Application Note

M100 Series

Linux driver and PPP connexion

Version 1.1

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1. Revision History

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2. Content

3. Instructions to use M100 modem with PPP

The operating system of the computer to which M100 modem is connected may be either windows or Linux. The procedure to connect and activate the modem is slightly different for each operating system.

The M100 has 2 ports: serial and USB. The Windows / Linux PC can be connected to M100 in one of the following 3 ways:

Connection computer / modem when:		… and M100 interface is …	
		Serial	USB
Computer interface is…	Serial	Yes	No
	USB	Yes	Yes

Please connect the M100 to your PC using one of the three connections above. Switch the power to M100 ON.

3.1.Supported Modems

Maestro modem part number	Embedded Sierra Module
M100CDMAPLUS-V	SL3010T
M1003GXT00	SL8080T
M1003GXT02	SL8082T
M1003GXT04	SL8084T

3.2.Driver Downloads

Note: If you don't want to install the latest drivers below, you can still use your Maestro Wireless modem with Linux. Starting from kernel ver.3.0.x most of Linux distributions include the Sierra Linux drivers and are equipped with the Network Manager application. Simply insert your modem and follow the prompts on your screen. Please refer to the KB article below for more details.
How can I use Network Manager Application on Linux OS ?

Kernel version	Driver Version
2.6.20	v.1.7.40
2.6.21	v.1.7.40
2.6.22	v.1.7.40
2.6.23	v.1.7.40
2.6.24	v.1.7.40
2.6.25	v.1.7.40
2.6.26	v.1.7.40
2.6.27	v.1.7.40
2.6.28	v.1.7.40
2.6.29	v.1.7.40
2.6.30	v.1.7.40
2.6.31	v.1.7.40
2.6.32	v.1.7.40
2.6.33	v.1.7.40
2.6.34	v.1.7.40
2.6.35	v.1.7.40
2.6.36	v.1.7.40
2.6.38	v.1.7.40
3.0.x	v.1.7.40

The pppd dialing scripts may be downloaded at this link:
http://www.sierrawireless.com/resources/support/Software/Linux/ppp-scripts.tar.gz

3.3.Driver Installation

3.3.1. Preparation

Maestro CDMA modem are pre-activated, nevertheless if you have a CDMA modem (M100 CDMA ^{plus}) and it has not been activated, you must activate it first on a Windows system with the supplied software. Some service providers pre-activate their devices, but Maestro Wireless recommends that you first try the device on a Windows machine.

Check whether or not your system already has the Sierra Wireless driver by typing the following command.
 # modinfo sierra

If the result is *"Could not find module sierra"* then the driver is not installed.

If a driver is installed, check whether the version of the installed driver is older or newer than the one posted above. If there is no version, it is older.

Prior to installing the driver, the kernel source code must be downloaded into **/usr/src/linux.** Depending on your Linux distribution, the location of the kernel source code varies. However, the distribution package manager (e.g. yum, yast, or apt) can help you find it (try searching in the manager for "kernel source").

3.3.2. Driver installation

1. Navigate to the directory that contains the sierra drivers and extract the files by typing the following commands:
 # tar -xvf v.x.y.z_kernel2.6.y.tar (e.g. tar -xvf v.1.7.x_kernel2.6.28.tar **)**

Please open the file sierra.c which you will find in the tar file above.

Add the following line in **static const struct usb_device_id id_table []**

{ USB_DEVICE(0x1199, 0x0300) }, /* SL301xT, SL501x */
Save the sierra.c file.

 # cd kernel-2.6.y

2. Compile and install the new driver by using the following command:

 # make
 # sudo make install
(Enter the password you use to log into your Linux account if prompted)

The driver is now installed.

3.3.3. Connecting to the Network

We will cover 3 methods of connecting to the network:

- Network Manager
- KPPP - a front end GUI that configures pppd
- Manual setup of pppd

3.3.4. Connecting using Network Manager

The Network Manager application has been included with Ubuntu 8.10, 9.04, 9.10, 10.4, Fedora 11 and many other distros. This is the native Linux support for Network interfaces. For more details please refer to the KB article below:

How can I use Network Manager Application on Linux OS?

