

Upfitter Interface Module®

A-UIM330-B 2024-2025 Toyota Highlander/Grand Highlander



Introduction

The Upfitter Interface Module® provides access to a broad range of vehicle data such as MPH, RPM, Park Brake, Service Brake, temperatures, transmission range, accelerator pedal, doors, lights, door locks, ABS, MIL, etc. Specific data is vehicle dependent, and by running the UIM Programming Utility software (free download from www.intermotive.net), available information on a particular chassis can easily be determined.

An upfitter harness provides eight programmable outputs, using the UIM Programming Utility. The Programmer allows logical combinations (AND, OR, =, >, <) of various vehicle data to control an output. For example, one output can be programmed to go active when ECT>230 OR TFT>250 AND RPM>300 (any numeric values can be used). This could drive a high temperature dash indicator. Another output could be programmed to drive a warning buzzer/lamp when the vehicle speed exceeds some limit, such as 70mph. Electric doors can be disabled unless certain safety conditions are met and so on. A clutch pump may be disabled if RPM rises too high. There are also two general purpose inputs that can be used as part of the programmable logic.

Installation Instructions

Disconnect vehicle battery before proceeding with installation



IMPORTANT—READ BEFORE INSTALLATION

It is the installer's responsibility to route and secure all wiring harnesses where they cannot be damaged by sharp objects, mechanical moving parts and high heat sources. Failure to do so could result in damage to the system or vehicle and create possible safety concerns for the operator and passengers.

Avoid placing the module where it could encounter strong magnetic fields from high current cabling connected to motors, solenoids, etc. Avoid radio frequency energy from antennas or inverters next to the module. Avoid high voltage spikes in vehicle wiring by always using diode clamped relays when installing upfitter circuits.

UIM Module

Remove the lower dash panel below the steering column area and find a suitable location to mount the UIM module. Locate the module in an area away from any high heat sources (engine heat, heater ducts, etc.). Do not mount the module until all wire harnesses are routed and secure. The last step of the installation is to mount the module.

UIM Programming Utility Instructions (used for configuring the 8 programmable outputs)

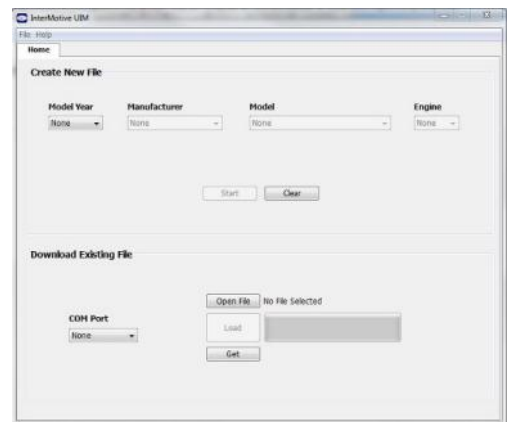
Requirements

- Java Runtime Environment must be installed on your computer prior to running this utility. Most PC's already have Java installed. The most recent version can be obtained for free at <http://java.com/en/download/manual.jsp>.
- The UIM Programming Utility. This is a free Intermotive software program that can be downloaded onto your PC. The files are available from the download page at www.intermotive.net. It is recommended that an "InterMotive" folder be created to store the files.
- USB to Serial cable (part# S-H37A1) is included in an "A-IPU" kit and is a one-time purchase. This kit is required for all programming and is recommended to be kept in a central location.

Computer Installation

Ensure the proper driver is installed for the USB to Serial download cable. This driver can be found at:
<http://www.ftdichip.com/Drivers/VCP.htm>

1. To install the programming utility, unzip the UIM Programming Utility folder to your local hard drive.
2. Create a shortcut on the desktop if necessary, but do not separate the UIM Programming Utility.exe file from the rtxSerial.dll file!
3. Plug in the USB cable (Part# S-Hh37A1) prior to starting the application.
4. Double click the UIM Programming Utility.exe file to launch.
5. This screen will come up. →



If the program does not launch, close all applications and reinstall the Java Runtime Environment and the UIM Programming Utility.

