



DTL01 and DTL02 User's Manual



Table of Contents

Background	3
Overview of Radio Module Hardware	4
Theory of Operation.....	5
Pin-out Chart for the DTL01	Error! Bookmark not defined.
Operation of the DTL01 Radio Modem.....	5
Operation of the DTL02 Radio Modem.....	6
Command Set.....	6
RF Exposure Limit Warning	8
FCC Certification Requirements	8
Warning (Part 15.21).....	8
Compliance Statement (Industry Canada).....	9
Example Applications	10
Installation	10
Host Manufacturer Statements	10
Host Labeling.....	11



Background

The DTL01 radio module is intended for installation in Bluetooth streetlight controls applications and to communicate to keyfobDTL02. The module is supplied regulated 3.3Vdc by a DTL custom host board with +/-1% regulated supply in all applications. The keyfob is supplied by 3V coin cell CR2032.

The module assembly DTL01is also known as ROAM part numbers; 401-00213-001

The keyfob assembly DTL02is also known as DTL part number; 401-00258-001

FIGURE REMOVED TO KEEP CONFIDENTIALITY

KeyFobDTL02

PCB#: 401-00258-001

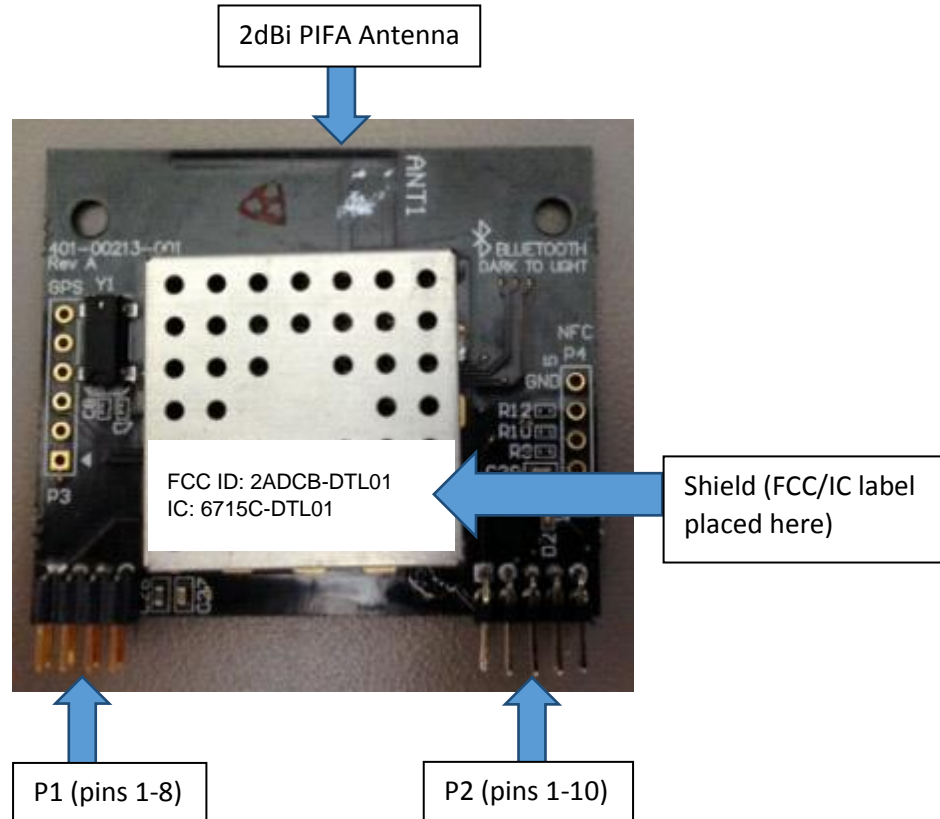
FIGURE REMOVED TO KEEP CONFIDENTIALITY

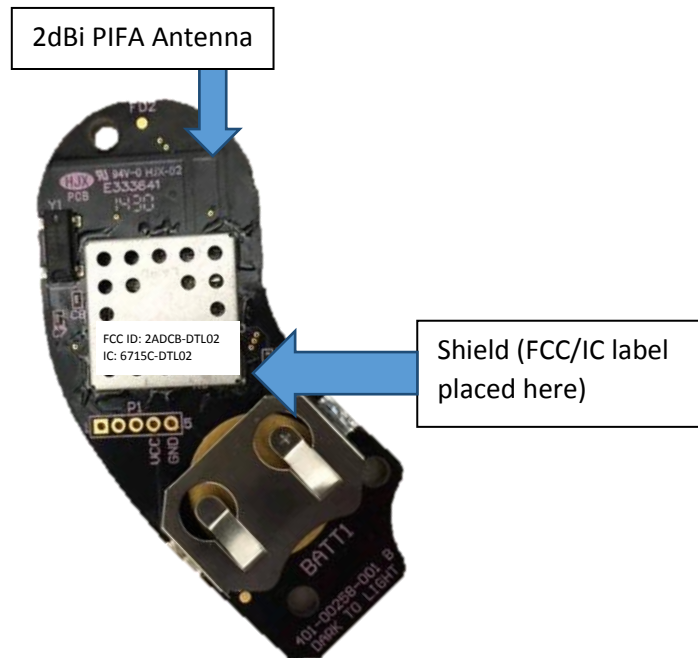
Radio Module DTL01

PCB#: 401-00213-001

Overview of Radio Module Hardware

The DTL01 and DTL02 are Bluetooth modules emitting GFSK 2.4GHz on the ISM band. The features are outlined below. FCC ID label will be applied as shown. Only the following antenna gain and type have been approved for use with these products: 2 dBi gain, PIFA antenna.





Theory of Operation

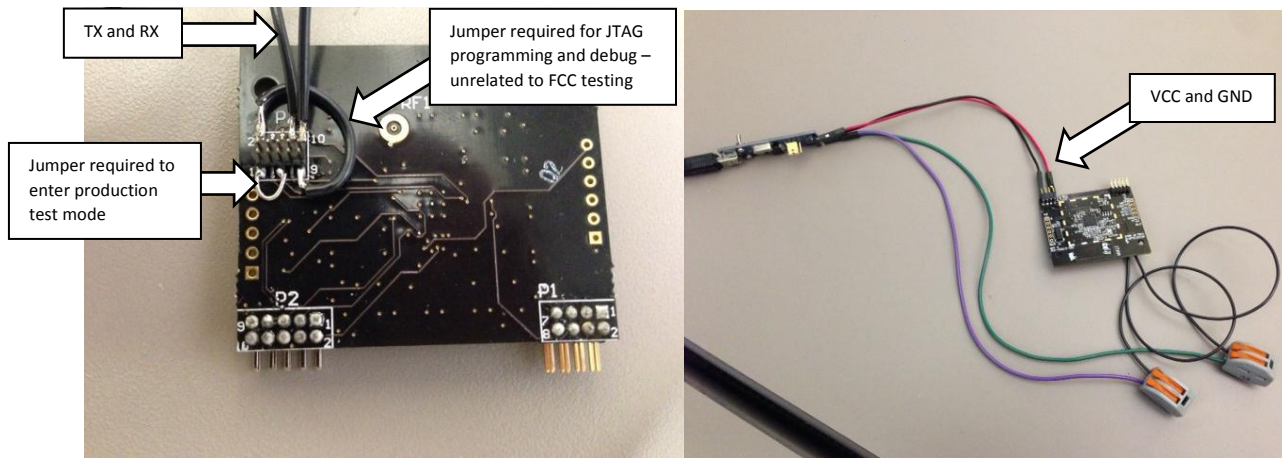
THIS SECTION REMOVED TO KEEP CONFIDENTIALITY

Operation of the DTL01 Radio Modem

Communication with the DTL01 radio modem happens through UART 1. The baud rate is set to 115000, 8N1. Communications through P7 pin 8 (Tx) and pin 10 (Rx). Power through P1 pin 2 (GND) and pin 8 (Vcc). All 4 lines go through USB to UART converter (PL-2303HX) from Mini.



NOTE: In order for the CC2541 to enter production test mode to handle HCI commands, you must connect P7 pin 5 (CTS) to GND as shown below.

