



# **AIM Titanium® Installation Guide**

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## AIM Titanium® Installation Guide

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- US and Canadian equipment certifications through the following:
  - FCC (Federal Communications Commission),
  - Intertek (ETL, cETL),
  - CAN/CSA (Canadian Standards Association),
  - National Conference on Weights and Measures (National Type Evaluation Program: NTEP),
  - Payment Card Industry (PCI) Security Standards Council (PA-DSS compliance),
  - California Air Resources Board (CARB)
- Microsoft Gold Partner

## Document Version History

Version	Date	Description
1.0	06/04/2021	Initial release of AIM Titanium document.
1.5	3/9/2022	Edited for conciseness. Reformatted to fit styling standards. Added AIM cable images to <a href="#">Part Numbers and Descriptions</a> section.
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# Chapter 1 Introduction

## Who Should Read this Guide?

Technicians that are

- qualified to complete electrical work on vehicle electrical systems
- trained by a Syntech qualified AIM installation trainer

## What Is Included

These instructions cover the AIM module installation on a wide assortment of vehicles being prepared for passive fueling. Post installation inspections of the installed equipment include a checklist for completion by the installation technician and customer (signatures required).

## Related Documentation

### Other Manuals (FM)

- FMU Installation Manual (Syntech part ID FM-010)
- FleetMaster® RDCU Installation Guide
- Software User Instructions
  - FMPlus User Manual (Legacy software)
  - FMLive Online Help Content
    - FMLive User Manual
    - FMLive Admin Guide
    - FMLive Reports Guide
- AIM Programming and Software Configuration (Legacy Firmware/Software)
- AIM Programming and Software Configuration (FMLive)

### Troubleshooting Guides

- PB-222, Quick Reference Guide - AIM Titanium Troubleshooting

### Product Bulletins (PB)

- PB-084, Installation of the 941B0157 RFID Tag on an OPW 11VAI-27 and -37 Stage 2 Vacuum Assist System Nozzle
- PB-085, Installation of the 941B0218 RFID Tag on an OPW 11VF-47 and -47/R Stage 1 Balance Vapor Recovery System Nozzles
- PB-086, Installation of the 941B0220 RFID Tag on an OPW 12VW Stage 2 Vacuum Assist System Nozzle
- PB-140, Upgrade FMU-2500 Plus to FMU-3500

- PB-145, Installation of 941B0453 Nozzle Tag on Healy 400 & 900 Series Vapor Recovery Nozzles
- PB-149, Installation of 941B0218-20 Nozzle Tag on a VST EVR Nozzle
- PB-150, Installation of 941B0466 Environmental Protection Enclosure Kits
- PB-150a, Installation of 941B0466J Environmental Protection Enclosure Kits for New Refrigeration Trailer Installs
- PB-151, Installation of 941B0168C Filler Neck Rings for use with Emo Wheaton Posi-Lock Systems
- PB-166, Laptop Connect to AIM
- PB-169, Multi-Product Authorization Setup
- PB-171, Making Your AIMs Last
- PB-175, AIM Odometer Calibration
- PB-176, Setting Force OBD Sleep Silence (FOSS) to Prevent Excessive Battery Drain
- PB-182, Access Management Unit Survey
- PB-183, Install 941B0509 AIM Switched Power OBD Adapter
- PB-191, Setting the Force OBD Ignition Off Silence (FOIOS) Option
- PB-196, Upgrade Fixed FMUs (FMU-2500, 3000, 3500) to FMU-3505
- PB-201, FMU Sunscreen Standoff Repair
- PB-204, Adjust FMU (Gen2-FreeStar) 2.4GHz TPL and Remove Interference Between Radios
- PB-209, AIM: Use with Ambulances
- PB-222, Quick Reference Guide AIM Titanium Troubleshooting
- PB-223, AIM RFID Interface Module (RFIDIM)
- PB-225, Installation of Controlling Access Management Unit
- PB-234, Removing AIM Titanium from Light Duty Vehicle
- PB-242, Implementation of J1939 500kbps OBD Interface
- PB-244, Switched Vehicle Detection and Test
- PB-245, Dash Odometer Support for AIM2.4 and AIM Titanium
- PB-250\_AIM Firmware Update using Cyclone Pro
- PB-253, Calibrating an AIM via an FMLive Unit
- PB-258\_AIM Firmware Update using Cyclones LC-FX

## Chapter 2 General Information

### Purpose

This guide provides instructions for the installation of an AIM Titanium. This guide includes interfacing equipment designed to adapt AIM to all known passive fueling applications. **Passive fueling** is the initiation of a fueling transaction by the AIM equipment without the need for operator input.

### Safety Precautions and Corrective Actions

#### Correcting RF Interference

This equipment generates, uses, and can radiate, radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. If this equipment does cause harmful interference to radio or television reception (determined by turning off and on the equipment), the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the radio/TV's receiving antenna
- Increase the separation between the equipment and the radio/TV's receiver
- Connect the equipment into an outlet on a circuit different from that to which the radio/TV's receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

### Certification/Approval

The equipment supplied for AIM integration is tested and safety certified by Intertek's ETL SEMKO Division. Nameplates displaying the ETL logo are affixed to certified AIM components.

### WARNINGS, CAUTIONS, and NOTES

This guide emphasizes special operations with WARNINGS, CAUTIONS, or NOTES preceding the applicable procedure:

- A **WARNING** indicates a safety precaution that, if not followed, could result in personal injury.
- A **CAUTION** indicates a safety precaution that, if not followed, could result in damage to equipment.
- A **NOTE** indicates a procedure requiring special emphasis for the proper installation and operation of Passive Mobile equipment.

## FuelMaster Warranty

The basic warranty on FuelMaster equipment concludes 12 months after installation or 15 months after shipment from Syntech Systems Inc., whichever occurs first.

Under terms of the warranty, FuelMaster support engineers, with the assistance of the customer, may telephonically diagnose problems to determine warrantable conditions and possible solutions. Syntech Systems will replace all defective parts and provide assistance to the customer during installation of replacement parts. This warranty does not cover site visits by FuelMaster technicians for repair.

Damages resulting from user abuse, accidents, or faulty installation or operation are not covered under the basic warranty. This warranty specifically excludes any indirect, special, or consequential damages to include, but not limited to, loss of product, profit, or litigation fees. Associated equipment including printers, personal computers, wireless communications devices and other items sold by, but not manufactured by, Syntech Systems are warranted for 90 days after initial shipment. Additionally, warranties are limited to approved locations (generally the continental United States) and are not transferable except by written permission of Syntech Systems.

## Initialization Requirement

All FuelMaster Fuel Management Systems must be initialized by Syntech certified personnel. Initialization is the startup inspection and tests performed to certify the installation. Initialization can be completed only by a Syntech FuelMaster technician or a technician who has completed installation training and certification for AIM. Final certification must be accomplished jointly by the Customer and Syntech trained personnel. Customers who wish to perform their own AIM vehicle installations will receive mandatory installation training by a Syntech FuelMaster trained and certified technician.

## Safety Related Inspections and Preventative Maintenance

AIM does not require preventative maintenance to retain its user safety features. Whenever an AIM is updated or repaired, a post-installation safety inspection should be performed for all wire connections and hardware installations.

## Parts Substitution and Modification

Modification of the equipment provided, substitution of any material requirements, or any deviation from these installation instructions must comply with all applicable safety codes and standards. If the modifications of the equipment do not comply with safety codes and standards, the warranty may be void.