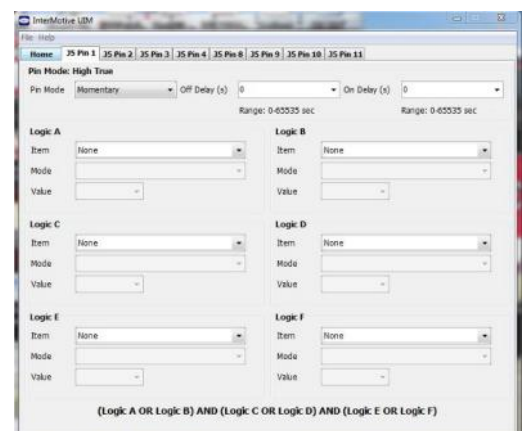
Setting the UIM Programming Utility Pin Configurations

To view a video on tips for configuring the module, go to www.intermotive.net

1. Under the "vehicle" tab, select the model year, manufacturer, model, and engine size of the vehicle the UIM will be installed in.
2. Click the "Start" button.
3. This screen will come up. →
4. Configure each pin as desired. See the following page for more information. Press the Enter button after each entry.

Note: CTO (Clean Tach Out) can only be programmed on pin 11.
2.2 Hz per MPH can only be programmed on pin 9.

5. Select "Save Configuration" under the "File" tab.
6. Enter a configuration name (Max. 16 characters) and click "OK".
7. Review the configuration summary and click "Save Configuration".
8. Enter a filename and choose a location that will be easy to locate.
9. Under the "File" menu, select "Save Configuration Summary".
10. Double click the .imc file previously configured.
11. Enter Company Name, phone number, and notes and click the 'OK' button. **Note: Enter the vehicle model year, model, and engine in the notes section.**
12. Enter a file name and click the 'Save' button.
13. Click the 'Open File' button.
14. Right click on summary and select 'Print'.
15. Cut the printed label and place it in the bag attached to the 12-pin connector.



Pin Mode Settings — UIM Application Software

The outputs can be set for various modes, as described below. Momentary mode is the most commonly used, where an output is 'active' only when the proper conditions have been met.

Momentary: Output follows condition set but with a turn on delay, and a turn off delay. Setting 'On Delay' and 'Off Delay' to zero causes the output pin to simply "follow" the condition set being true (ON) and false (OFF).

Pin Mode	Momentary	Off Delay (s)	0	On Delay (s)	0
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Latching: This mode will latch an output pin ON, starting 'On Delay' seconds after the conditions are met, and will keep it ON even after the conditions are no longer true. It will then latch the output OFF, following 'Off Delay' seconds after the conditions are met again. Think of it as toggle on—toggle off. The simplest use would be when using a momentary button as the only input condition and setting the Delays to zero. Thus a load could be turned on by pushing a momentary button, and turned back off by pushing the button a second time.

Pin Mode	Latching	Off Delay (s)	0	On Delay (s)	0
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Time Hold: The output pin goes ON after the conditions become true, and stays ON for the selected 'On Time', regardless of the conditions. Off Time is Not Applicable.

Pin Mode	Time Hold	Off Time (s)		On Time (s)	0
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Time Delay: Output is turned ON after the selected 'delay' time after the conditions are met. It stays on for selected 'On time', regardless of input conditions.

Pin Mode	Time Delay	Delay (s)	0	On Time (s)	0
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Flashing—Momentary: Used for creating a flashing output. When conditions are met, output flashes. When conditions are no longer met, flashing stops. Flashing ON and OFF times (duty cycle) are controlled by entering the following values.

Pin Mode	Flashing - Momentary	Off Time (.1s)	0	On Time (.1s)	0
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Flashing - Latching: Same as above, except flashing will continue after conditions are no longer true, and will stop when conditions become true again—toggle ON, toggle OFF. Duty cycle is controlled by the ON and OFF times.

Pin Mode	Flashing - Latching	Off Time (.1s)	0	On Time (.1s)	0
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Desktop Programming the UIM

The InterMotive "A-IPU" kit is sold separately and allows programming the UIM on your desktop. It consists of a 12VDC wall adapter and download cable and works with the UIM programming software utility.

Note: Do not have the UIM Programming Utility opened until instructed to do so.