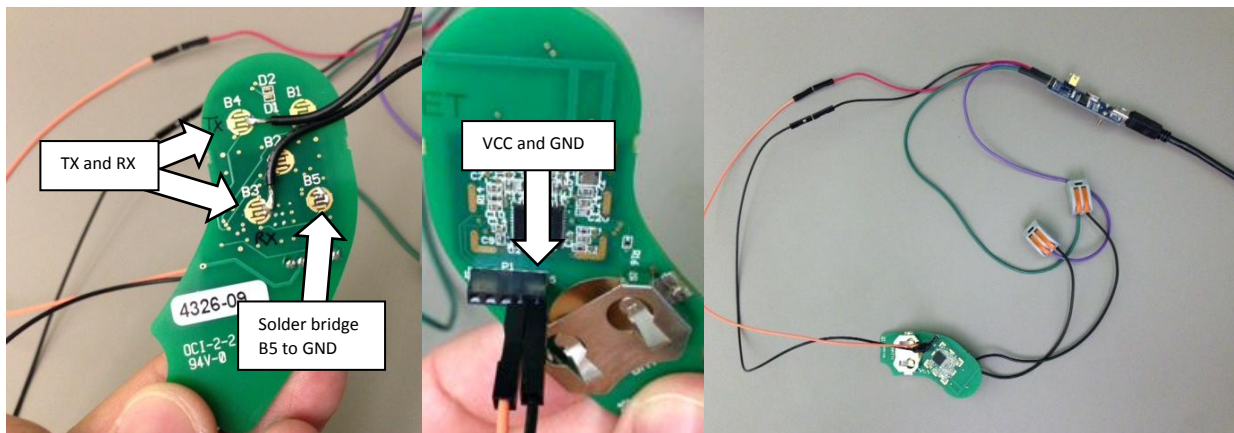


Operation of the DTL02 Radio Modem

Communication with the DTL02 radio modem happens through UART 1. The baud rate is set to 115000, 8N1. Communications through B4 (Tx) and B3 (Rx). Power is supplied through P1 pin 4 (Vcc) and pin 5 (Gnd). Again all 4 lines go through USB to UART converter (PL-2303HX) from Mini.



NOTE: In order for the CC2541 to enter production test mode to handle HCI commands, you must connect B5 (CTS) to GND as shown below.



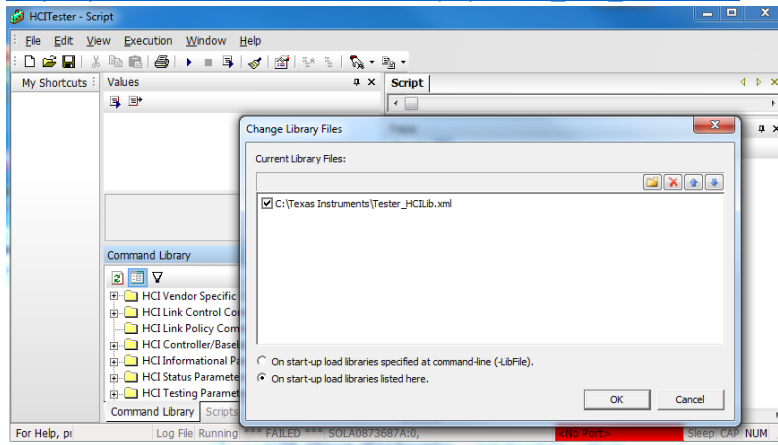
Command Set

Open an instance of “HCI Tester” and verify that the serial port are the correct settings as shown above. You can download the HCI tester at:

http://e2e.ti.com/support/wireless_connectivity/m/videos_files/623388.aspx

Then install the XML files needed for the HCI commands on BLE.

