

CB2-BLUE15M-TCU Owner's Manual Draft

VISTEON
CORPORATION

1 System Diagram

The following diagram shows a high-level overview of how the user will be able to connect through the TCU to receive TCU services from the telematics service provider as well as the OEM servers.

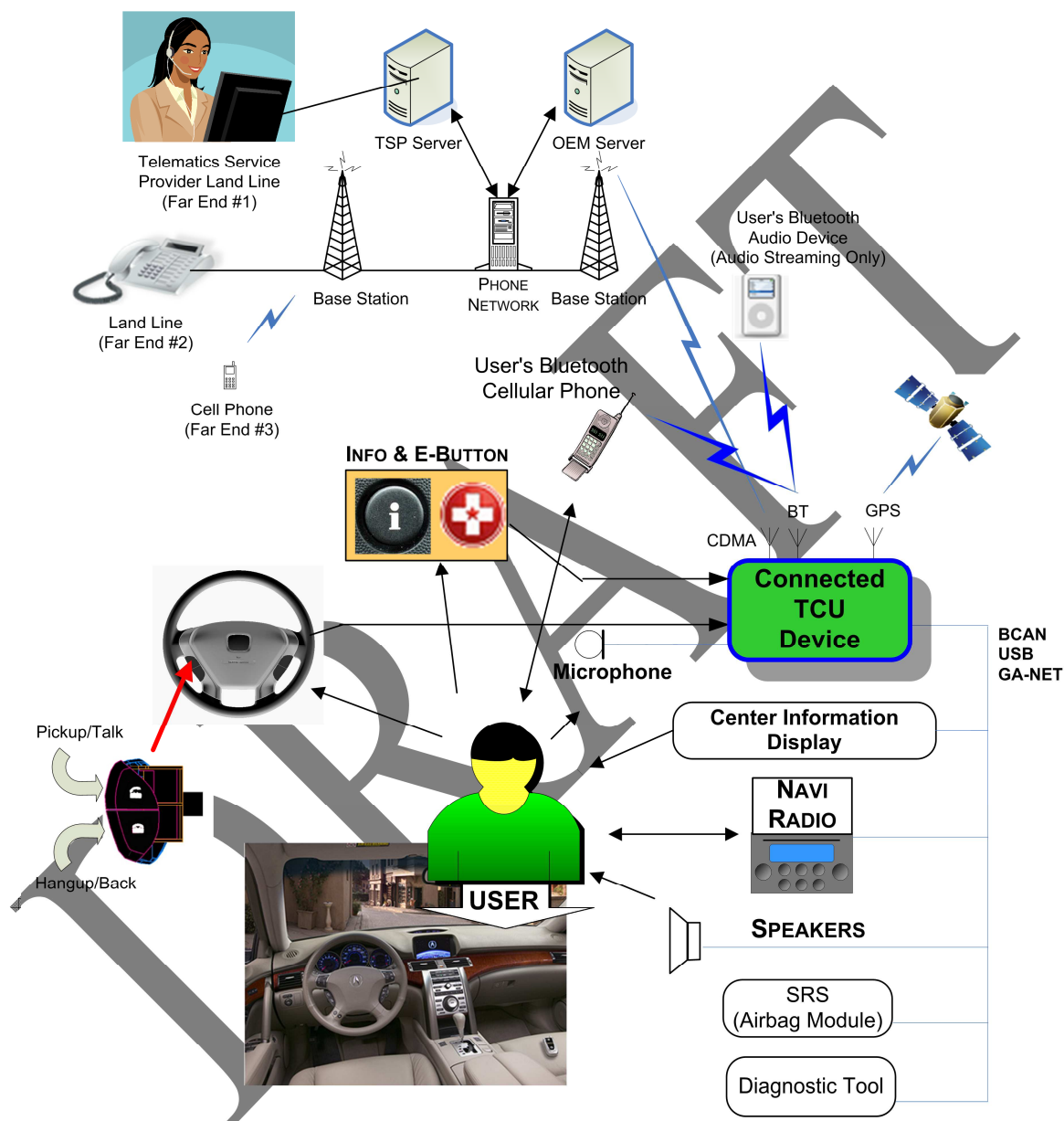


Figure 1: TCU Context Diagram

2 Embedded Phone (CDMA) Features

2.1 Automatic Crash Notification (ACN)

The ACN feature is used to establish a voice call with the Telematics Service Provider (TSP) call center in the event of a collision. A message is sent to the TSP with the location and vehicle status while an LED is blinked, textual indicators are displayed, and a prompt is played to the passengers notifying them of a pending voice call with the TSP. The TSP call center representative subsequently places an incoming voice call to the TCU and it is automatically answered.