1. Plug the Module Desktop Power/Ground Supply inverter into a 120V AC power source.
2. Locate the 6-Pin Female connector on the module but do not connect the AC adapter to the UIM module until indicated in the following steps.
3. Plug the phone jack end of the download cable into the J4 COMM port of the UIM module and the USB end into your PC.



J4 COMM Port

Loading Configuration file into the UIM

Open the UIM Programming Utility. Under the "Download" tab on the UIM Programming Utility, choose the COM Port the USB cable is connected to.

Note: This can be determined on Windows 7 by right-clicking on 'Computer' and selecting 'Properties.' From this window click on 'Device Manager.' In the Device Manager window, expand the 'Ports' menu and the download cable will display as 'USB Serial Port (COM#).'

Click the 'Open File' button.

1. Open the UIM*.ims or configuration file to load on the UIMxxx-B module. (This file must already be loaded on the computer).
2. Click the load button on the computer screen. "Waiting" will come up next to the progress bar. This means the program is waiting for the download cable to be plugged into the UIM module.
3. Plug in the 6 pin connector of the power adapter into the UIMxxx-B module. The progress bar on the computer screen will display status as the configuration loads and takes approximately 2 seconds or less. Configuration is loaded once the screen says "DONE" and programming is complete.
4. To verify that the correct data was loaded into the module, disconnect the 6 pin connector from the module and press the 'Get' button on the screen. Plug in the 6 pin connector and the information will be displayed.



To program another module with the same configuration file, start with step 2.

Data Link Harness (A-UIM330-B)

2024-2025 Toyota Highlander/Grand Highlander

- 1) Remove passenger side dash panel.



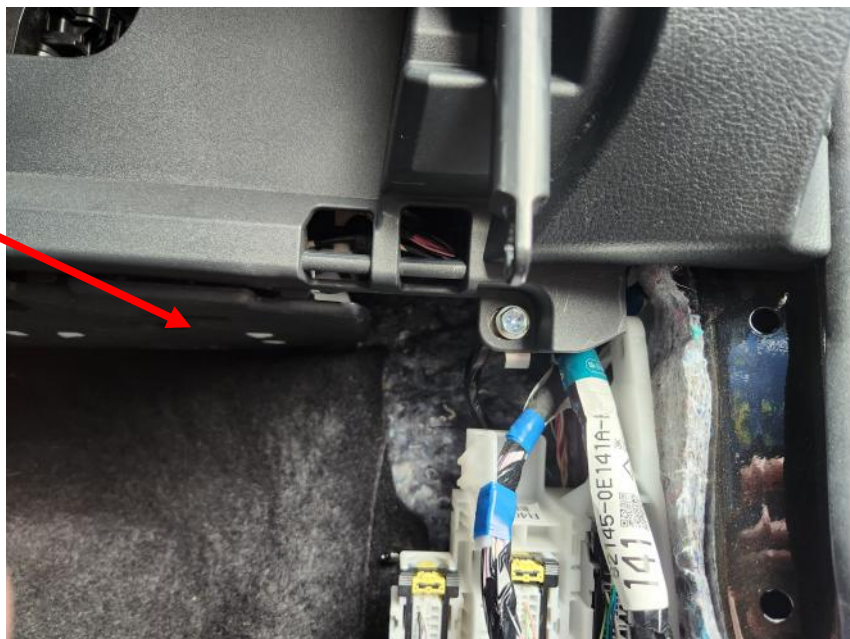
- 2) Remove glove box.



Data Link Harness (A-UIM330-B)

2024-2025 Toyota Grand Highlander

- 3) Remove lower dash kick panel beneath glove box



- 4) Locate and disconnect connector **C51** (shown). Plug connector **C51** into the mating connector on the DLC harness. Plug the female 30w DLC connector into the OEM module. Route the DLC harness to the mounting location for module.
- 5) Plug the 6-pin DLC connector into the UIM330 module and mount module.
- 6) Reverse installation instructions to reassemble vehicle.

