MULTITECH®

AT Command Addendum and Getting Started Guide for LEU1 Devices

Telit Firmware 17.00.5x3 Reference Guide

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Welcome

This is an addendum to the Telit LE910 AT Command Reference Guide. This documents any known AT command issues and provides basic getting started information.

Known Issues (Applies to all LE910-XXX 17.00.xx3)

Command	Description
S Parameters	
S7	Connection Completion Time-out
Network Service Handling	
+CPOL	Preferred Operator List
+CDIP	Called Line Identification Presentation
#NASC	Non-Access-Stratum Compliancy
Configuration AT Commands	
#GPIO	General Purpose Input/Output PIN Control
#PSNT	Packet Service Network Type
#BND	Select Band
GPS AT Commands Set	
$GPSP	GPS Power Management
Mobile Equipment Control	
+CSIM	Generic SIM Access
Generic Modem Control	
+FCLASS	Select Active Service Class

S7

S7 is settable to 0, when manual shows range of 1-255

+CDIP?

+CDIP? responds with ERROR, it should respond with +CDIP:(list of supported <n>s)

#NASC?

#NASC? should respond with a default of 2 but instead says 3.

+CPOL? and +CPOL=?

+CPOL? And +CPOL=? respond with Error, when manual states it should report setting and ranges.

+CSIM=?

+CSIM should respond with OK but instead responds with Error.

+FCLASS=?

+FCLASS=? should report options 0,1,8 but some modems respond with options 0,2.0.

+CPOL

To obtain list requires
AT+CPLS=1 AT+CPOL

#PSNT

It appears the manual is incorrect and should be changed to indicate the following:
0 - GPRS network
1 - EGPRS network
2 - WCDMA network
3 - HSDPA network
4 - LTE
5 - Unknown or not registered.

#GPIO

AT#GPIO=1,0,2 does not function in any version of 17.00.xx3 LTE firmware in regards to getting the Status LED to reflect actual network registration.

#BND

Regardless of the values which are set the GSM and UMTS values when queried do not actually reflect the values the device is set for. There is no way to know what values are actually set for.

$GPSP (GPS Function)

Note: NMEA port is only available on USB devices (-U in the model name).

Issue the following to get GPS information out NMEA Port:
AT$GPSSLSR=2,3   AT$GPSP=1
AT$GPSNMUN=1,1,1,1,1,1,1
or
AT$GPSNMUN=2,1,1,1,1,1,1

Issue the following to stream GPS information from the Serial Port or USB:
AT$GPSSLSR=2,3
AT$GPSP=1
AT$GPSNMUN=3,1,1,1,1,1,1

Shift **+++** (to escape to command mode)

Configuring and Communicating with Your Device
Interacting with Your Device Overview

Using terminal software such as Kermit, you can issue AT commands to communicate with and configure your modem. The AT commands let you establish, read, and modify device parameters. They also help you control how the device operates. This section documents basic interactions with your device, such as verifying signal strength and network registrations, sending and reading SMS text messages, and sending and receiving data.

Generally, USB modems are used as unintelligent bit pipes. In Windows, you can create a dial-up network connection using the Windows IP stack to create a PPP connection to the cellular network.

When connecting with the modems IP stack, it is assigned an IP address from the cellular carrier. This connection provides Internet access and is the basis for TCP/IP communication for sending email, creating TCP/UDP Sockets, or putting and getting files from an FTP server.

In Linux, PPPD is used to dial the modem and create the connection to the cellular TCP/IP network. This provides Internet access for sending email, creating TCP/UDP Sockets, or putting and getting files from an FTP server.

Before You Begin

- If you have not done so, install any drivers. Refer to the separate driver installation guide for your device.

- Power up your device and ensure it is connected to the computer that you use to issue AT commands.

- Install terminal software that can communicate with the device, such as HyperTerminal, Tera Term, Kermit, or Putty.

Using Command Mode and Online Data Mode

Modems have two operation modes, command and online data. When you power up the modem it is in command mode and ready to accept AT commands.

Use AT commands to communicate with and configure your modem. They allow you to establish, read, and modify device parameters and control how the modem works. The device can also generate responses to AT commands that help determine the modem's current state.

If the modem is in online data mode, it only accepts the Escape command (+++).

To send the modem AT Commands from terminal emulation software, set the software to match the modem's default data format, which is:

- Speed: 115,200 bps

- Data bits: 8

- Parity: none

- Stop bit: 1

■ Flow control: hardware

To confirm you are communicating with the device:

■ Type **AT** and press **Enter**.

If the device responds with OK, you are communicating with the device.