http://processors.wiki.ti.com/index.php/LPRF_BLE_HCITester

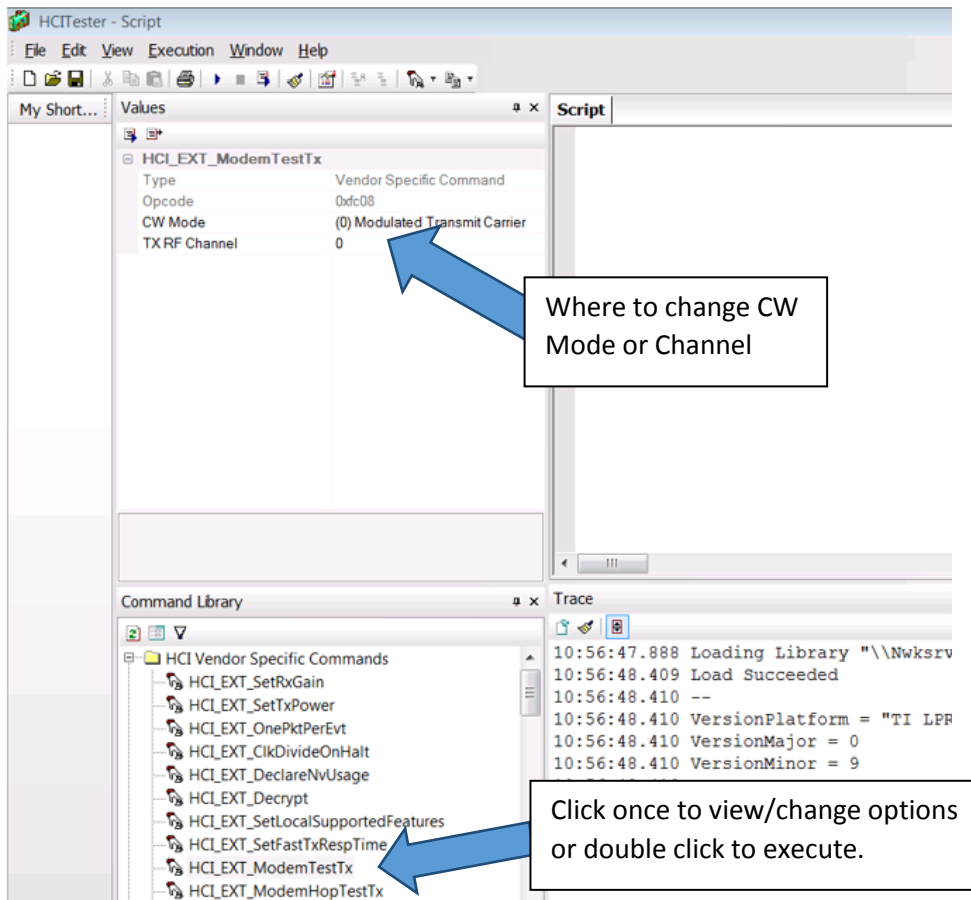


Once the program can connect with the radio UART, the FCC tests that will need to be run are listed at:

http://processors.wiki.ti.com/index.php/FCC_ETSI_Test

Command	CW Mode	RF Channel	Description
HCI_EXT_ModemTestTx	Unmodulated	0	TX Continuous Wave (CW), 2402 MHz, 0 dBm
HCI_EXT_ModemTestTx	Unmodulated	19	TX Continuous Wave (CW), 2440 MHz, 0 dBm
HCI_EXT_ModemTestTx	Unmodulated	39	TX Continuous Wave (CW), 2480 MHz, 0 dBm
HCI_EXT_ModemTestTx	Modulated	0	TX Modulated, 2402 MHz 0 dBm
HCI_EXT_ModemTestTx	Modulated	19	TX Modulated, 2440 MHz 0 dBm
HCI_EXT_ModemTestTx	Modulated	39	TX Modulated, 2480 MHz 0 dBm
HCI_EXT_ModemTestRx	N/A	0	RX On, 2402 MHz Standard gain
HCI_EXT_ModemTestRx	N/A	19	RX On, 2440 MHz Standard gain
HCI_EXT_ModemTestRx	N/A	39	RX On, 2480 MHz Standard gain

Note that between each test the user may need to execute “HCI_EXT_EndModemTest”.



RF Exposure Limit Warning

TBD

FCC Certification Requirements

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Warning (Part 15.21)

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



Compliance Statement (Industry Canada)

IC – Canada This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radio électrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Example Applications

Picture of typical application of the DTL01 Module:



The DCC127 series photocontrol will use this DTL01 bluetooth board in order to communicate to the keyfobDTL02.



The DCR remote key fob uses the DTL02 bluetooth radio to communicate to the DCC127 series photocontrol.

Installation

The DTL01 module is limited to OEM installation only. OEM integrators may not provide instruction for end user to remove/install module.

Host Manufacturer Statements

To ensure compliance with all non-transmitter functions the host manufacturer (DTL/Acuity Brands Lighting, Inc.) is responsible for ensuring compliance with the module(s) installed and fully operational. For example, if a host was previously authorized as an unintentional radiator under the Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that the after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements. Since this may depend on the details of how the module is integrated with the host, the grantee (the party responsible for the module grant) shall provide guidance to the host manufacturer for compliance with the Part 15B requirements.

Host Labeling

The following are pictures and locations of the device labels.



Underside of control



Backside of key fob