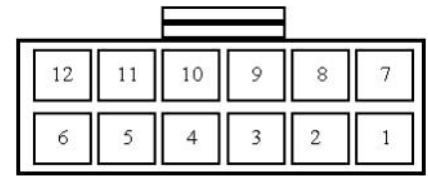


12-Pin UIM Connector Pin-Out Definition

This connector contains the UIM's 8 output pins. Each output is rated at 1/2A and is intended to drive relay coils or other low current loads. Note that Pin 1 of the eight outputs is active high (12V) while the rest are active low (ground). **Note: when driving relays, a diode-protected type must be used. InterMotive recommends DigiKey #PB682-ND Relay.**

The 8 outputs are defined as follows:

- Pin #1 (Purple wire) Configurable Output, **Active High***
- Pin #2 (Green wire) Configurable Output, Active Low
- Pin #3 (White wire) Configurable Output, Active Low
- Pin #4 (Gray wire) Configurable Output, Active Low
- Pins #5-6 are no-connects
- Pin #7 (Red wire) fixed jumper to pin 12
- Pin #8 (Brown wire) Configurable Output, Active Low
- Pin #9 (Orange wire) Configurable Output, Active Low
- Pin #10 (Blue wire) Configurable Output, Active Low
- Pin #11 (Yellow wire) Configurable Output, Active Low
- Pin #12 (Red wire) fixed jumper to pin 7



Back of Connector

Connect the desired outputs to vehicle equipment as needed. Tape up unused leads. **When connecting to relays, use relays with appropriate kick-back suppression, such as Digikey #PB682-ND.** Unsuppressed relays will induce very high voltage spikes throughout modern vehicles sensitive computer electronics and should not be used, per Ford, GM, SAE, etc.

The default configuration for the 8 outputs are as follows:

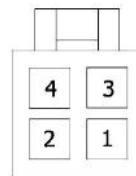
- Pin #1 (Purple wire) Trans Range=Reverse
- Pin #2 (Green wire) Vehicle Speed >65
- Pin #3 (White wire) Engine Coolant Temp>230
- Pin #4 (Gray wire) Service Brake = Applied
- Pin #8 (Brown wire) Engine Running = True
- Pin #9 (Orange wire) VSS — 2.2Hz/MPH
- Pin #10 (Blue wire) Trans Range = Park
- Pin #11 (Yellow wire) Clean Tach Out, 0-12V pulsed
CTO = ((RPM/2)*#Cyl) = pulses per minute. E.G. 600rpm = 2400 (8 cylinders)

4-Pin Input Connector Definition

This 4 pin connector contains the UIM's 2 discrete wire inputs. These are both active low inputs which means external devices must pull these inputs to ground. These inputs have their own internal pull up resistors so they can be left floating when not used or not active. These inputs can be used as part of the programmable logic to configure the output pins.

- Pin #1 - (Blue/White stripe) Input 1, Active low
- Pin #2 - Not Used
- Pin #3 - (Green/White stripe) Input 2, Active low
- Pin #4 - Not Used

Connect inputs as needed. Tape up unused input wires.



Back of Connector



4 Pin I/O

Reconnect the vehicle battery

Initial Installation Power-Up

When the UIM module is first plugged in, it attempts to acquire the vehicles VIN to interpret vehicle data on the OBD network. The key must be in the Run position for network traffic to be present (engine off is OK).

1. Turn the ignition switch to the Run position.
 2. Plug the 6 pin Data Link connector into the module
- If the module LEDs "scroll", then it has NOT acquired a recognized VIN. The chassis may be a new Model Year which the module does not recognize, or the chassis has an unrecognized engine. Ensure your chassis is listed at the top of page one of these instructions. Contact Intermotive Tech Support for assistance.
 - If no LEDs come on when the module is plugged in and powered up, it is working properly. Proceed to post installation testing.

UIM Module Mounting

Ensure all the harnesses are properly connected and routed, and are not hanging below the dash area. Mount the UIM module using screws or double sided tape. Reinstall the lower dash panel.

UIM Post Installation Testing

1. Turn the ignition ON to wake up and initialize the UIM module.
2. With the conditions met, ensure that all desired outputs are responding correctly per their programmed condition set (e.g., default condition of output 5 goes low when engine is running).