2.2 Emergency Call (E-Call)

The E-Call feature establishes a voice call with the TSP when user presses the Emergency button. An SMS is sent to the TSP call center with the location and vehicle status while a visual indicator is blinked, textual indicators are displayed, and a prompt is played notifying a pending voice call with the TSP. A TSP call center representative then places an incoming voice call to the TCU where it is automatically answered.

2.3 Roadside Assistance (R-Call)

The R-Call feature establishes a voice call with the TSP when the user desires Roadside Assistance. When the NAVI sends an Establish Roadside Assistance (RA) message, the TCU sends an SMS to the TSP call center requesting an R-Call session. When the TSP call center responds with a voice call to the TCU, the TCU automatically answers the R-Call.

2.4 Information Call (I-Call)

I-Call feature establishes a voice call with the TSP's IVR system when the user presses the Information (I-Call) button. A message is sent to the TSP requesting an I-Call session, while a visual indicator is blinked, textual indicators are displayed, and a prompt is played notifying of a pending voice call with the TSP. The TSP calls the TCU and it is automatically answered.

2.5 Security and Alerts

The Security and Alerts feature notifies the user when specific events occur. Once an event is triggered, the TCU sends a report via SMS to the TSP.

2.6 Stolen Vehicle Tracking (SVT)

The Stolen Vehicle Tracking feature tracks vehicle position. While SVT is active, the TCU sends periodic location updates to the TSP call center.

2.7 Remote Vehicle Functions

Remote Vehicle Function feature is controlled by the TSP to remotely operate the electromechanical door locks in the vehicle and to view vehicle status.

The feature supports unlocking the driver door, locking all doors, and sending vehicle indicators that could be viewed when in the vehicle. When the TCU receives a Remote Vehicle Function request via SMS from the TSP, it will perform the function requested and send the confirmation back to the TSP.

2.8 Point of Interest (POI) Download

The POI Download feature allows the user to request a destination download to their vehicle. Downloads can be initiated via the TSP operator or a website that offers a destination download option. TCU receives a message requesting POI information. The TCU will then import the destination information and report back to the TSP.

3 Handsfree Telephone (Bluetooth) Features

3.1 Product Description

The TCU provides hands-free calling in the vehicle via the short-range wireless radio frequency communications protocol known as Bluetooth. Integrated into the vehicle audio systems and active on the data bus, the TCU provides the primary human interface functions to both telephone and installed audio systems when operating in the hands-free mode. The TCU includes the speech recognition engine and defined voice tree enabling the voice commanded operation of the system. Primary Hands-Free Telephone commands may also be initiated via switches provided on the steering wheel and Point of Interest selection screens via the Navi touch screen display.

The transfer of stored cellular phone book entries to the TCU (Phone Book Access Push) and the transfer of the complete cellular phone book to the navigation unit upon request (Phone Book Access Pull) are accomplished via the Hands Free Link/Navi Communications.

3.2 Connection Management

Connection Management refers to all the processes related to managing a mobile device (phone or audio player) including pairing device(s), deleting device(s), and managing connections to paired Bluetooth device(s).

3.2.1 Pairing

The TCU supports two methods to pair a device. The first method, Legacy, requires the user to enter a pre-defined 4-digit pairing code. The second method enables a user to pair a device without entering a pairing code. This method is called "Secure Simple Pairing". There are some phones that require a 4-digit pairing code before they will begin communicating with the TCU to initiate pairing. As a result the TCU will provide pairing code instructions to the user in some cases when it may not be necessary. This will be described in detail under Passive Pairing, below.

The TCU system can add Mobile Devices, one device at a time. Prior to pairing a new device, the TCU will disconnect from all currently connected devices to prevent unwanted interruptions during the pairing process.