## Consumables/Special Tools

Consumable/Special Tool	Application
CV joint boot clamp pliers	Crimp nozzle tag security clamps
Dielectric grease	Prevent corrosion and protect electrical connections exposed to the environment
12 AWG THHN stranded wire (GREEN)	AIM ground wire(s)
3/8" Wire loom	Cable/wire protection
Rubber grommets	Protect cables/wires routed through drilled holes
Silicon sealant (GE blacktop/roof, 100% silicon)	Seal grommets
Cable ties (BLACK UV protected)	Secure cables/wires
3M Scotch® Rubber Mastic Tape 2228	Weatherproof RFID Interface Module
18 AWG THHN stranded wire (RED, BLACK, GREEN, WHITE, BROWN)	Speed sensor wires
18 AWG THHN stranded wire (ORANGE, BLUE)	Analog chronometer wires

## Commercially Available Products

This guide makes recommendations for commercially available equipment and materials required to complete an installation. Trade names and part numbers are also referenced to cite products that have been tested and are known to be serviceable with passive fueling equipment. There may be other products (not referenced), which have not yet been tested but may be equally suitable. Syntech inventories commercially available products necessary to complete a FuelMaster installation.

## Chapter 3 System Description

The passive fueling FMU types are the FMU-35xx and FMU-45xx (henceforth referred together as “AIM FMU” ). An AIM (Automotive Information Module) is a small vehicle-installed, RF (radio frequency) transceiver and computer that works with the AIM FMU.

### Passive Fueling

FuelMaster passive fueling provides for secure, accountable control of fuel dispensing without the need for user access of the FMU. Vehicles (or other fuel consuming equipment) are fitted with an AIM and an AIM FMU is installed to authorize and record fueling.

The various models of the AIM FMUs have a secondary function selected by the customer for user access with a Prokee, magstripe card, or through manual transaction entry.

### Typical Fueling Transaction

1. Drive AIM equipped vehicle up to the fuel dispenser.
2. Take the fueling hose down, and turn the dispenser pump handle on.
3. Insert the fuel nozzle into the fuel tank filler neck.
  - AIM sends authorization information to the FMU. Once FMU receives authorized input, the FMU turns on the selected dispenser hose.
4. Dispense fuel.
  - The FMU records the fuel quantity pumped into the vehicle.
5. Remove the nozzle, turn the dispenser pump-handle off, and hang up the nozzle.

#### NOTE

Removing the fuel nozzle from the vehicle's filler neck ends the transaction and turns off the dispenser. Fueling cannot be resumed without reinserting the nozzle into an AIM equipped vehicle, or by the user accessing the FMU with an alternate access device (Prokee, Smartcard, or credit card) or keyless configured entry. Automated transactions may only be initiated by vehicles or access devices with the same Site Signature (unique customer identifier) as the FMU controlling the fuel dispensers.

### Transaction Data Collected by AIM

You may refer to the FMLive Reports Guide or the [FMPlus User Manual, Chapter 12](#) for the list of data that is collected from the AIM during a transaction.

Vehicle use and operational data may be recovered by AIM through an OBD II (second-generation On-Board Diagnostics) connection. The onboard diagnostics information provided to an AIM depends on the data offered by the specific vehicle's onboard computer.

## Components of a Passive Fueling System

The following are descriptions of the components that make up a passive fueling system:

### Automotive Information Module (AIM)



Figure 1 AIM Titanium

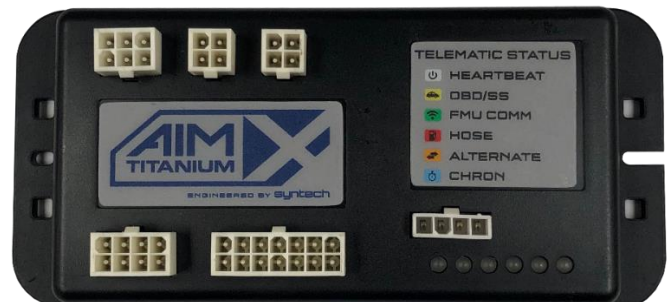


Figure 2 AIM Titanium X

AIM Titanium([Figure 1](#)) uses a 2.4 GHz frequency radio and has these other features:

- Advanced Encryption Standard (AES), FIPS 140-2 validation for cryptographic security
- Draws an average of 10mA of current while sleeping (compared to 45mA for AIM2 and AIM2.4)
- Has onboard power filtering (AIM2 and AIM2.4 required an added filter, when needed)
- Effective wake-up solution
- Support for OBD protocols
- Safety certifications

AIMs may receive input data through:

- the vehicle's OBD II (On Board Diagnostics, version 2) receptacle or
- the analog speed sensor/chronometer inputs.

Power for the AIMs may be supplied through:

- the OBD II receptacle or
- an analog speed sensor cable.

The chronometer cable supplies analog inputs but does not make power connections. A chronometer connection requires an analog speed sensor cable for power.

Colored LEDs are built into the AIM module for feedback of operating and programming conditions. These LEDs must remain visible after installation for testing and troubleshooting.

AIMs “go to sleep” (become idle and operation reduces input power) 2 minutes after the vehicle ignition is turned off or out of range of an FMU/RDCU. If within communications range of an active AIM FMU, the AIM stays powered for 15 minutes after the vehicle ignition is turned off. However, if AIM Automatic Update is in process, the AIM will stay awake until the transfer is complete. If the AIM module is in sleep mode, it must be “awakened” before fueling may occur. Turning on the

vehicle ignition or starting the engine will wake the module, in most cases. Some exceptions require the addition of a “wake up” wire to force the wake-up.

External dimensions of the AIM Titanium are at 5-7/8-inch-long x 2-9/16-inch-wide x 13/16 inch deep. AIM Titanium has a blue PCB and a black enclosure ([Figure 1](#)). The bottom side has the part number, certifications, and logo designed for that module.

Acceptable input power for AIM Titanium is 8 VDC to 28 VDC. AIMs may draw 0.4 amps when active, and 0.006-0.045 amps in sleep mode. AIM Titanium is temperature rated for operation at -40F to 185F (-40C to 85C).

## AIM Titanium X

The AIM Titanium X ([Figure 2](#)) has the same capabilities as all other AIMs. The AIM Titanium X also supports:

- Vehicle Models from 1996 and newer
- Dual Tank Support

## AIM Programming Key

An AIM Programming Key (i.e., Prokee or Smartcard) only permits AIM programming through the FMU.

## Nozzle Tag (Hose or RF/ID Tag)

The Nozzle Tag ([Figure 3](#)) is an intrinsically safe device installed on the fuel dispenser (or Passive Mobile truck) fueling nozzle to initiate a passive fueling transaction. The Nozzle Tag contains an antenna coil and RFID chip programmed with a number to identify the fueling nozzle it is attached to. Unique to FuelMaster, the Nozzle Tag does not require a cable routed down or through the fueling hose for power. These tags are available in a variety of sizes and shapes to accommodate most known fuel nozzle types.

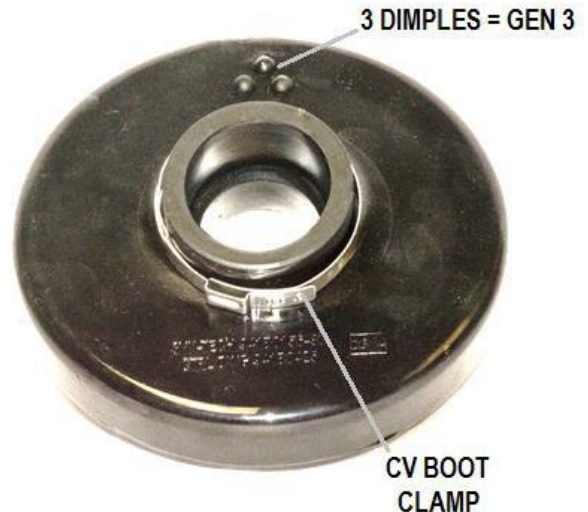


Figure 3 Nozzle Tag w/CV Boot Clamp

## Programming Hose Tag (PHT)

A specially **programmed hose tag** is used to identify vehicles during the AIM’s programming phase. The PHTs are identified with an attached label containing a letter (A through F). Each FMU may be configured to use a single PHT, which is needed to complete the programming interface between an AIM and the FMU. PHTs are made from operational nozzle tags that closely match the application in which they are used.