Verifying Signal Strength

To verify the device signal strength, enter: **AT+CSQ**

The command indicates signal quality, in the form: **+CSQ: <rssi>,<ber>** Where:

<rssi> Received signal strength indication.

0 (-113) dBm or less

1 (-111) dBm

2-30 (-109) dBm - (-53) dBm / 2 dBm per step

31 (-51) dBm or greater

99 Not known or not detectable

<ber> Bit error rate, in percent

0 Less than 0.2%

1 0.2% to 0.4%

2 0.4% to 0.8%

3 0.8% to 1.6%

4 1.6% to 3.2%

5 3.2% to 6.4%

6 6.4% to 12.8%

7 More than 12.8%

99 Not known or not detectable

Note: Signal strength of 10 or higher is needed for successful packet data sessions.

Example

An example response to AT+CSQ: +CSQ: 15,1

Checking Network Registration

Before establishing a packet data connection, verify the device is registered on the network. To do this enter the network registration report read command: **AT+CGREG?**

> If the device returns a **1** or **5** in the status field, the device is registered. The status results appear after the comma in the returned value:
>
> > **+CGREG: 0,1**
> >
> > **+CGREG: 0,5**
>
> If the device returns any other value in the status field, you do not have service.

Sending and Receiving Data

Connecting Device to TCP Server as TCP Client

1. Define modem PDP.

Enter: **AT+CGDCONT=1,"IP","########"**

Where "########" is the APN of the service provider.

2. Bring up Data Connection Using Internal IP stack.

Enter: **AT#SGACT=1,1**

The device responds with the IP Address the cellular provider assigned to the device on connection, followed by OK.

Example:

#SGACT: 25.194.185.116

OK

3. Create Client Connection to TCP Server on Port 500.

Enter: **AT#SD=1,0,500,"###.##.###.##"**

Where ###.##.###.## is the TCP server IP Address.

The device responds with OK. You can now send or receive data without entering additional commands.

Closing the Socket and the Connection

To close the socket:

- Enter the escape sequence: **+++**

- To close Socket 1, enter: **AT#SH=1**

    The device responds with OK.

To close the data connection:

- Enter: **AT#SGACT=1,0**

    The device responds with OK.

Configuring Device as UDP Listener to Accept UDP Client Connections

Note: Wireless account need a Public IP.

To configure the device as a UDP client:

1. Check signal strength.

Enter: **AT+CSQ**

2. Verify device is registered on the cellular network.

Enter: **AT+CGREG?**

Should return:

> **+CGREG: 0,1**
>
> **OK**

3. Configure socket parameters.

Enter: **AT#SCFG=1,1,300,240,600,50**

4. Define modem PDP.

Enter: **AT+CGDCONT=1,"IP","########"**

Where "########" is the APN of the service provider.

5. Activate context one.

Enter: **AT#SGACT=1,1**

6. Set firewall rule to accept connections:

Enter: **AT#FRWL=1,"###.##.###.#","###.##.###.#"**

Where ###.##.###.# represents the IP range.

Example:

AT#FRWL=1,"204.26.122.1","204.26.122.255"

7. Set connection ID 1 for UDP listening mode on port 7000.

Enter: **AT#SLUDP=1,1,7000**

The device responds with and unsolicited indication that a host is trying to connect to connection ID 1 on port 7000.

SRING: 1

8. Accept incoming connection ID 1

Enter: **AT#SA=1**

The device indicates a client successfully established a listener connection.

CONNECT

You can send and receive data.

Exit Data Mode and Close Connection

To exit data mode and close the socket:

■ Enter the escape sequence: **+++**

■ To close Socket 1, enter: **AT#SH=1** The device

responds with OK.

■ To close the data connection, enter: **AT#SGACT=1,0** The device

responds with OK.

Configuring Device as UDP Client to Connect to UDP Server

Configure and Connect the Device

To configure the device as a UDP client:

1. Check signal strength.

    Enter: **AT+CSQ**

2. Verify device is registered on the cellular network.

    Enter: **AT+CGREG?**

    Should receive:

    +CGREG: 0,1

    OK

3. Configure socket parameters.

    Enter: **AT#SCFG=1,1,300,240,600,50**

4. Define modem PDP.

    Enter: **AT+CGDCONT=1,"IP","########"**

      Where "########" is the APN of the service provider.

5. Activate context one.

    Enter: **AT#SGACT=1,1**

6. Create UDP connection to Server port.

    Enter: **AT#SD=1,1,####,"###.##.###.##"**

      Where #### is the server port and ###.##.###.## is the IP number.

The device responds with OK, which indicates a successful connection. You can send and receive data through the socket connection.

