Idle Timer Controller - ITC805
2013-2023 Freightliner MT45
Contact InterMotive for additional vehicle applications

System Operation

The ITC805 system shuts down idling gas or diesel engines after a certain prescribed time period. If the vehicle is in Park or neutral with the engine running, the ITC805 shuts down the engine in either 5 minutes (default period with Park Brake applied) or 15 minutes (default period with Park Brake released). Additionally, the ITC805 module monitors the vehicle's battery Voltage, and if it becomes lower than a set value (programmable), the module will control an optional power relay which shuts off all loads attached to the relay thus reducing battery load.

Installation Instructions

Disconnect vehicle's battery before proceeding with 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.
It is important to avoid placing the module where it could encounter strong magnetic fields from high current cabling connected to motors, solenoids, etc. Also avoid radio frequency energy from antenna's or inverters next to the module. Finally, avoid high voltage spikes in vehicle wiring by always using diode clamped relays when installing upfitter circuits.

ITC805 Module

Remove the lower dash panel below the steering column area and find a suitable location to mount the ITC805 module. Locate the module in an area away from any external heat sources (engine heat, heater ducts, etc.). Do not mount the module until all wire harnesses are routed and secure. The last step of installation is to mount the module

Optional Data Link Harnesses

-P2G	Green Flange Mount	Freightliner MT45	2016-2023
-P3G	Green Nut Mount	Freightliner MT45	2017-2022

Optional Main Harness

-P6	Plug and Play	Freightliner MT45	2010-2015

J1939 Blunt Cut Data Link Harness Installation

Note: Skip this section if using the optional P2 Plug and Play Data Link Harness—see below.

Important: On the following wires use solder and electrical tape to make all of the connections.

1. Locate the vehicle's J1939 Connector. It is usually be located below the lower left dash panel. Removing the OEM J1939 Connector from the mounting bracket usually makes wire tapping easier.
2. Locate Pin A of the J1939 connector. Do not cut the wire! Strip the insulation 1" from the J1939 connector and attach the Black wire from the ITC805 Data Link Harness.
3. Locate Pin B of the J1939 connector. Do not cut the wire! Strip the insulation 1" from the J1939 connector and attach the Red wire from the ITC805 Data Link Harness.
4. Locate Pin C of the J1939 connector. Do not cut the wire! Strip the insulation 1" from the J1939 connector and attach the Yellow wire from the ITC805 Da-ta Link Harness.
5. Locate Pin D of the J1939 connector. Do not cut the wire! Strip the insulation 1" from the J1939 connector and attach the Green wire from the ITC805 Data Link Harness.
6. Plug the free end of the ITC805 Data Link harness into the mating 6-pin connector on the module.
7. Secure the ITC805 Data Link harness so that it does not hang below the lower dash panel. Reinstall the OEM J1939 connector if removed.

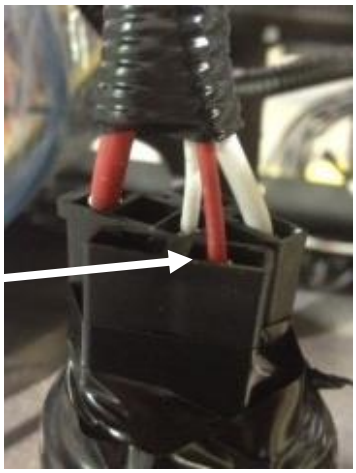
Back of the connector

J1939 Plug and Play Data Link Harness (Optional P3G Data Link Harness)

1. Locate the vehicle's J1939 Connector. It is usually located below the lower left dash panel.
2. Remove the J1939 Connector from the mounting bracket.
3. Connect the ITC805 Data Link harness J1939 female connector to the vehicle's J1939 connector.
4. Mount the ITC805 Data Link harness J1939 male connector to the vehicle's J1939 connector mounting bracket.
5. Plug the free end of the ITC805 Data Link harness into the mating 6-pin connector on the module.
6. Secure the ITC805 Data Link harness so that it does not hang below the lower dash panel.

Freightliner MT45 Ignition Switch Connectors

The connections below must be made by using solder and the supplied heat shrink tubing. The tubing should be cut to 1" lengths for this purpose.



- Remove the lower steering column trim cover. Locate the ignition switch connector and disconnect it from the switch
- Looking at the back (wire side) of the just-removed connector, orient it with the 10 Gauge wire on top. Cut the 16 Gauge wire on the left side of the connector back about 3 inches from the connector.
- Attach the "connector" side of the cut wire to the Brown wire coming from the Intermotive 2-pin connector.
- Attach the other end of the cut wire to the Yellow wire coming from the Intermotive 2-pin connector.
- Attach the 2-pin ignition connectors to the ITC805 harness.
- Attach the 12-pin connector of the ITC805 harness to the ITC805 module 12 pin connector.
- Attach the 4-pin connector of the ITC805 harness to the ITC805 module 4 pin connector.
- Reattach the Ignition Switch Connector to the Ignition Switch.

