



Digi Embedded Yocto 1.6

Cellular Guide

User Guide

Revision history—90001487

Revision	Date	Description
A	November, 2015	Initial release of document.
B	January, 2016	Fixed PDF properties.
C	April, 2016	Replaced caution with specific limitations. Rebranded.
D	May, 2017	Rebranded and made minor enhancements.

Trademarks and copyright

Digi, Digi International, and the Digi logo are trademarks or registered trademarks in the United States and other countries worldwide. All other trademarks mentioned in this document are the property of their respective owners.

© 2017 Digi International Inc. All rights reserved.

Disclaimers

Information in this document is subject to change without notice and does not represent a commitment on the part of Digi International. Digi provides this document “as is,” without warranty of any kind, expressed or implied, including, but not limited to, the implied warranties of fitness or merchantability for a particular purpose. Digi may make improvements and/or changes in this manual or in the product(s) and/or the program(s) described in this manual at any time.

Warranty

To view product warranty information, go to the following website:

www.digi.com/howtobuy/terms

Send comments

Documentation feedback: To provide feedback on this document, send your comments to techcomm@digi.com.

Customer support

Digi Technical Support: Digi offers multiple technical support plans and service packages to help our customers get the most out of their Digi product. For information on Technical Support plans and pricing, contact us at +1 952.912.3444 or visit us at www.digi.com/support.

Contents

Digi Embedded Yocto 1.6 Cellular Guide

Supported modems	5
Configuration settings	5
Protocols	6
Configuration examples	6
Instructions for unsupported modems	7
Known issues	7
Limitations	7

Digi Embedded Yocto 1.6 Cellular Guide

Supported modems	5
Configuration settings	5
Protocols	6
Configuration examples	6
Instructions for unsupported modems	7
Known issues	7

Supported modems

Digi Embedded Yocto 1.6.8 includes support for the following cellular modems:

- [Telit LE910](#)
- [Telit HE910](#)
- [Huawei ME909u](#)
- [Sierra Wireless MC7710](#)

The Digi Embedded Yocto distribution uses the ModemManager daemon to identify your modem and configure it correctly.

[ModemManager](#) is a DBus-activated daemon that controls mobile broadband devices and connections. ModemManager is used in Digi Embedded Yocto to enable the modem and runs at startup to connect to your service provider. It provides a low-level command line utility called `mmcli`.

Configuration settings

Set the following variables in your Digi Embedded Yocto project's `conf/local.conf` to configure your cellular interface and network provider:

- **CELLULAR_INTERFACE** (required): Name of the network interface created by the modem, usually `wwan0` (for network drivers) or `ppp0` (for serial drivers).
- **CELLULAR_APN** (required): Access Point Name (APN) as defined by your cellular provider. You can also obtain this information from the [Mobile Broadband Info](#) web page.
- **CELLULAR_PIN** (optional): SIM card pin number. Do not define if the SIM card is not locked.
- **CELLULAR_AUTO** (optional): If defined, the cellular network interface is brought up on boot.

The configuration above should be enough to work with most modern cellular modems, such as the Telit LE910, Huawei ME909u, and Sierra Wireless MC7710. These modems do not need to use `pppd` to bring a network interface up.

Some older serial-only modems such as the Telit HE910, which require `pppd` to bring up a network interface, require the following additional configuration settings:

- **CELLULAR_PORT** (required): Device node name of the data serial port of the modem, usually `ttyUSBn` or `ttyACMn`. This is mandatory for serial-only modems.
- **CELLULAR_USER** (optional): Username for `ppp` authentication.
- **CELLULAR_PASSWORD** (optional): Password for `ppp` authentication.

The authentication settings are optional depending on the cellular network. See the [Mobile Broadband Info](#) web page.

The scripts at `/etc/network/if-pre-up/` and at `/etc/network/if-post-down/` establish or close a cellular connection when bringing the network interface up or down, respectively.

The cellular variables on your project's `conf/local.conf` are inserted into the `/etc/network/interfaces` file as shown in the following example:

```
# Cellular interface
#auto wwan0
iface wwan0 inet manual
    apn ac.vodafone.es
    pin 1234
```

You can manually edit this file to match other environments.

Protocols

The following table shows the default protocol and other protocols supported by these modems.

Modem	Default protocol	Other supported protocols
Telit LE910	QMI	USB Serial
Telit HE910	USB Serial	-
Huawei ME909u	USB NET	Serial, MBIM
Sierra Wireless MC7710	USB NET	Serial, QMI, MBIM

Configuration examples

The following sections list specific configuration for the modems listed above. In these examples, we use *movistar.es* as provider and a locked SIM with the pincode "1234".

Telit LE910

```
local.conf
-----
CELLULAR_INTERFACE = "wwan0"
CELLULAR_APN = "movistar.es"
CELLULAR_PIN = "1234"
CELLULAR_AUTO = "1"
```

Telit HE910

```
local.conf
-----
CELLULAR_INTERFACE = "ppp0"
CELLULAR_APN = "movistar.es"
CELLULAR_PIN = "1234"
CELLULAR_AUTO = "1"
CELLULAR_PORT = "ttyACM0"
CELLULAR_USER = "movistar"
CELLULAR_PASSWORD = "movistar"
```

Huawei ME909u

```
local.conf
-----
CELLULAR_INTERFACE = "eth1"
CELLULAR_APN = "movistar.es"
CELLULAR_PIN = "1234"
CELLULAR_AUTO = "1"
```

Sierra Wireless MC7710

```
local.conf
-----
CELLULAR_INTERFACE = "wwan0"
CELLULAR_APN = "movistar.es"
CELLULAR_PIN = "1234"
CELLULAR_AUTO = "1"
```

Instructions for unsupported modems

If your modem is not supported by Digi Embedded Yocto, Digi can provide a cellular integration guide to help you integrate a modem into your Digi Embedded Yocto system. Contact your local Digi representative or [Digi Technical Support](#) to obtain the Cellular Integration Guide.

Known issues

- The ConnectCore 6 SBC version 1 (PCB number 30014752 01) delivers a maximum of 1500 mA on the PCIe interface. Ensure that the cellular modem you use doesn't exceed the power limits of the ConnectCore 6 SBC PCIe interface to avoid random communication problems.
- When you are using the QMI protocol, ModemManager will disconnect the connection upon receipt of a "limited capability" message.
- When you are using ModemManager, the initialization of some cellular modems could fail if there is no power cycling of the card between two initializations. This could happen when going through a software reset. To avoid this situation, we recommend you incorporate a mechanism in your carrier board to power cycle the modem at boot time.

Limitations

The cellular support in Digi Embedded Yocto is based on the ModemManager open source software package. Some advanced features such as link monitoring and re-connection are not currently implemented.