# Fleet Management Controller
# User Guide

**September 16, 2015**
**Revision F**

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**Warning:**

All companies and individuals accessing the Garmin Fleet Management Interface Control Specification are advised to ensure the correctness of their Device software and to avoid the use of undocumented features, particularly with respect to packet ID, command ID, and packet data content. Any software implementation errors or use of undocumented features, whether intentional or not, may result in damage to and/or unsafe operation of the device.

# Table of Contents

This document is meant to serve as an overview of the usage of Garmin's Fleet Management Controller. Download it from http://developer.garmin.com/lbs/fleet-management/.

# I.    Establishing an FMI connection with FMC

Prerequisite: Device is connected to a computer using an FMI cable, and it has a power supply.

1. Open the Fleet Management Controller.  You will get the following prompt: select "No".
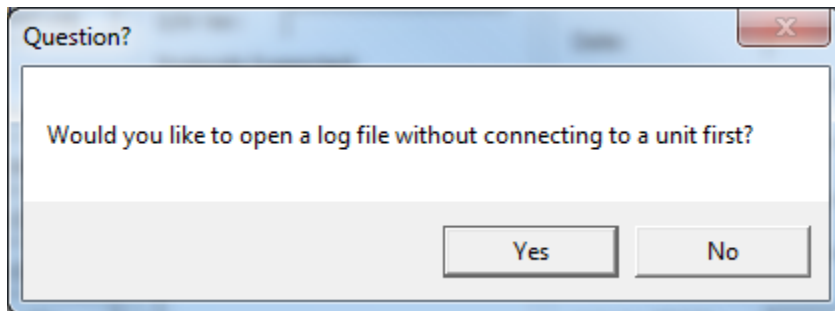


2. You will then be prompted to choose a COM port through which the connection will be established.  This information can be found in your computer's Device Manager.
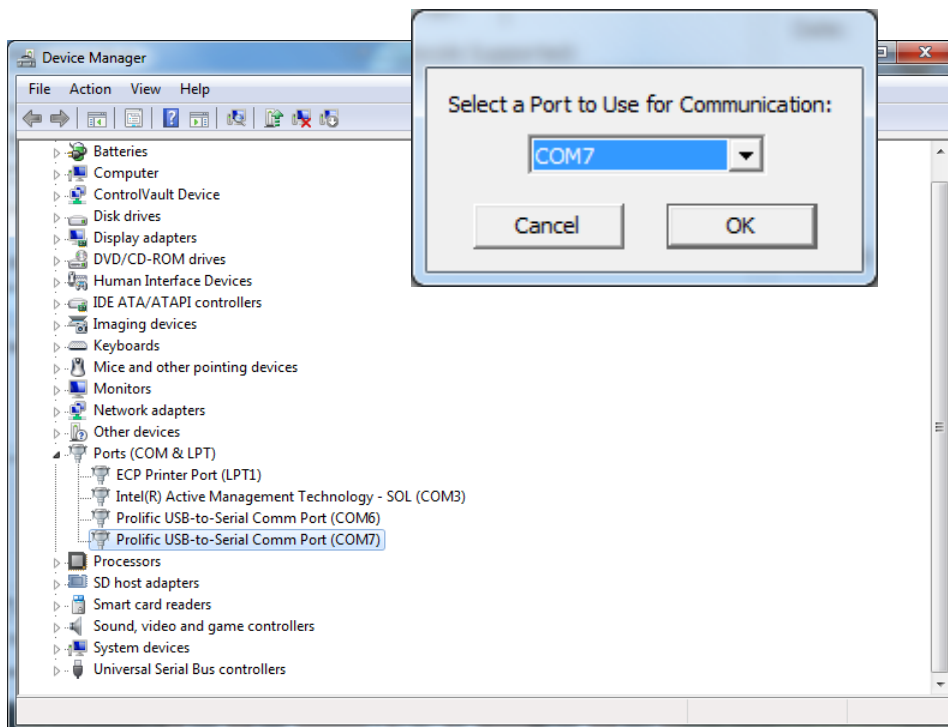
3. You will then be prompted to "Select Features". Depending on desired functionality, you may select any of the following checkboxes, and then click "OK". A discussion of these features can be found in Section 5.1.2 of the FMI Protocol Spec.
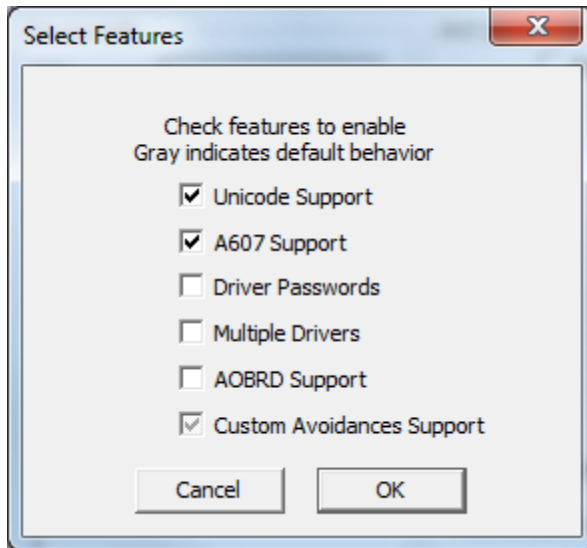


4. Provided that the connection is successfully made, you are taken to the main FMC window. All further operations will start from here.
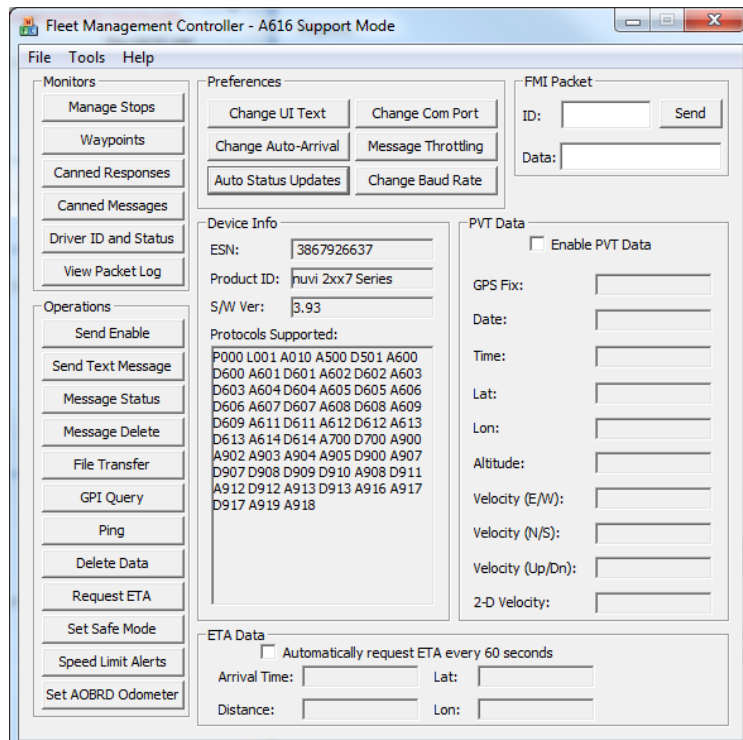
## II.    Viewing the Packet Log

By opening the packet log, it is possible to view all non-throttled messages sent between the server and the device. It is beyond the scope of this guide to discuss the FMI Protocol, which is defined in the specification document. The packet log is quite useful for debugging purposes, and the packet logs can be saved to a .log document.
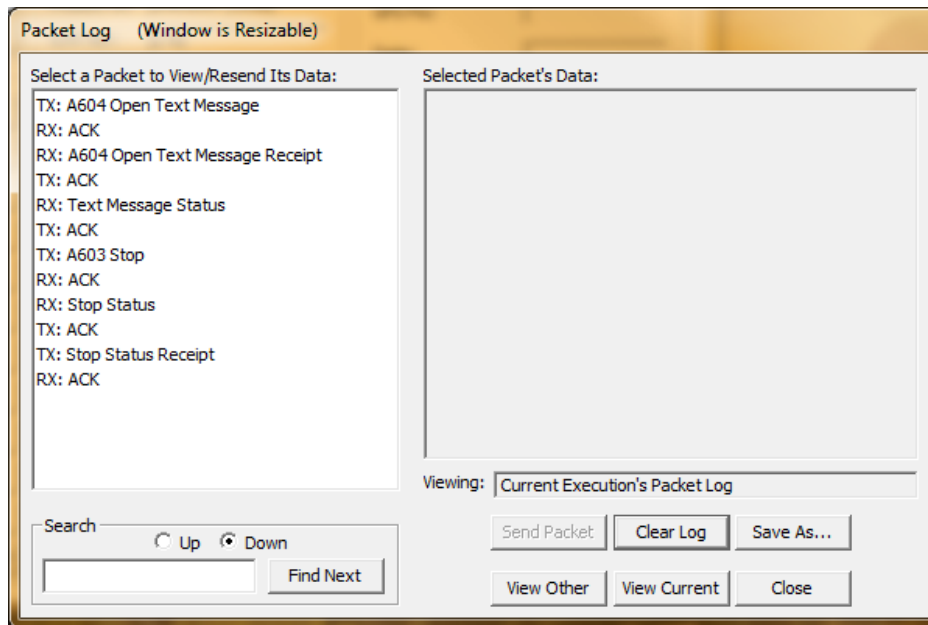


## III.    Send Enable

If the device-server connection is lost, or if certain features need to be enabled or disabled, the "Send Enable" button opens the dialog box discussed in section I. The "Enable" protocol itself is discussed in Section 5.1.2 of the FMI Protocol Definition.
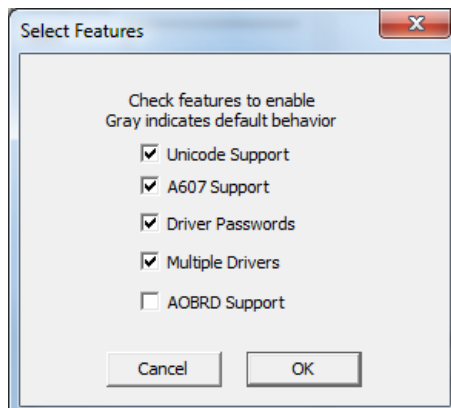
## IV.     Change COM Port

Should the server use a different COM port to communicate with the device, the port can be changed through this dialog.
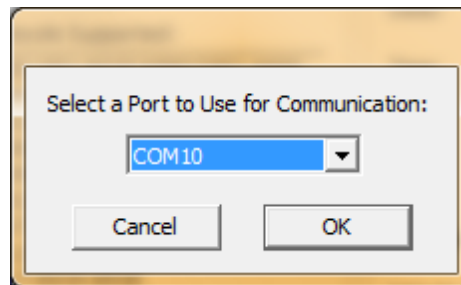


## V.     Device Information

When the connection between the server and the device is established, the device sends information regarding the protocols it supports, as well as the Serial Number, the software version, and the product ID. These are described in Sections 5.1.3 and 5.1.4 of the FMI Protocol Definition.
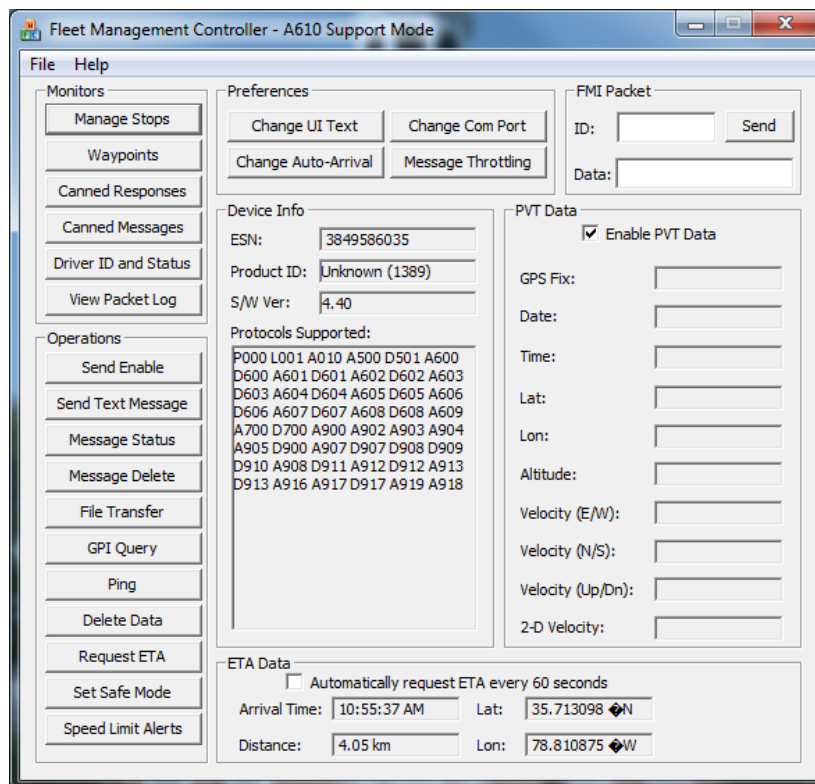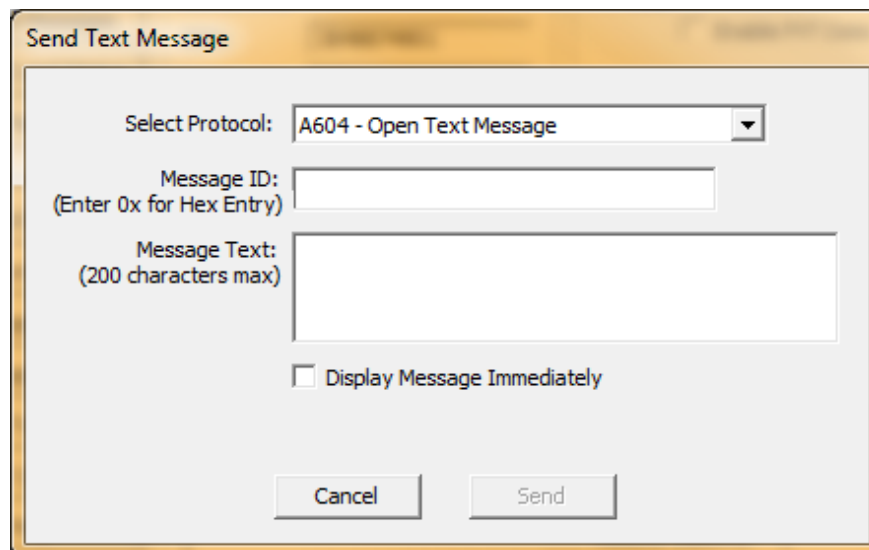
The ESN, or Electronic Serial Number, can be found on the device under Tools →
Settings → System → About → Unit ID. This screenshot is taken from dezl560.

**About**

**Model:** dēzl 560
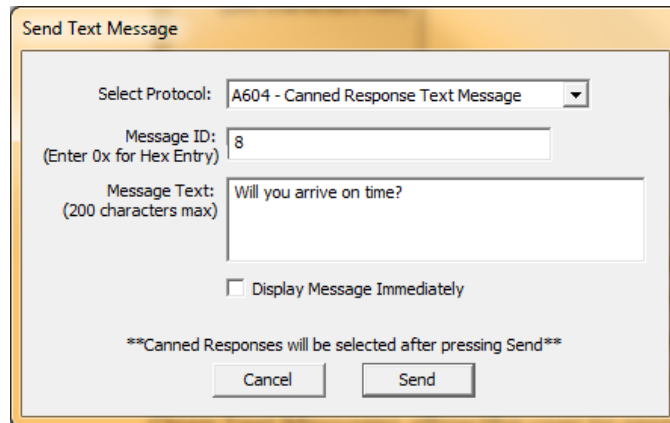**Unit ID:** 3816065438
**Software Version:** 3.12 **with Long Text Prototype**
**NTTS:** 2011.30
**Audio Version:** 2.70 (American English-Jill)
**GTM:** 2.20
**Text Version:** 3.12 (American English)
**GPS Firmware:** 2.89
**Bluetooth Firmware:** 5.03 A15
**FMI:** 2.7
**HOS_FMI:** 1.0

## VI.    Send Text Message

From this dialog box, text messages can be sent from the server to the device.

Send Text Message

Select Protocol: A604 - Open Text Message

Message ID:
(Enter 0x for Hex Entry)

Message Text:
(200 characters max)

☐ Display Message Immediately

Cancel          Send

Depending on the protocols supported by the server system, different types of text
messages can be sent. The server may also define whether the message is displayed to
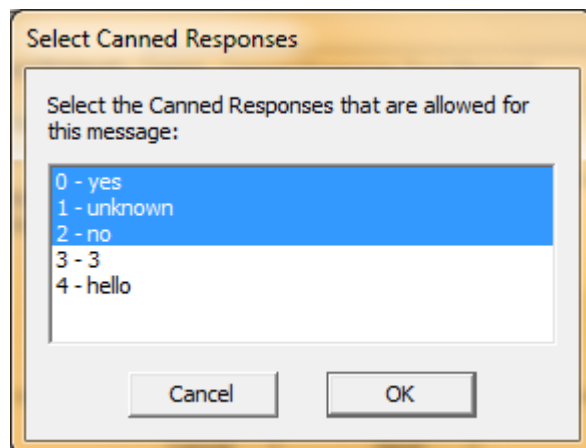the user immediately after it is received.

- Open Text Messages allow the user to respond using either a keyboard or a
  "Canned Message". Canned messages are described in Section X of this
  document.

- Canned Response Text Messages require the user to respond using one of the server-defined "Canned Responses" described in Section IX. of this document.
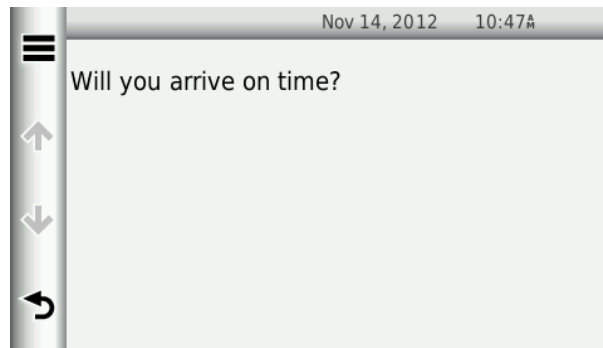


The selected canned responses *MUST* be present on the device before the message is sent. Otherwise, an error will occur.