3.3.5. Connecting using KPPP

KPPP must first be installed. If it is not installed, try using your package manager to install it (e.g. yum, apt, or yast).

1. Switch to root and execute KPPP by typing the following commands:

   $ **su**

   # **kppp &**

2. Configure the account by doing the following:

   a. Click on Configure or Setup.

   b. Select the Accounts tab and click New.

   c. Click Manual Setup.

   d. Type WWAN in the Connection name field.

   e. Complete the phone number field:

      For CDMA devices: #777

   f. Select PAP/CHAP for authentication.

   g. Click OK.

3. Configure the modem by doing the following:

   a. Click Configure to switch to the Configuration window.

   b. Select the Modems tab and click New.

   c. Type in the modem name in Modem name.

   d. Select /dev/ttyUSBx as the device, where x is the Data Port number for your Serra Wireless modem in the table under "GSM/UMTS AT Commands" chapter. E.g. For Mercury-Compass 885 modem the Data Port is /dev/ttyUSB4

   e. Verify that flow control is set to Hardware.

   f. Do the following if you are using a GSM/UMTS Device:

      i. Click the Modem tab and then the Modem Commands… button.

ii. Type at+cgdcont=1,"IP","APN" in the 'Initialization String 1' field where

APN is Access Point Name of your service provider (e.g. isp.cingular if your service provider is AT&T. If you do not know the APN, contact your service provider.)

g. Save the changes and exit the Configuration window.

4. Enter your user name and password (Contact your service provider if you do not know what these are).

5. Click Connect.

3.3.6. Connecting using PPPD

To connect using the manual pppd method you will need to download the pppd scripts here.

1. Navigate to the directory that contains pppd-scripts.tar.gz and extract it to the default location by typing the following commands:
   $ **cd "directory"**
   $ **tar -zxf pppd-scripts.tar.gz**

2. Switch to root and copy the files to the ppp/peers directory by typing the following commands:
   # su
   # cp -r ./ppp /etc/
   # cd /etc/ppp
   # chmod a+x ip-up.local ip-down.local

3. If using a GSM/UMTS device follow these steps to set the authentication settings; otherwise, skip this step:

   a. **# cd /etc/ppp/peers**

   b. **# vi ./gsm_chat** *(You may use other editing programs such as **emacs** or **gedit** to edit the script)*

   c. Go to the APN section and replace the listed APN with that of your service provider (e.g. If your service provider is AT&T, you would type in isp.cingular).

   d. There are a few sample APN lines listed in the script that can be tried.

   e. Save and exit.

4. Test the connection by typing the following command (you may need to use the root account to run pppd):

   # pppd call cdma

5. If the connection test is not successful; further authentication may be required.

a. # **vi ./gsm** (You can use other editing programs such as emacs or gedit)

b. Put a **'#'** next to the "**noauth**" line (this disables the line).

c. Remove the '#' next to the user and password lines.

d. Type in the appropriate user name and password. (Contact your service provider if you do not know what these are.)

e. Some pppd version may not correctly set up the dynamic DNS configuration. It may be necessary to copy or link **/etc/ppp/resolv.conf** to **/etc/resolv.conf**.

3.4.CDMA AT Commands

AT commands should be issued to endpoint 2 (**/dev/ttyUSB0),** assuming there are no other serial devices plugged into to your computer's USB connectors) on CDMA devices and cannot be used during a connection (the Heatherington escape method is not supported).
** Use the wvdialconf and dmesg commands to determine the ports that your computer is using.

Enter the following AT command in any terminal application (e.g. Minicom) to obtain the signal quality (RSSI):
at!rssi?or **at!status?**
A range from -60 dbm to -90 dBm is considered adequate.
Enter the following AT command to see whether your modem is online:
at!pcinfo

Enter the following AT command to turn the radio on (if the modem is in low power mode (LPM) the radio is off):
at!pcstate=1