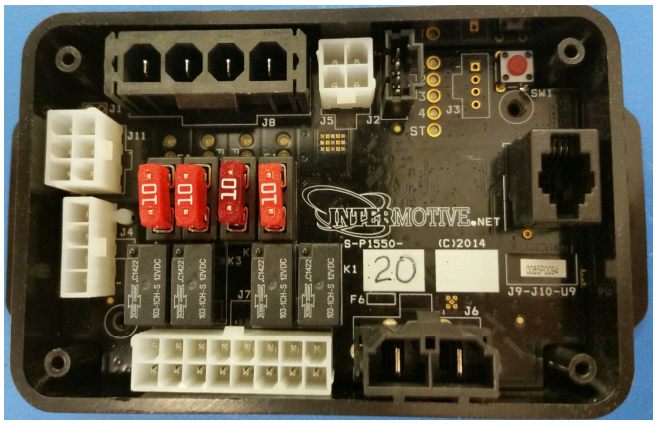
PTM805-A-W (Pre-Trip Module)

For Medium Duty J1939 Vehicles
2010 - 2015 Use P2 J1939 Black Connector
2016 - 2017 Use P2G J1939 Green Connector



Introduction

The PTM805-A-W controls exterior lights for a Pre-Trip Inspection on medium duty J1939 vehicles. Pre-Trip mode cycles lights sequentially ON and OFF so the user can verify that all exterior lights on the vehicle are working properly. The PTM uses 4 on-board relays that can supply a maximum of 10 amps each. These are to be connected to High-Beam Headlights, Low-Beam Headlights, Reverse Lights, and Brake Lights. There are 4 additional connections supplied by 1 amp maximum low current outputs (LCOs) each. These are to be connected to Park Lights, Right Turn Signal Control and Left Turn Signal Control. The remaining LCO is available for an additional light of the customer's choice. It is turned on last during the sequence.

Additionally the PTM805-A-W has an optional Bluetooth module that reports a number of vehicle parameters to a paired tablet or other Bluetooth enabled device. These parameters include Odometer, Fuel Level, Malfunction Indicator Light, Idle Time and Vehicle Speed. Any one or more of these parameters may be unavailable on specific vehicles.

The PTM805-A-W comes in a full enclosure without a cover. All of the connectors are accessible from the top opening of the enclosure.

PTM Versions and the vehicles they currently support

Make sure that the version of PTM you are installing is the correct one for your medium duty J1939 vehicle. There may be new vehicles added to the approved list. If you don't see your vehicle below, please check with InterMotive.

A-PTM805-A-W	Freightliner, International (Navistar), Ford F650/F750 (6.7L Diesel)	Pre 2016 only
B-PTM805-A-W	Freightliner, International (Navistar), Ford F650/F750 (6.7L Diesel)	2016 and beyond

AUTO-BAUD rate

The PTM805-A-W will listen to and determine the baud rate (data communications speed) of the CAN network to which it is attached. It will then set itself up to operate at the correct rate. When installing on a model year 2016 or newer vehicle it will need to have a different Data Link Harness than when it is installed on an earlier model. The newer harness has a P2G connector (which is indicated by making it green in color) instead of the P2 (black or grey) connector on the harness for older vehicles. The P1 (black or grey) connector is only for use with the 250 Kb CAN network on pre 2016 vehicles. A harness with a P1 connector will NOT physically connect to a vehicle with the new P2G connection. The P2G (green) connector is primarily for the newer vehicles with the 500 Kb CAN network, however, the P2G (green) connector can be used on older vehicles as it will connect to the older P1 connector. However use caution when deciding to use a P2G connector on an older vehicle. If there are scanners or other devices that need to plug into a P2 connector for use on this vehicle there will need to be alternate P2 connections available on the vehicle as these devices will no longer plug into the new P2G connector.

A-PTM805-A-W comes with the P2 (black) connector (supplied cable harness, S-H59BX).

B-PTM805-A-W comes with the P2G (green) connector (supplied cable harness, S-H59DX).

Installation Instructions

Disconnect the battery before proceeding with the installation.

WARNING
Disconnect the battery to prevent setting a check engine light.

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 or 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.