## Filler Neck Rings/RFID Interface Module

Like the PHTs, **filler neck rings** contain an antenna coil and RFID chip for communications with the nozzle tag. The filler neck ring has a 48-inch pigtail for connection to the RFID interface module (also referred to as Lump Board).

Filler neck rings ([Figure 4](#)) are available in a variety of sizes for installation on a variety of vehicle fuel tank filler necks.

Filler neck rings may be glued in place with a gasoline and oil-resistant adhesive (e.g., Seal-All from Eclectic Products, Permatex, 3M Super Weather strip adhesive, or Gorilla Glue for rough surfaces). Use any adhesive with similar properties, which is gas and oil-resistant and that will not damage the rubber surface of the filler neck ring. Lipped filler neck rings may also be tacked in place with screws if care is taken not to contact the internal coil of the filler neck ring.

The **RFID Interface Module** ([Figure 5](#)) generates the signal for the filler neck ring to communicate to the nozzle tag. When the nozzle tag is brought close enough to the filler neck ring, the hose number programmed into the nozzle tag is received and transmitted by the RFID Interface Module through the RFID Extension Cable to the AIM.



Figure 4 Filter Neck Ring

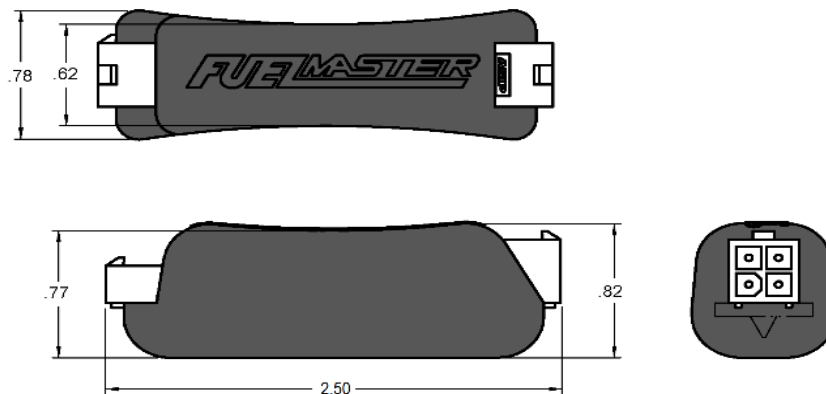


Figure 5 RFID Interface Module

## Connecting Cables

The AIM receives connections from an assortment of cables. RFID Extension Cables connect between the RFID Interface Module and AIMs and are available in 6", and 5, 10, 15, 20, 30, 50, and 80' lengths for non-HD modules.

Cables for analog connections to a speed sensor or chronometer have pigtails for the necessary connections. Analog chronometer connections do not connect to vehicle power. AIM power must be derived from an OBD or speed sensor cable connection.

A chronometer does not need to be a physical device added to the vehicle/equipment to attain the desired information. A chronometer input may be as simple as a power source that is only powered under special circumstances.

Engine runtime may be a power source that is only supplying power when the engine is running. PTO (power takeoff) engage time may be a power source that is only supplying power when the PTO is engaged. Chronometer inputs may be from as many as three different sources: through the OBD connection and up to two analog chronometer inputs to record vehicle run time, idle time, and PTO time.

Cables are available for combining two separate fuel tanks and their filler neck rings into one AIM. If you are combining two separate fuel tanks and their filler neck rings into one AIM, fuel fills to either tank, and both transactions are recorded. When the transactions are downloaded into the software, the vehicle record has only one tank record, so transactions from both vehicle tanks are combined to look as if one tank was filled.

Reefer applications may require special consideration before installations begin. Reefers may draw from the same fuel tank as the truck, or fuel consumption may be separately tracked using their own AIMs when a separate fuel tank is installed.

## Environmental Enclosures

AIMs cannot be installed where they are exposed to weather or instances of extreme heat (i.e. engine compartments). Environmental enclosures can be used to install the modules as close to the application as possible without actual exposure. See Product Bulletins 150 and 150A for instructions for the AIM Environmental Protection Enclosure Kits.

### FMU-353x Passive Mobile

The FMU-353x Passive Mobile is an FMU-35xx adapted for mobile use on tanker trucks. It provides mobile capability for fueling AIM Titanium-equipped vehicles or equipment which may not have convenient access to a fueling site.

Passive Mobile installations are covered in a separate Passive Mobile Installation Manual.

### Access Management Units (AMUs)

An AMU is a device developed solely to control gate/door/carwash access or monitor vehicle movement via RF transmission from an AIM2.4 equipped vehicle.

A controlling AMU is a complete FMU modified to control gates/doors/carwashes through an input from an AIM. A full description and installation procedures for a controlling AMU may be found in Product Bulletin 225.

## Remote Data Collection Unit (RDCU)

The Remote Data Collection Unit was developed to account for vehicle access and capture OBD data from AIM equipped vehicles as they pass within RF range of the RDCU. The RDCU is a compact AMU; it does not require a complete FMU as is necessary with a controlling AMU.

There are two generations of the RDCU. The larger first generation was developed primarily for use with AIM2. The second generation RDCU-45xx 5605/5705/5805 was developed to be used with version AIM2.4 and above. The four versions of RDCU include:

- RDCU 5705-A0 - Cellular
- RDCU 5605-P0 - Wired Ethernet/Power over Ethernet (PoE)
- RDCU 5605-A0 - Wired Ethernet/Non-PoE
- RDCU 5805-A0 - Wi-Fi

# Chapter 4      AIM Installation

## Installation Requirements/Prerequisites

### Overview

- Configure the Software
- Configure the FMU to handle AIM
- Install the AIM
- Program the AIM

Syntech recommends installation of the AIM FMU (or upgrade to AIM FMU) to be used with the *FMLive* cloud application for use with a direct access device such as a Prokee or Smartcard. This permits the development of the required database and installation of the AIMS in preparation for passive fueling.

For an AIM FMU to activate a fueling hose when the nozzle is inserted into the vehicle's filler neck, two additional communication functions beyond standard FMU operation must perform satisfactorily:

- The nozzle tag must communicate with the filler neck ring to initiate a transaction.
- The AIMS must communicate with the FMU to activate the transaction.

### Version Compatibility

If you have questions about versions and enhancements, please contact our Customer Support Center at 800-888-9136 or [support@MYFUELMASTER.com](mailto:support@MYFUELMASTER.com).

### Selecting the Correct Nozzle Tag

The PHT must fit on the dispenser fueling nozzle and provide a match with the filler neck rings being used on the various vehicles and equipment. When the nozzle is inserted into the vehicle's fuel tank filler neck, the PHT must be within two inches of the filler neck ring, preferably closer or touching, and the two devices should be parallel to each other. This alignment must be correct to initiate a fueling transaction. Being within 2 inches on one side and 3 inches on another side will not initiate communications.

The PHT has no wire connections up the fueling hose to the fuel dispenser and is therefore totally independent. Nozzle tags should be secured to fueling nozzles by placing a clamp around the nozzle tag as shown in [Figure 6](#).