On the device, the message appears in the Inbox. Clicking on the message will bring up the message screen.
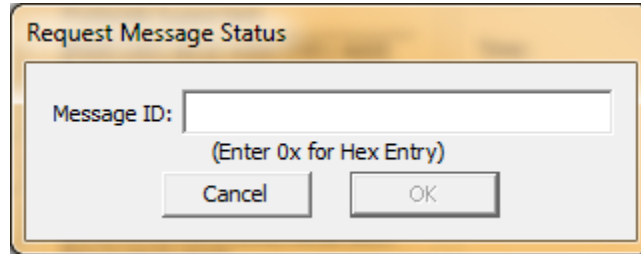


Then, when the user replies to the message, the canned responses appear.



The text message protocol is discussed in Section 5.1.5 of the FMI Protocol Definition.

## VII.  Message Status

The server may request the status of a particular message at any time by entering the message ID using the following request form.
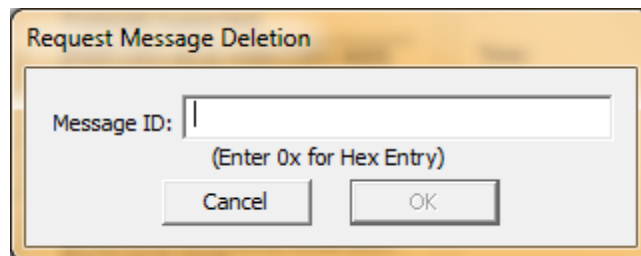


The device will respond with "unread", "read inactive", "active", or "not found", depending on the state of the message. "Not found" usually indicates that the message has been deleted by the user. The relevant protocol is discussed in section 5.1.5.2 of the FMI Protocol Definition.

## VIII.  Message Delete

If the server wishes to force the deletion of a particular message from the device, the message ID can be specified in the "Request Message Deletion" box. The relevant protocol is discussed in section 5.1.5.3 of the FMI Protocol Definition.

## IX.    Canned Responses

Canned responses are a list of pre-defined responses initialized by the server that can be displayed as quick replies to the PND user when displaying a text message. First, a list of canned replies needs to be downloaded from the server to the PND. On subsequent text messages, the server can specify that one or more of these replies be displayed to the user.



Each canned response has a unique ID and associated text. The text of a canned response can be updated by sending the ID with new text.
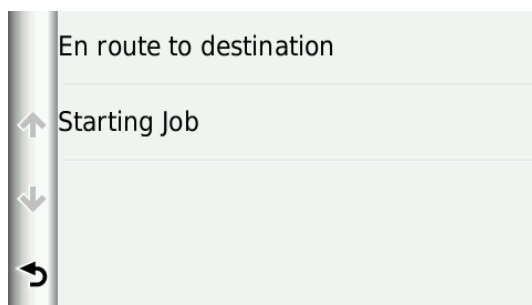


The relevant protocol is discussed in section 5.1.5.4 of the FMI Protocol Definition.

## X.  Canned Messages

Canned messages are a list of pre-defined messages initialized by the server that can be displayed as "quick messages" to send to the server. First, a list of canned messages needs to be downloaded from the server to the PND. The user can then send these messages at any point to the server. For example, if the driver frequently sends the same message to the server, it can be defined as a canned message through the "Canned Message" dialog box. Similar to Canned Responses, these have a unique ID and associated text.
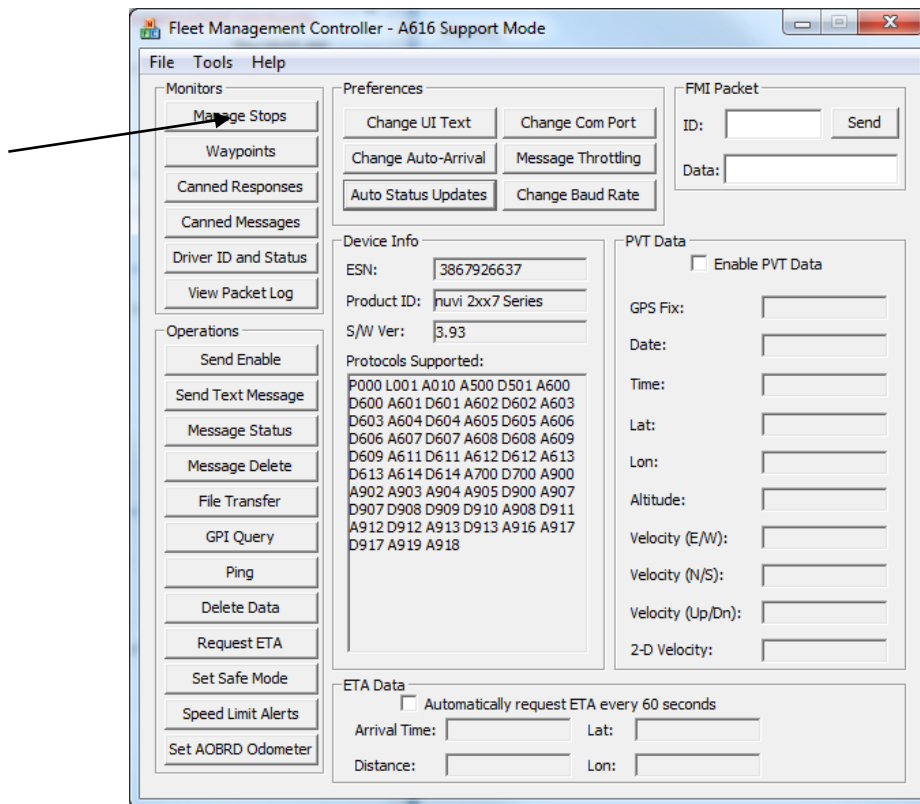


On the device, these messages can be found through Dispatch → Messages → Quick Message.



The relevant protocol is discussed in section 5.1.5.6 of the FMI Protocol Definition.
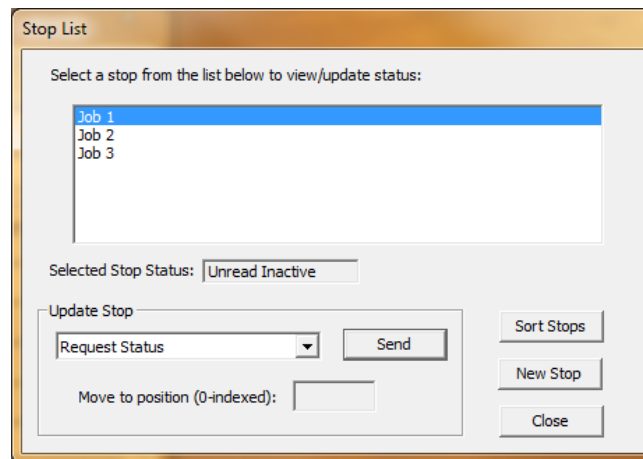
## XI.    Managing stops

From this dialog box, the server can perform stop-related operations.



Clicking the "Manage Stops" button brings up the "Stop List" dialog, which lists all of the stops that are present on a device. By clicking on a stop and using the drop-down menu, the server can request the status of a stop, activate the stop, delete the stop, or mark the stop as completed. Also, if destinations need to be in a specific order, the server can re-order the stops using the "Move Stop" function from the drop-down menu.

The "Sort Stops" button automatically orders all stops in terms of distance from the current location.
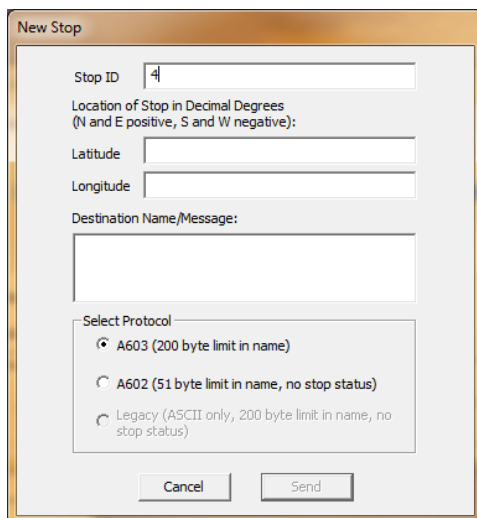


To create a new stop, click the "New Stop" button. This brings up the following dialog box. From here, the server defines the latitude and longitude of the stop, as well as the unique Stop ID and the name of the stop. Once all of the information has been filled out, clicking the "Send" button pushes the stop to the device.
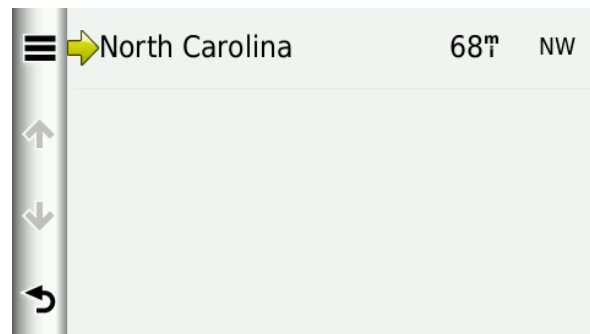
It is also possible to access a **custom form** from a stop by accessing the stop, tapping the "Menu" button, and choosing "Forms". For more on Custom Forms, see section XXVIII.

The relevant protocol is discussed in section 5.1.6 of the FMI Protocol Definition.

## XII.   Request ETA

If there is an active stop on the device, the Estimated Time of Arrival can be queried by clicking this button. The data will be displayed in the "ETA Data" section of the main FMC window. If the checkbox is checked, then ETA data will be pulled from the device once per minute.



The relevant protocol is discussed in section 5.1.8 of the FMI Protocol Definition.

**XIII. Change Auto-Arrival**

The server may define circumstances under which a stop is classified as "completed". Distance to the stop and vehicle stop time can be used as parameters. For example, if the server sets the values to be 200 meters and 30 seconds, then the driver must be completely stopped within 200 meters of the current stop for at least 30 seconds.



The relevant protocol is discussed in section 5.1.9 of the FMI Protocol Definition.

## XIV. Driver ID and Status
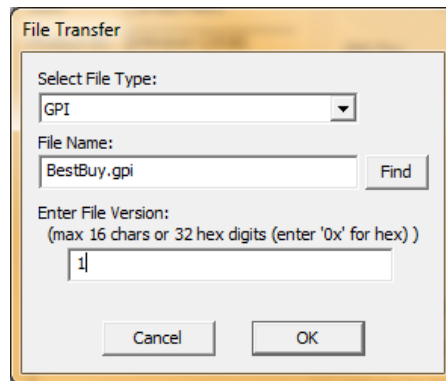
If **not** using the AOBRD protocol, the "Driver ID and Status" Dialog box can be used to define Driver IDs and to create a list of statuses for drivers to choose from.
The ID/status can be server-defined by entering the driver ID (i.e., "John Smith") or status (i.e. "en route"), and then clicking "Send".



If using driver passwords, the "Driver Logins" button can be used to access this page, where the driver ID and required password can be set.



The relevant protocol is discussed in section 5.1.12 of the FMI Protocol Definition.

## XV. File Transfer

GPI files can be sent to the device using the "File Transfer" functionality of the FMC. Navigate to the desired .gpi file, enter the file version number, and then click "OK". Transferring the file can take several minutes.
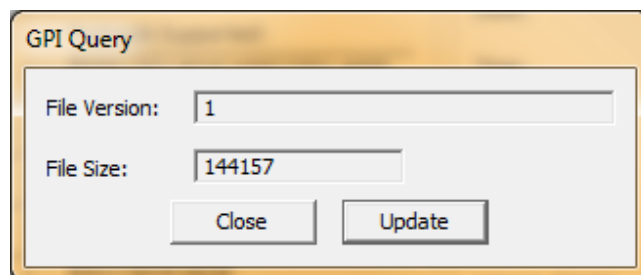


The relevant protocol is discussed in section 5.1.13 of the FMI Protocol Definition.


## XVI. GPI File Query

If a file has been sent using "File Transfer", the file can be queried through the "GPI Query" dialog.

## XVII. Delete Data

Using this dialog box, some or all of the FMI information on the device can be deleted. Disabling FMI will restart the device and remove *all data.* This is not a reversible operation, so handle it with care!
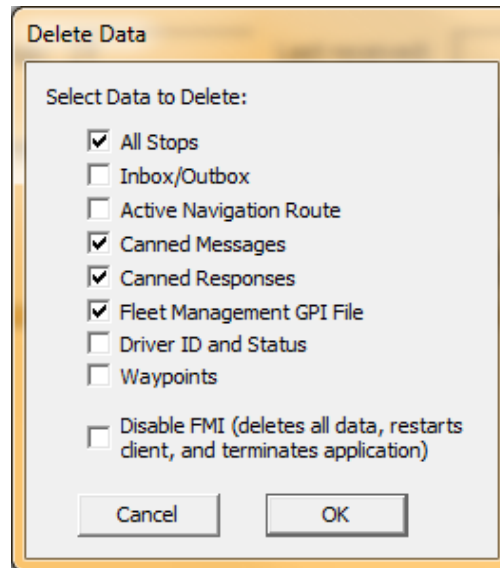


Before and after disabling FMI:
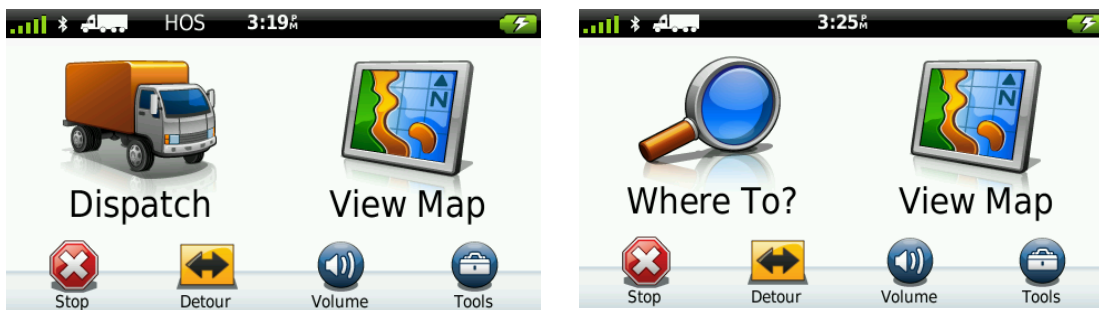


The relevant protocol is discussed in section 5.1.14 of the FMI Protocol Definition.

### XVIII.  Change UI Text

The server has the option of changing the Text associated with FMI on the main menu. Once sent, the text will immediately update on the device.
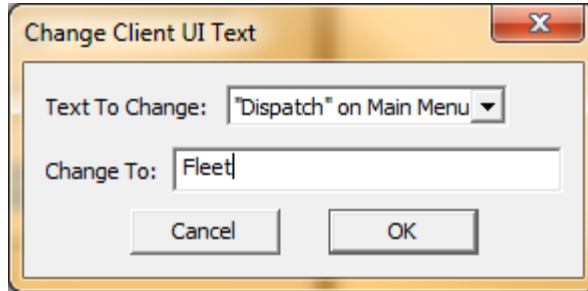


The relevant protocol is discussed in section 5.1.15 of the FMI Protocol Definition.

### XIX.  Ping

The server can ping the device at any time using the "Ping" Dialog box. The number of successful pings, as well as the time of the most recent ping, can be viewed.

If Client-to-Server pings are not throttled, then these will appear as well.
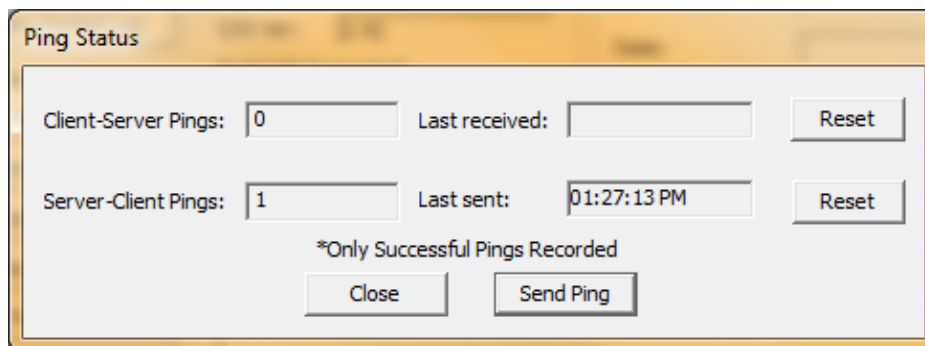


The relevant protocol is discussed in section 5.1.16 of the FMI Protocol Definition.

## XX.  Message Throttling

In order to limit the amount of data sent, the server can throttle certain types of messages from being sent from the client to the server. Details regarding the effects of message throttling can be found in Section 5.1.17 of the FMI Protocol Spec.
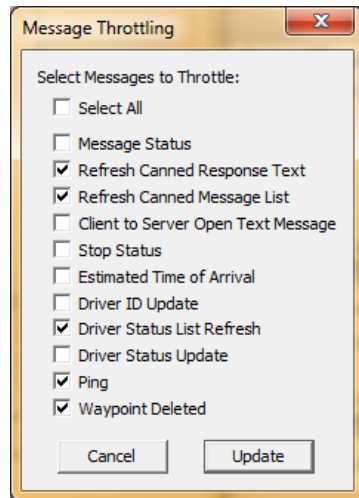


## XXI.  Set Safe Mode

On devices that support it, the server can define a speed threshold required to use the device. Any value greater than 2.2352 m/s (5mph) defaults to 5 mph. The effects of enabling FMI safe mode are:
- The driver will be restricted from going to "Dispatch" and "Tools" menus.
- If the driver is browsing a page descending from the "Dispatch" or "Tools" menus, the driver will be taken to the main map page.
- The driver will not be able to read new stops or non-immediate text messages.
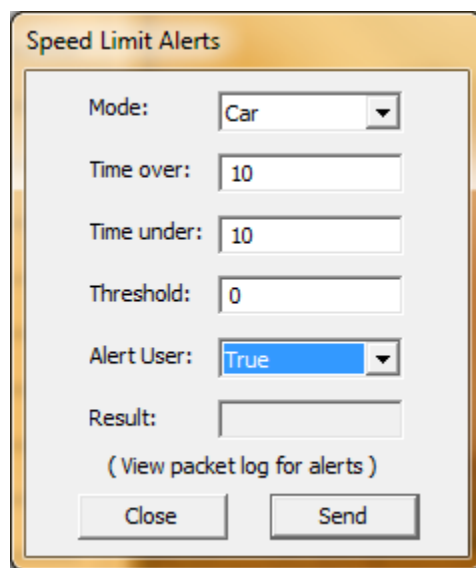
The relevant protocol is discussed in section 5.1.18 of the FMI Protocol Definition.

