

# **EC20** WinCE USB Driver User Guide

**UMTS/HSPA Module Series**

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## About the Document

### History

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# 1 Introduction

This document mainly introduces how to integrate the USB driver for EC20 module in WinCE 6.0 OS, and how to use the USB port after the USB driver is loaded successfully.

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Preliminary

## 2 USB Interface Descriptor

This chapter lists the USB interface descriptors for EC20 as composite communication device.

### 2.1. Composite Communication Device Enumeration

#### 2.1.1. Device Descriptor

Table 1: Device Descriptor

Name	Value	Dec	Hex
bLength	18	18	0x12
bDescriptorType	DEVICE	1	0x01
bcdUSB	2.0	512	0x0200
bDeviceClass	Class defined at interface level	0	0x00
bDeviceSubClass	Subclass defined at interface level	0	0x00
bDeviceProtocol	None	0	0x00
bMaxPacketSize0	64	64	0x40
idVendor	0x05c6	1478	0x05c6
idProduct	0x9215	37397	0x9215
bcdDevice	0.0	0	0x0000
iManufacturer	3	3	0x03
iProduct	2	2	0x02
iSerialNumber	0	0	0x00
bNumConfigurations	1	1	0x01



## 2.1.2. Configuration

Table 2: Configuration Descriptor\Configuration

Name	Value	Dec	Hex
bLength	Valid	9	0x09
bDescriptorType	CONFIGURATION	2	0x02
wTotalLength	209 bytes	209	0x00D1
bNumInterfaxe	5	5	0x05
bConfigurationValue	1	1	0x01
iConfiguration	1	1	0x01
bmAttributes	0xA0	160	0xA0
bmAttributes.RemoteWakeup	Supported	1	0x01
bmAttributes.SelfPowered	Yes	1	0x01
bmAttributes.Reserved7	One	1	0x01
bMaxPower	500 mA	250	0xFA

## 2.1.3. Interface 0 (DM Port)

Table 3: Configuration Descriptor\Interface 0

Name	Value	Dec	Hex
bLength	Valid	9	0x09
bDescriptorType	INTERFACE	4	0x04
bInterfaceNumber	0	0	0x00
bAlternateSetting	0	0	0x00
bNumEndpoints	2	2	0x02
bInterfaceClass	Vendor-specific	255	0xFF
bInterfaceSubClass	Vendor-specific	255	0xFF

<b>bInterfaceProtocol</b>	Vendor-specific	255	0xFF
<b>iInterface</b>	0	0	0x00

**Table 4: Configuration Descriptor\Interface 0\Endpoint Descriptor 1**

Name	Value	Dec	Hex
<b>bLength</b>	Valid	7	0x07
<b>bDescriptorType</b>	ENDPOINT	5	0x05
<b>bEndpointAddress</b>	1 IN <sup>1</sup>	129	0x81
<b>bmAttributes</b>	Transfer-Types: BULK	2	0x02
<b>wMaxPacketSize</b>	512 bytes	512	0x0200
<b>bInterval</b>	At most one NAK each 32 microframes	32	0x20

<sup>1</sup>: Given endpoint address is an example and can be modified.

**Table 5: Configuration Descriptor\Interface 0\Endpoint Descriptor 2**

Name	Value	Dec	Hex
<b>bLength</b>	Valid	7	0x07
<b>bDescriptorType</b>	ENDPOINT	5	0x05
<b>bEndpointAddress</b>	1 OUT <sup>1</sup>	1	0x01
<b>bmAttributes</b>	Transfer-Types: BULK	2	0x02
<b>wMaxPacketSize</b>	512 bytes	512	0x0200
<b>bInterval</b>	At most one NAK each 32 microframes	32	0x20

1. Given endpoint address is an example and can be modified.

## 2.1.4. Interface 1 (NMEA Port)

Table 6: Configuration Descriptor\Interface 1

Name	Value	Dec	Hex
bLength	Valid	9	0x09
bDescriptorType	INTERFACE	4	0x04
bInterfaceNumber	1	1	0x01
bAlternateSetting	0	0	0x00
bNumEndpoints	2	2	0x02
bInterfaceClass	Vendor-specific	255	0xFF
bInterfaceSubClass	Vendor-specific	255	0xFF
bInterfaceProtocol	Vendor-specific	255	0xFF
iInterface	0	0	0x00

Table 7: Configuration Descriptor\Interface 1\Endpoint Descriptor 1

Name	Value	Dec	Hex
bLength	Valid	7	0x07
bDescriptorType	ENDPOINT	5	0x05
bEndpointAddress	2 IN <sup>1</sup>	130	0x82
bmAttributes	Transfer-Types: BULK	2	0x02
wMaxPacketSize	512 bytes	512	0x0200
bInterval	At most one NAK each 32 microframes	32	0x20

<sup>1</sup>. Given endpoint address is an example and can be modified.