The UIM is properly installed only if it passes the above tests. If any irregular operational issues persist, recheck the condition set configuration. Contact InterMotive at 530-823-1048 for technical assistance.

Diagnostics

To enter diagnostic mode, momentarily press the Red "Test" button on the module with the ignition on. There are six 'pages' of diagnostic data. Each time the Red "Test" button is momentarily pressed the module will advance to the next 'page'. The Status LED will flash the page number (e.g. the Status LED will flash 5 times when in 'page' 5).

Page 1

The on-board LED's will light when a corresponding load is active:

LED1 = Output #1
LED2 = Output #2
LED3 = Output #3
LED4 = Output #4
LED5 = Output #5
LED6 = Output #6
LED7 = Output #7
LED8 = Output #8
LED9 = Input #1
LED10 = Input #2

Page 2

The on-board LED's will light when corresponding vehicle data is detected:

LED1 = Transmission
LED2 = RPM
LED3 = VSS (vehicle speed sensor)
LED4 = Park Brake
LED5 = Service Brake
LED6 = APP (accelerator pedal position)
LED7 = Key Position
LED8 = TFT (transmission fluid temperature)
LED9 = ECT (engine coolant temperature)
LED10 = AAT (ambient air temperature)

Diagnostics (Continued)

Page 3

The on-board LED's will light when corresponding vehicle data is detected:

LED1 = FL (fuel level)
LED2 = MIL (malfunction indicator lamp)
LED3 = ABS
LED4 = AC
LED5 = Rear Door
LED6 = Driver Front Door
LED7 = Passenger Front Door
LED8 = Driver Rear Door
LED9 = Passenger Rear Door
LED10 = Turn Signal

Page 4

The on-board LED's will light when corresponding vehicle data is detected:

LED1 = ParkLamp
LED2 = LowBeam
LED3 = HiBeam
LED4 = DRL
LED5 = All Lock
LED6 = All Unlock
LED7 = Driver Door Unlock
LED8 = Driver Seat
LED9 = Passenger Seat
LED10 = Driver Belt

Page 5

The on-board LED's will light when corresponding vehicle data is detected:

LED1 = Passenger Belt
LED2 = EOP (engine oil pressure)
LED3 = Mute
LED4 = Hazard
LED5 = Light
LED6 = Brake Torque
LED7 = Engine Torque
LED8 = Odometer
LED9 = Not Used
LED10 = VIN PnR Active

Diagnostics (Continued)

Page 6

Output Trouble Codes

If there is an issue with one of the UIM outputs, the status LED will flash a two digit code while in diagnostic mode, page 6. A 1-1 code means everything is working properly. The first digit flashed will correspond to the output number and the second digit will indicate the specific problem. The second digit can be:

- 2 - Output fault (overcurrent or overvoltage)
- 3 - Invalid data (The data associated with the output is invalid)
- 4 - Data timed out (The data associated with the output has timed out)
- 5 - Unsupported data (The data associated with the output is not supported on the current vehicle)

Scrolling LED's may indicate one of the following errors:

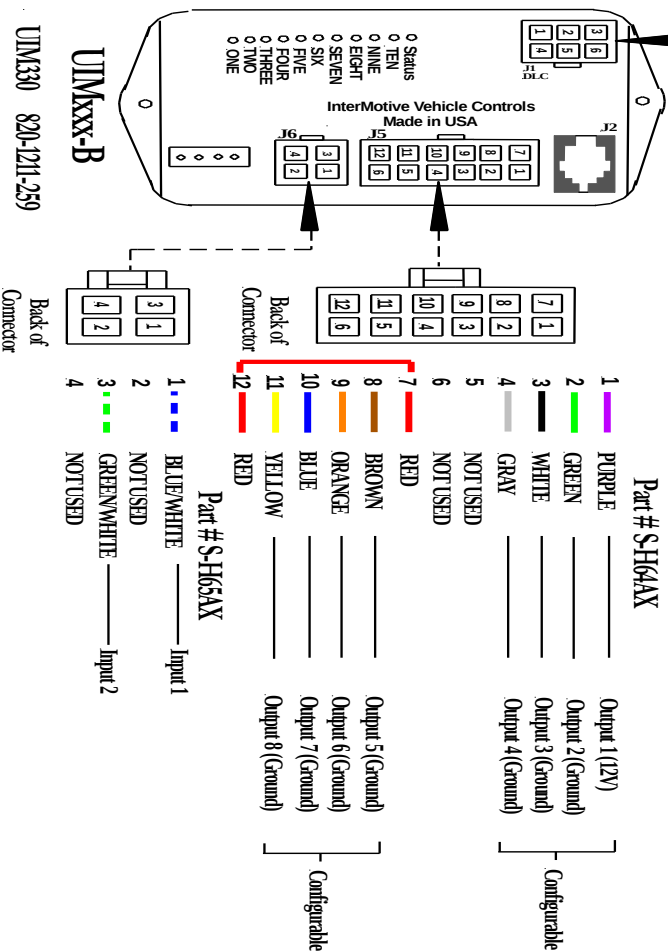
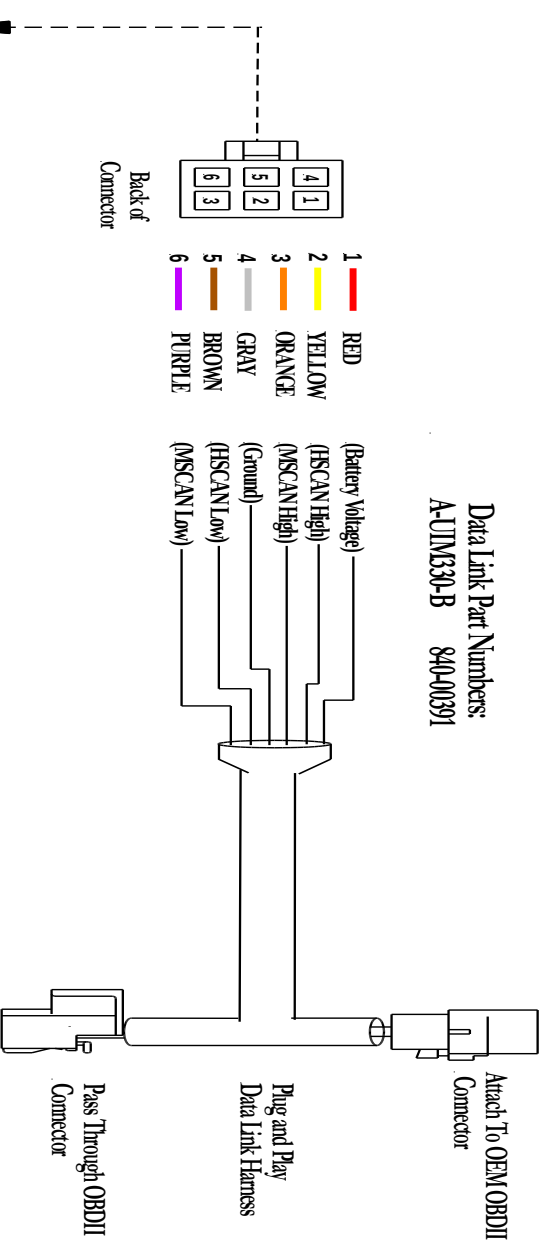
- LED's scrolling sequentially one at a time indicates that an invalid or incomplete VIN was captured.
- LED's scrolling from the middle outward indicates a configuration error. This can be the result of configuring the UIM for one chassis, but installing it in a different chassis.

UIM Operation

Turning the vehicle ignition ON will wake up and initialize the UIM module. Outputs are controlled based on the module's configuration created using the Intermotive UIM Programming Utility program.

When the key is turned OFF, the UIM module will go into a low power sleep mode and it's outputs will shut off. This may take up to five minutes, and the Diagnostic LED's (if active) on the module will go out once in sleep mode. Other vehicle activity such as opening doors, inserting key in the ignition, etc. may delay sleep mode.

Data Link Part Numbers: A-UM330-B 840-00391



Submit product registration at www.intermotive.net

If the UIM fails any step in the Post Installation Test, review the installation instructions and the loaded configuration by running the Graphical User Interface application. If necessary, call InterMotive Technical Support at (530) 823-1048.