## XXII. Speed Limit Alerts

Using this dialog box, the server can determine under what circumstances a speeding event will trigger a notification to the server (on devices that have Speed Limit Alert capability).

The server can enable the alerts for Car or Truck Mode, and can also define how long the driver must stay over/under the speed limit alert to begin/end the alert. The protocol is defined more clearly in section 5.1.19 of the FMI Protocol Definition.



## XXIII. Remote Reboot

Should the device ever enter a state in which it is unusable, a "remote reboot" command can be sent from the server to the device. *This method should only be used as a last resort to restart a device*. Repeated use could have harmful effects on your device. The command can be accessed by clicking File→Remote Reboot.

The relevant protocol is discussed in section 5.1.20 of the FMI Protocol Definition.

## XXIV. PVT Data

If enabled, PVT (Position-Velocity-Time) data is sent from the device to the server approximately once per second. The data can be seen on the right-hand side of the main window, and includes data such as latitude, longitude, and velocity. Clearing the "Enable PVT Data" checkbox will disable this feature.

PVT is discussed in Section 5.2.4 of the FMI Protocol Definition.

## XXV. FMI Packet

Although not associated with a specific protocol, the "FMI Packet" fields can be used by the server to send a specific packet type with certain data to the device. For developers, this can be useful for testing purposes. Since the data is in hexadecimal, both the ID and data should be prefaced with "0x".

## XXVI. AOBRD Drivers

An Automatic On-Board Recording Device is a system that allows drivers to log the time spent driving, on duty, in the sleeper berth, etc. during the course of a normal workday or workweek. It is an alternative to the paper logs used by many fleet managers. It can be enabled by checking the "AOBRD Enable" checkbox in the "Send Enable" dialog box (see step 3 in Section I for details). This functionality is only supported on the dēzl 560 and dēzl 760 at this time. Further details regarding this functionality can be found in section 6.5 of the FMI Protocol Definition.

If the system plans to support the use of the PND as an AOBRD, then drivers can be defined under File→AOBRD Drivers. On devices supporting HOS v2.0, drivers may be defined as driving Passenger-Carrying Vehicles, and will use the FMCSA regulations for this vehicle type. The following dialog box will appear.

Drivers can be created and edited from this box. If the device supports AOBRD, the driver will need to log in using the Driver ID and password defined here. *A driver cannot log in until the server has created a profile*.

To log in on the device, the driver must go to Tools → Hours of Service. The following prompt will be displayed when the driver presses "Hours of Service".
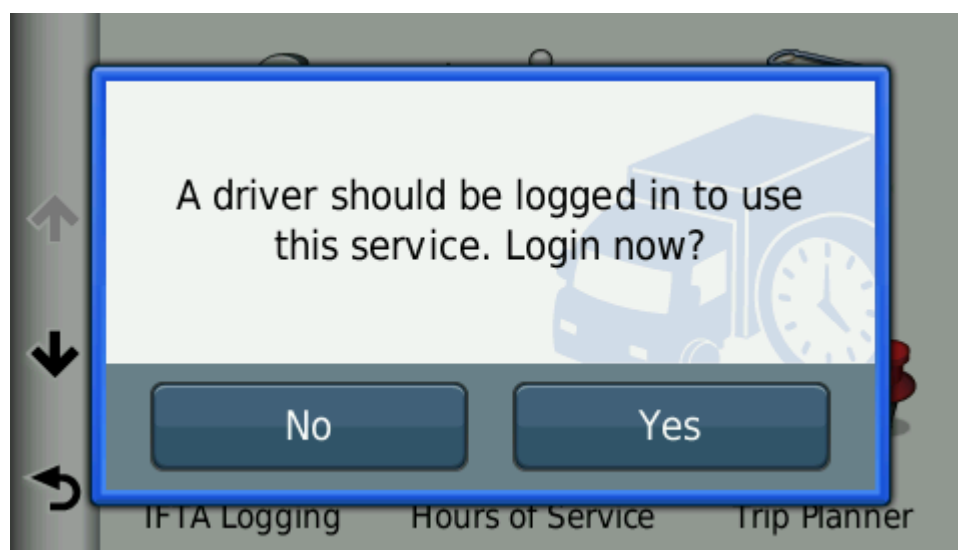


After responding "Yes", the driver will be prompted to enter their ID and password.

1. Once the ID and password is entered, the device will send a Login Request to the server. The server will respond to the login request with a result code (see section 6.5.1.1 of the FMI Protocol Definition for details).

2. If the ID and password are correct, the device will then request that the driver profile be downloaded to the device. The server will respond with the driver profile as described in section 6.5.1.2 of the FMI Protocol Definition.

3. Once the driver profile has been sent to the device and processed, the device shall request a Driver Status Update as described in Section 6.5.1.3 of the FMI Protocol Definition. This allows the device to receive event data associated with that particular driver (drive hours, etc.). If logs for the driver exist, then they shall be downloaded to the device.

4. The device shall then request that annotations associated with the driver's event logs be downloaded to the device (that is, comments associated with a specific event block). If annotations exist, then they shall be downloaded to the device. See Section 6.5.1.5 of the FMI Protocol Definition for details.

5. Finally, the device shall request that shipments associated with a particular driver shall be downloaded to the device. If the driver has any shipments, they shall also be downloaded to the device.
The labels 1-5 below correspond to Section 6.5 of the FMI Protocol Definition.
Steps 1-5 are outline in the opening of the section.
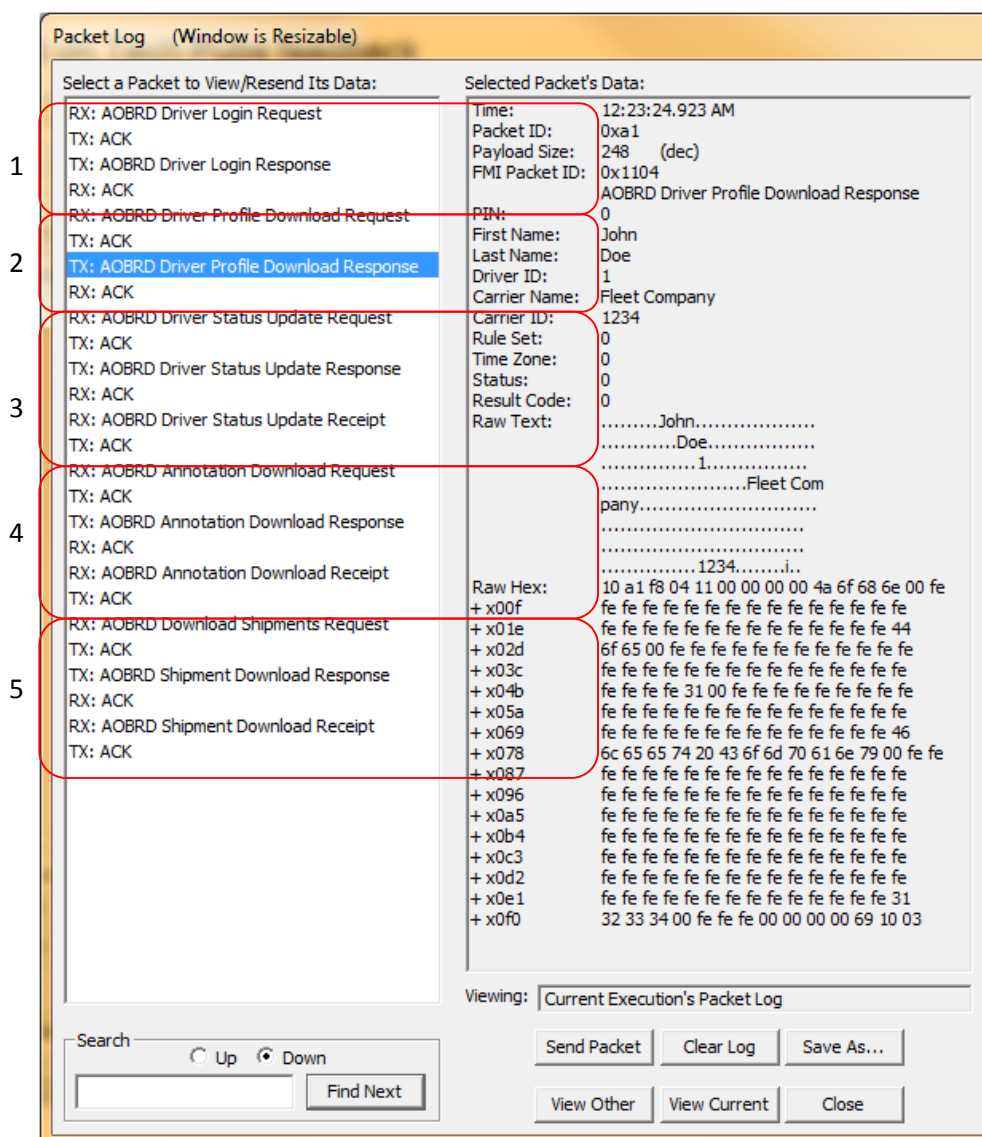
During the course of a workday, a driver will likely make several duty status changes as seen in the following screenshots.
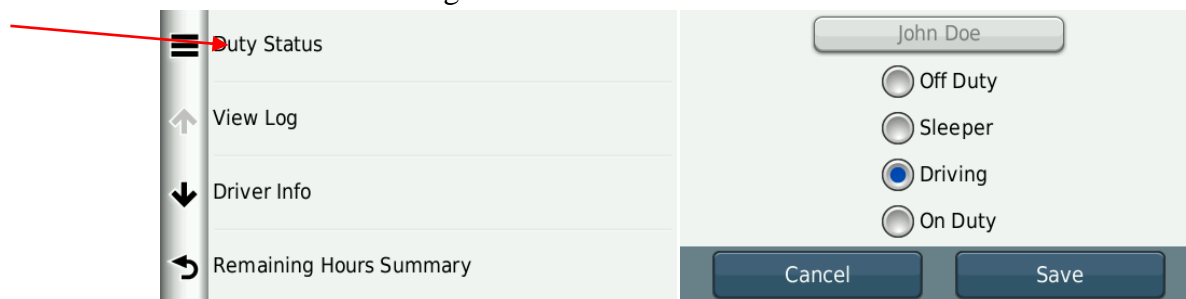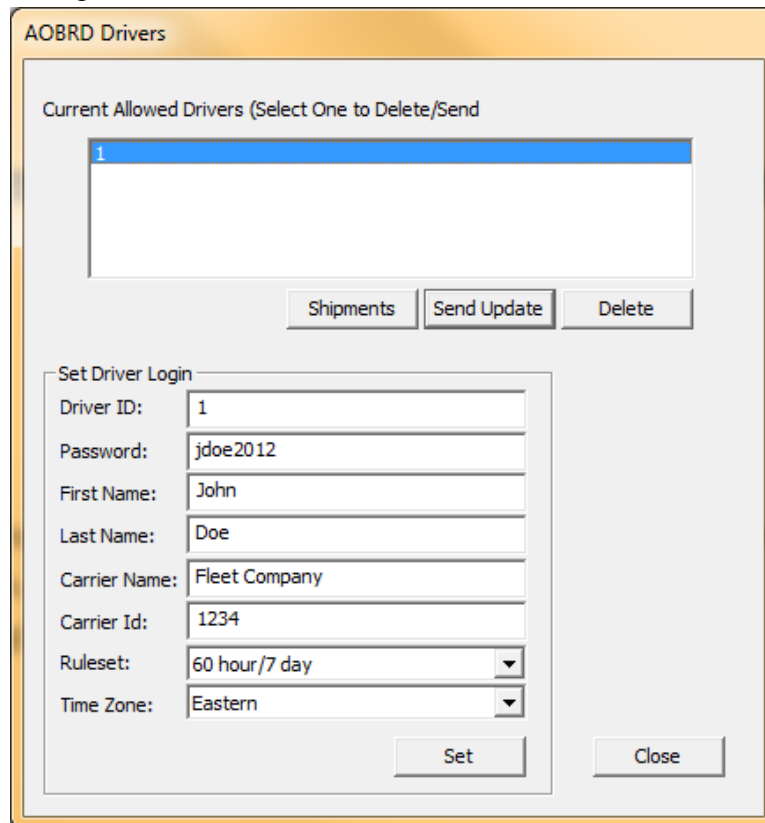


When this operation is completed, the device will initiate a file transfer with the server. This file data will include information about the driver and the status change, shown in the screenshot below.
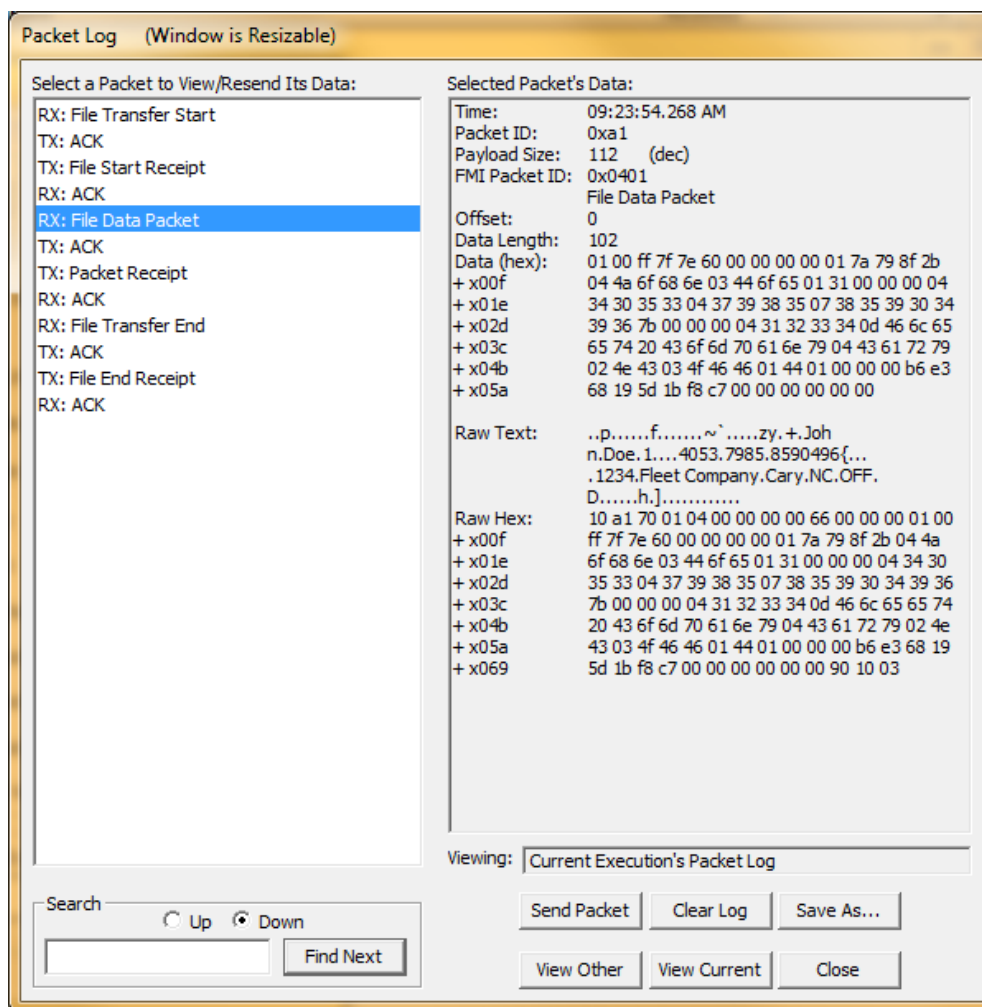
This information is saved in a .csv file on the server. Should the driver log out and then log back in, these status changes will be downloaded to the device in the following way (compare to the "clean" login for reference).
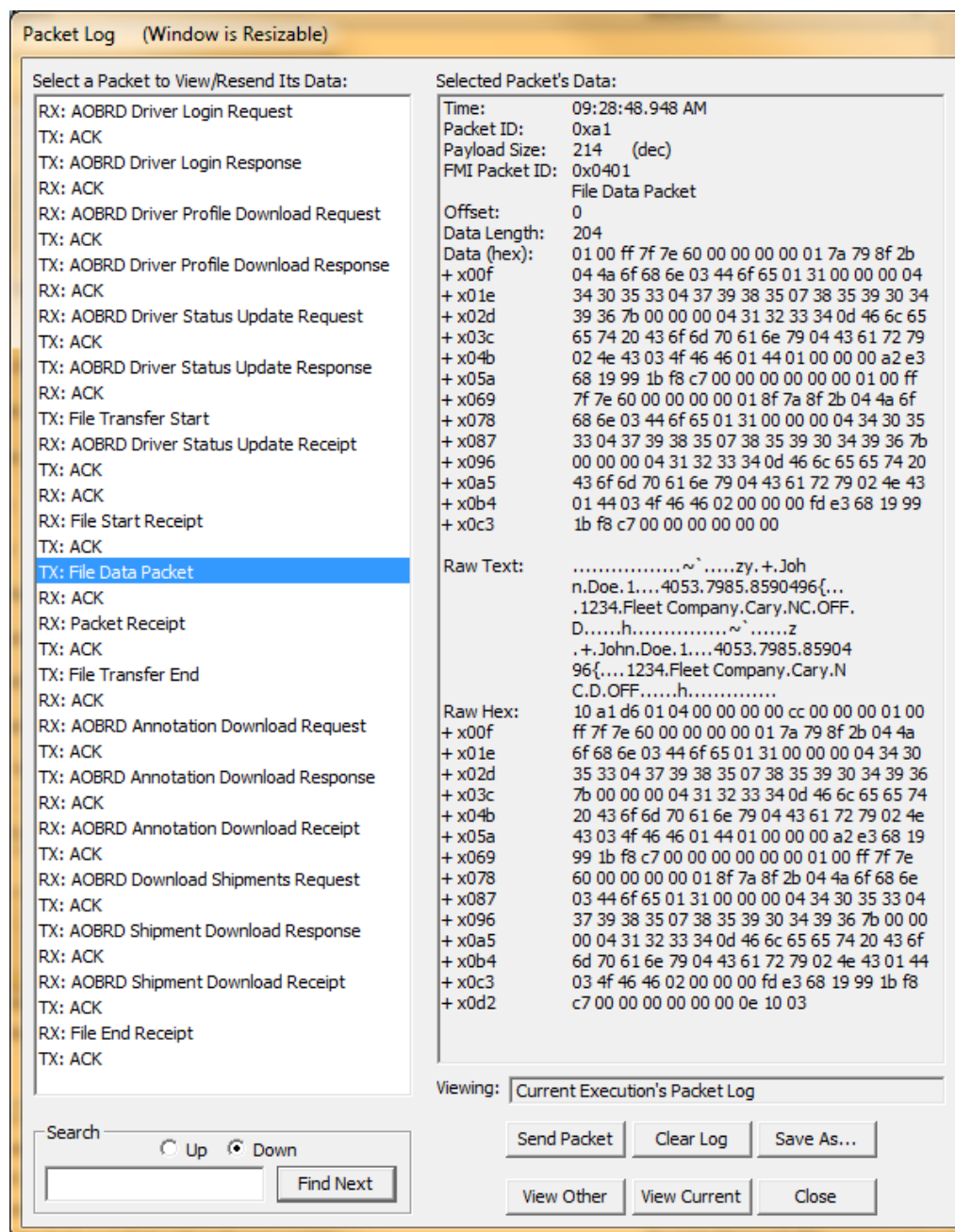
All driver information except First and Last Name can be edited and pushed to the device using "Send Update". The driver will need to accept the update before the settings take effect. See section 6.5.2.2 for details.
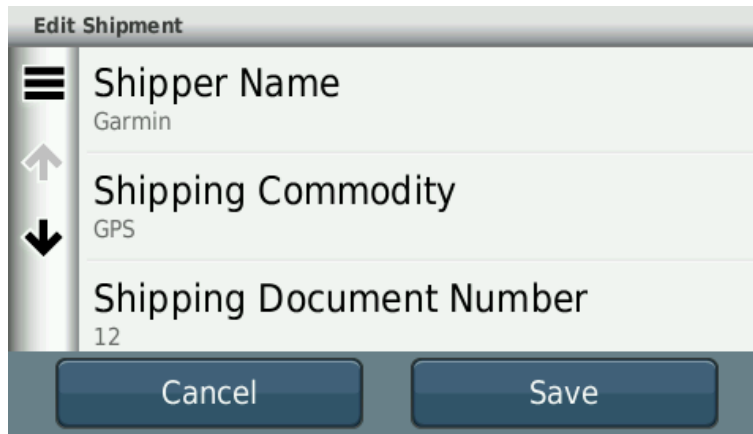
| AOBRD Drivers | |
|---|---|