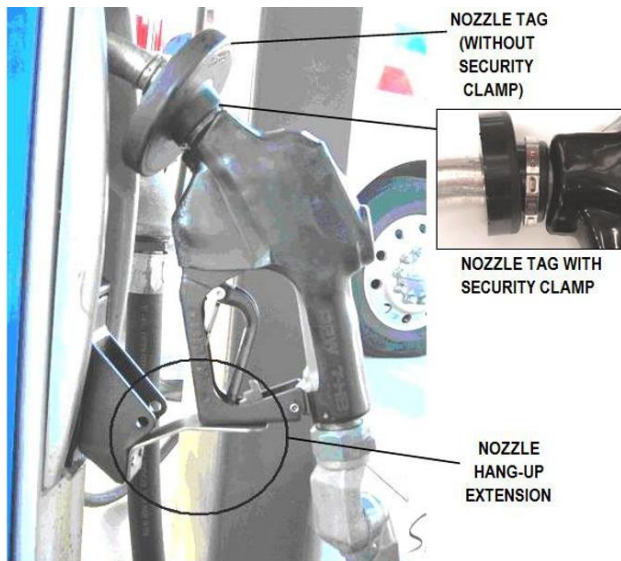


Figure 6 Sample Nozzle Tag Installation



Figure 7 CV Joint Boot Clamp

CV joint boot clamps, which require a special tool for installation, provide the best security because of their difficult removal. Kits, which contain a nozzle tags and a CV joint boot clamp are available through Syntech. CV joint boot clamp pliers ([Figure 7](#)) are required to install these clamps, and are available through most automotive part outlets. Substitution of the standard stainless-steel hose clamps can end up damaging the nozzle tag, which could affect your warranty.

Nozzle tags may prevent the normal hang-up of the fueling nozzle after the transaction is complete. [Figure 6](#) shows an example of a nozzle hang-up extension installed to permit the nozzle to be hung up on the dispenser after a nozzle tag is installed. The extension shown was manufactured by the customer.

### Selecting the Correct Filler Neck Ring and RFID Extension Cables

The following must be considered when selecting a filler neck ring for installation. Filler neck rings must:

- Fit around the filler neck of the fuel tank
- Allow the filler cap to be installed
- Permit the nozzle tag on the fuel nozzle to be brought up against (or parallel within 2") of the filler neck ring
- Connect to the RFID Interface Module (Lump Board) installed in a protected mounting location

The appropriate RFID Extension Cables in the correct length must be selected to connect between the RFID Interface Module and the AIM. RFID Extension Cables should not be extended or spliced.

## Selecting the FMU Mounting Location

The AIM FMU must be positioned where it can communicate with the AIMs mounted in vehicles and equipment. AIMs are often installed under the vehicle dash to protect them from the elements.

When using the standard antennas provided with the FMU, the AIM FMU should be mounted within 60 feet and line-of-sight of the AIMs when the vehicles are in the fueling positions. Remote FMU antennas may be installed to restore the line-of-sight to AIMs if traffic is continually moving between the FMU and fueling vehicles, if the FMU is inside a building, or if the FMU is mounted behind a wall or other obstruction.

## FMU Components Necessary for Passive Fueling

Passive FMUs must be properly equipped for their selected assignments. The needs for each application are as follows:

- AIM Titanium 2.4GHz Application Only
  - A **Radio Interface Board (RIB)** is used with these applications. The RIB functions contain no radios.
  - An **External 2.4GHz Radio** is a radio and antenna combined into a single package for fixed site or Passive Mobile FMU mounted on the FMU or remotely for best RF coverage. The External 2.4GHz Radio eliminates the need for radios to be incorporated in the interface board plugged into the FMU mainboard and for separate antennas to be mounted on the FMU. One External 2.4GHz Radio is installed on fixed site AIM Titanium FMUs. Two external radios are used with Passive Mobiles for greater coverage around the fueling truck.
- Dual Band 2.4GHz (AIM Titanium)
  - All the parts listed under AIM Titanium 2.4GHZ applications (i.e., RIB and External Radio) are required.

**NOTE**

Access Management Units (AMU) and Remote Data Collection Units (RDCU) are not compatible with Dual Band operation. AMU and RDCU can only be configured for 900Mhz OR 2.4Ghz operations (not both).

## Identifying the Vehicle Application

General purpose vehicles (e.g., sedans, vans, and pickups) manufactured since 1996 have an OBD II (2nd generation on-board diagnostic) receptacle. The receptacle style determines the cable necessary to connect the AIM to the vehicle. The cable provided must plug into one of the receptacles illustrated in [Figure 8](#). These vehicles power the AIMs through this diagnostic connection.

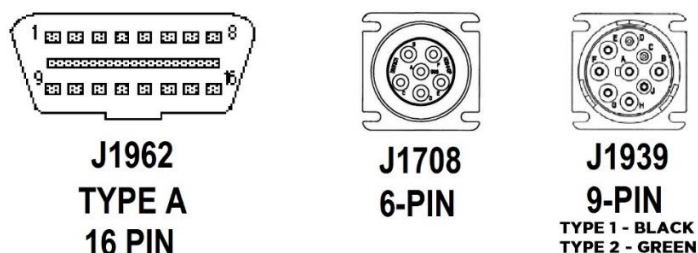


Figure 8 OBD Receptacle

**NOTE**

Vehicle and equipment manufacturers have no obligation to inform Syntech of changes made to their products. Consequently, it is possible new vehicles or equipment may incorporate changes, unknown to Syntech, which are not compatible with AIM. If you find changes incompatible with AIM, inform Syntech's Customer Satisfaction Center or your FuelMaster representative (regional sales manager or distributor), and every effort will be made to make AIM operable with the changes.

"Type 2" cables are backwards compatible to "Type 1" vehicles receptacles. At this time, Syntech will be shipping out "Type 1" cables unless a "Type 2" cable is required.

Most vehicles manufactured prior to 1996, and vehicles that do not have computers, may require AIM connection to an analog speed sensor or chronometer to derive vehicle mileage or operating hours. Some vehicles with computers may also have cable driven speedometers. If a speed sensor is not installed, aftermarket options may exist but are not available from Syntech. The Analog chronometer interface tracks the run-time of the device where the AIM chronometer leads are connected. Analog AIM interface via speed sensor or chronometer requires a connection to an external power source.

AIM Titanium may be powered by any power source from 8-28 VDC. Two power connections are required: one to an unswitched power source and another to a switched power source powered by the ignition switch. All power source connections should be fused.

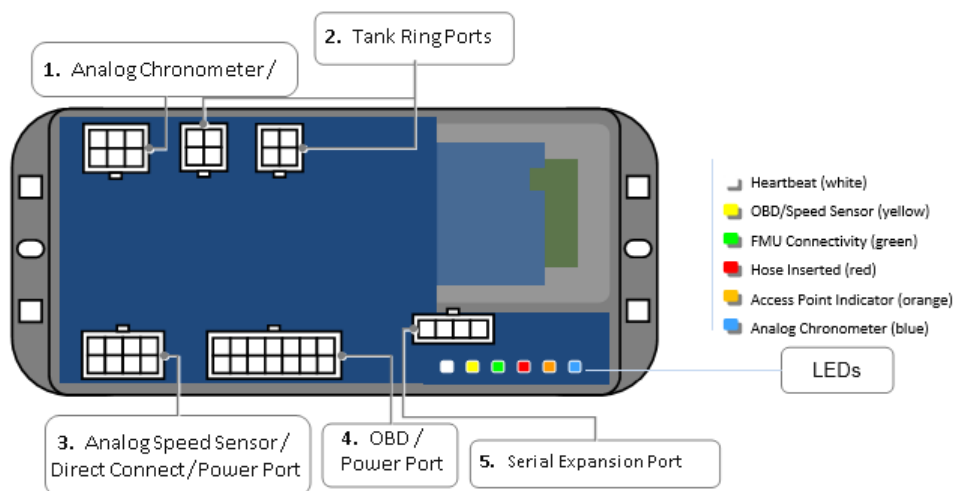


Figure 9. AIM Titanium Module

# Installing AIM

## Interface Settings

Setting	Indication
None	Default; AIMS will not go to sleep
OBD	New and cleaned AIM will detect OBD when vehicle is on
Speed Sensor	AIM changes state when external power is applied through the unswitched and switched power connections on the Analog Speed Sensor harness

### NOTE

Some OBD AIM installations require a Wake-up Wire assembly.