If the device supports BT version 2.1 or greater, the TCU will determine the security level available on the Mobile Device. If the device supports BT version 2.0 or earlier, the TCU will initiate the Legacy Pairing method.

4-Digit Code Pairing (Legacy Pairing):

When adding a device to the TCU, the user may enter a pairing code on the mobile device (only if the device does not support Bluetooth 2.1). The TCU has a pre-defined pairing code so that the user does not have to enter a pairing code on the TCU at the time of pairing. During the pairing function, the TCU's pairing code will be displayed on the in-vehicle display. The user will be able to change the

pre-defined pairing code to any four-digit number. The pairing code is retained across power cycles and will not change unless the user chooses to change it. In addition, depending on platform, there may be operational prompts to guide user through the pairing process.

Secure Simple Pairing:

The primary goal of the Secure Simple Pairing option is to simplify the pairing procedure for the user. Secondary goals are to maintain or improve the security in Bluetooth wireless technology. (Refer: Bluetooth 2.1+EDR).

Note that the secure simple pairing does not allow any retry during pairing. This means that if the authentication fails, the pairing attempt will fail and the TCU will exit pairing mode.

3.2.2 Auto Pair

The AutoPair feature provides a simplified user experience for pairing a mobile device. In AutoPairing the user is relieved of burdens that are required in normal pairing:

The user will not need to choose between active or passive pairing.

The user will not need to enter a PIN on the HU/NAVI

The TCU will not require a PIN from the Phone

The user will receive displays indicating AutoPair progress

AutoPairing can be performed with Mobile Devices that support any of the following pairing protocols:

Legacy Pairing

Secure Simple Pairing – Just Works

Secure Simple Pairing – Numeric Comparison

3.2.3 Delete Device

A paired Mobile Device can be deleted from the Paired Device List. When a Mobile Device is deleted, corresponding Profile Data is also deleted. Profile Data consists of Speed Dial and Voice Tag of each paired telephony device and SMS user settings.

3.2.4 Connect to Specific Device

The user may select a device to connect to the TCU on the in-vehicle display.

3.2.5 Disconnect

The Bluetooth device can get disconnected from TCU from any of the following triggers:

Disconnect from user-initiated button press

Disconnect from Bluetooth Mobile Device

Search

Pair

Delete

Connect to another device

Connection Lost (e.g. out of range, device stops responding, etc...)

3.2.6 TCU Bluetooth Name

The TCU Bluetooth Name is the name that is provided by the TCU to the other Bluetooth devices (i.e. phones, music players, etc...). This name provides a user friendly way (instead of the Bluetooth address) to identify the TCU during pairing, connecting, etc. This name is set during the manufacturing process and the name used depends on the targeted vehicle and destination for the TCU. Typically the Bluetooth Name will display as "Honda HFT".

3.2.7 Bluetooth On/Off Setting

The user may disable Bluetooth (BT) connectivity to prevent the TCU from performing BT connections with other devices, or to stop BT wireless Radio Frequency (RF) emissions. When BT operation is disabled, all BT functions will be invalid. Also, when BT operation is disabled neither pairing nor connection with other BT devices can be accomplished.

3.2.8 AVP Battery Strength Indication

When the TCU makes a Bluetooth (BT) wireless connection to any device, the battery status of the device is determined (if possible) and sent to the in-vehicle display to the user of the vehicle. This Battery Status is displayed in case the user is not aware of a problem with the device battery.

3.3 Phonebook Management

The TCU provides users with the ability to list a phonebook and call the contacts present in the telephony device phonebook. The users can access their phonebook using the in-vehicle controls while a Mobile Device is connected to the TCU and the phonebook has been successfully downloaded from the Mobile Device. The TCU will only import the main phonebook.

3.4 Call History

Call history includes Dialed, Missed, Received, and All Call History categories as received from the Mobile Device and can be listed to make an outgoing call when the MD is connected. The Call History list is, however not available while a Mobile Device is disconnected. If a Call History request is made while no Mobile Device is connected, the TCU will not fulfill the request.

3.5 Call Management

3.5.1 Dial from Phonebook Contact

The user can initiate an outgoing call by selecting any contact from the on-screen phonebook.

3.5.2 Dial from Call History

The user can initiate an outgoing call by selecting any entry from the on-screen call history list.