**Table 8: Configuration Descriptor\Interface 1\Endpoint Descriptor 2**

Name	Value	Dec	Hex
<b>bLength</b>	Valid	7	0x07
<b>bDescriptorType</b>	ENDPOINT	5	0x05
<b>bEndpointAddress</b>	2 OUT <sup>1</sup>	2	0x02
<b>bmAttributes</b>	Transfer-Types: BULK	2	0x02
<b>wMaxPacketSize</b>	512 bytes	512	0x0200
<b>bInterval</b>	At most one NAK each 32 microframes	32	0x20

<sup>1</sup>: Given endpoint address is an example and can be modified.

### 2.1.5. Interface 2 (AT Port)

**Table 9: Configuration Descriptor\Interface 2**

Name	Value	Dec	Hex
<b>bLength</b>	Valid	9	0x09
<b>bDescriptorType</b>	INTERFACE	4	0x04
<b>bInterfaceNumber</b>	2	2	0x02
<b>bAlternateSetting</b>	0	0	0x00
<b>bNumEndpoints</b>	2	2	0x02
<b>bInterfaceClass</b>	Vendor-specific	255	0xFF
<b>bInterfaceSubClass</b>	Vendor-specific	255	0xFF
<b>bInterfaceProtocol</b>	Vendor-specific	255	0xFF
<b>iInterface</b>	0	0	0x00

**Table 10: Configuration Descriptor\Interface 2\Endpoint Descriptor 1**

Name	Value	Dec	Hex
<b>bLength</b>	Valid	7	0x07
<b>bDescriptorType</b>	ENDPOINT	5	0x05
<b>bEndpointAddress</b>	3 IN <sup>1</sup>	131	0x83
<b>bmAttributes</b>	Transfer-Types: BULK	2	0x02
<b>wMaxPacketSize</b>	512 bytes	512	0x0200
<b>bInterval</b>	At most one NAK each 32 microframes	32	0x20

<sup>1</sup>: Given endpoint address is an example and can be modified.

**Table 11: Configuration Descriptor\Interface 2\Endpoint Descriptor 2**

Name	Value	Dec	Hex
<b>bLength</b>	Valid	7	0x07
<b>bDescriptorType</b>	ENDPOINT	5	0x05
<b>bEndpointAddress</b>	3 OUT <sup>1</sup>	3	0x03
<b>bmAttributes</b>	Transfer-Types: BULK	2	0x02
<b>wMaxPacketSize</b>	512 bytes	512	0x0200
<b>bInterval</b>	At most one NAK each 32 microframes	32	0x20

<sup>1</sup>: Given endpoint address is an example and can be modified.

### 2.1.6. Interface 3 (Modem Port)

**Table 12: Configuration Descriptor\Interface 3**

Name	Value	Dec	Hex
<b>bLength</b>	Valid	9	0x09

<b>bDescriptorType</b>	INTERFACE	4	0x04
<b>bInterfaceNumber</b>	3	3	0x03
<b>bAlternateSetting</b>	0	0	0x00
<b>bNumEndpoints</b>	3	3	0x03
<b>bInterfaceClass</b>	Vendor-specific	255	0xFF
<b>bInterfaceSubClass</b>	Vendor-specific	255	0xFF
<b>bInterfaceProtocol</b>	Vendor-specific	255	0xFF
<b>iInterface</b>	0	0	0x00

Table 13: Configuration Descriptor\Interface 3\Endpoint Descriptor 1

Name	Value	Dec	Hex
<b>bLength</b>	Valid	7	0x07
<b>bDescriptorType</b>	ENDPOINT	5	0x05
<b>bEndpointAddress</b>	4 IN <sup>1</sup>	132	0x84
<b>bmAttributes</b>	Transfer-Types: INTERRUPT	3	0x03
<b>wMaxPacketSize</b>	64 bytes	64	0x0040
<b>bInterval</b>	At most one NAK each 32 microframes	32	0x20

<sup>1</sup>: Given endpoint address is an example and can be modified.

Table 14: Configuration Descriptor\Interface 3\Endpoint Descriptor 2

Name	Value	Dec	Hex
<b>BLength</b>	Valid	7	0x07
<b>BDescriptorType</b>	ENDPOINT	5	0x05
<b>BEndpointAddress</b>	5 IN <sup>1</sup>	133	0x85
<b>bmAttributes</b>	Transfer-Types: BULK	2	0x02
<b>wMaxPacketSize</b>	512 bytes	512	0x0200

<b>bInterval</b>	At most one NAK each 32 microframes	32	0x20
------------------	-------------------------------------	----	------

<sup>1</sup>. Given endpoint address is an example and can be modified.

**Table 15: Configuration Descriptor\Interface 3\Endpoint Descriptor 3**

Name	Value	Dec	Hex
<b>bLength</b>	Valid	7	0x07
<b>bDescriptorType</b>	ENDPOINT	5	0x05
<b>bEndpointAddress</b>	4 OUT <sup>1</sup>	4	0x04
<b>bmAttributes</b>	Transfer-Types: BULK	2	0x02
<b>wMaxPacketSize</b>	512 bytes	512	0x0200
<b>bInterval</b>	At most one NAK each 32 microframes	32	0x20

<sup>1</sup>. Given endpoint address is an example and can be modified.