This assembly uses the “switched power” connection from the Analog Speed Sensor connector to notify the AIM when the vehicle is switched on and off. Do ***NOT*** connect this wire to the AIM until the OBD connection (YELLOW LED on AIM goes solid) has occurred. If you are unsure if OBD has been selected by the AIM, wait to install the Wake-up Wire assembly after programming has been completed. Always use a fused and switch source for this connection.

## Some additional things to consider in your AIM installations:

- The AIM module uses RF technology to communicate with the FMU.
- If more than one OBD receptacle is available in the vehicle being installed, the serviceability of the connection may be tested by starting the vehicle’s engine and then making a connection to the vehicle OBD receptacle with the AIM and OBD cable only. No other cabling or wires should be connected to the AIM at that point. If the connection is serviceable, a YELLOW OBD LED will illuminate solid on the AIM module after a few minutes. When a heavy-duty vehicle has more than one OBD receptacle, the 9-Pin receptacle should be tested first.

### NOTE

The AIM should be cleaned before switching between OBD receptacles.

- If an installation is being made in a vehicle with a cable-driven speedometer (no OBD connection), a transducer may be required to send vehicle speed data to the AIM. Syntech Systems does not stock transducers for these installations. Consult a parts distributor for the make of vehicle under consideration.
- Installations will vary from vehicle-to-vehicle by year, make, and model. Do not assume an installation will work without testing if similar installations were performed on similar vehicles.
- Do not install any AIM components within proximity of hot or moving vehicle parts.
- AIM nozzle tags must be labeled with a unique AIM nozzle ID (ANID).
- The use of dielectric grease to prevent corrosion is recommended to seal cable connections exposed to the environment.

## Installation Options

Installations will vary according to the type of connection to the vehicle and the type of information to be collected. The following installation options are available:

- [Install an AIM with an OBD Connection](#)
- [Install an AIM with a Vehicle Speed Sensor \(Odometer\) Input Only](#)
- [Install an AIM with an Analog Chronometer Input](#)

### Install an AIM with an OBD Connection

<b>CAUTION</b>	The AIMs should be mounted out of harm's way but remain accessible for service and troubleshooting. Troubleshooting will utilize the AIM's <a href="#">LED Lights</a> .
<b>MISE EN GARDE</b>	<i>Le module AIM doit être monté hors de danger, mais reste accessible pour le service et le dépannage.</i>

1. Select a mounting location for the AIM. Recommended locations are under the dash or under the seat on the same side of the vehicle as the fuel tank's filler neck. The OBD interface cable must connect between the AIM and the OBD receptacle.

<b>NOTE</b>	Installations in Canada require the use of two 12-gauge wires to ground the AIM2.4 to a chassis ground (Ref: CAN/CSA-C22.2, No. 157-92, para 4.3.8.6).
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2. Mount the AIM in the selected location.

<b>CAUTION</b>	Protective wire loom should be used to enclose and protect cabling routed outside the vehicle passenger compartment.
<b>MISE EN GARDE</b>	<i>Le métier à tisser de protection doit être utilisé pour enfermer et protéger le câblage acheminé à l'extérieur de l'habitacle du véhicule.</i>

3. Using 12 AWG THHN wire, make a ground connection between the AIM ground connector and the vehicle/equipment chassis.
4. Plug one end of the cable into one of the module's two Tank Ring Ports. Either end of the RFID Extension Cable may be connected to the AIM. Plug one end of the cable into one of the module's two Tank Ring Ports.
5. Route the other end of the RFID Extension Cable from the AIM to the fuel tank filler neck. If possible, use an existing wire chase opening to route the RFID Extension Cable outside the passenger compartment.
6. Where required, drill a hole large enough for the connector on the RFID Extension Cable to fit through. Use protective wire loom for any cable routed outside the passenger compartment, and install grommets to seal any drilled holes. Leave room to adjust slack, and loosely attach the loom and cable to the vehicle with cable ties.
7. Place the Filler Neck Ring around the filler neck under the fuel tank cap. If the filler neck does not have something to hold the filler neck ring close to the inlet, a clamp, cable tie, or other such hardware will have to be positioned under the filler neck ring to prevent it from sliding down the filler neck.

<b>WARNING</b>	Use caution when working around the fuel tank filler neck with power tools. Some fuels are easily ignitable. Use only non-spark generating/spark-resistant tools approved for use where flammable gases and highly volatile liquids are stored or used.
<b>ATTENTION</b>	<i>Soyez prudent lorsque vous travaillez autour du goulot de remplissage du réservoir d'essence avec des outils électriques. Certains carburants sont facilement inflammables. Utiliser uniquement des outils anti-étincelles / ignifuges approuvés pour une utilisation lorsque des gaz inflammables et des liquides hautement volatils sont stockés ou utilisés.</i>

8. Route the Filler Neck Ring cable down the filler neck. As required, drill an access hole for the Filler Neck Ring connector to pass through the housing at the top of the filler neck where the fuel tank cap is located. If an access hole was drilled, protect the cable with a grommet.
9. Attach the RFID Interface Module to the Filler Neck Ring cable and the RFID Extension Cable with cable ties. If these connections are not in a protected space, use a product similar to 3M Scotch Rubber Mastic Tape (product number 2228) or equivalent to cover and protect all exposed connections.
10. From the AIM mounting location, pull and coil the slack from the RFID Extension Cable out of the way of the vehicle operator and/or moving parts.
11. As required, repeat steps 3 through 10 for the second tank of a dual tank installation.
12. Pull all cable ties tight and clip off the tag ends of the ties.
13. Seal any drilled holes/grommets with silicon sealant.
14. Turn the vehicle on.
15. Connect the OBD interface cable to the vehicle OBD receptacle and the AIM's OBD port, securing the cable out of the way of the driver and/or any moving parts.
16. Proceed to AIM Post Installation Tests.



## Install an AIM with a Vehicle Speed Sensor (Odometer) Input Only

<b>CAUTION</b>	The AIMs should be mounted out of harm's way but remain accessible for service and troubleshooting. Troubleshooting will utilize the AIM's <a href="#">LED Lights</a> .
<b>MISE EN GARDE</b>	<i>Le module AIM doit être monté hors de danger, mais reste accessible pour le service et le dépannage</i>

<b>NOTE</b>	The BROWN Analog Speed Sensor Cable wire must be connected to a source providing 4 to 42VDC for AIM2.4 for a wake-up signal to the AIM. This source must drop off to 2 VDC or less to permit the module to go to sleep.
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1. Select a mounting location for the AIM. Recommended locations are under the dash or under the seat on the same side of the vehicle as the fuel tank's filler neck. Consider the Analog Speed Sensor Cable conductor length listing below, and mount the AIM in the selected location.
  - RED (8 feet long) to +VDC fused and unswitched
  - BLACK (2 feet long) to chassis ground
  - GREEN (8 feet long) to positive odometer
  - WHITE (8 feet long) to negative odometer
  - BROWN (8 feet long) for wake-up/switched +VDC

<b>CAUTION</b>	Some vehicles use more than one battery to increase system voltage or available starting current. How the batteries are connected determines if the increase is in voltage or current. If the same vehicle chassis ground to which the batteries are grounded is not used when wiring the ground to the AIM, AIM power will not match vehicle power and damage to the AIM and/or vehicle electrical system may occur. Always ground the AIMs to the same ground used by the batteries for the vehicle chassis ground.
<b>MISE EN GARDE</b>	<i>Certains véhicules utilisent plus d'une batterie pour augmenter la tension du système ou le courant de démarrage disponible. La façon dont les piles sont connectées ensemble déterminera si l'augmentation est en tension ou en courant. Si le même châssis du véhicule sur lequel les batteries sont mises à la terre n'est pas utilisé lors du câblage du sol au module AIM, l'alimentation AIM ne correspond pas à l'alimentation du véhicule et les dommages au module AIM et / ou au système électrique du véhicule peuvent se produire. Toujours broyer le module AIM sur le même sol utilisé par les batteries pour la masse du châssis du véhicule.</i>

<b>NOTE</b>	Installations in Canada require the use of two 12-gauge wires to ground the AIM2.4 module to a chassis ground (Ref: CAN/CSA-C22.2, No. 157-92, para 4.3.8.6).
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2. Using 12 AWG THHN wire, make a ground connection between the AIM ground connector and the vehicle/equipment chassis.