3.5.3 Redial

The user can redial the last dialed number. This is done by sending a command to the Telephony device. It is the responsibility of the Telephony device to dial a number. For example, if the call history on the telephony device is empty, it is possible that no call will be made.

3.5.4 Dial using Speed Dial

The user can dial an outgoing call using speed dial previously stored in the system. The speed dial are associated with the phone numbers & not with contacts in the phonebook (refer to the Speed Dial section for details).

3.5.5 Dial from Phone

The user can dial an outgoing call with Mobile Device. When the user attempts to make outgoing call from Mobile Device, how the TCU acts depend on auto-transfer setting state. If auto-transfer is enabled, the TCU acts the same as if TCU make outgoing call. If auto-transfer is disabled, the TCU attempt to reject the call audio request from the Mobile Device.

3.5.6 Caller ID Display

In the case of an incoming call, the phone number of the incoming call will be displayed on the in-vehicle screen while the system ring tone is played.

3.5.7 Transfer

Call audio can be transferred between TCU and telephony device by selecting the “Transfer” option using the in-vehicle controls.

3.5.8 Microphone Mute On/Off

TCU stop transmitting the audio from microphone to the mobile device when the user selects “mute” option using the in-vehicle controls.

3.6 Speed Dial

TCU allows the user to set speed dials to the numbers present in a phonebook contact, the number present in call history, the number from an active call or numbers entered manually.

Speed dials consist of Category type, Contact Name and Number. The speed dials are stored in TCU and maintained separately from the phonebook & call history (i.e. updates to the imported phonebook do not carry over to speed dial list).

TCU stores the profile data (Voice tags & Speed Dial) for all the paired devices.

3.7 Voice Tag

TCU can record a voice tag for a given speed dial entry. TCU add voice tags and delete voice tags. The TCU allow a voice tag to be recorded for a speed dial entry for the active phone.

3.8 Bluetooth Audio

The TCU supports playback of audio files stored on a paired Bluetooth Audio device.

3.9 SMS Messaging Feature

This feature provides for Short Message Service (SMS) message processing by the TCU when connected to an SMS-capable (text messaging) mobile device.

Users of the feature can:

- View incoming messages on the head unit display
- Listen to incoming messages audibly read through the vehicle speakers
- Reply to the sender by choosing from a set of pre-defined reply messages
- Initiate a phone call to a message sender

3.10 Enhanced Messaging Feature (Platform Dependent)

Depending on the vehicle, enhanced capability may be available.

The enhanced capabilities include:

- Processing e-mail if available on the Mobile Device (MD)
- Accessing all folders within a given E-mail account (only inbox supported for SMS)
- Accessing the entire contents of a folder or account
- Replying to messages with arbitrary text

4 Voice Recognition

Vehicles with this version of the TCU will use a Speaker Independent Voice Recognition (SIVR) system instead of a Speaker Dependent Voice Recognition (SDVR) system.

The benefit of an SIVR system over an SDVR is that it gives the user the ability to expand their Hands Free calling capabilities beyond calling using voice tags. The user can utter commands, names, and numbers without first having to record their voice.

The TCU will process the utterance and match to expected words in a particular language, giving the user the increased Hands Free capability. For example, the user can simply say, "redial" or dial by number using SIVR. Please see the Voice Tree Navigation section for all of the SIVR capabilities.

4.1 SIVR Voice Tree Overview

When SIVR is not active, the system defines this to be VR Idle state. The user initiates SIVR by pressing the Talk Button. Once pressed, available SIVR functions are presented to the user in a sequenced menu structure. In other words, only certain VR commands are available at certain times as the user executes a VR session.

The menu structure, with its associated branches and allowed verbal commands, is defined in the Voice Tree. Please see the following diagram for available commands.