### 2.1.7. Interface 4 (NDIS Port)

**Table 16: Configuration Descriptor\Interface 4**

Name	Value	Dec	Hex
<b>BLength</b>	Valid	9	0x09
<b>bDescriptorType</b>	INTERFACE	4	0x04
<b>bInterfaceNumber</b>	4	4	0x04
<b>bAlternateSetting</b>	0	0	0x00
<b>bNumEndpoints</b>	3	3	0x03
<b>bInterfaceClass</b>	Vendor-specific	255	0xFF
<b>bInterfaceSubClass</b>	Vendor-specific	255	0xFF
<b>bInterfaceProtocol</b>	Vendor-specific	255	0xFF
<b>iInterface</b>	0	0	0x00

**Table 17: Configuration Descriptor\Interface 4\Endpoint Descriptor 1**

Name	Value	Dec	Hex
<b>bLength</b>	Valid	7	0x07
<b>bDescriptorType</b>	ENDPOINT	5	0x05
<b>bEndpointAddress</b>	6 IN <sup>1</sup>	134	0x86
<b>bmAttributes</b>	Transfer-Types: INTERRUPT	3	0x03
<b>wMaxPacketSize</b>	64 bytes	64	0x0040
<b>bInterval</b>	At most one NAK each 32 microframes	32	0x20

<sup>1</sup>: Given endpoint address is an example and can be modified.

**Table 18: Configuration Descriptor\Interface 4\Endpoint Descriptor 2**

Name	Value	Dec	Hex
<b>BLength</b>	Valid	7	0x07
<b>BDescriptorType</b>	ENDPOINT	5	0x05
<b>BEndpointAddress</b>	7 IN <sup>1</sup>	135	0x87
<b>bmAttributes</b>	Transfer-Types: BULK	2	0x02
<b>wMaxPacketSize</b>	512 bytes	512	0x0200
<b>bInterval</b>	At most one NAK each 32 microframes	32	0x20

<sup>1</sup>: Given endpoint address is an example and can be modified.

**Table 19: Configuration Descriptor\Interface 4\Endpoint Descriptor 3**

Name	Value	Dec	Hex
<b>bLength</b>	Valid	7	0x07
<b>bDescriptorType</b>	ENDPOINT	5	0x05
<b>bEndpointAddress</b>	5 OUT <sup>1</sup>	5	0x05
<b>bmAttributes</b>	Transfer-Types: BULK	2	0x02



<b>wMaxPacketSize</b>	512 bytes	512	0x0200
<b>bInterval</b>	At most one NAK each 32 microframes	32	0x20

<sup>1</sup>. Given endpoint address is an example and can be modified.

**NOTE**

The driver package does not support the NDIS interface temporarily.

## 3 System Integrating

When USB device is connected to the host system, the host system will load USB driver automatically. Therefore, it is strongly recommended that you integrate the USB driver into the development board when you create the WinCE system image.

### 3.1. Introduction of Driver Package

EC20 driver package contains registry configuration file and drive file, as shown below:

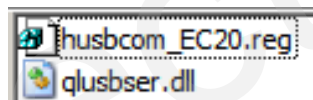


Figure 1: USB Driver Package Structure

### 3.2. Integrate USB Driver Files

The way of integrating WinCE USB driver mainly introduces how to add the driver BINARY and REG files in your WinCE system. When you start the integration, you should follow the steps as below:

#### 3.2.1. Check System Component

Before integrating driver package for EC20, you should make sure that you have enabled USB Host Support under kernel option in your WinCE system because the running of USB driver depends on this system component.

#### 3.2.2. Copy Files

Please copy the qlusbser.dll and husbcom\_EC20.reg in driver package to your BSP project folder, i.e. C:\WINCE600\PLATFORM\<TARGETBSP>\FILES.

**NOTE**

Please do remember to change <TARGETBSP> as your own BSP directory name.

### 3.2.3. Modify the Platform.reg

Add the line below at the end of platform.reg.

```
#include "$(_PLATFORMROOT)\<TARGETBSP>\FILES\husbcom_EC20.reg"
```

**NOTE**

For the restriction on the kernel resource of WinCE6.0, allocation of interface resource may fail if excessively using USB devices, which leads to failure of loading driver. In the current settings, we only enabled AT, Modem, if you need other interfaces, please refer to registry document for any modification.

### 3.2.4. Modify the Platform.bib

1. For WinCE6.0, add the line below:

```
MODULES
..
..
qlusbser.dll      $(_PLATFORMROOT)\(TARGETBSP)\FILES\qlusbser.dll    NK      SHK
..
..
```

2. For WinCE5.0, add the line below:

```
MODULES
..
..
qlusbser.dll      $(_PLATFORMROOT)\(TARGETBSP)\FILES\qlusbser.dll    NK      SHC
..
..
```

### 3.2.5. Rebuild and Create System Image

After you have done the four steps above, you need to execute "clean sysgen" command to rebuild your project and create the new system image.