PTM805-A-W Module

Remove the lower dash panel below the steering column and find a suitable location to mount the module. Do not mount the module until all wire harnesses are routed and secure, and a preliminary test of operation is performed (see page 6.) The last step of the installation is to mount the module. Make sure the mounting location is in an area away from any external heat sources (engine heat, heater ducts, etc.). Route the harnesses such that the tilt steering column does not contact them in the full down position. When installing the harnesses, leave several inches of take-out in order to easily remove the module when necessary.

Data Link Harness (6-pin connector, J11)

1. Locate the vehicle's J1939 Data Link Connector. It should be mounted below the lower left dash panel.
2. Determine whether the data link connector is a P2 (black or grey color) or a P2G (green) connector. Vehicles that are 2016 or newer should have the P2G connector.
3. If the vehicle has a P2G connector you must have a B-PTM805-A-W module with its supplied P2G connector harness (S-H59DX).
4. If the vehicle has a P2 connector you can install either version of the PTM.
5. Remove the mounting screws for the J1939 connector. Plug the female connector from the supplied PTM Data Link Harness (S-H59BX for a P2 or S-H59DX for a P2G) with its twist lock shroud into the vehicle's J1939 connector. Ensure the connection is fully seated and the twist lock fully tightened.

P2 Connector

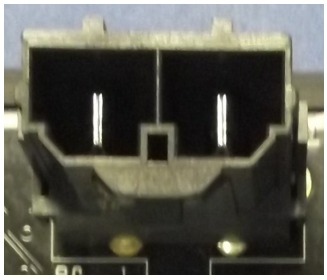
6. Mount the pass-through male connector from the PTM Data Link Harness in the former location of the vehicle's J1939 connector.
7. Secure the PTM Data Link harness so that it does not hang below the lower dash panel.

NOTE: Do <u>NOT</u> plug the Data Link harness into the 6-pin connector, J11, on the PTM805-A-W module. This will be done at a later step.

PTM Power Connection

Locate the supplied power harness (supplied cable harness S-H118AX) that will be connected later to the 2-pin Molex Mini-Fit Senior connector, J6. Connect the end of the red wire directly to a +12V vehicle battery source (using an inline 20 amp fuse is recommended.) Connect the end of the black wire to a clean bare metal chassis ground. The installer ***must*** provide strain relief on the cable outside of the PTM's enclosure. It is recommended that the strain relief is within 6" of the enclosure. The absence of strain relief could result in damage to the module.

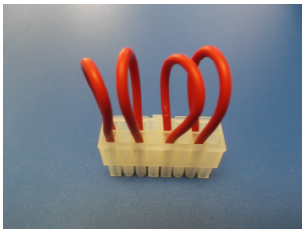
Pin #	1	2
	Ground	Power



16-Pin PTM Relay Hardware Configuration Connector

For any of the PTM relay outputs to operate there must be a configuration mating connector plugged into the relay configuration connector, J7. This connector is a 16-pin Molex Mini-Fit Plus connector and is used to connect the relay inputs with the source that is needed for the application. The supplied configuration connector shown in the photo below (InterMotive part number S-H30EX) enables all 4 relay outputs. Make sure that this connector is installed.

16 Pin Configuration



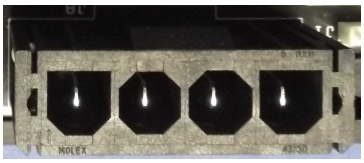
4-Pin PTM Relay Connector Pin-Out Definition

Connector J8 contains the 4 PTM fused relay output pins. These 4 fused output pins are connected to 4 relay outputs. Each relay output is capable of 10A maximum. **The PTM805-A-W module has a total maximum current rating of 20A (no more than 2 relays are activated at the same time.)**

The 4 fused relay output pins on connector J8 are defined as follows (supplied cable harness S-H117CX):

