



Enabling CDC_ETHER Connection for Skywire GSM CAT1

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1. Introduction

1.1 Orderable Part Numbers

Orderable Device	Description	Carrier	Network Type
NL-SW-LTE-WM1 4	Skywire CAT1 LTE GSM	Any GSM (AT&T, T-Mobile, etc.)	LTE GSM
NL-AB-BBBC	Skywire BeagleBone Black Cape	Any	Any

1.2 Overview

The Skywire™ CAT1 LTE modem supports CDC_ETHER, an Ethernet over USB protocol that allows for an easy data connection. This application note provides a working example of setting up the CDC_ETHER connection on a BeagleBone Black.

1.3 A Note on CDC_ETHER

For CDC_ETHER to work, the Linux kernel needs to have support for the CDC_ETHER USB device class built in. If it does, then when the modem is connected via USB, an ethernet device will simply appear (usually as “eth1”, “eth2”, etc.). If it does not appear, then chances are the Linux kernel version you have does not support CDC_ETHER.

1.4 Testing

This procedure was tested on the following OSs and hardware:

Hardware

BeagleBone Black Rev. 3

Operating Systems

Debian 8.6 (Kernel 4.4.36-ti-r72)

2. BeagleBone Black Setup

2.1 Overview

Setting up the CDC_ETHER connection on the BeagleBone Black allows for automatic setup and connection, providing an easy way to get a internet data connection to your BeagleBone Black.

2.2 BeagleBone Black Setup

Start your BeagleBone Black and login as `root`.

2.2 Modem Setup

You will need to set your APN in the modem. To do this, connect to the modem using a terminal program such as `screen`, `minicom`, or `picocom`. This example uses `picocom`, and the modem will show up as `/dev/ttyACM0`:

```
# picocom -b 115200 /dev/ttyACM0
```

Once connected, issue the following command:

```
AT+CGDCONT=1,"IP","[your apn]"
```

replacing `[your apn]` with the APN of your SIM. For instance, if you setup your modem with a AT&T SIM, and your APN is `broadband`, you would enter:

```
AT+CGDCONT=1,"IP","broadband"
```

Reboot your BeagleBone Black.

2.3 Verify and Test The Connection

Once the BeagleBone Black has rebooted, log in. The CDC_ETHER connection will automatically come up as eth1. Below is a partial response to ifconfig. Your response should be similar:

```
# ifconfig
eth0      Link encap:Ethernet  HWaddr ec:11:27:cf:db:5e
          UP BROADCAST MULTICAST DYNAMIC  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
          Interrupt:173

eth1      Link encap:Ethernet  HWaddr 00:11:22:33:44:56
          inet addr:10.144.23.15  Bcast:10.144.23.31  Mask:255.255.255.224
          inet6 addr: fe80::211:22ff:fe33:4456/64  Scope:Link
          UP BROADCAST RUNNING MULTICAST DYNAMIC  MTU:1500  Metric:1
          RX packets:57 errors:0 dropped:0 overruns:0 frame:0
          TX packets:155 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:5977 (5.8 KiB)  TX bytes:26728 (26.1 KiB)
```

You can now test the connection:

```
# ping google.com
PING google.com (172.217.4.238) 56(84) bytes of data.
64 bytes from ord30s31-in-f14.1e100.net (172.217.4.238): icmp_seq=1 ttl=46
time=148 ms
64 bytes from ord30s31-in-f14.1e100.net (172.217.4.238): icmp_seq=2 ttl=46
time=187 ms
64 bytes from ord30s31-in-f14.1e100.net (172.217.4.238): icmp_seq=3 ttl=46
time=136 ms
64 bytes from ord30s31-in-f14.1e100.net (172.217.4.238): icmp_seq=4 ttl=46
time=133 ms
^C
--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3004ms
rtt min/avg/max/mdev = 133.884/151.565/187.424/21.462 ms
```

Your CDC_ETHER connection is now setup.

3 Troubleshooting

No connection in Section 2.3

The most common reason for this is the APN is not correct. Verify that your APN is correct and re-enter it.

If you signed up for service through NimbeLink, please consult the following APNs:

AT&T Network: c2.korem2m.com

T-Mobile Network: c1.korem2m.com

Vodafone Network: vfd1.korem2m.com

If the above options do not work and you signed up for service through NimbeLink, please contact us at:

product.support@nimbelink.com

to get your APN information. Please include your SIM ID and IMEI of your Skywire™ .

If you signed up for service directly through a carrier, please contact your carrier to get your APN information.