Exit Data Mode and Close Connection

To exit data mode and close the socket:

- Enter the escape sequence: **+++**

- To close Socket 1, enter: **AT#SH=1** The device

    responds with OK.

- To close the data connection, enter: **AT#SGACT=1,0**

    The device responds with OK.

Transferring FTP File to FTP Server

To connect to FTP server and upload files:

1. Check signal strength.

   Enter: **AT+CSQ**

2. Define modem PDP.

   Enter: **AT+CGDCONT=1,"IP","########"**

   Where "########" is the APN of the service provider.

3. Activate context one.

   Enter: **AT#SGACT=1,1**

4. Set FTP operations timeout to 10 seconds.

   Enter: **AT#FTPTO=1000**

5. Configure FTP server IP address with username and password.

   Enter: **AT#FTPOPEN="###.##.###.#","username","password",0**

   Where ###.##.###.# is the IP address and the username and password for the FTP server.

6. Configure file transfer type.

   Enter: **AT#FTPTYPE=#**

   Where # is 0 for binary or 1 for ASCII.

7. Enter the file name to be sent to the FTP server and initiate connection.

   Enter: **AT#FTPPUT="file.txt"** The device

   responds with:

   CONNECT

8. Send the file through the device.

Closing the FTP Data Connection

When you finish sending the file:

1. Enter the escape sequence.

   Enter: **+++**

   The device responds with:

   NO CARRIER

2. Close the FTP connection.

   Enter: **AT#FTPCLOSE**

3. Close the PPP data connection.

Enter: **AT#SGACT=1,0**

The device responds with OK.

Downloading File from FTP Server

To connect to an FTP server and download files:

1. Check signal strength.

Enter: **AT+CSQ**

2. Define modem PDP.

Enter: **AT+CGDCONT=1,"IP","########"**

Where "########" is the APN of the service provider.

3. Activate context one.

Enter: **AT#SGACT=1,1**

4. Set FTP operations timeout to 10 seconds.

Enter: **AT#FTPTO=1000**

5. Configure FTP server IP address with username and password.

Enter: **AT#FTPOPEN="###.##.###.#","username","password",0**

Where ###.##.###.# is the IP address and the username and password for the FTP server.

6. Configure file transfer type.

Enter: **AT#FTPTYPE=#**

Where # is 0 for binary or 1 for ASCII.

7. If required, change the working directory to "folder1".

Enter: **AT#FTPCWD="folder1"**

8. Enter the file name.

Enter: **AT#FTPGET="filename.txt"**

Where filename.txt is the file you want to download.

The device responds with: CONNECT

The file is received through the device.

The device responds with: NO CARRIER

The data connection closes automatically when the file sending ends.

Closing the FTP Data Connection

When you finish sending the file:

1. Close the FTP connection.

   Enter: **AT#FTPCLOSE**

2. Close the PPP data connection.

   Enter: **AT#SGACT=1,0**

   The device responds with OK.

Reading, Writing and Deleting Messages

Reading Text Messages

To read a text message in text mode:

1. Put the device in text mode.

Enter: **AT+CMGF=1**

2. Read message.

Enter: **AT+CMGR=1**

Example:

```
AT+CMGR=1
+CMGR: "REC READ","+16156219630","","15/02/26,15:57:20-24"
How are you

OK
```

Sending Text Messages

To send a text message in text mode:

1. Put the device in text mode.

Enter: **AT+CMGF=1**

The device responds.

OK

2. Enter the recipient's number and your message.

Enter: **AT+CMGS="##########"**

>Your message here

Where ########## is the recipient's number.

3. Send the message.

Enter: **CTRL+Z**

The device responds: +CMGS: #

Where # is the message reference number

OK **Example:**

```
AT+CMGF=1

OK
```

AT+CMGS="6155554563"

> How are you? <CTRL+Z to send>

+CMGS: 255

OK

Deleting Messages

To delete one text message, enter: **AT+CMGD=I,#**

Where I is the index in the select storage and # is the delflag option. Enter:

0 Deletes message in the specified index.

1 Deletes all read messages. Leaves unread messages and stored device originated messages.

2 Deletes all read and sent device-originated messages. Leaves unread messages and unsent device-originated messages.

3 Deletes all read messages and sent and unsent device-originated messages. Leaves unread messages.

4 Deletes all messages.

Example:

AT+CMGD=1 (delete message at index 1) AT+CMGD=2 (delete

message at index 2)

AT+CMGD=1,0

AT+CMGD=1,1

AT+CMGD=1,2

AT+CMGD=1,3

AT+CMGD=1,4