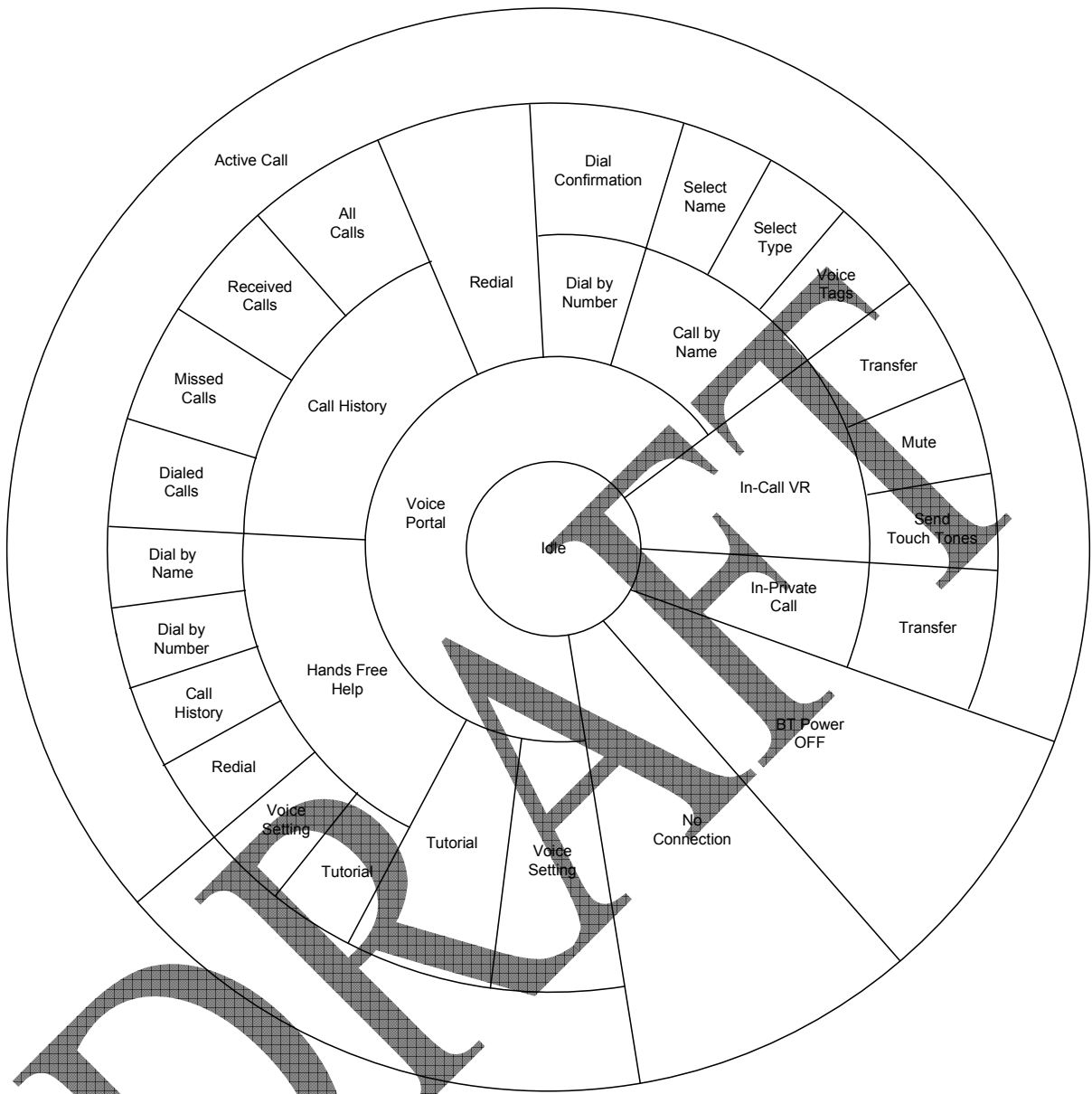


Figure 2: Voice Tree Wheel

5 System Interfaces

This section describes the user interface of TCU system. These include the various components for user interaction (e.g. the head unit display, head unit buttons and knobs, steering wheel buttons, microphone/speaker).

5.1 User Interfaces

The user and the TCU system interact through various interfaces including:

- Buttons on the steering wheel
- Head Unit (In-vehicle controls)
- Head Unit Display (In-vehicle display)
- Microphone
- Speaker (Audio System)

The following sections provide further information on each of these user interfaces.

5.1.1 Steering Wheel Buttons

Depending on the vehicle type, there are up to 4 steering wheel buttons that provide input to the vehicle audio system.

5.1.2 Head Unit

The head unit (in-vehicle controls) incorporates several controls and is usually integrated with the radio system and can include a small display.