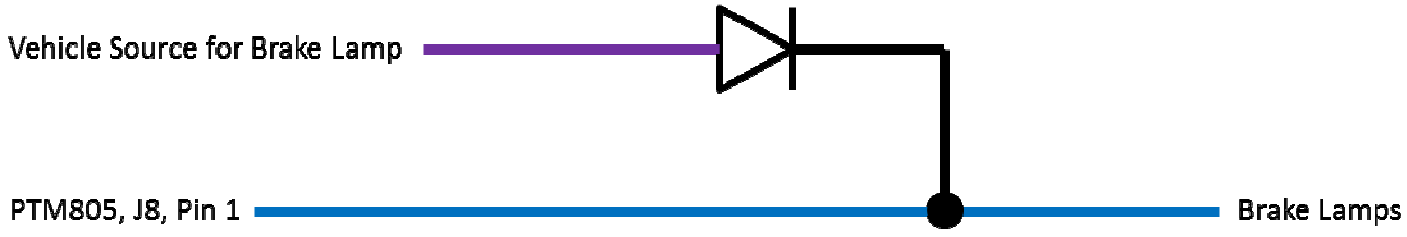
- Pin #1 - Relay Output 1, Fuse 1, Blue Wire (Violet Wire for Diode), Brake Lamps
- Pin #2 - Relay Output 2, Fuse 2, Yellow Wire (Pink Wire for Diode), High Beams
- Pin #3 - Relay Output 3, Fuse 3, Green Wire (Tan Wire for Diode), Low Beams
- Pin #4 - Relay Output 4, Fuse 4, Orange Wire (Brown Wire for Diode), Reverse Lamps

Pin # 1 2 3 4



4 Pin Output

Connect the outputs to the vehicle equipment as indicated. Each of these output wires must be connected to a protection diode which is then connected to the vehicle output driving these lamps. The supplied harness has the diodes included on all 4 outputs. See the example in the diagram below.



4-Pin PTM LCO Connector Pin-Out Definition

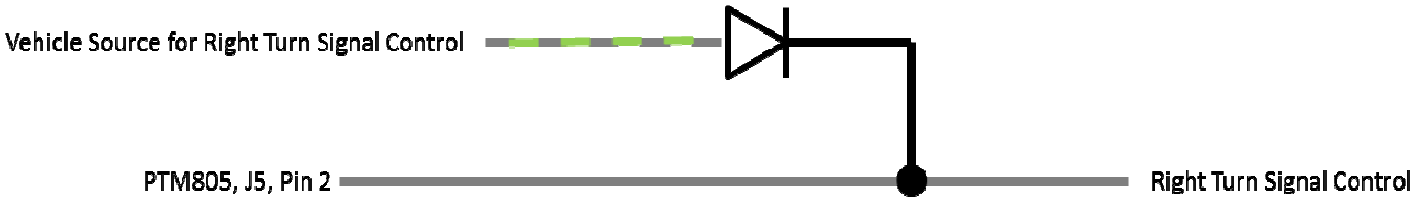
Connector J5 contains the PTM's 4 low current output (LCO) pins. Each output is rated at 1A, and is intended to drive LEDs, relay coils or other low current loads. **Note: when driving relays, a diode-protected type must be used. InterMotive recommends Digi-Key #PB682-ND Relay.**

4 Pin Output

The 4 LCO pins on connector J5 are defined as follows (supplied cable harness S-H111BX):

- Pin #1 - LCO 1, Light Green Wire (Light Green/Violet Wire for Diode), Park Lamps
- Pin #2 - LCO 2, Gray Wire (Gray/Light Green Wire for Diode), Right Turn Signal Control
- Pin #3 - LCO 3, White/Black Wire (White/Orange Wire for Diode), Left Turn Signal Control
- Pin #4 - LCO 4, Tan/Black Wire (Brown/Black Wire for Diode), Optional other (user defined) Lamps

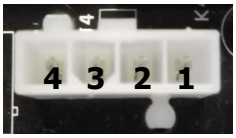
Connect the outputs to the vehicle equipment as indicated. Each of these output wires must be connected to a protection diode which is then connected to the vehicle output driving these lamps. The supplied harness has the diodes included on all 4 outputs. See the example in the diagram below.



4-Pin PTM Input Connector Definition

Connector J4 contains the PTM's 4 discrete wire inputs. Two of these are active low (1 and 2), and two are active high (3 and 4). The active low inputs have their own internal pull up resistors so they can be left floating when not used or not active.