### 3.3. USB COM Port

Download the new system image to your target board and reboot your WinCE system. For the newly installed system, USB driver will be loaded when you connect EC20 module to the board with USB port. After the USB driver has been loaded, the driver will register three COM devices to the system device manager. The index of default COM devices which are defined in the `husbcom_EC20.reg` lists as below:

- COM6
- COM7

You can use serial port tool to check whether these COM ports are created or not. And the corresponding relations between interface and device name below which had been set in the default REG files are shown as below:

**Table 20: Relationship between Interfaces and COM Devices**

INDEX	Interface Name	Device Name
0	DM Interface	NONE
1	NMEA Interface	NONE
2	AT Interface	COM6
3	Modem Interface	COM7
4	NDIS Interface	NONE

#### NOTES

The index for interface is defined in REG files in the driver package. You must modify the index as your free COM index of your WinCE board.

## 4 COM Port for Application

For WinCE system, you can send AT commands with USB AT Port and set up the PPP connection with USB Modem Port. In this way, you can enjoy the VOICE CALL or SMS over USB AT Port and surf the Internet over the USB Modem Port.

### 4.1. Testing AT Commands on AT Port

Open the USB AT Port with the serial debugging tool and send “AT\r\n” to the COM port. If the tool receives the result code “OK”, it proves that the EC20 module is available for system.

### 4.2. Create PPP Connection on Modem Port

In WinCE, you can make a new PPP connection on “Network and Dial-up Connections” system options. It is simple to set up PPP dial-up over our EC20 module via the new PPP connection. After PPP dial-up connection is established, you can enjoy surfing the Internet. The method of creating PPP connection is given as below:

1. Open and Enter “Control Panel”.

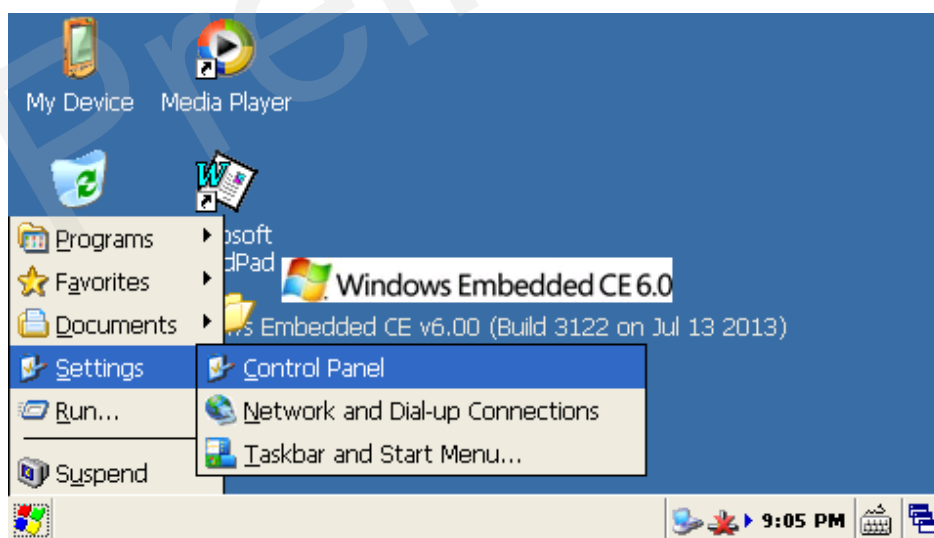


Figure 2: Open Control Panel

2. Double Click “Network and Dial-up Connections”



Figure 3: Click Network and Dial-up Connections

3. Enter below Window Interface:

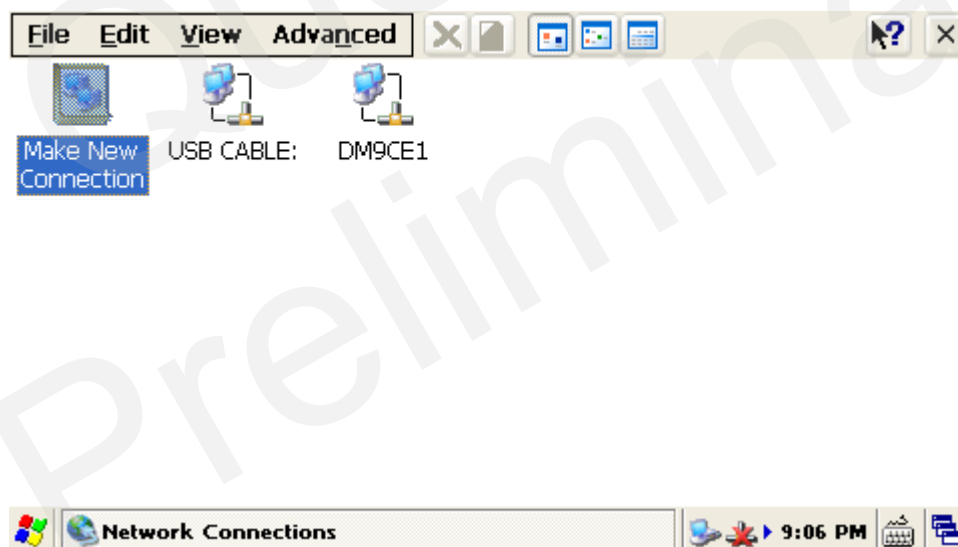


Figure 4: Click Make New Connection

4. Double click the “Make New Connection” and the pop-up box is displayed:

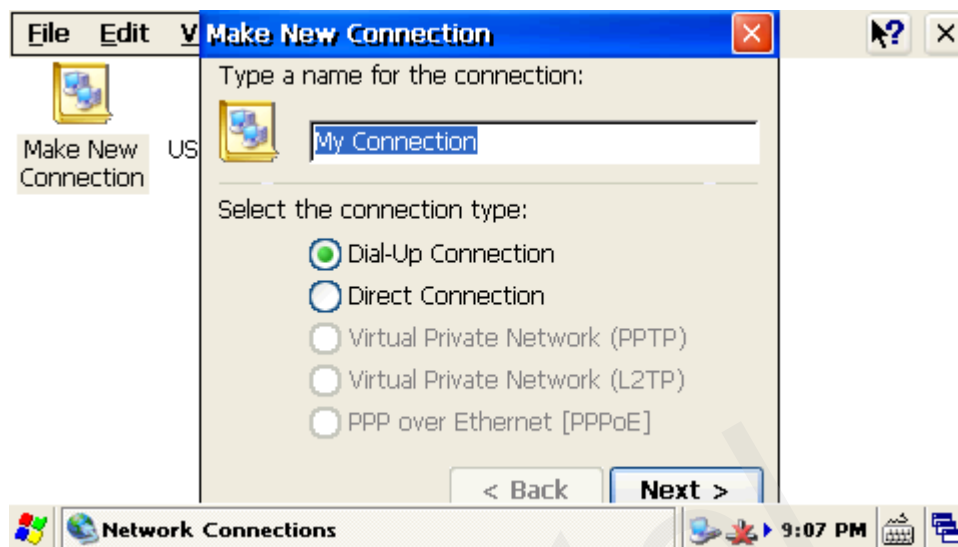


Figure 5: Make New Connection Interface

5. Click the “Next” button:

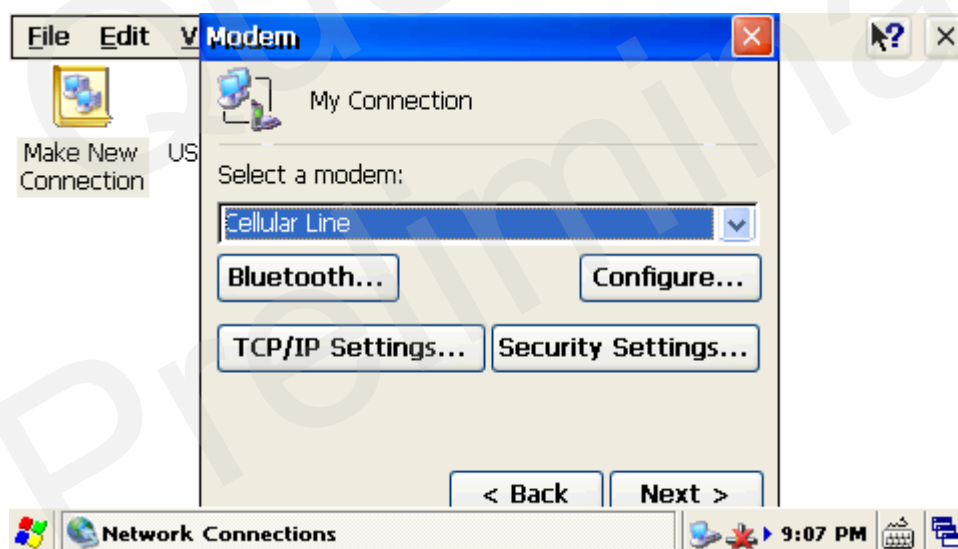


Figure 6: Modem Selection Interface