Current Allowed Drivers (Select One to Delete/Send

1

[ Shipments ] [ Send Update ] [ Delete ]

Set Driver Login

Driver ID:      1
Password:       jdoe2012
First Name:     John
Last Name:      Doe
Carrier Name:   Fleet Company
Carrier Id:     1234
Ruleset:        60 hour/7 day
Time Zone:      Eastern

[ Set ]      [ Close ]

After logging in on the device, this information can be viewed under Tools→Hours of Service→Driver Name→Driver Info.

A driver may also have shipments associated with him/her. The server can define the start and end time of the shipments, as well as the commodity. Shipments associated with a driver are only updated when the driver logs in.



If the driver is logged in on the device and the shipment has been sent, it can be viewed under Tools→Hours of Service→Driver Name→Manage Shipments.

**Edit Shipment**

Shipper Name
Garmin

Shipping Commodity
GPS

Shipping Document Number
12

Cancel        Save

## XXVII.    Path-Specific Routing

a.  Overview and Setup

This feature allows the server to define a series of points through which a device must travel in order to reach a destination. There are two types of points; shaping points (represented by blue dots) and intermediate destinations (represented by orange flags). The types of points are discussed in Section b below.

Use of this feature in the Fleet Management Controller requires a Bing Maps developer key – see Section XXVIII a. for details.

Before you begin using the new feature, you must disable FMI. This will clear all FMI-related data from the device and help ensure that no data corruption occurs. To clear FMI data, you must use the "Delete Data" functionality described in section XVII.

b.  Creating and Viewing a Path-Specific Stop

Once a Bing Maps key is inserted into the settings.xml file, creating a route is relatively straightforward. From the main FMC window, click Tools → Map Viewer.
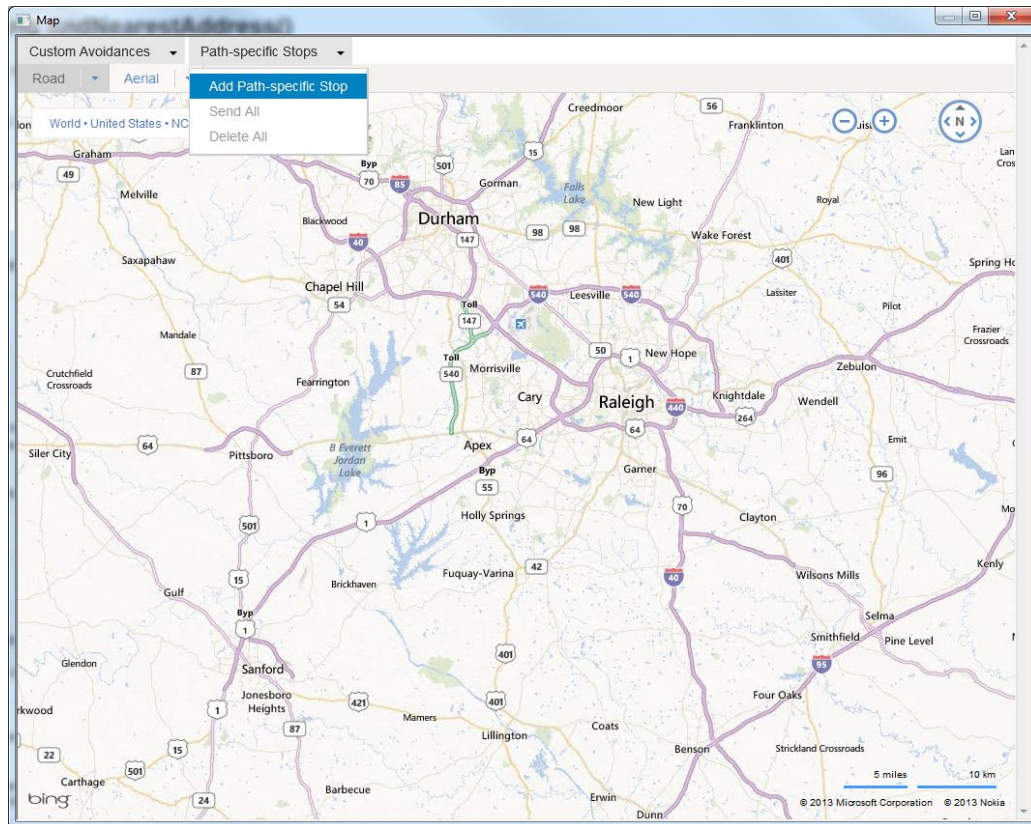
At the top of the window, there is a tab labeled "Path-Specific Stops". Click this tab, and then click "Add Path-Specific Stop".



You will then be prompted to define a Stop ID, a Trip Name, and some Stop Text. The Stop ID should be unique across both "Simple Stops" and "Path-Specific Stops". Attempting to send a stop with an in-use unique ID will result in an error.

The "Stop Text" is the text that identifies a stop on the device (under Dispatch → My Stops). If it is not defined, then the Trip Name is used for the Stop Text.

1. The first point that must be placed is the final destination. If desired, an address can be entered in the appropriate text field. When using the FMC, the route must be built from the end to the start.

2.  Upon clicking "Locate address", the point is placed, and you are then prompted to add either Intermediate Destinations or Shaping Points.
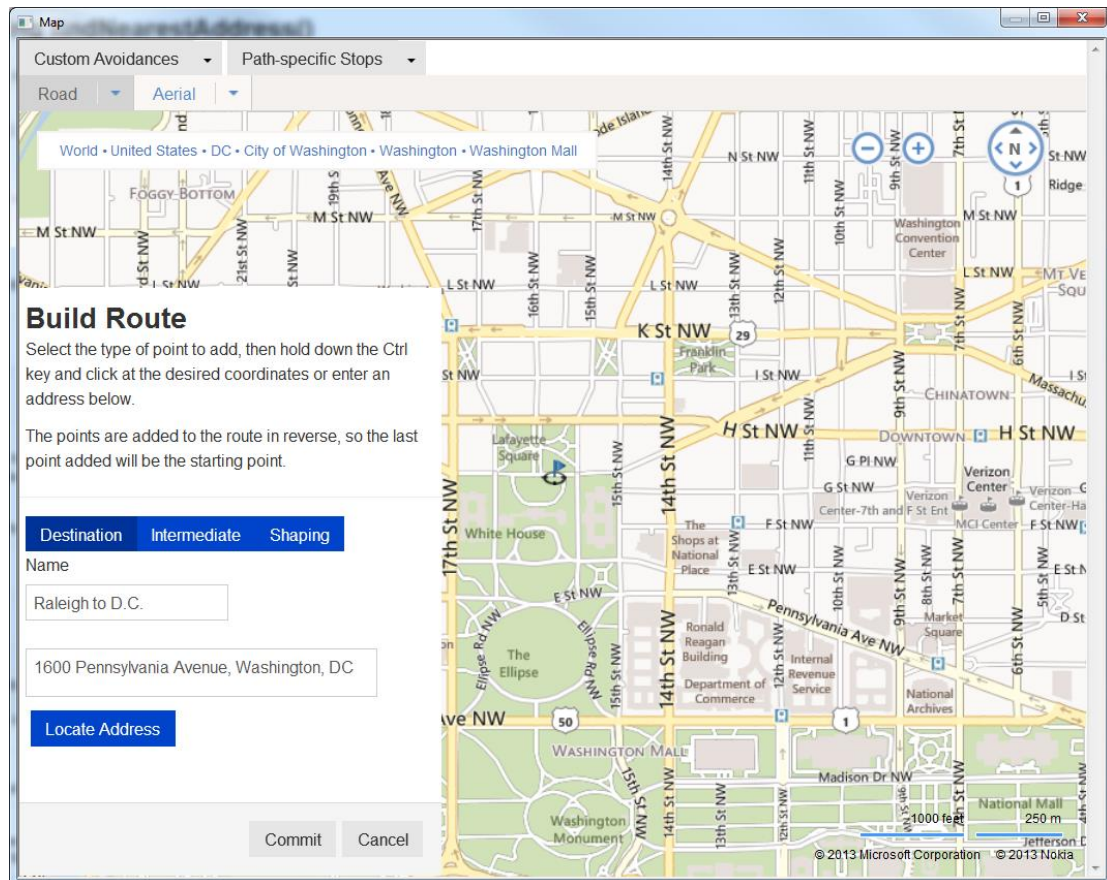


A point can be manually placed on the map by holding the Control key and clicking on the desired location. Two types of points can be placed. Shaping points appear as blue dots, but are not announced by the device as the device passes through them. Furthermore, the device is not required to pass through the points. That is, if the device leaves the path while routing, and a more optimal route is found to the next intermediate destination, the shaping points will not be taken into account. Intermediate destinations appear as orange flags, and the associated names are announced by the device upon arrival. This is useful for creating waypoints along the route (i.e., "Pick up materials", "Stop for gas", "Customer's home").

Either type of point can be clicked and dragged before saving the route. Furthermore, a point can be "snapped to road" to ensure it is not in an inaccessible location.

This is how a shaping point appears on the map.
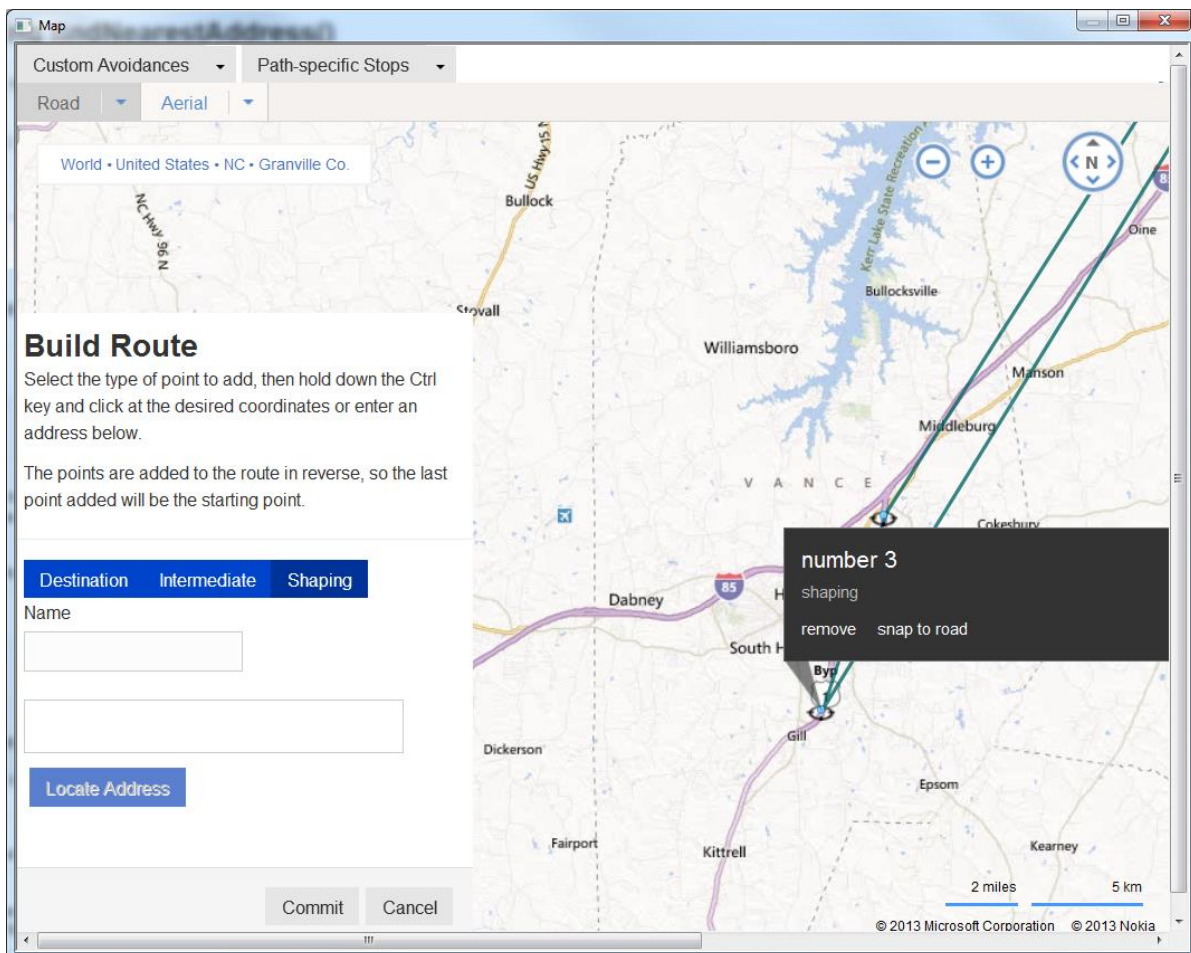
This is how an intermediate destination appears on the map. An intermediate destination must be named before it is placed on the map.
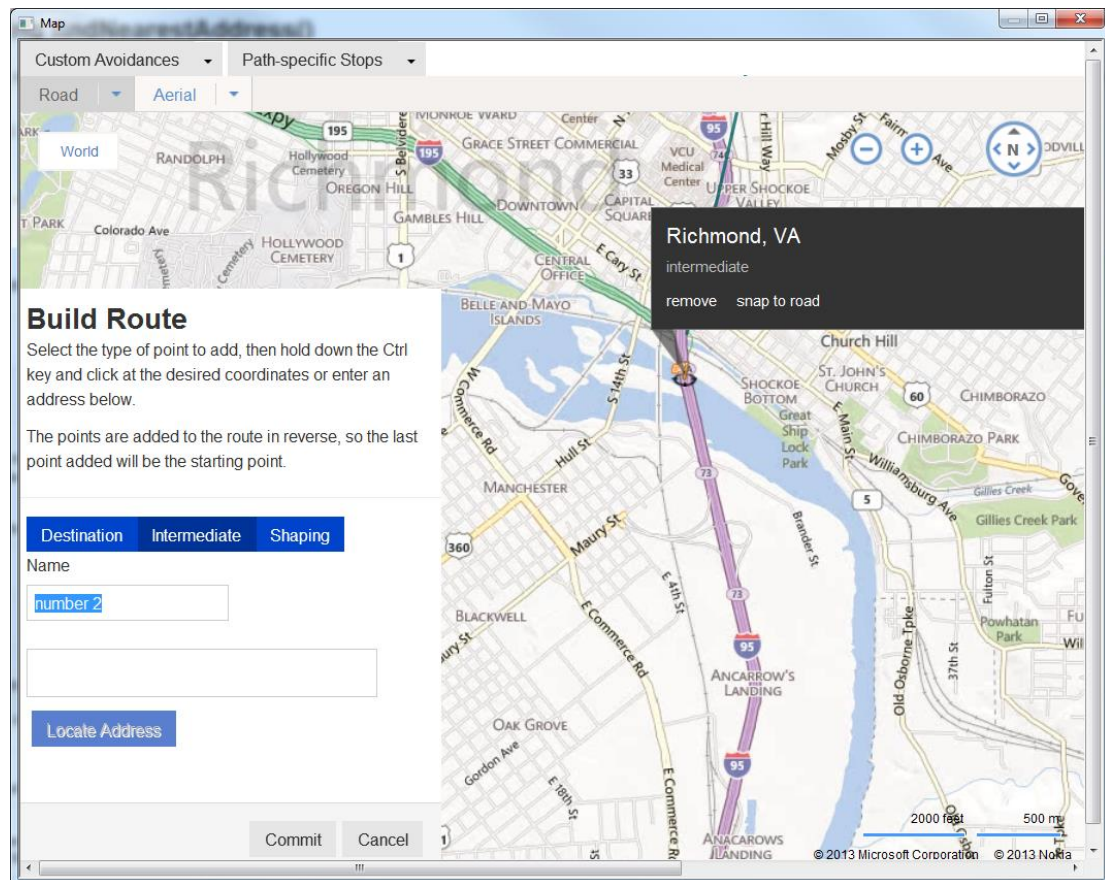
On the device, the two points are displayed in the following way.