**CAUTION**

To avoid possible damage to the AIM, do not connect the Analog Speed Sensor Cable to the AIM until all other cable connections are complete.

**MISE EN GARDE**

*Pour éviter d'endommager le module AIM, ne connectez pas le câble du capteur de vitesse analogique au module AIM jusqu'à ce que toutes les autres connexions de câble soient terminées.*

**NOTE**

Important! Some applications may not function correctly unless the WHITE negative odometer wire is connected directly to the negative side of the speed sensor.

3. Connect the Analog Speed Sensor Cable BLACK ground wire and WHITE negative odometer wire to a chassis/battery ground.

**CAUTION**

If the vehicle has multiple batteries, take a voltage reading of the switched and unswitched inputs of another existing vehicle accessory. Select power sources for AIM, which have the same voltage inputs. Doing so may prevent damage to the AIM and/or the vehicle electrical system.

**MISE EN GARDE**

*Si le véhicule possède plusieurs batteries, prenez une tension de lecture des entrées commutées et non commutées d'un autre accessoire de véhicule existant. Sélectionnez les sources d'alimentation pour AIM qui ont les mêmes entrées de tension. Cela pourrait empêcher d'endommager le module AIM et / ou le système électrique du véhicule.*

4. Connect the Analog Speed Sensor RED wire to a fused and unswitched (constant with ignition OFF) +VDC power supply.
5. Connect the Analog Speed Sensor BROWN wire to a fused and switched (constant with ignition ON only) + VDC power supply. This connection will “wake-up” the AIM module when the ignition switch is turned ON.

**NOTE**

On vehicles with Allison transmissions, connect the Analog Speed Sensor Cable GREEN wire to the ECM speed sensing output ONLY.

6. Connect the Analog Speed Sensor Cable GREEN wire to the VSS (Vehicle Speed Sensor) output. This signal may also be found at the vehicle's computer module (ECM). Many speed sensors have a two-wire connection with the output typically being the wire with the higher resistance reading. Refer to vehicle specific wiring diagrams for clarification.

**CAUTION**

Protective wire loom should be used to enclose and protect cabling routed outside the vehicle passenger compartment.

**MISE EN GARDE**

*Le métier à tisser de protection doit être utilisé pour enfermer et protéger le câblage acheminé à l'extérieur de l'habitacle du véhicule.*

7. Plug one end of the cable into one of the module's two Tank Ring Ports. Either end of the RFID Extension Cable may be connected to the AIM (Figure 9).
8. Route the other end of the RFID Extension Cable from the AIM to the fuel tank filler neck. If possible use an existing wire chase opening to route the RFID Extension Cable outside the passenger compartment.



9. Where required, drill a hole large enough for the connector on the RFID Extension Cable to fit through. Use protective wire loom for any cable routed outside the passenger compartment, and install grommets to seal any drilled holes. Leave room to adjust slack, and loosely attach the loom and cable to the vehicle with cable ties.
10. Place the Filler Neck Ring around the filler neck under the fuel tank cap. If the filler neck does not have something to hold the filler neck ring close to the inlet, a clamp, cable tie, or other such hardware will have to be positioned under the filler neck ring to prevent it from sliding down the filler neck.

<b>WARNING</b>	Use caution when working around the fuel tank filler neck with power tools. Some fuels are easily ignitable. Use only non-spark generating/spark-resistant tools approved for use where flammable gases and highly volatile liquids are stored or used.
<b>ATTENTION</b>	<i>Soyez prudent lorsque vous travaillez autour du goulot de remplissage du réservoir d'essence avec des outils électriques. Certains carburants sont facilement inflammables. Utiliser uniquement des outils anti-étincelles / ignifuges approuvés pour une utilisation lorsque des gaz inflammables et des liquides hautement volatils sont stockés ou utilisés</i>

11. Route the Filler Neck Ring cable down the filler neck. As required, drill an access hole for the Filler Neck Ring connector to pass through the housing at the top of the filler neck where the fuel tank cap is located. If an access hole was drilled, protect the cable with a grommet.
12. Attach the RFID Interface Module between the Filler Neck Ring cable and the RFID Extension Cable, and secure in place with cable ties. If these connections are not in a protected space, use a product similar to 3M Scotch Rubber Mastic Tape (product number 2228) or equivalent to cover and protect all exposed connections.
13. From the AIM mounting location, coil and pull the slack from the RFID Extension Cable out of the way of the vehicle operator and/or moving parts.
14. As required, repeat steps 7 through 12 for the second tank of a dual tank installation.
15. Pull all cable ties tight and clip off the tag ends of the ties.
16. Seal any drilled holes/grommets with silicon sealant.
17. Connect the Analog Speed Sensor Cable to the AIM module Power/Speed Sensor Port (Figure 9).
18. Proceed to AIM Post Installation Tests.

## Install AIM with an Analog Chronometer Input

Installations for analog chronometer input may be made with or without an OBD connection. When made with an OBD connection, AIM module power is derived through the OBD cable. When made without an OBD connection, an Analog Speed Sensor cable must be installed to connect to vehicle power.

### CAUTION

The AIMs should be mounted out of harm's way but remain accessible for service and troubleshooting. Troubleshooting will utilize the AIM's [LED Lights](#).

### MISE EN GARDE

Le module AIM doit être monté hors de danger, mais reste accessible pour le service et le dépannage.

### NOTE

A chronometer need not be a physical device added to the vehicle/equipment to attain the desired information. A chronometer input may be as simple as a power source which is only powered under special circumstances.

The Analog Speed Sensor Cable and Analog Chronometer wires may be lengthened as needed.

1. Select a mounting location for the AIM. Recommended locations are under the dash or under the seat on the same side of the vehicle as the fuel tank's filler neck. Consider the distance to the required connections when selecting a mounting location.
2. Mount the AIM module in the selected location.
  - (With OBD) The OBD interface cable must be connected between the AIM and the OBD receptacle. The Analog Chronometer Cable has two conductors eight feet long for connections to two analog chronometers.
  - (Analog Only) The Analog Speed Sensor Cable and Analog Chronometer Cable must be connected to the AIM module. The Analog Speed Sensor Cable uses eight-foot conductors to connect to switched and unswitched power, and a two-foot conductor to connect to vehicle/battery ground. The Analog Chronometer Cable has two conductors eight feet long for connections to two analog chronometers.

### CAUTION

Some vehicles use more than one battery to increase system voltage or available starting current. How the batteries are connected determines if the increase is in voltage or current. If the same vehicle chassis ground to which the batteries are grounded is not used when wiring the ground to the AIM, AIM power will not match vehicle power and damage to the AIM and/or vehicle electrical system may occur. Always ground the AIM to the same ground used by the batteries for the vehicle chassis ground.

### MISE EN GARDE

*Certains véhicules utilisent plus d'une batterie pour augmenter la tension du système ou le courant de démarrage disponible. La façon dont les piles sont connectées ensemble déterminera si l'augmentation est en tension ou en courant. Si le même châssis du véhicule sur lequel les batteries sont mises à la terre n'est pas utilisé lors du câblage du sol au module AIM, l'alimentation AIM ne correspond pas à l'alimentation du véhicule et les dommages au module AIM et / ou au système électrique du véhicule peuvent se produire. Toujours broyer le module AIM sur le même sol utilisé par les batteries pour la masse du châssis du véhicule.*

**NOTE**

Installations in Canada require the use of two 12-gauge wires to ground the AIM2.4 to a chassis ground (Ref: CAN/CSA-C22.2, No. 157-92, para 4.3.8.6).