6. Select the “Quectel EC20 HSUSB Modem” on the pull-down menu:

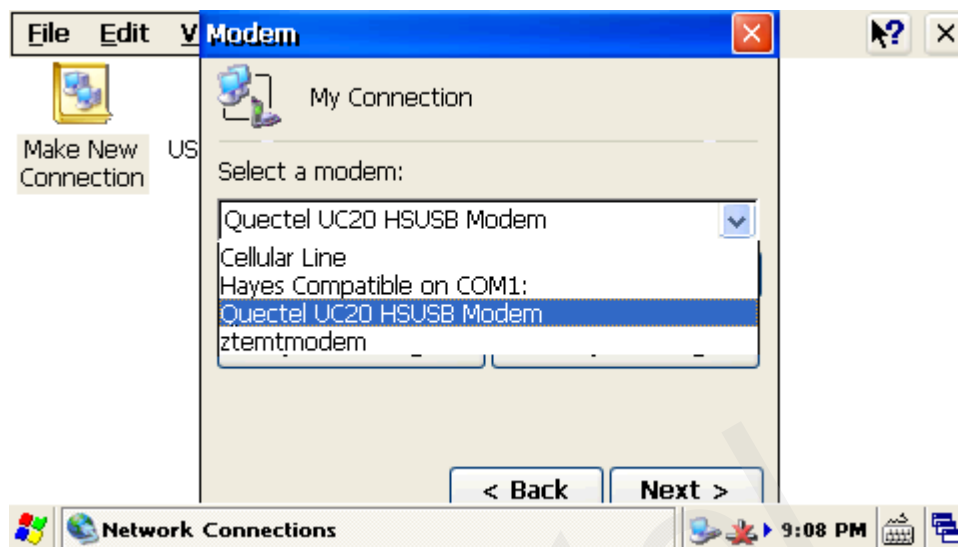


Figure 7: Select “Quectel EC20 HSUSB Modem”

7. Click the “Configure” button:



Figure 8: Connection Properties



8. Select "Call Options" and configure the APN in the "Extra Settings" text-box. For example, you can use SIM Card of CHINA-UNICOM, and you need to set "3gnet" for CHINA-UNICOM to your APN:

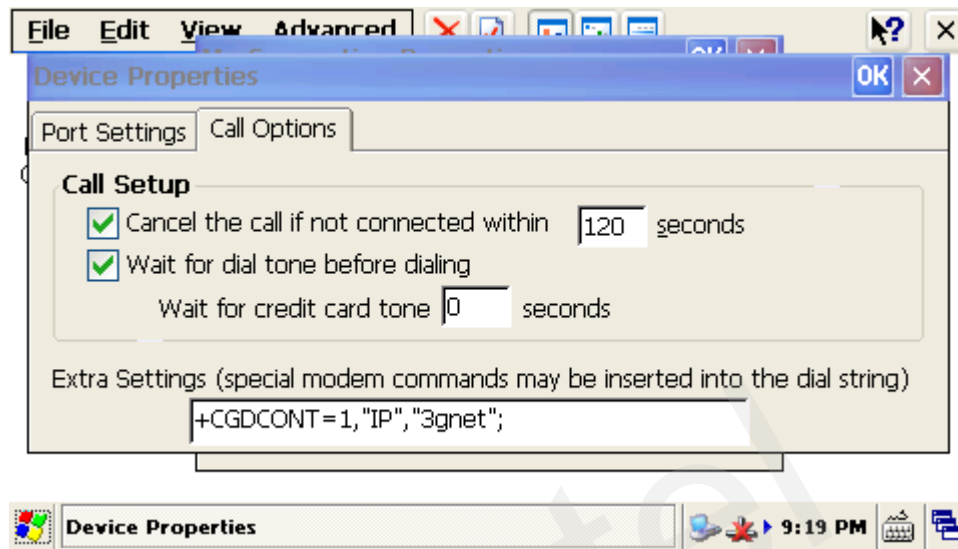


Figure 9: Set APN

9. Click "OK" and click "Next" button. It goes to the interface of phone number configuration. Then, fill in "\*99#" the Phone number text-box:

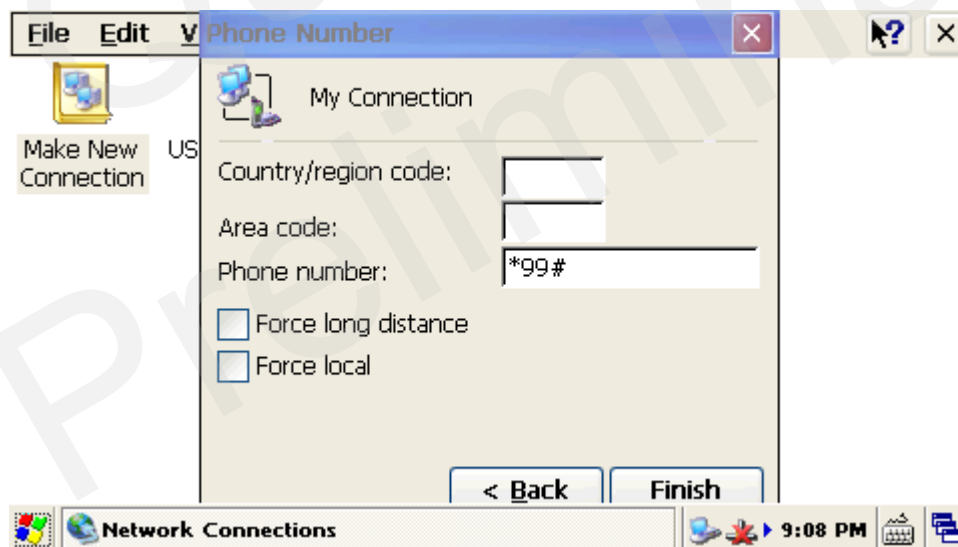


Figure 10: Set Phone number

10. Click “Finish” button and a new icon named “My Connection” will appear in this window:

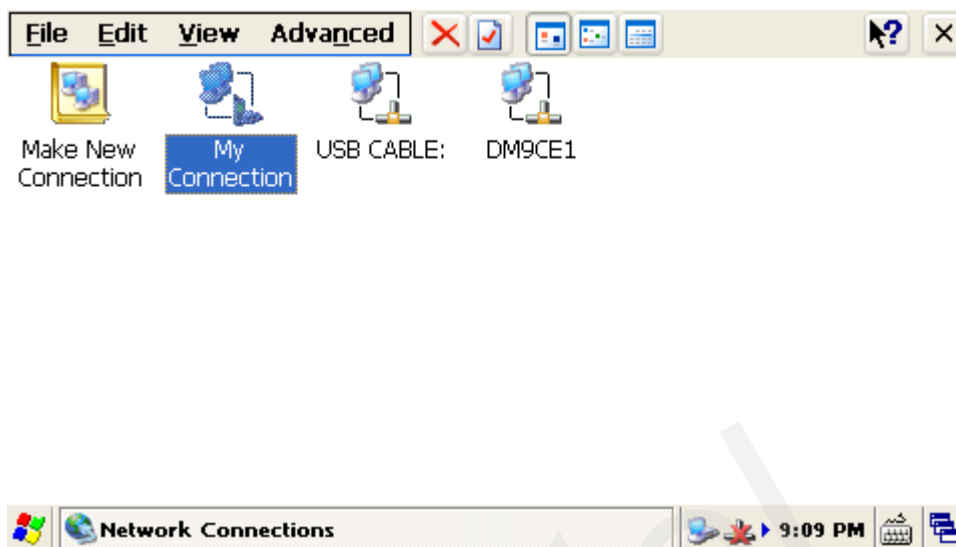


Figure 11: Add New Connection OK

11. Double click “My Connection” icon:

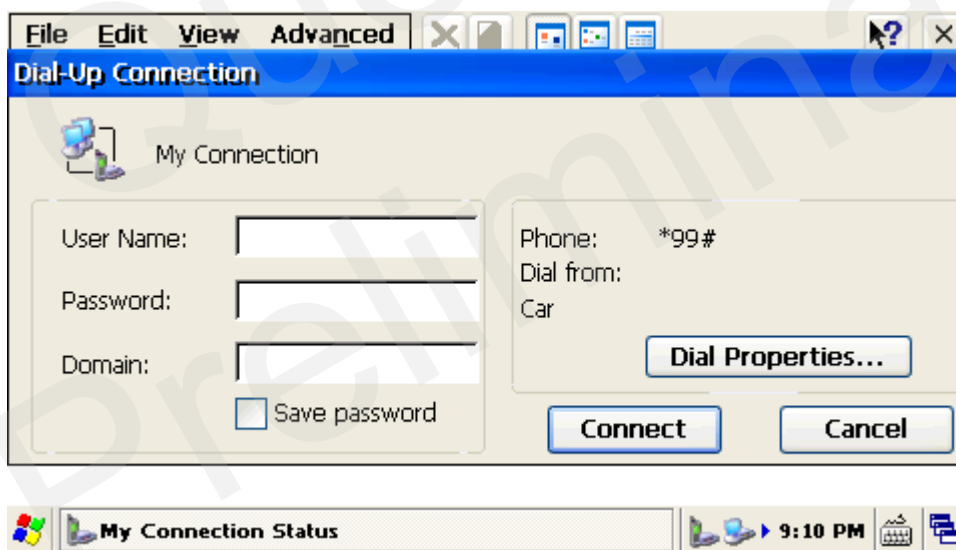


Figure 12: Dial-up Connection Interface

12. Fill in user name and password of PPP dial-up in the text-box. It uses “wap” as User Name and Password here:

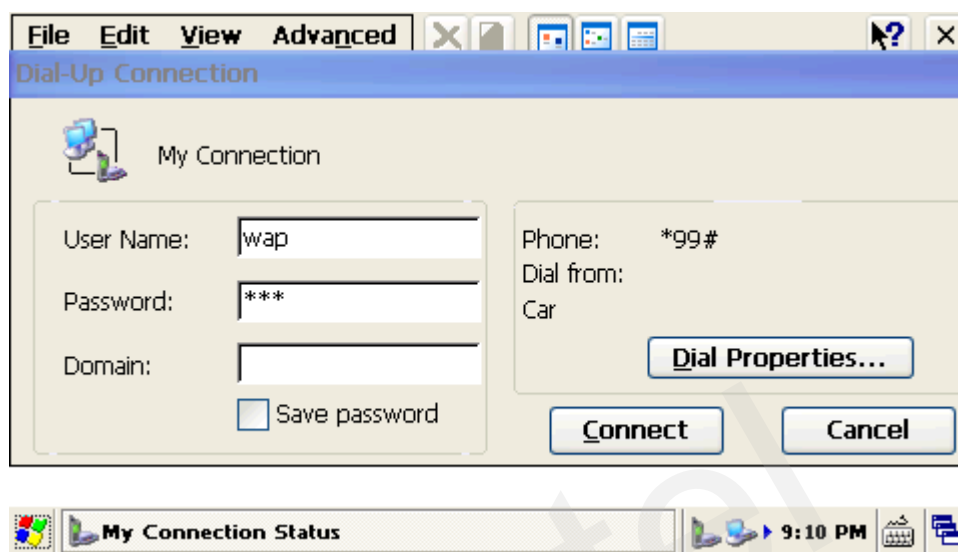


Figure 13: Add User Name and Password

13. Click “Connect” button to set up the PPP connection:

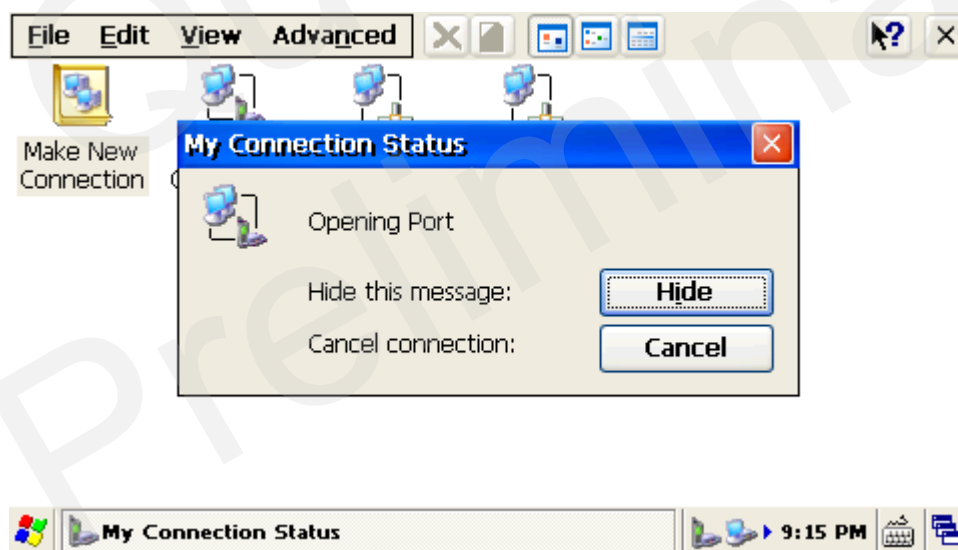


Figure 14: Begin to set-up PPP connection

14. Usually, the PPP dial-up will be connected in several seconds:

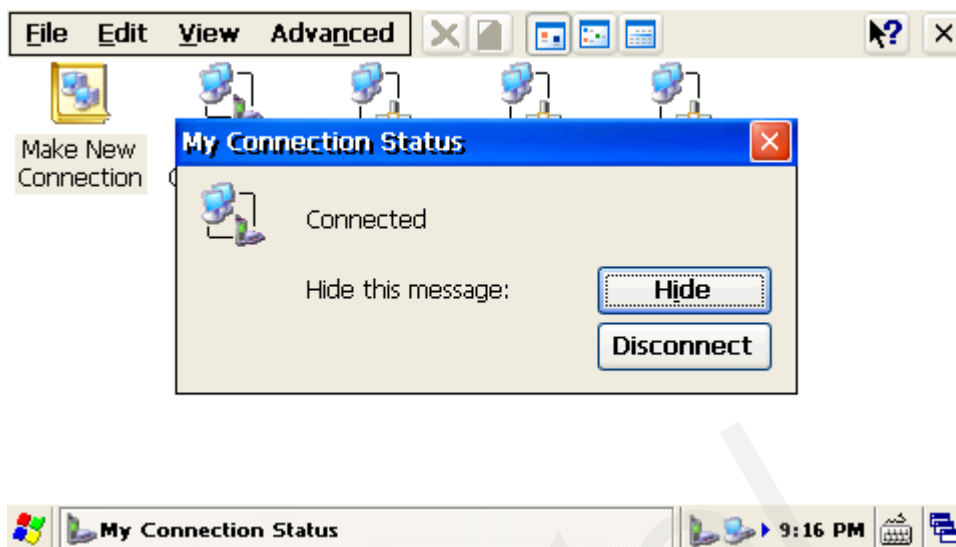


Figure 15: PPP Connected

15. Finally, you can surf the Internet on your WinCE board:



Figure 16: Surf the Internet

**NOTE**

Here we set Quectel UC20 module as an example, there may be a little changes on specific information.

## 5 Appendix A Reference

Table 21: Terms and Abbreviations

Abbreviation	Description
OS	Operating System
USB	Universal Serial Bus
BSP	Board Support Package