In order to be compliant with the FMI Protocol, the first point in a route (that is, the last point added when building a route in the FMC) must be an intermediate destination. Clicking the "commit" button saves the route on the server, but does not send it to the device.

The protocol supports 24 intermediate destinations and 100 shaping points per route, as well as the final destination.

3. To send a route to the device, click on the final destination. A pop-up will appear with several options. Clicking "Send" will initiate a file transfer.
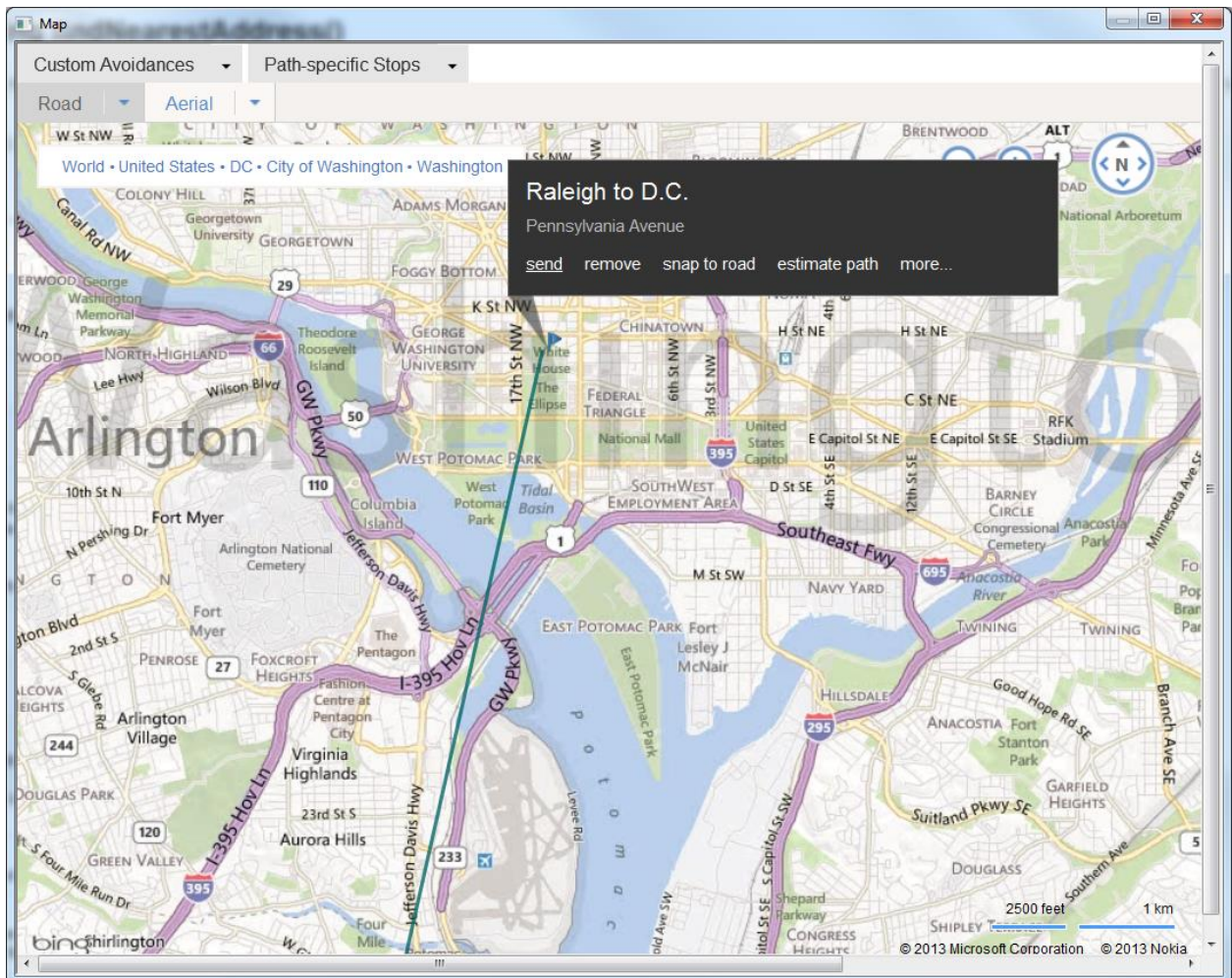


Once the transfer is complete, the stop icon will appear on the device, and the stop will appear under Dispatch → My Stops.
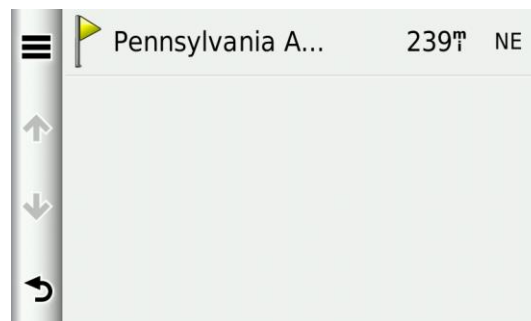
e. Interacting with Path-Specific Stops

It is important to keep in mind that path specific stops share many characteristics with "simple stops". Path specific stops utilize the Stop Status protocol in the same manner as simple stops. The server has the capability to activate the stop, mark it as done, change the order of stops on the device, or delete the stop as well.

To edit a path-specific stop from the server, click on the final destination of the route, and then click on "more…" Then, the dialog box shown below appears.
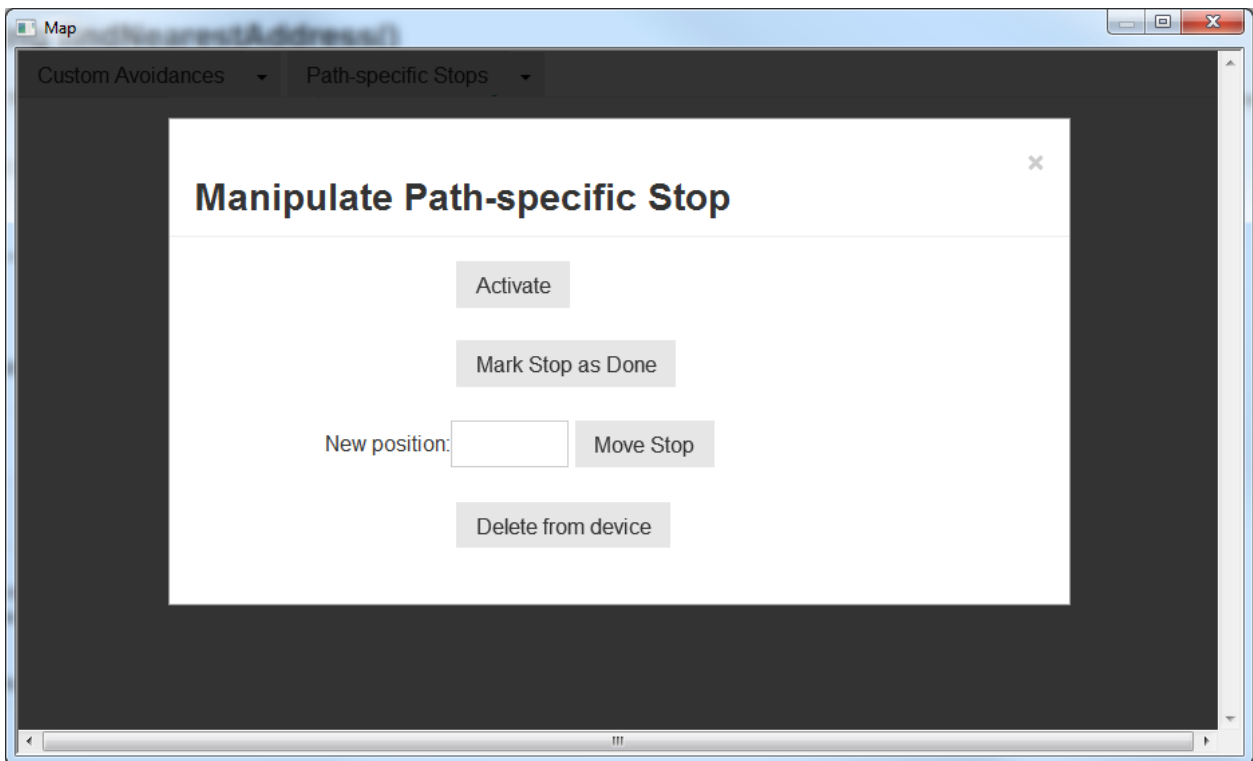


From here, the server can perform any actions that also can be performed on simple stops. Clicking "Activate" causes the device to begin navigation. "Mark Stop as Done" and "Delete from Device" both change the stop status. "Move Stop" allows the server to specify an index in the stop list (from 0 to n-1, n being the number of stops).

On the device, the user has the ability to bypass destinations, edit the stop status, and view the entire route. Once the route is active, the user can view turn-by-turn directions by clicking the bar along the top of the screen.
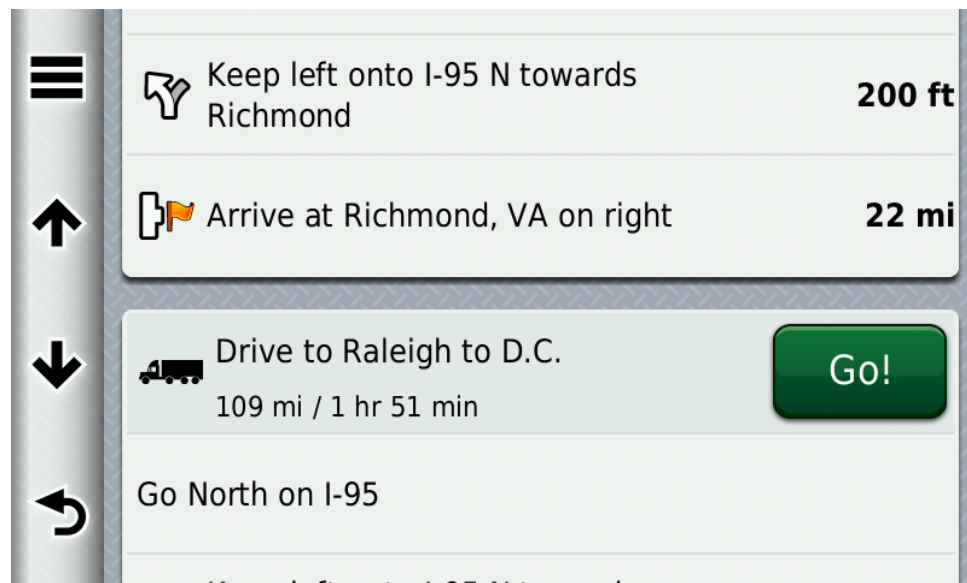


The last item in the directions is the user-defined stop.
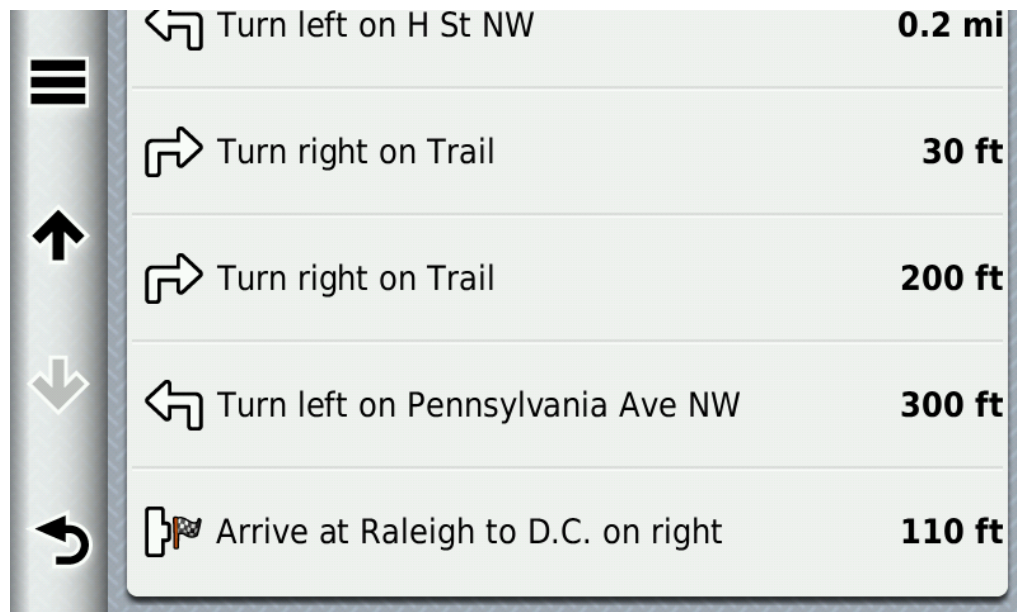
From the directions screen, clicking the Menu button gives the user the option of viewing the map. The "Map" view displays the route in its entirety.

Finally, it is possible to navigate directly to intermediate destinations, if so desired. Once the route is active, the user may click "Go!" next to an intermediate destination in the directions list. Any preceding intermediate destinations are ignored. However, shaping points between the last skipped destination and the chosen destination are honored. Once the user arrives at the chosen destination, the path specific route is followed.
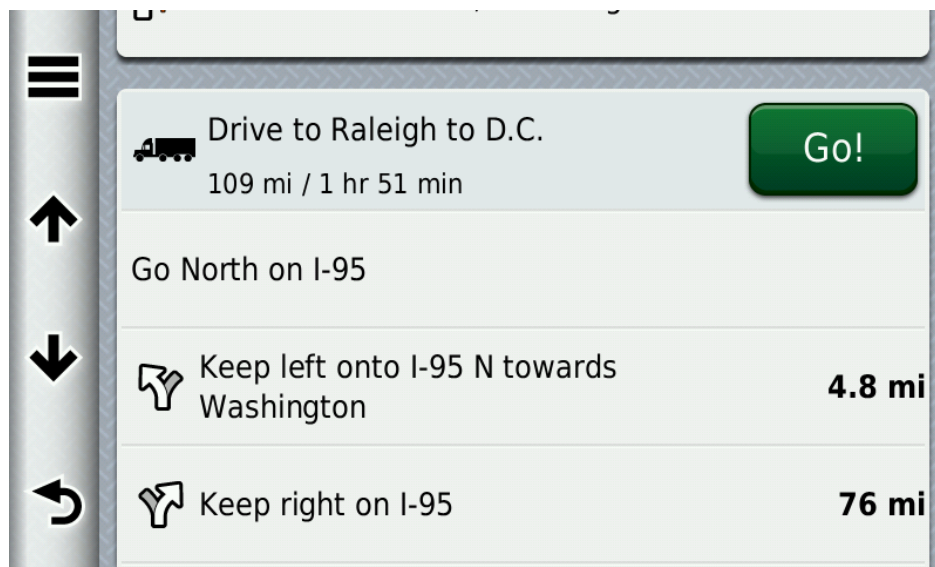


Path Specific Stops are discussed in section 5.1.6.2 of the FMI Protocol Definition.

## XXVIII. Custom Forms

a. Overview and Setup

The "Custom Forms" feature allows the server to define a form using xml and then send that form to the device. The constraints placed on this .xml file are detailed in form_template.xsd.

Custom Forms are discussed in section 5.1.21 of the FMI Protocol Definition.

b. Creating and Sending a Custom Form

Although we have provided several sample custom forms in the FMC "Documents" folder, you are able to create your own .xml files. However, detailing the creation of an .xml file is outside the scope of this document. Assuming a valid .xml file has been created, the first step is to load the file into the FMC. Open the Custom Forms window by clicking Tools → Custom Forms. The following window will appear.