5.1.3 Head Unit Display

In a vehicle with the navigation option, a larger screen which is integrated with the GPS feature is available to display prompts sent to it by the TCU.

5.1.4 Microphone

The Microphone is responsible for capturing the user's voice input for voice recognition (Dial by Voice tag) and to support conversations while a call is active.

5.1.5 Speaker

The TCU system uses front left and front right speaker. The Bluetooth Audio system uses all the speakers in the vehicle.

The device under test is manufactured by the grantee (Visteon Corporation) and sold as an OEM product. Per **47 CFR 2.909, 2.927, 2.931, 2.1033, 15.15(b), RSS-Gen, RSS-247, RSS,-102, etc...**, the grantee must ensure the end-user has all applicable / appropriate operating instructions.

When end-user instructions are required, as in the case with this product, the grantee must notify the OEM to notify the end-user.

Visteon Corporation will supply the following information to the reseller/distributor dictating what must be included in the end user's manual for the commercial product:

INFORMATION TO BE INCLUDED IN THE END USER'S MANUAL

The following information must be included in the end product user's manual to ensure continued FCC and IC regulatory compliance.

Modification statement

Visteon Corporation has not approved any changes or modifications to this device by the user. Any changes or modifications could void the user's authority to operate the equipment.

Visteon Corporation *n'approuve aucune modification apportée à l'appareil par l'utilisateur, quelle qu'en soit la nature. Tout changement ou modification peuvent annuler le droit d'utilisation de l'appareil par l'utilisateur.*

Interference statement

This device complies with Part 15 of the FCC Rules and Industry Canada licence-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 radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Wireless notice:

This product emits radio frequency energy, but the radiated output power of this device is far below the FCC and IC frequency exposure limits. This equipment complies with FCC and IC RF radiation exposure limits forth for an uncontrolled environment. Nevertheless, the device should be used in such a manner that the potential for human contact with the antenna during normal operation is minimized.

This product integrates an AR5550 CDMA modem (FCC ID: N7NAR5550, IC: 2417C-AR5550). The AR5550 modem is granted with a modular approval for mobile applications. Integration has been done meeting the following conditions:

1. At least 20cm separation distance between the antenna and any person body is maintained at all times.
2. To comply with FCC/IC regulations limiting both maximum RF output power and human exposure to RF radiation, the maximum antenna gain including cable loss in a mobile only exposure condition does not exceed 4.25dBi for CDMA 800 band and 6.1dBi for CDMA PCS band.
3. The AR5550 antenna is not co-located with any other antennas.

Ce produit émet énergie de radio fréquence, mais la puissance de sortie rayonnée de l'équipement est assez inférieure aux limites de fréquences d'exposition établie par la IC. Cet appareil est conforme aux limites d'exposition aux rayonnements de la IC pour un environnement non contrôlé. Cependant, le produit devrait être utilisé de telle manière que le potentiel contact humain avec l'antenne durant une utilisation normale soit minime.

Ce produit intègre le modem CDMA AR5550 (FCC ID: N7NAR5550, IC: 2417C-AR5550). Le modem AR5550 est homologué comme étant un module pour les applications mobiles. L'intégration a été accomplie selon les suivantes conditions :

1. *L'antenne doit être installée de façon à garder une distance minimale de 20 centimètres entre la source de rayonnements et votre corps.*
2. *Pour être conforme avec la réglementation IC, et la puissance de sortie RF et l'exposition humaine au rayonnement RF, le gain maximum de l'antenne doit ne excède: 4.25dBi pour la bande CDMA 800 et 6.1dBi pour la bande CDMA PCS.*
3. *L'émetteur ne doit pas être co-localisé ni fonctionner conjointement avec à autre antenne ou autre émetteur.*

It is preferred that the following ID numbers be included in the manual if the device label is not readily accessible to the end user.

FCC ID: NT8-BLUE15M-TCU

IC: 3043A-BLUE15M-TCU

The following information should be provided to the end user, regardless of placement of the device (portable vs. installed in vehicle), by citation in the manual. Please note that co-location is generally considered to be when 2 transmitters radiating elements are < 20 cm apart from each other.

The antenna used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter, except in accordance with FCC and Industry Canada multi-transmitter product procedures. End-users and installers must be provided with installation instructions and transmitter operating conditions for satisfying RF exposure compliance.