3. Using 12 AWG THHN wire, make a ground connection between the AIM ground connector and the vehicle/equipment chassis.

**CAUTION**

To avoid possible damage to the AIM, do not connect the Analog Speed Sensor Cable to the AIM until all other cable connections are complete.

**MISE EN GARDE**

*Pour éviter d'endommager le module AIM, ne connectez pas le câble du capteur de vitesse analogique au module AIM jusqu'à ce que toutes les autres connexions de câble soient terminées.*

**NOTE**

Some applications may not function correctly unless the WHITE negative odometer wire is connected directly to the negative side of the speed sensor.

4. (Analog Only) Connect the Analog Speed Sensor Cable BLACK ground wire and WHITE negative odometer wire to a chassis/battery ground.

**CAUTION**

If the vehicle has multiple batteries, take a voltage reading of the switched and unswitched inputs of another existing vehicle accessory. Select power sources for AIM which have the same voltage inputs. Doing so may prevent damage to the AIM and/or the vehicle electrical system.

**MISE EN GARDE**

*Si le véhicule possède plusieurs batteries, prenez une tension de lecture des entrées commutées et non commutées d'un autre accessoire de véhicule existant. Sélectionnez les sources d'alimentation pour AIM qui ont les mêmes entrées de tension. Cela pourrait empêcher d'endommager le module AIM et / ou le système électrique du véhicule.*

5. (Analog Only) Connect the Analog Speed Sensor RED wire to a fused and unswitched (constant with ignition OFF) +VDC power supply.
6. (Analog Only) Connect the Analog Speed Sensor BROWN wire to a fused and switched (constant with ignition ON only) +VDC power source. This connection will “wake up” the AIM when the ignition switch is turned ON. This power source must drop to 2 VDC or less when switched off for the module to go to sleep.
7. Determine the desired application(s). For engine run time, a connection must be made to a source providing power only when the engine is running (connect the Analog Chronometer Cable channel 1 ORANGE wire). For PTO engage time, a connection must be made to a source providing power only when the PTO is engaged (connect the channel 2 BLUE wire). Note the channel and connection type for software configuration.

**CAUTION**

Protective wire loom should be used to enclose and protect cabling routed outside the vehicle passenger compartment.

**MISE EN GARDE**

*Le métier à tisser de protection doit être utilisé pour enfermer et protéger le câblage acheminé à l'extérieur de l'habitacle du véhicule.*

8. Plug one end of the cable into one of the module's two Tank Ring Ports. Either end of the RFID Extension Cable may be connected to the AIM (Figure 9).

9. Route the other end of the RFID Extension Cable from the AIM to the fuel tank filler neck. If possible, use an existing wire chase opening to route the RFID Extension Cable outside the passenger compartment.
10. Where required, drill a hole large enough for the connector on the RFID Extension Cable to fit through. Use protective wire loom for any cable routed outside the passenger compartment, and install grommets to seal any drilled holes. Leave room to adjust slack, and loosely attach the loom and cable to the vehicle with cable ties.
11. Place the Filler Neck Ring around the filler neck under the fuel tank cap. If the filler neck does not have something to hold the filler neck ring close to the inlet, a clamp, cable tie, or other such hardware must be positioned under the filler neck ring to prevent it from sliding down the filler neck.

<b>WARNING</b>	Use caution when working around the fuel tank filler neck with power tools. Some fuels are easily ignitable. Use only non-spark generating/spark-resistant tools approved for use where flammable gases and highly volatile liquids are stored or used.
<b>ATTENTION</b>	<i>Soyez prudent lorsque vous travaillez autour du goulot de remplissage du réservoir d'essence avec des outils électriques. Certains carburants sont facilement inflammables. Utiliser uniquement des outils anti-étincelles / ignifuges approuvés pour une utilisation lorsque des gaz inflammables et des liquides hautement volatils sont stockés ou utilisés.</i>

12. Route the Filler Neck Ring cable down the filler neck.
13. As required, drill an access hole for the Filler Neck Ring connector to pass through the housing at the top of the filler neck where the fuel tank cap is located. If an access hole is drilled, protect the cable with a grommet.
14. Attach the RFID Interface Module between the Filler Neck Ring cable and the RFID Extension Cable, and secure in place with cable ties. If these connections are not in a protected space, use a product similar to 3M Scotch Rubber Mastic Tape (product number 2228) or equivalent to cover and protect all exposed connections.
15. From the AIM mounting location coil and pull the slack from the RFID Extension Cable out of the way of the vehicle operator and/or moving parts.
16. As required, repeat steps 7 through 12 for the second tank of a dual tank installation.
17. Pull all cable ties tight and clip off the tag ends of the ties.
18. Seal any drilled holes/grommets with silicon sealant.
19. (Analog) Connect the Analog Speed Sensor Cable to the AIMs Power/Speed Sensor Port (Figure 9).
20. (With OBD) Start the vehicle, and connect the OBD interface cable to the vehicle OBD receptacle and AIM OBD Port. Secure the cable out of the way of the driver and/or any moving parts.
21. Proceed to AIM Post Installation Tests.

## Post Installation Acceptance Test Procedure

Following successful installation of the AIM, the module must be programmed with information from the software. The information is sent to an AIM FMU Programmer, then from the FMU to the AIMS. All of these conditions must be met before the AIMS may be programmed.

The AIM cannot be programmed if it does not

- have a heartbeat
- recognize an OBD/power connection (YELLOW OBD/Speed Sensor LED is flashing)
- recognize a nozzle tag insertion into a filler neck ring
- recognize an AIM FMU

**NOTE** If Auto-Pairing is enabled in FMLive, the AIM can be programmed without testing if a nozzle tag insertion was detected in the filler neck ring.

### Post Installation Prerequisites

A Programming Hose Tag (PHT) is shipped with each new AIM system. The PHT may be used to test a nozzle tag insertion into a filler neck ring in lieu of a fueling nozzle tag.

### AIM LED Lights Behavior

An AIM FMU or AIM FMU Programmer is required to complete the AIM post installation tests. An AIM FMU Programmer is required to program installed AIMS. A portable AIM FMU Programmer is available to test and program at a remote location.

**NOTE** The GREEN FMU Connect LED will illuminate solid when the AIM connects to an AIM FMU and will blink when the AIM detects an AIM FMU but has not connected to it.

1. Start the vehicle engine. The WHITE Heartbeat LED should start pulsing.
  - a. (OBD) The YELLOW OBD/Speed Sensor LED should illuminate solid
  - b. (Analog Speed Sensor) Drive the vehicle. The YELLOW OBD/Speed Sensor LED should illuminate solid.
2. Turn engine off, and position a PHT over the filler neck ring, ensuring the RED Hose-Inserted LED illuminates solid.
3. Remove the PHT, ensuring the RED Hose-Inserted LED goes out.
4. Move the vehicle within RF range of an AIM FMU or AIM FMU Programmer. The GREEN FMU Connect LED should illuminate solid. If the GREEN LED is blinking, the AIM sees the FMU but cannot connect.
5. When the Heartbeat LED blinks, the GREEN FMU Connect LED is solid, and when the RED Hose-Inserted LED is solid, the AIM is ready to be programmed.