Next, click on "Import Form Template", and select the desired custom form to be loaded. If validation of the .xml file against the FMC's internal .xsd file is successful, the form will appear in the custom forms window. If validation fails, the application will display an error message describing the cause of failure.
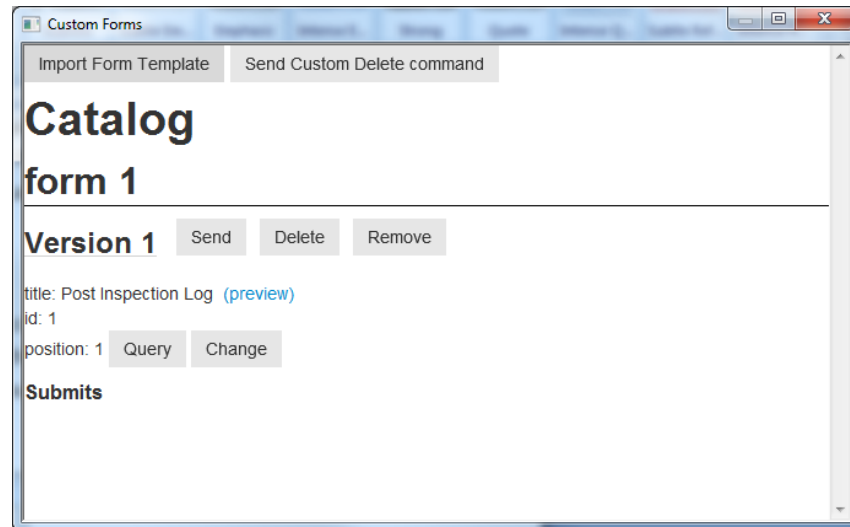


Now that the form has been imported successfully, it must be sent to the device. Click "Send" to push the form to the device. A file transfer dialog box will appear detailing the file size and amount of data sent. When the transfer is complete, it will display "Done".
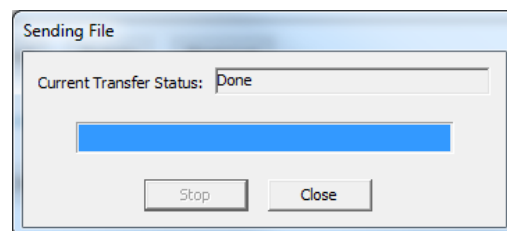
Below are screenshots of the File Transfer Begin and File Transfer End packets, as well as a data packet.
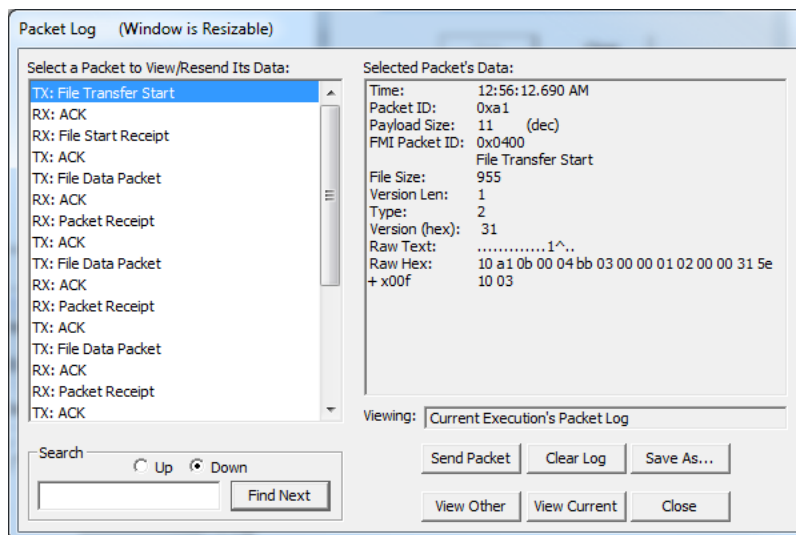


Data Packet:
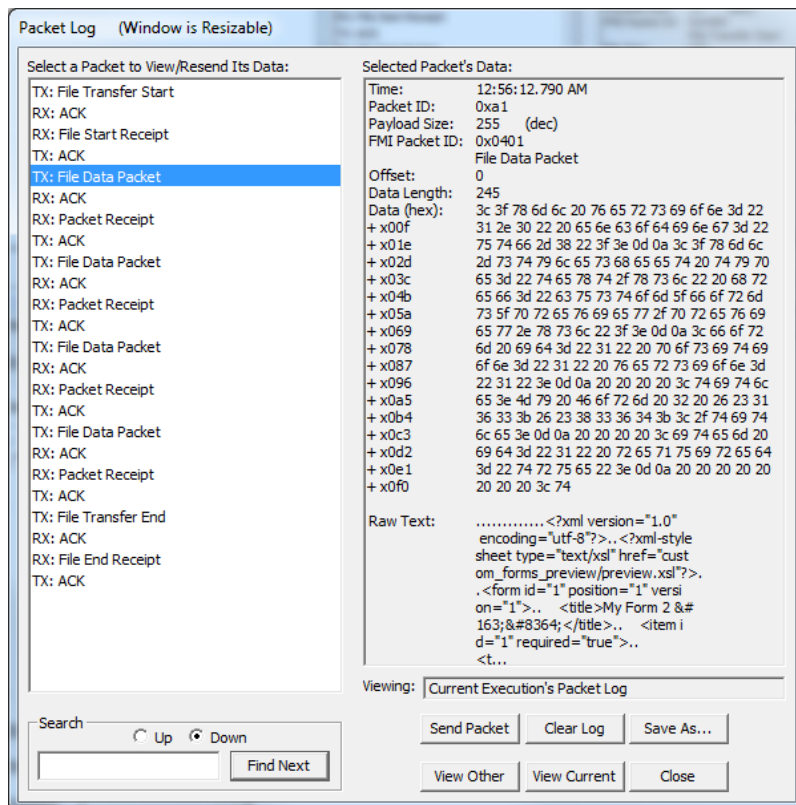
End Packet:
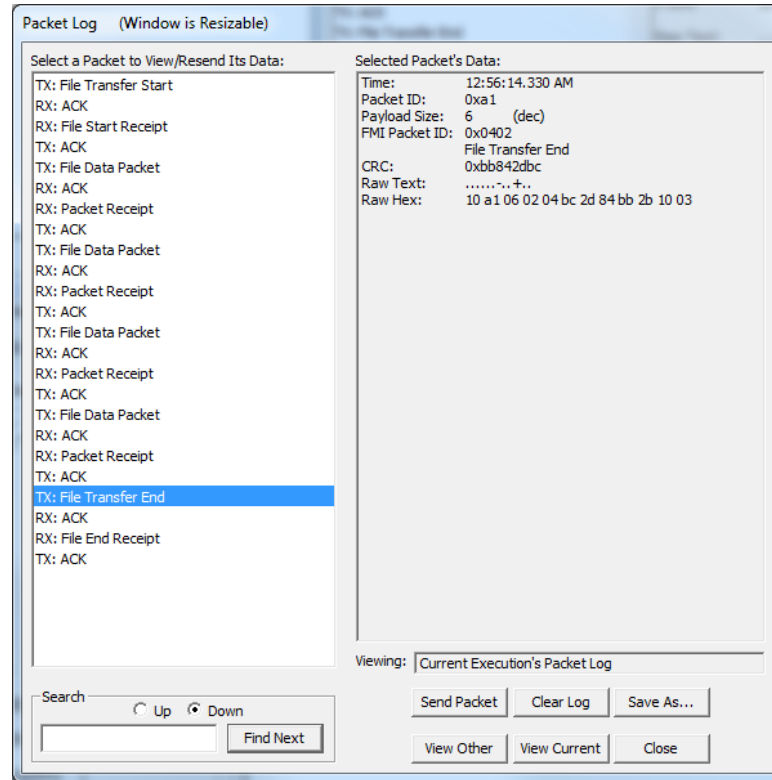


Custom forms can be found on the device under Dispatch→Forms, as seen here. On the main form page, there is a menu that will display details of submitted forms.
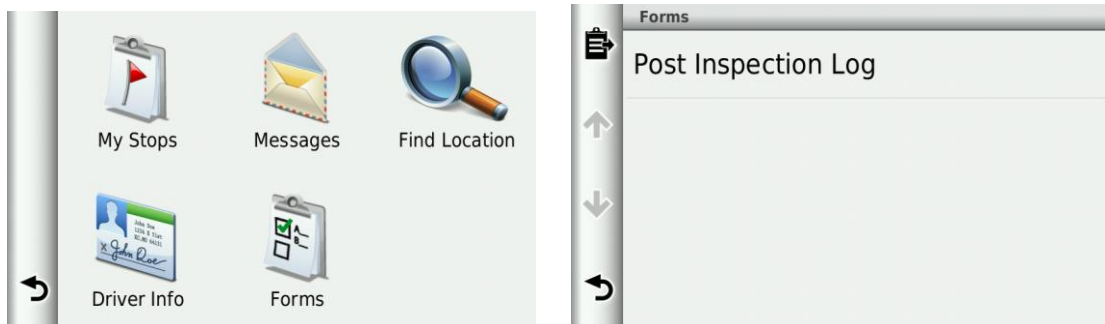
c.  Completing and Submitting a Custom Form

Clicking on the form title will bring up the form itself. The sample form has a keyboard entry and a multi-select entry.



Below are screenshots of some of the data types.

Once all required data fields (indicated by the red asterisk) have been filled out appropriately, the "Submit" button will be activated. The criteria for validity are described below.

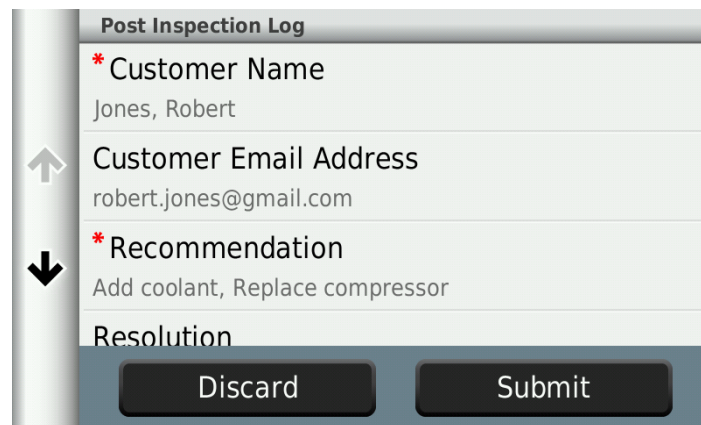| Data Type | Initial List Value | Initial Value | Changed Criteria | Valid Criteria | Auto Valid Value |
|---|---|---|---|---|---|
| Alphanumeric Keyboard | Default list value defined by template | Empty text. | Not equal to initial value | Not empty text. This can be handled by the keyboard Done button being disabled if the text is empty. | No |
| Integer Keyboard | Default list value defined by template | Empty text. | Not equal to initial value | Not empty text. This can be handled by the keyboard Done button being disabled if the text is empty. | No |
| Single Selection | **Template defines selected option:** Selected option **Template does not defines selected option:** Default list value defined by template | Selected option defined by the template or empty text (-1). | Not equal to initial value | An option is selected. This can be handled by the radio button page as the Save button is disabled if an option is not selected. | Yes, if an option is selected |
| Multiple Selection | **Template defines selected options:** Selected options **Template does not defines selected options:** Default list value defined by template | Selected options defined by the template or empty text. | Not equal to initial value | Either at least one option is specified selected in the template or the check box page is dismissed via the save button. | Yes, if at least one option is selected |
| Date Selection | **Template specifies use current date:** Current date **Template specifies specific date:** Specified date **Other:** Default list value defined by template | Current date or specific date if either is specified by the template or empty text. | Not equal to initial value | If either use current date or a specific date is specified, this is automatically valid. Otherwise the date will be validated by the date time selector widget. | Yes, if use current date or a specific date is specified. |
| Time Selection | **Template specifies use current time:** Current time **Template specifies specific time:** Specified time **Other:** Default list value defined by template | Current time or specific time if either is specified by the template or empty text. | Not equal to initial value | If either use current time or a specific time is specified, this is automatically valid. Otherwise the time will be validated by the date time selector widget. | Yes, if use current time or a specific time is specified. |
| FMI Stop Selection | **Forms list pushed by specific FMI stop:** FMI stop message text **Forms list pushed by FMI menu:** Default list value defined by template | FMI stop message text if the forms list is pushed by a specific stop or empty text (-1). | Not equal to initial value | An FMI stop is selected. This can be handled by the radio button page as the Save button is disabled if an option is not selected. | Yes, if the forms list is pushed from a specific stop. |

On devices that support FMI 3.5, picture fields are supported as well. The user can select a picture from the device's photo gallery, attach it to a form, and submit it to the server.

Pressing the "Submit" button will send the completed form to the server, using a client-to-server file transfer protocol similar to the transfer shown in step 3 above.

Pressing the "Discard" button will return the user to the "Forms" menu, losing all changes made to the form. *Changes are not saved*. If a form is discarded, it will need to be filled out from scratch.
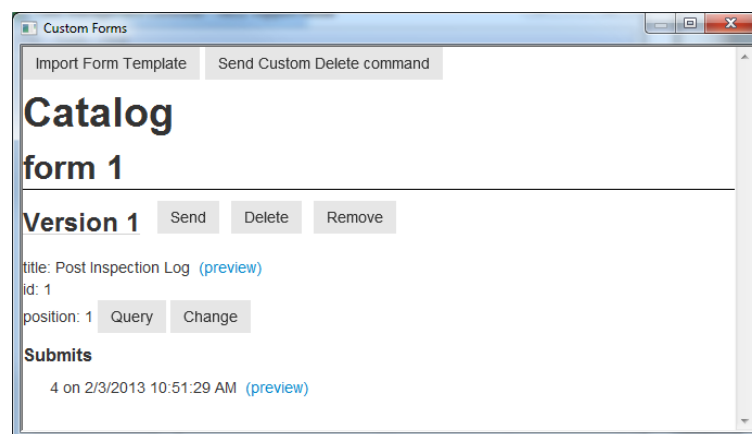


The submitted form can be viewed from the FMC Custom Forms window by clicking "Preview" next to the submitted form.

In the FMC, the submitted form looks like the following screenshot.
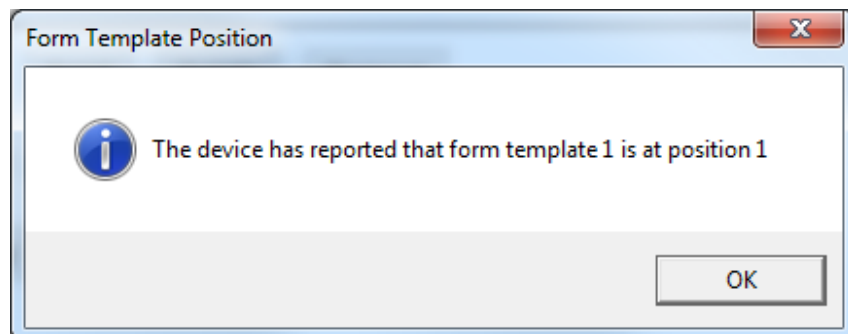


The literal .xml of the submitted form can be found under ./Fleet-Management-Controller/custom-forms/FORM_ID/FORM/VERSION/TIMESTAMP.xml, and can be viewed in a web browser or text editor if desired.

d. Reordering, Querying, and Auto-Opening a Custom Form

The server may change the order in which custom forms appear on the device. This is done by clicking "Change" next to a form, and then entering a positive integer. The device will respond with the form's position after the request is made.

The server may also query the position of the form on the device by clicking "Query" next to the form.

On devices that support FMI 3.5, the server may trigger the immediate display of a form by clicking "Show". This works in a similar manner to immediate text messages, but a form must be sent to the device before the immediate-open command is valid.

# form 3

## Version 1    Send    Delete    Remove    Show

title: Defect Report  (preview)
id: 3
position: 3    Query    Change

e.  Deleting and Removing a Custom Form

The server may delete a custom form from the device by clicking "Delete" next to the form in the Custom Forms window. This does not remove it from the server – only the device.
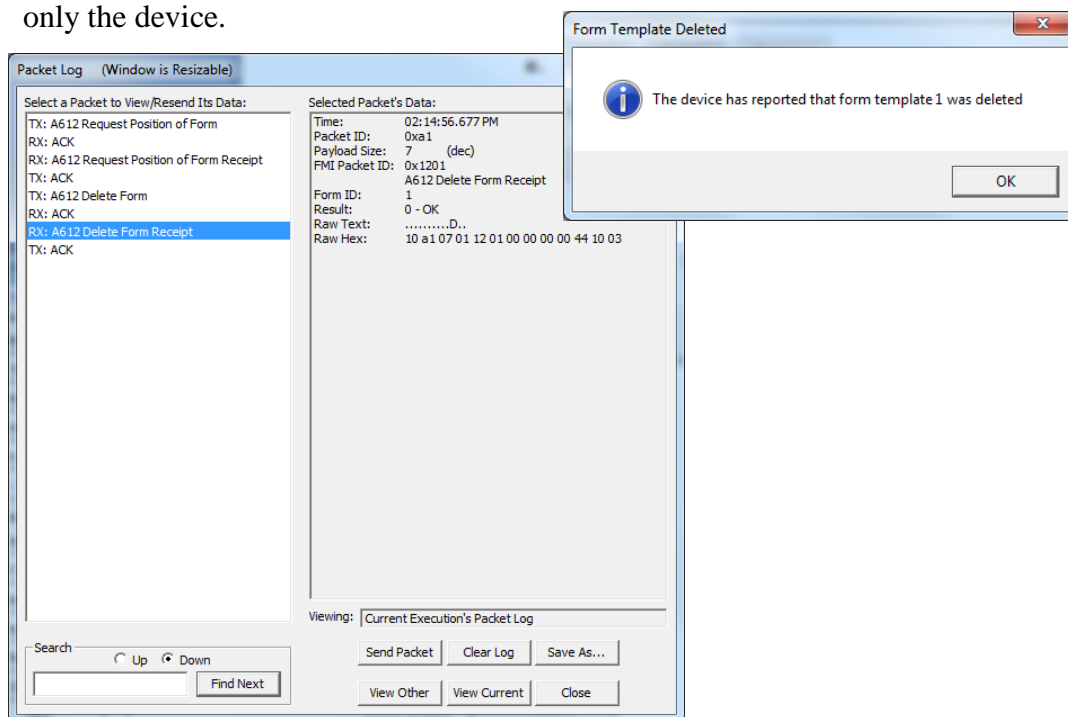


Removing a form from the FMC can be done by clicking "Remove" next to a form in the Custom Forms window. This removes the form from the server, but does *not* remove associated submitted forms.
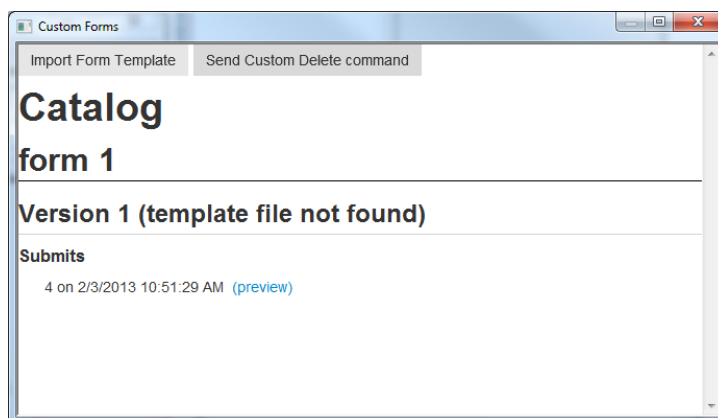
## XXIX. Custom Avoidances

a. Overview and Setup

This feature allows a user to define corners of an area on a map that will be off-limits to the navigation engine. To use this feature, you will need to acquire a Bing Maps developer key from http://www.microsoft.com/maps/. Once a key is acquired, the FMC's settings.xml file will need to be edited to include the key. The file is located in the main project folder: open this file and then paste your developer key in between the BING_MAPS_KEY tags.