The 4 input pins on connector J4 are defined as follows (supplied cable harness S-H119CX):



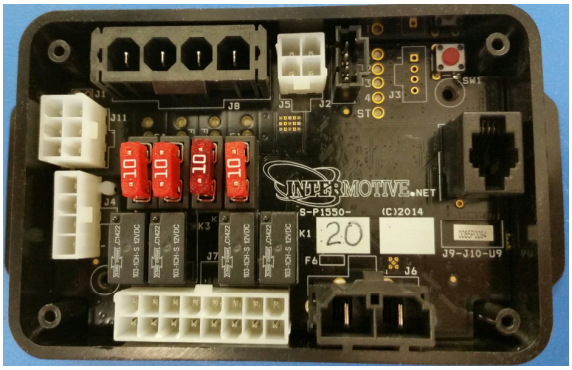
4 Pin Input

- Pin #1 - Input 1, Active low, Dark Green/White Wire, Momentary low to activate lamp sequence, connect this wire to a momentary switch that will ground the input
- Pin #2 - Input 2, Active low, Not used
- Pin #3 - Input 3, Active high, Red/White Wire, Momentary high to activate lamp sequence, connect this wire to a momentary switch that will supply +12V to the input
- Pin #4 - Input 4, Active high, Brown/White Wire, RUN position from ignition switch

Connect the inputs to the vehicle equipment as indicated. Do NOT connect both Pin 1 and Pin 3, only one method of activation can be used. Chose the method for the vehicle and connect only the input needed to the appropriate momentary switch.

Finishing the Installation and Testing Operation

Connect the Harnessing (Module is not yet mounted):



The following sequence should be performed **prior to** reconnecting the vehicle battery:

1. Connect each of the harness connectors to the corresponding connector on the PTM805-A-W. Each connector has a different number of pins and will only fit into the connector on the board with the same number of pins. Do not use force to insert a connector.
2. Make sure the Brown/White input wire is connected to the ignition switch.
3. The vehicle battery may now be reconnected.

Perform the following tests before actually mounting the module, to allow easy viewing of the diagnostic LED's, if needed.

1. Place the ignition in the Run position and verify that LED's 1 - 4 turn On indicating Bluetooth was successfully renamed.
2. Cycle the ignition Off and back On, and verify that LED's 1 - 4 are turned Off when the ignition is in the Run position.
3. Place the transmission in Park (Neutral if there is no Park position), apply the parking brake and start the engine.
4. Momentarily press the designated switch for enabling Pre-Trip mode.
5. When the Pre-Trip mode is active the module will cycle the exterior lights. **Note:** This will cycle for about 8 minutes then shut off automatically.
6. Before the 8 minutes are over release the parking brake and confirm that the Pre-Trip mode stopped.
7. Apply the parking brake and repeat step 4 to confirm that the Pre-Trip mode is once again be enabled.

If the PTM805 fails any of the above tests, check harnesses and review instructions, or check diagnostics below. If necessary, call InterMotive Technical Support at (530) 823-1048.

The PTM805-A-W is properly installed only if it passes the above tests. If any irregular operational issues persist, recheck the harnesses and review instructions. Contact InterMotive at 530-823-1048 for technical assistance.

Install Fuses for the Relays

Install a fuse into each fuse position that has a relay being used. Make sure to use fuses that are rated for the load being driven by the relay. **Do not exceed 10A per fuse.**

Module Mounting

1. Ensure all the harnesses are properly routed with strain relief where needed.
2. Mount the PTM805-A-W module as described on page two.
3. Verify that the module is in an area away from any external heat sources (engine heat, heater ducts, etc.).
4. Secure using screws or double sided tape.

PTM805-A-W Post Installation Testing

1. Turn the ignition ON to wake up and initialize the PTM module.
2. Initiate the Pre-Trip mode and make sure the lights are sequencing on the vehicle.
3. If there is a Bluetooth enabled tablet computer or a smart phone available, check to see if there is a Bluetooth signal, and that the name of the Bluetooth module that is found is PTM followed by the VIN number of the vehicle in which it is installed.

Status Displays and Diagnostics

Blown Fuse Detection

There are 8 red LEDs between the fuses and the output connector (J8). The 4 LEDs closest to the output connector are the ones that will be used on the PTM product. One of these will turn on whenever the adjacent fuse is blown with the output load connected and the relay activated (during Pre-Trip mode).

Diagnostics Operation

There are 5 "pages" of diagnostic and status displays that can be selected. Each page displays a different status using the on board LEDs. Each status page is described below. In addition, when in any of the pages, the amber STATUS LED will blink the page number.

Selecting the Page:

The page to be displayed is selected by pressing and releasing the red TEST button (you must have the ignition on—in normal operating mode). When pressing this button, hold it down for about 1 second before releasing it (holding longer than 1 second is not going to cause a problem). To select page 3 starting from normal operating mode, press and release the test button three times. To move from page 2 to page 4, press and release the test button 2 times. The amber STATUS LED will blink the page number. The green LEDs labelled 1, 2, 3, and 4 will indicate the status for the selected page. See the table on the next page for the status that is shown on each page.

