connections and allows the device to be configured remotely.' Below this is a section for 'Basic Configurations for TELNET Server' with a warning: 'Use extreme caution when configuring the telnet server. Should the telnet server be misconfigured, a malicious user could gain complete control of your home gateway. The telnet server is intended for advanced users only.' There are two checkboxes: 'TELNET Server Enabled' (checked) and 'Require Authentication' (unchecked). A 'Submit' button is at the bottom. The second section is 'TELNET Users', with instructions: 'Use this section to control access to the TELNET server for each user. To add new users go to the Add Users page. You can choose which users can access the telnet server.' It features a table with columns 'UserName' and 'Enabled/Disabled'. The 'ADMIN' user is listed with an unchecked checkbox. A 'Submit' button is at the bottom.

Figure 3.56 Telnet Server

3.9.7 Security

You can add/delete users and share in security.

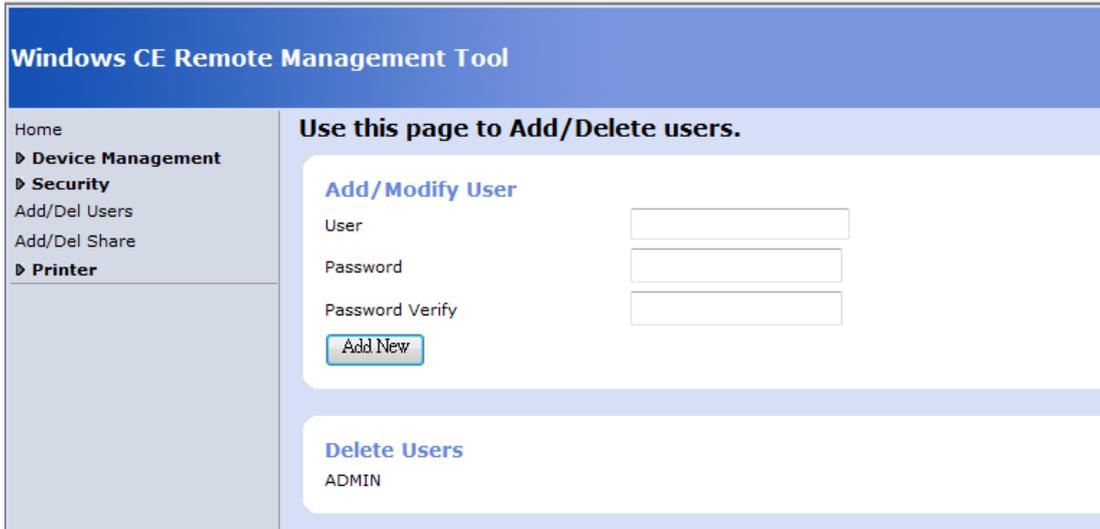


Figure 3.57 Add/Modify Users

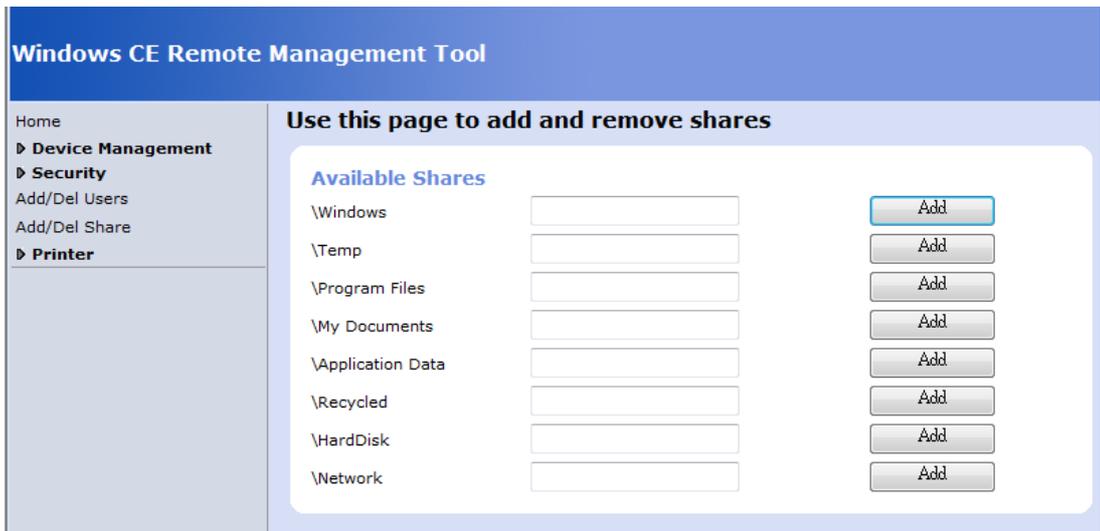


Figure 3.58 Add/Modify Shares

3.9.8 Printer

You can add/delete printer here.



Figure 3.59 Add/Modify Printer

www.advantech.com

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