Custom Avoidances are discussed in section 5.1.22 of the FMI Protocol Definition.

b. Creating and Viewing a Custom Avoidance

Click on Tools → Map Viewer. This will bring up a Bing Maps window. All operations involving Custom Avoidances will be run from this window.
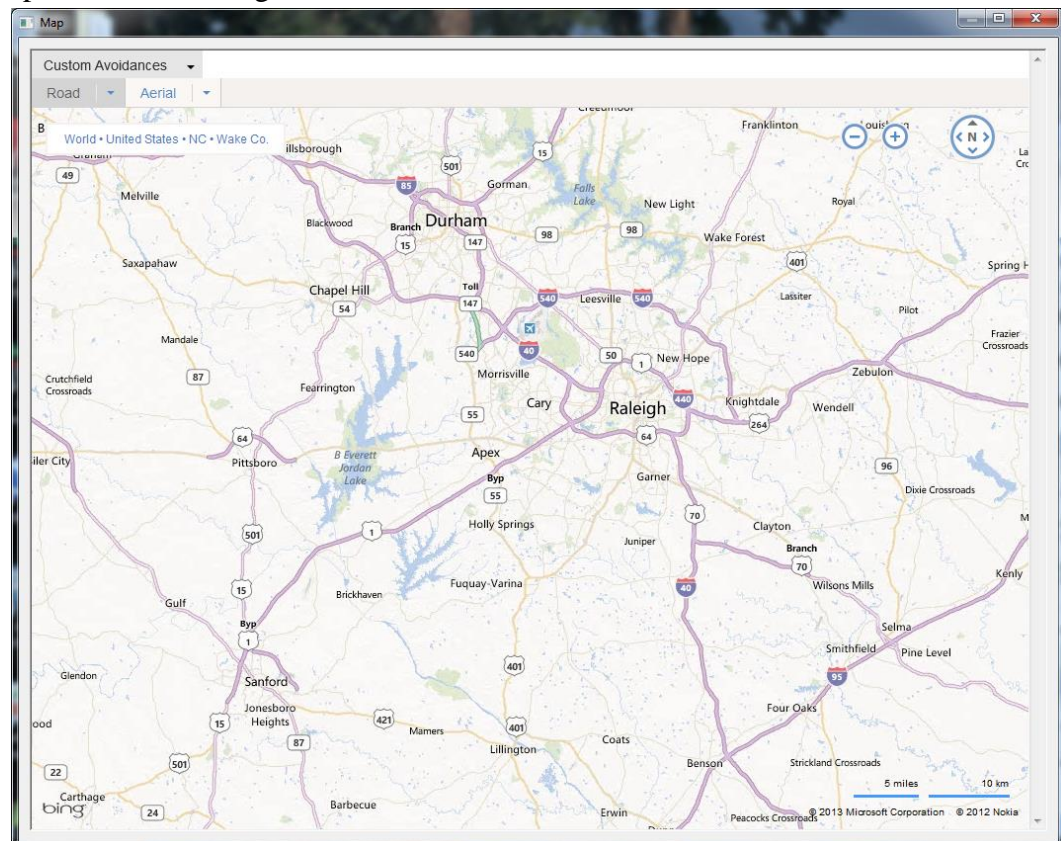
Next, click the "Custom Avoidances" → "Add Custom Avoidance" button in the upper-left corner. You will be prompted to create a name, an ID, and a description for the new avoidance. The description is optional.
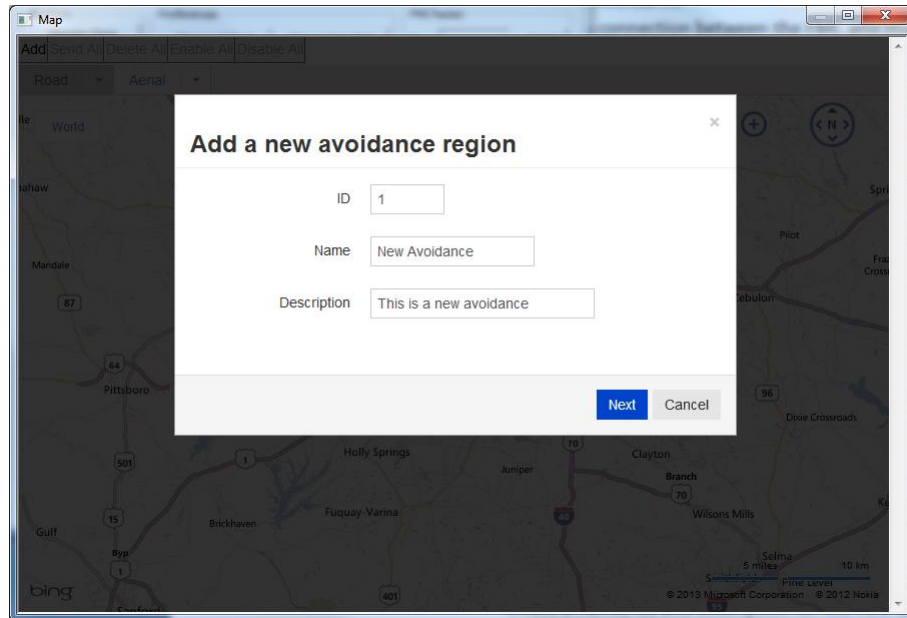


Clicking "Next" will return you to the map screen, where you will be prompted to select the opposite corners of the area you want avoid.
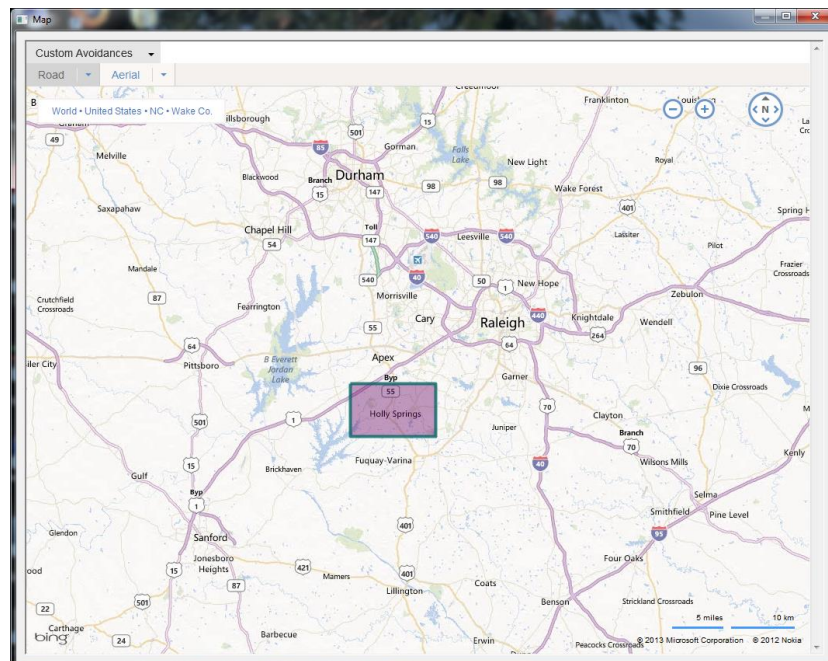
Clicking on the highlighted area will display options related to the avoidance.
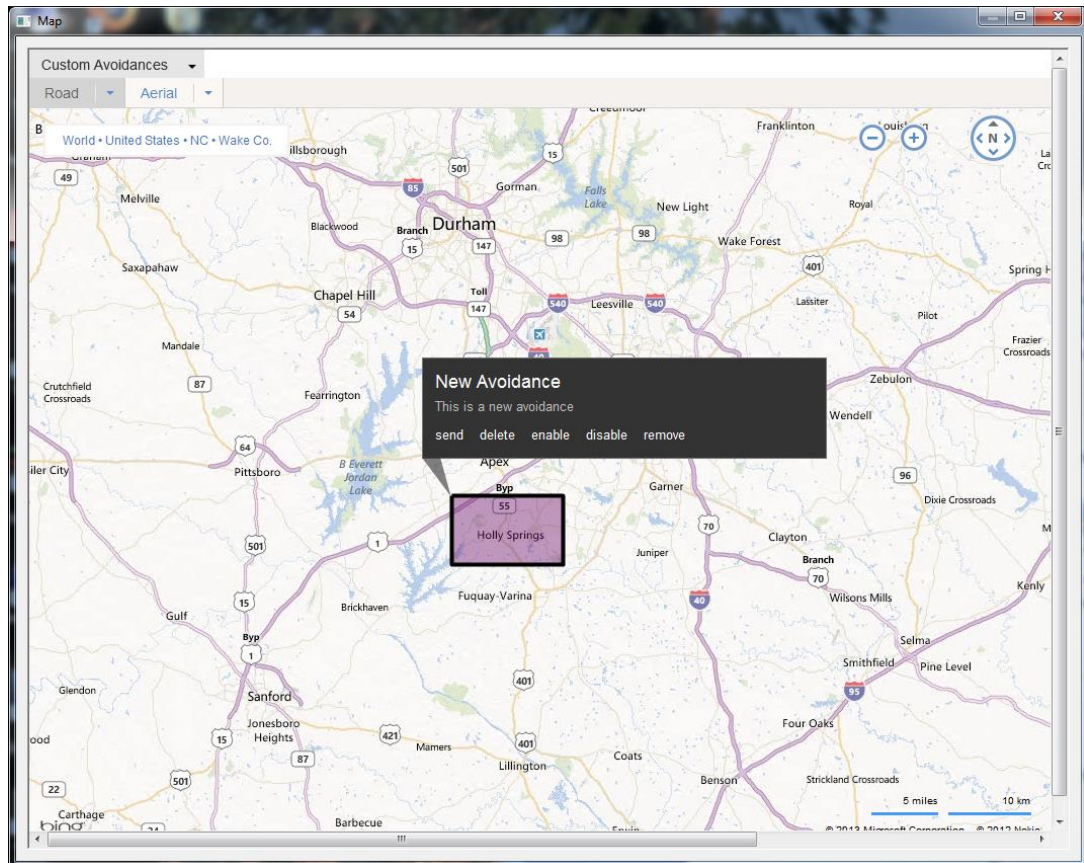


Now that the custom avoidance has been created, it must be sent to the device. Establish a connection as described in section I., and then click "Send" to push the settings to the device. Although avoidances can be created without a serial connection, they cannot be sent to the device until a connection is made.

You can view the "Add Custom Avoidance" and "Receipt" packets in the Packet Log window. A sample packet and receipt are shown below. The receipt will show a result of "0 – Success" if the avoidance is sent to the device correctly.

All Custom Avoidances on a device can be viewed under Settings → Navigation → Custom Avoidances. Although the user can add new Road Avoidances, they cannot add Area Avoidances while the FMI Custom Avoidances feature is enabled.
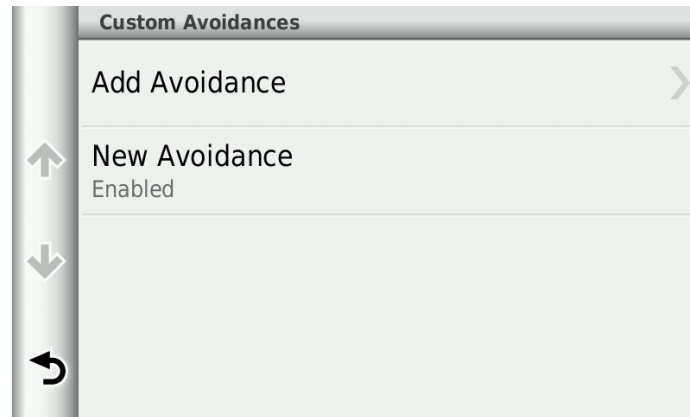


Clicking on a custom avoidance in the list will pull up a map detailing the defined avoidance. The user cannot edit this avoidance in any way – only the server has this capability.
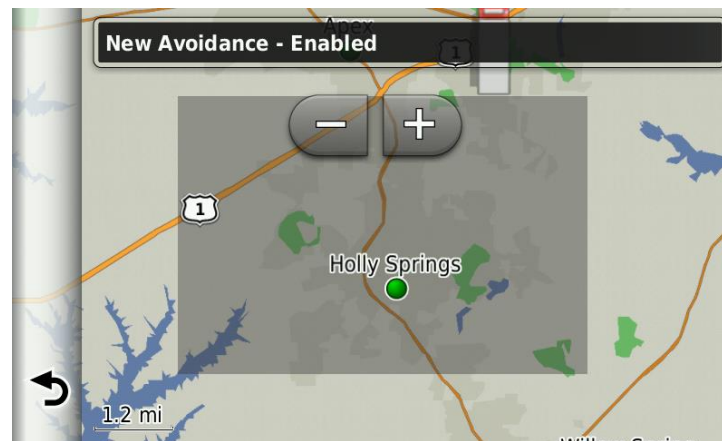
c. Disabling, Deleting, and Removing Custom Avoidances

Disabling a custom avoidance deactivates the avoidance, but does not remove it from the device. This is done by clicking on the avoidance in the FMC Map window and clicking "Disable". Details can be viewed in the Packet Log, as shown here. A result code of 0 is returned upon a successful "Disable" command.
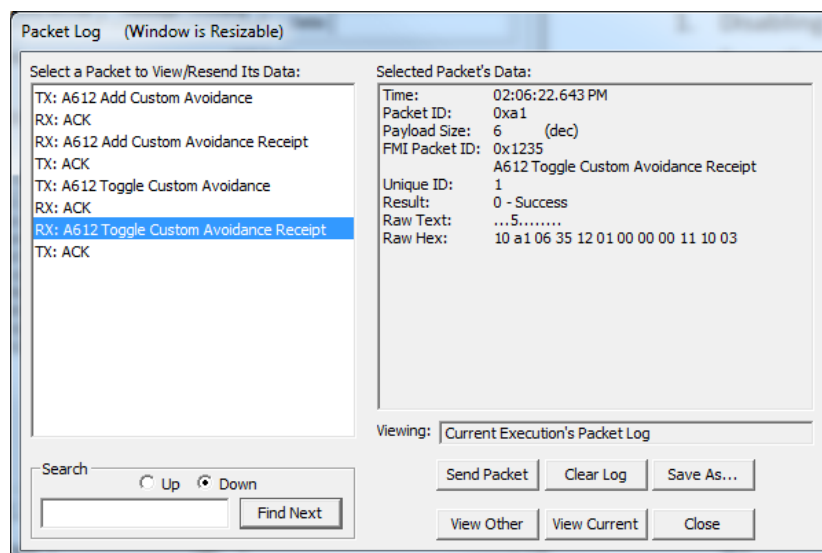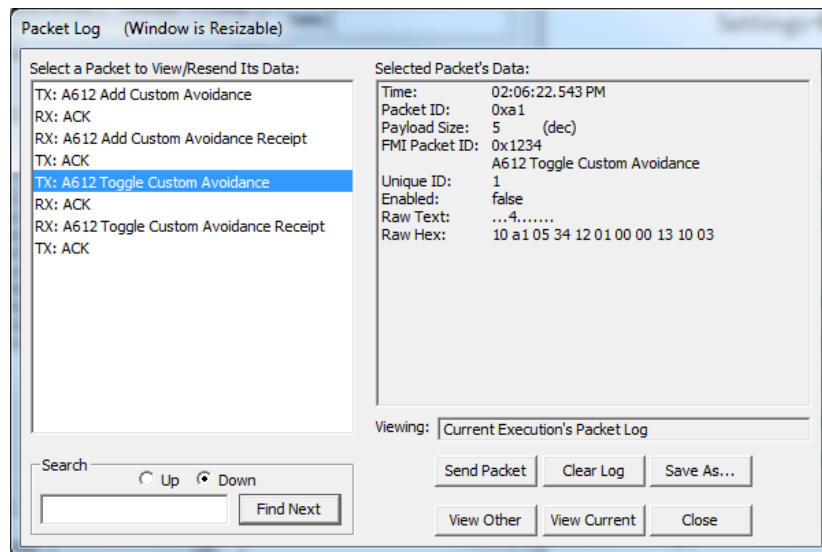
Deleting a custom avoidance removes it completely from the device. This is done by clicking on the avoidance in the FMC "Map Window" and clicking "Delete". Details can be viewed in the Packet Log, as shown here. As with the "Disable" command, a result code of 0 is returned upon a successful deletion.
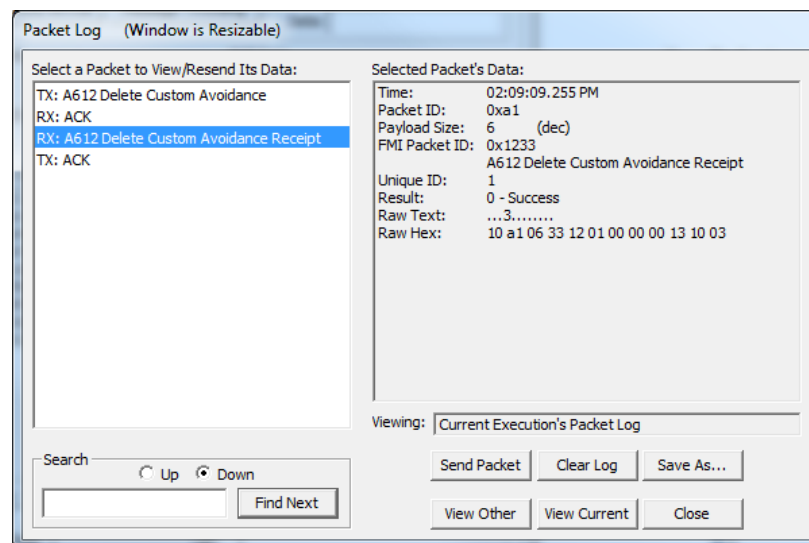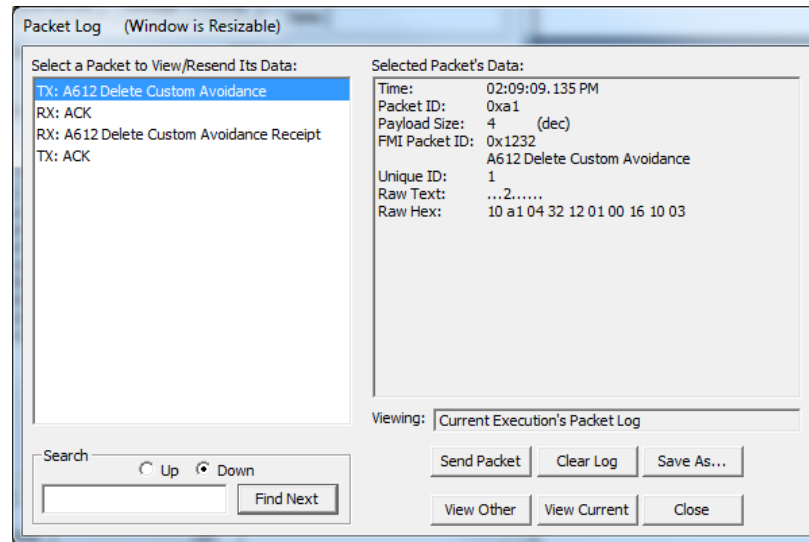




Removing a custom avoidance does not perform any action on the device itself. This command simply deletes a custom avoidance from the server. After performing this action, the avoidance will no longer be displayed in the "Map Window" of the FMC.