**NOTE** FMLive doesn't require a PHT to be programmed.

## Appendix A – Part Numbers & Descriptions

### AIM Titanium Modules


Part #	Part Description
144A0130	AIM Module ( <a href="#">Figure 10</a> )
144A0120B	Internal Antenna
144A0120C	External Antenna
<b>Module/Octopus Assembly – Internal Antenna – Commercial</b>	
144A0220F	Analog
144A0220G	OBD
144A0220H	Analog & OBD
<b>Module/Octopus Assembly – External Antenna – Commercial</b>	
144A0220J	Analog
144A0220K	OBD
144A0220L	Analog & OBD
<b>Module Only – Internal Antenna</b>	
144A0201B	Commercial
<b>Module Only – External Antenna</b>	
144A0201C	Commercial



Figure 10. AIM Titanium - 144A0130



## AIM Cables

OBD/Diagnostic Cables			General Cables		
Cable #	Cable Description	Photos	Cable #	Cable Description	Photos
144A0112	OBD-II Pass-Thru		144A0118	OBD Green 9-pin Y Splitter (AIM2.4 and AIM Titanium compatible only)	
144A0113	OBD 6-pin Right Angle 3ft		941B0410	RFID Extension 10ft	
144A0114	OBD 9-pin Right Angle 3ft		941B0411	Analog Speed Sensor	
144A0115	OBD-II AIM2 to AIM Titanium		941B0421	Analog Chronometer Cable	
144A0116	OBD Green 9-pin Right Angle 4ft		941B0505	Wake-up Wire assembly	
			941B0517	Power/Chronometer	N/A






## Augmented Version of AIM Titanium Cables:

OBD/Diagnostic Cables		General Cables	
Cable #	Cable Description	Cable #	Cable Description
144A0115 A	OBD-II AIM2 to AIM Titanium OBD 6 or 9-pin AIM2 to AIM Titanium	941B0410 A B C D E F G	RFID Extension 10ft 15ft 20ft 30ft 50ft 80ft 5ft 6in
144A0116 A	OBD Green 9-pin Right Angle 4ft 10ft	941B0410A Loom B Loom C Loom D Loom E Loom	6in with Loom 15ft with Loom 20ft with Loom 30ft with Loom 50ft with Loom
		941B0507 A B C	RFID Extension 7ft 10ft 15ft 20ft
		941B0508 A B C	Power/Chronometer extension 7ft 10ft 15ft 20ft



## Filler Neck Rings

Following are photos and dimensions of the nozzle tags in Syntech inventory. Unless otherwise noted, all Filler Neck Rings have a four-foot cable.

<b>Part Number</b>	<b>Description</b>	<b>Inner Diam(in.)</b>	<b>Outer Diam(in.)</b>	<b>Depth</b>	<b>Photos</b>
941B0299	Light Duty	1.75 – 2.50	3.58	0.35	
941B0159C	Medium Duty	3.42	4.04	0.25	
941B0159D	Volvo Medium Duty (VHB)	2.99	4.00	0.25	
941B0164C	Small(DEF/Propane)	1.61	2.50	0.25	
941B0166C	Medium Duty	3.62	4.50	0.25	

941B0168C	Heavy Duty - Lipless	4.75	5.50	0.25	
941B0193B	Heavy Duty	4.25	5.50	0.63	
941B0195C	Heavy Duty	5.75	8.0	0.625	
941B0231B	Light Duty	2.27	2.63	0.40	
941B0262A	Heavy Duty	4.97	6.88	2.00	
941B0473	Heavy Duty	3.50	4.13	2.00	

## Nozzle Tags

Following are photos and dimensions of the nozzle tags in Syntech inventory. Nozzle tag kits are also available, and are supplied with CV joint clamps. Some Nozzle Tag Kits are supplied with two different part number CV joint clamps with minor differences for different applications.

ID stands for Inner Diameter and OD stands for Outer Diameter.

<b>Part Number</b>	<b>Kit Number</b>	<b>ID (inches)</b>	<b>OD (Inches)</b>	<b>Photos</b>
941B0148B	941B0149	2.095	2.44	
941B0156B	941B0156	1.185	1.90	
941B0157D	941B0156E-CL	0.88	1.25	
941B0157E	941B0157D-CL	1.00	1.37	(See Above)
941B0218	941B0265B-CL	2.36	3.09	
941B0218E	941B0265B-CL	1.69	3.14	
941B0220B	941B0263C	2.66	3.44	

<b>Part Number</b>	<b>Kit Number</b>	<b>ID (inches)</b>	<b>OD (Inches)</b>	<b>Photos</b>
941B0240B	941B0265B-CL	2.11	3.23	
941B0250	941B0250B-CL	1.437	2.93	
941B0249B	941B0265B-CL	3.120	4.50	
941B0265B	941B0266	1.750	2.98	
941B0273	941B0263F	3.012	5.25	
941B0276	941B0265B-CL	1.18	5.11	

## Nozzle Tag Kits/Clamps Cross Reference

This section displays our kits including the respective nozzle tag, clamp(s), and dimensions. Certain kits offer multiple clamps depending on the dimensions needed.

<b>Kit</b>	<b>Nozzle Tag</b>	<b>Clamp(s)</b>	<b>Dimensions</b>
941B0149	941B0148	250627	2.26-2.38 DIA X 0.28 W, 1 EAR
941B0156B-CL	941B0156	249734 249769	STEPLESS, 7 X 0.6 X 46.8-50MM STEPLESS, 7 X 0.6 X 48.3-51.1MM
941B0156E-CL	941B0157/-157B/-157E	221104 221112	STEPLESS, 7 X 0.6 X 33.1MM STEPLESS, 7 X 0.6 X 31.4-34.6MM
941B0157D-CL	941B0157A/-157C/-157D	249726 249750	STEPLESS, 7 X 0.6 X 32.9-36.1MM STEPLESS, 7 X 0.6 X 34.4-37.6MM
941B0263C	941B0220/-220A	249785 249769	STEPLESS 7 X 0.6 X 51.3-54MM ( above)
941B0250B-CL	941B0250/-250A/-250B	249734 249769	(see above) (see above)
941B0266	941B0265/-265A/-265B	250902	2.08-2.21 DIA X 0.28 W, 1 EAR
941B0483	941B0218A	250511 252093	2.38-2.50 DIA X 0.28 W, 1 EAR (see above)
941B0484	941B0469/-469A	252581	2.02-2.15 DIA X 0.28 W, 1 EAR

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## AUTOMATED FUELING DEVICE (AIM)

It is no longer necessary to use your fuel key at the Fuel Site.

To fuel:

Step 1 ~ Shut vehicle off.

Step 2 ~ Remove nozzle from pump.

Step 3 ~ Completely insert nozzle into tank.

Step 4 ~ Turn dispenser handle on.

Step 5 ~ Squeeze handle. Fuel should begin to flow in 10 seconds or less.

\*\* Please notify your supervisor if your system does not fuel \*\*

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## AUTOMATED FUELING DEVICE (AIM) with User

ID Enabled after the fuel nozzle is inserted.

It is no longer necessary to use your fuel key at the Fuel Site.

To fuel:

Step 1 ~ Shut vehicle off.

Step 2 ~ Remove nozzle from pump.

Step 3 ~ Completely insert nozzle into tank.

Step 4 ~ The unit will prompt the user to press enter, and then it will ask for your user ID. Press enter.

Step 5 ~ Turn dispenser handle on.

Step 6 ~ Squeeze handle. Fuel should begin to flow in 10 seconds or less.

\*\* Please notify your supervisor if your system does not fuel. \*\*

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## AUTOMATED FUELING DEVICE(AIM) with User

ID Enabled before the fuel nozzle is inserted.

It is no longer necessary to use your fuel key at the Fuel Site.

To fuel:

Step 1 ~ Shut vehicle off.

Step 2 ~ The unit will prompt the user to press enter, and then it will ask for your user ID. Press enter.

Step 3 ~ Remove nozzle from pump.

Step 4 ~ Completely insert nozzle into tank.

Step 5 ~ Turn dispenser handle on.

Step 6 ~ Squeeze handle. Fuel should begin to flow in 10 seconds or less.

\*\* Please notify your supervisor if your system does not fuel. \*\*

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