PAGE 1: Status display of the Relay Outputs

To enter relay display mode, momentarily press the red test button once with the ignition on. The on-board amber STATUS LED will repeatedly blink once to indicate page 1. The on-board green LED's will light when a corresponding relay is active as shown in the table below.

PAGE 2: Status display of the Low Current Outputs, LCOs

To enter LCO display mode, momentarily press the red test button twice with the ignition on. The on-board amber STATUS LED will repeatedly blink twice to indicate page 2. The on-board green LED's will light when a corresponding LCO is active as shown in the table below.

PAGE 3: Status display of conditions for activating the light sequencing

To enter this display mode, momentarily press the red test button three times with the ignition on. The on-board amber STATUS LED will repeatedly blink three times to indicate page 3. The on-board green LED's will light to show the vehicle status that allows the activation of the light sequence as shown in the table below.

PAGE 4: Display showing whether the light sequence is active.

To enter this display mode, momentarily press the red test button four times with the ignition on. The on-board amber STATUS LED will repeatedly blink four times to indicate page 4. The on-board green LED's will light to indicate the status of light sequencing as shown in the table below.

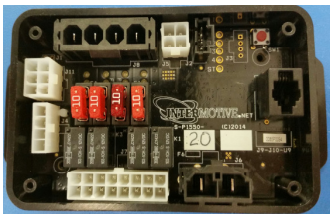
PAGE 5: Bluetooth status

To enter Bluetooth status mode, momentarily press the red test button five times with the ignition on. The on-board amber STATUS LED will repeatedly blink five times to indicate page 5. The on board LED 1 will light to indicate that the Bluetooth module is paired with an external device.

STATUS LED	Page 1	Page 2	Page 3	Page 4	Page 5
LED_1	Relay 1 ON	LCO1 ON	PB	PTM Mode	BT Connected
LED_2	Relay 2 ON	LCO2 ON	VSS<2	Active High Trigger	*Factory use only*
LED_3	Relay 3 ON	LCO3 ON	TR=Park or Neutral if there is no park available	Active Low Trigger	*Factory use only*
LED_4	Relay 4 ON	LCO4 ON	*Factory use only*	*Factory use only*	*Factory use only*

Leave in Vehicle

PTM805 (Pre-Trip Module)



For Medium Duty J1939 Vehicles
2010 - 2015 Use P2 J1939 Black Connector
2016 - 2017 Use P2G J1939 Green Connector

System Operation

The Pre-Trip Module can cycle the exterior lights in order to assist the driver in verifying that all the lights on the vehicle are working properly.

Pre-Trip Mode:

To enter the Pre-Trip Mode, all of the following conditions must be met.

- Put the Transmission in Park (or Neutral if there is no Park position on the vehicle)
- Apply the Parking Brake
- Vehicle speed must be zero
- Momentarily press the switch that has been designated on the vehicle to initiate the PTM

The Pre-Trip Mode cycles the lights as shown in the table below. Each full cycle takes 20 seconds. If not exited it will stop on its own after 24 cycles (8 minutes).

Time in seconds		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
High Beams	Relay 2	■	■	■	■																
Reverse Lamps	Relay 4			■	■	■															
Low Beams	Relay 3						■	■	■	■											
Brake Lamps	Relay 1								■	■	■										
Park Lamps	LCO 1											■	■	■	■						
Right Turn Signal	LCO 2													■	■	■					
Left Turn Signal	LCO 3																■	■	■	■	
User Defined	LCO 4																		■	■	■

To exit the Pre-Trip Mode, any one of the following conditions may be used:

- Momentarily press the designated Pre-Trip switch
- Release the Parking Brake
- Place the Transmission out of Park (or Neutral)