### XXX.  Auto-Status Driver Updates

With this new protocol, the server will have the option of enabling automatic driver status updates. Once a time threshold is received from the server, the device will automatically transition from "Driving" to "On-Duty" once the vehicle has stopped for the amount of time specified by the server. The device will also automatically move an "On-Duty" driver to "Driving" if the vehicle begins moving for 30 seconds and if there is only one "On-Duty" driver.

For the relevant protocol, see section 6.5.7 of the FMI Protocol Definition.

a.  Enabling Auto-Status Updates

To enable the feature, click the "Auto Status Updates" button, and enter a threshold value. Then, click "OK".
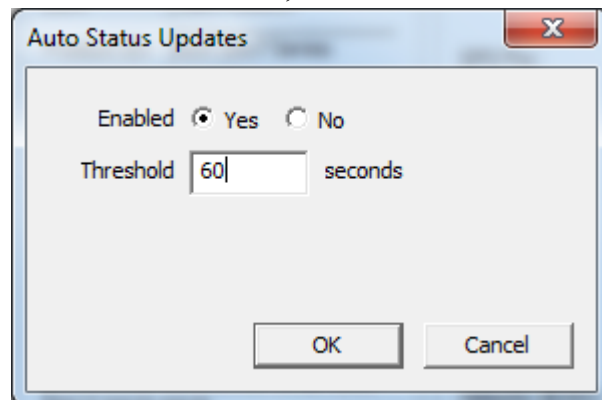


b.  Disabling Auto-Status Updates

To disable the feature, click the "Auto Status Updates" button, select the "No" radio button, and click "OK".
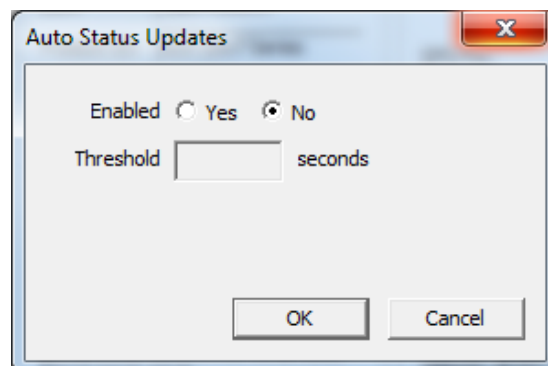
### XXXI.  8-Hour FMCSA Rule Configuration

For devices supporting HOS 2.0 that plan on using the HOS/AOBRD feature, the server now has the ability to enable or disable the FMCSA rule requiring a half-hour rest break every eight hours for a property-carrying vehicle. A discussion of AOBRD is outside the scope of this document – see the FMCSA regulations for more information at http://www.fmcsa.dot.gov/rules-regulations/topics/hos/index.htm.

To configure this rule, click on "Tools", "HOS", "8 Hour Rule", and then "Enable" or "Disable". If the rule is enabled, the driver will receive violation notifications if driving a property-carrying vehicle for more than 8 hours without a rest break.

See Section 6.5.8 of the FMI Protocol Definition for details.

## XXXII. Server-Initiated AOBRD Driver Logoff

For devices supporting HOS 2.0 that plan on using the HOS/AOBRD feature, the server now has the ability to initiate a logoff of a particular AOBRD driver.

To use this feature, click on "File", "AOBRD Drivers", select the driver from the list, and click "Send Logoff". A packet will be sent indicating that the driver's logoff was server-initiated. See section 6.5.10 of the FMI Protocol for details.
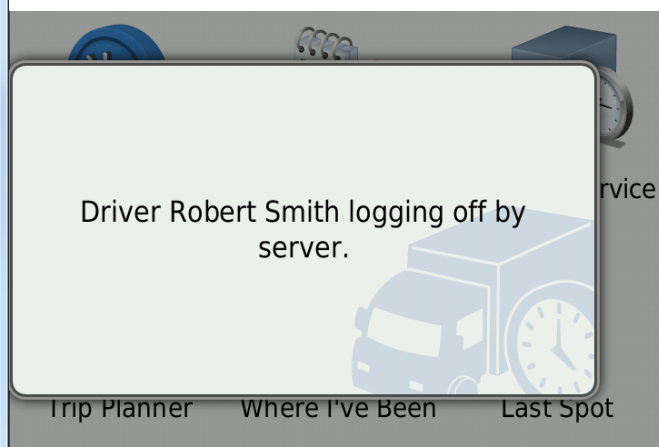
## XXXIII.  IFTA File Export

IFTA files log information necessary to remain compliant with the International Fuel Tax Agreement. These files **must** be exported from the device before the server can retrieve them. To access the IFTA file feature, click on "Tools", then "IFTA", bringing up the following dialog box.
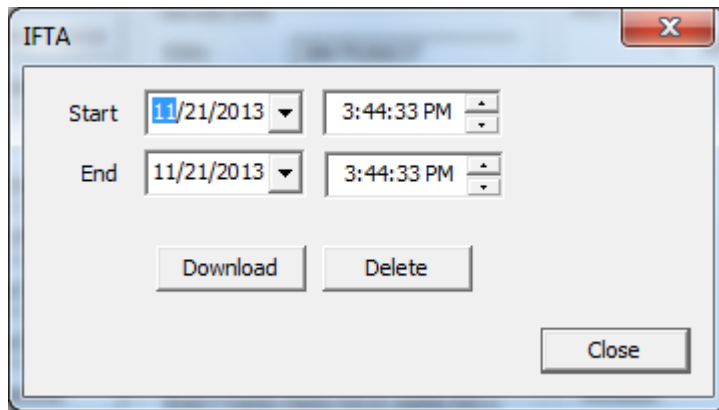


a.  IFTA File Retrieval

The server can select a start time and an end time. All IFTA files from between these two times shall be downloaded from the client. See section 6.5.9.1 for details.

b.  IFTA File Deletion

The server can select a start time and an end time. All IFTA files from between these two times shall be permanently deleted. See section 6.5.9.2 for details.

## XXXIV. Set Baud Rate

It is possible to configure the serial connection to run at 57600 baud instead of the default 9600 baud. To do so, click the "Change Baud Rate" button, opening this dialog box.



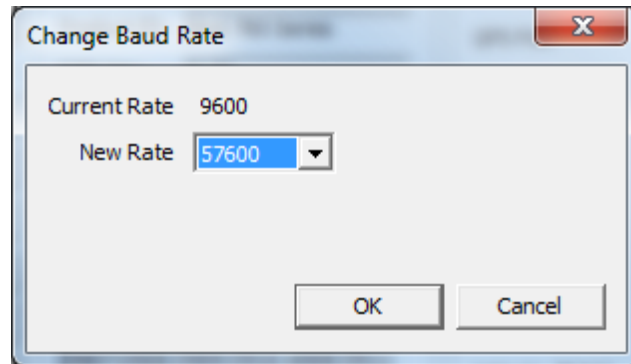When the user clicks "OK", the FMC will request the baud rate change, and then it will send a "Rate Sync" packet. If the device does not receive a sync packet within 30 seconds, the baud rate will return to the default 9600 baud.

See Section 5.1.23 of the FMI Protocol Definition for details.

**Important:** If the connection to the device is lost entirely, the baud rate defaults back to 9600.

### XXXV.    Sensors

On devices that support FMI 3.1, the server will have the ability to display sensor information on the device. To set up this feature, click the "Sensors" button in the lower-left corner of the application. This will open up the Sensors dialog box.

a.  Creating or Replacing a Sensor

To create a sensor (or replace it), first click the "Create or Replace" radio button. Then, enter the desired unique ID and sensor name. Finally, enter the desired display index (starting from 1), as well as the icon you want to have associated with the sensor. Clicking OK will send this sensor to the device. The severity will be normal, and there will be no status or description. If a sensor with the unique ID already exists, it will be overwritten.

b.  Updating a Sensor In-Place

To update a sensor's severity, status, or description, click the "Update" radio button. You can select the severity of the sensor, whether an audible notification is played, and whether the update is recorded in the device history. You will also determine what the sensor's status and description are – these can be viewed on the main sensors page and the sensor history page.
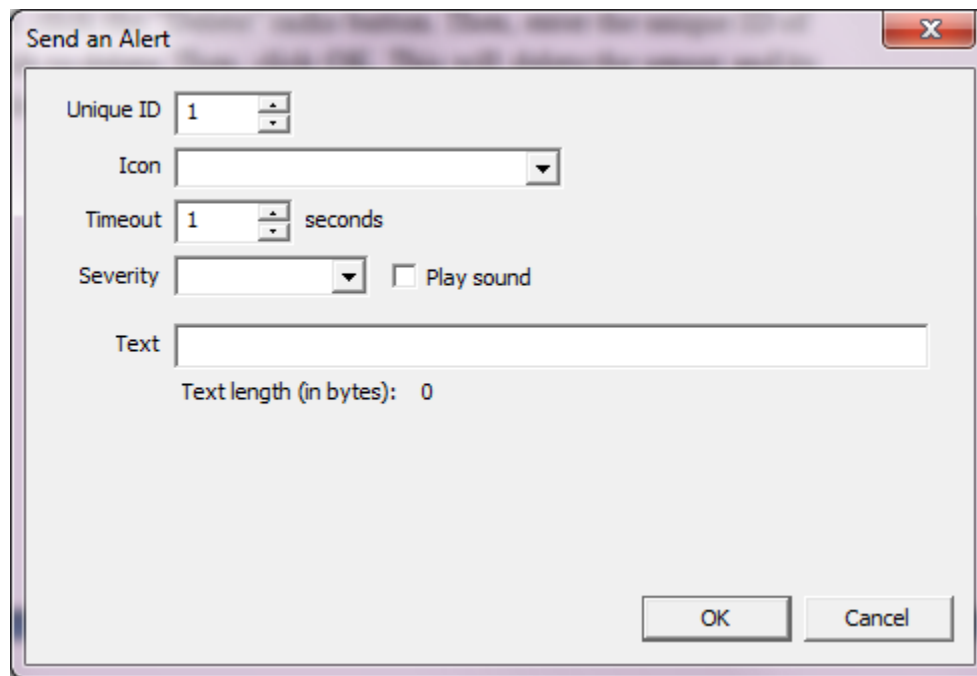


c.  Deleting a Sensor

To delete a sensor, click the "Delete" radio button. Then, enter the unique ID of the sensor you wish to delete. Then, click OK. This will delete the sensor and its history from the device.

## XXXVI.  Popup Alerts

On devices that support FMI 3.1, temporary "Popup Alerts" can be sent to the device. To create an alert, click the "Alerts" button in the lower-left corner of the application.

Then, you may define the following:

- o   Unique ID
- o   Icon (the same icons used for Sensors are used here)
- o   Timeout value, in seconds – determines how low the popup remains on the screen. Choosing a value of 0 sets the value to 2 hours.
- o   Severity – this is the same as with Sensors, where "Normal" is grey, "Medium" is orange, and "High" is red.
- o   Text – this is the string displayed in the popup.

Clicking "OK" sends the popup to the device. The driver must either acknowledge the popup or wait for the popup to be dismissed in order to take any further actions on the device.

## XXXVII.  Periodic Status Updates

On devices that support HOS 2.1, AOBRD can be configured to send status updates for all logged-in drivers to the server after a predetermined period of time. To enable or disable this feature, click "Tools"→"HOS"→ "Periodic Status Updates". The following window will appear.
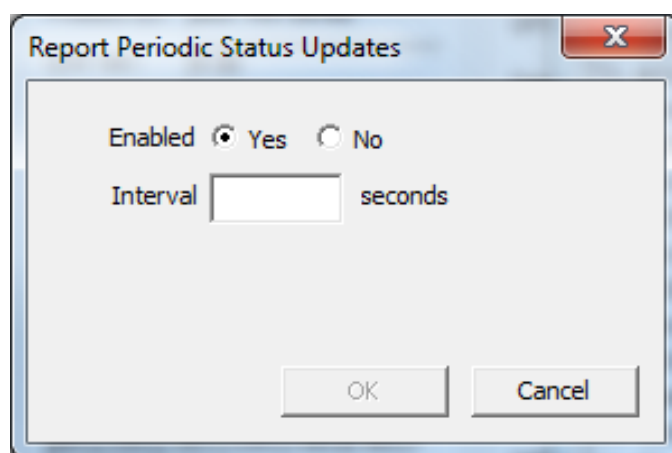


Simply select whether the feature should be enabled or disable. If enabled, enter the desired interval, in seconds, for updates to be sent. Any value less than 60 seconds will be automatically set to 60 seconds. The value must also be less than 65535 (0xFFFF).

In order for the feature to function, the device must be in motion and must be in AOBRD mode.

On pre-HOS 2.1 devices, this feature automatically sent statuses back to the server every 15 minutes, and was not configurable. This is still the default setting in HOS 2.1.
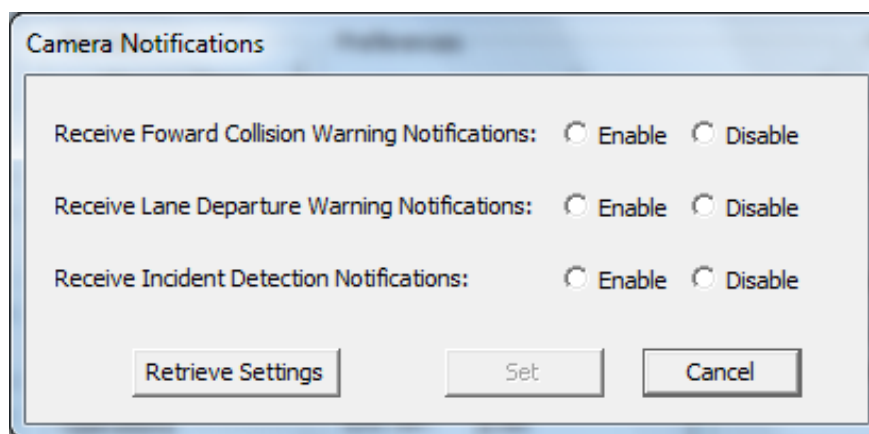
**XXXVIII. Dashcam Notifications and Settings**

On devices that support the CAM 1.0 features, the server can toggle numerous settings related to dashcam recording settings and data. Furthermore, the server can lock these settings to prevent any driver modification. Finally, the server can receive immediate notifications upon dashcam "events" (e.g., Lane Departure Warnings) if the device in question supports it.

a. Retrieving/Updating Event Notifications

The server can enable and disable three different notifications by clicking Tools →Camera → Notifications. The three notifications are as follows:

- o Forward Collision Warnings are triggered when the dashcam detects another vehicle in close proximity. This is only supported on nuviCam.
- o Lane Departure Warnings are triggered when the dashcam detects the driver has crossed over a solid line. This is only supported on nuviCam.
- o Incident Detection Notifications are triggered when the dashcam detects a sudden change in acceleration (i.e., the device is shaken in some way).

Camera Notifications

Receive Foward Collision Warning Notifications: ○ Enable ○ Disable

Receive Lane Departure Warning Notifications: ○ Enable ○ Disable

Receive Incident Detection Notifications: ○ Enable ○ Disable

Retrieve Settings   Set   Cancel

When these notifications are triggered, the server will receive details about the time and location of the event. After a short period of time (~2 minutes), the filename of the MP4 file of the event will be transmitted to the server. This file can be found on the device SD card at 0:\DCIM\100EVENT\.

Clicking the "Retrieve Settings" button will populate the radio buttons with the current device settings. See Section 5.1.26.4-7 of the FMI Protocol Definition for details on these packets.

b.  Updating/Locking Dashcam Settings

To lock/unlock Camera settings (found under Settings → Camera on the device), the server can send a lock/unlock request. To do so, click the Lock/Unlock radio buttons, and then click "Set Lock/Unlock". Locking the settings prevents the user from modifying the settings when using the device.

The server can also modify settings related to dashcam recording settings. These settings can be defined in a similar way. Make sure that the "Send" checkbox is selected before clicking the "SET" button.

Clicking the "Retrieve Settings" button will populate the radio buttons with the current device settings.

See Section 5.1.26.1-3 of the FMI Protocol Definition for details on these packets.

Note that attempting to define settings for unsupported features will result in an error.