Bluetooth operation

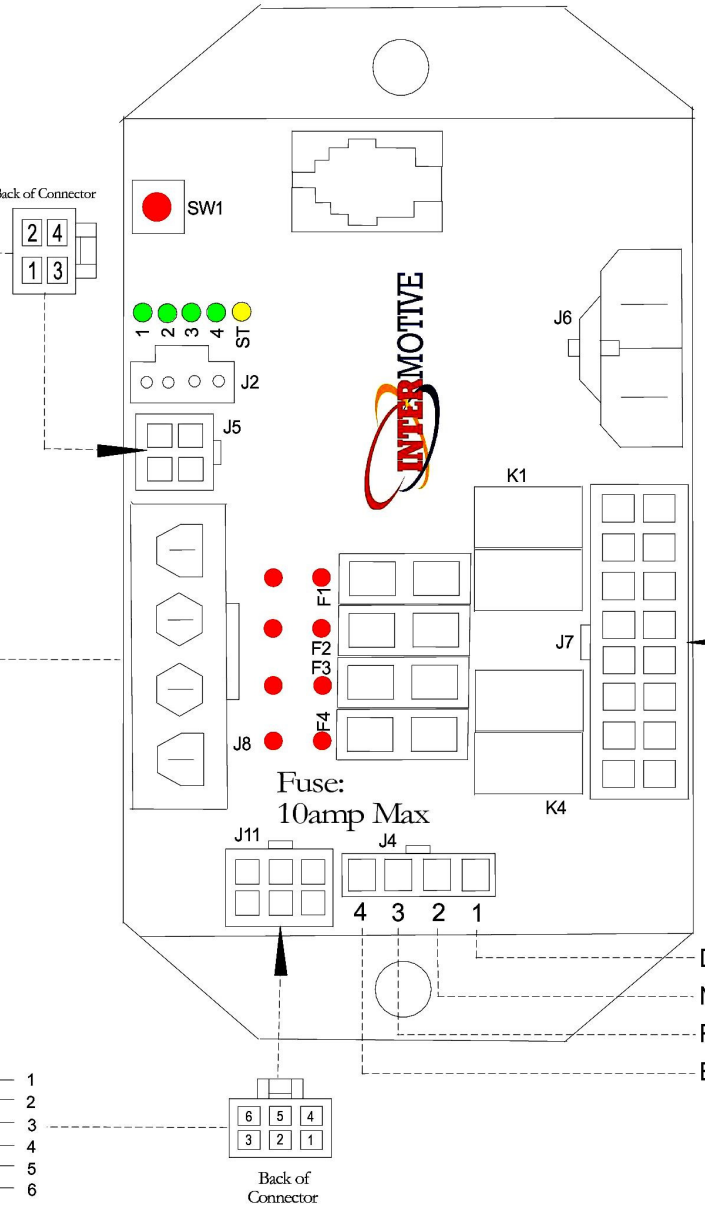
The Bluetooth features of the PTM805-A-W are intended for use with a Bluetooth enabled device that has a special software application that knows how to read and interpret the data sent by the PTM. If you are using such a device, please refer to the instructions given for that device.

Part # S-H111BX

Park Lamps	LT GREEN	LT GREEN/VIOLET	1
Right Turn Signal	GRAY	GRAY/LT GREEN	2
Left Turn Signal	WHITE/BLACK	WHITE/ORANGE	3
User Defined Lamps	TAN/BLACK	BROWN/BLACK	4

Part # S-H117CX

Brake Lamps	BLUE	VIOLET	1
High Beams	YELLOW	PINK	2
Low Beams	WHITE/BLACK	TAN	3
Reverse Lamp	ORANGE	BROWN	4



Part # S-H118AX

1	Ground
2	Power

Part # S-H30EX

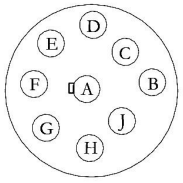
(All Red Wires)

Part # S-H119CX

DK GREEN/WHITE	(Active Low Input)
N/C	
RED/WHITE	(Active High Input)
BROWN/WHITE	From Ignition Run (Active High Input)

(Use Only One Input)

Part # S-H59BX (P2, 250Kb Only)
Part # S-H59DX (P2G, 500/250 Kb)



Front of J1939 Connector

InterMotive Supplied
Plug and Play J1939
Data Link Harness

(Battery Voltage)	RED	1
(CAN 1 High)	YELLOW	2
	NC	3
(Ground)	BLACK	4
(CAN 1 Low)	GREEN	5
	NC	6

Back of Connector

Submit product registration at www.intermotive.net

If the PTM805-A-W fails any step in the Post Installation Test, review the installation instructions. If necessary, call

InterMotive technical support @ (530) 823-1048.

PTM805-A-W-103116-INS