Optional I/O Functions:

The ITC805 provides 3 (optional) auxiliary functions that complement the main operation. On the 12-pin connector there are three blunt cut wires that can be used as follow:

1. Warning beeper - Orange wire (pin 2) when attached to the Intermotive-supplied beeper, becomes an audible alarm which operates in three ways:
   - Beep once or twice every 15 seconds when the engine is <u>not</u> running and VBAT value is within 0.2V of the non-running shut-off value.
   - Beep once or twice every 15 seconds when the engine <u>is</u> running and VBAT value is less than the "engine running" shut-off value.
   - Beep continuously for the last thirty seconds before engine is shut down.
2. Override High input - Green wire (pin 4). Applying +12V to this input will prevent engine shut down.
3. Override Low input - Blue wire (pin 5). Applying ground to this input will prevent engine shut down.

The override functions are used in conjunction with auxiliary equipment where engine shutdown while operating this equipment would not be desired. Ensure that unused flying leads never make contact with anything by taping, cutting, or extracting the wires (pin extraction requires Molex tool).

Latching Power Relay Installation/Operation (Optional)

The latching power relay is supplied for those installations that require control of electrical loads based on vehicle battery voltage (VBAT). Loads connected to this relay will be shut down anytime the engine is Off and VBAT drops below a certain programmable level in order to prevent further battery drain. Intermotive provides the Relay and harnessing to allow this operation, but the upfitter must provide either a single or dual momentary switch as part of the system (see CAD drawing).

Anytime the Intermotive module "opens" the relay due to low VBAT, this switch is used to manually reset the relay allowing power to be returned to the loads, and/or if a dual switch is used, the relay can be manually set to override the low VBAT feature. NOTE: this is the only way the relay can be reset and return power to the loads.

The upfitter should determine where the power relay will be mounted, and the momentary switch should be mounted on the dash or in a location easily reached by the driver.

Three blunt cut wires are provided for the switch connections. If using a single momentary switch, the Red (+12V) and Gray wires must be connected as shown (see CAD) and the Purple wire should be taped up to prevent any inadvertent electrical contact from occurring. The appropriate connection hardware should be used for the selected switch.

ITC805 Module Mounting

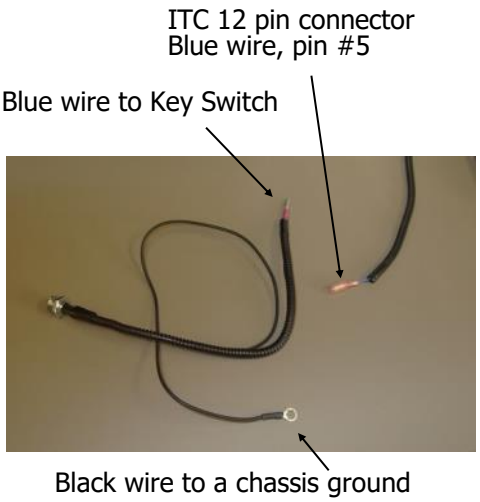
Ensure all harnesses are properly connected and routed, and are not hanging below the dash area. Mount the module using screws or double sided tape and reinstall all removed panels.

Reconnect vehicle battery

If the module's factory default settings do not need to be changed (below), proceed to the Post Installation Check List section.

Optional ITC countdown disable key switch

1. Locate a suitable place on the dash to mount the Key Switch. (Within 30” from the ITC module)
2. Drill a 1/2 inch hole to mount the Key Switch (Be careful not to damage OEM harnessing behind the dash).
3. Mount the Key Switch onto the dash.
4. Locate the ITC 12 pin connector Blue wire, pin #5.
5. Connect the male key switch bullet connector to the ITC 12-pin connector Blue wire, pin #5 female bullet connector.
6. Connect the eyelet connected to the Black wire to a chassis ground.



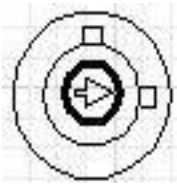
Operation Instructions

This key switch will enable or disable the idle timer function.

- To enable the idle timer, insert the key into the switch and position the arrow in the up position.
- To disable the idle timer, insert the key in the switch and position the arrow pointing to the right.

Idle Timer On

Idle Timer Off



Parameter modification (optional)

Requirements:

- USB to Serial Communication Cable (part number a-IPU) which is a one time purchase. This kit is required for all programming and is recommended to be kept in a central location.
- Laptop computer (reconfiguration is done while module is on the vehicle)

Reconfiguration

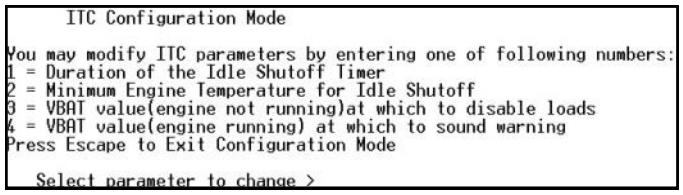
1. Ensure that the proper drivers are installed for the USB to Serial Communication cable provided by InterMotive. All driver files are located online at: http://www.ftdichip.com/Drivers/VCP.htm
2. Find the correct drivers for your system and follow the steps to download the latest version (located under the "Driver Version" heading). If unsure about the installation process, please contact InterMotive for further assistance.
2. Once the installation process is complete, plug the Communication cable into one of the computer's USB ports.
3. Ensure the vehicle's key is off and plug the other end of the download cable into the port labeled 'COMM' on the module.
5. Open the communication application HyperTerminal. This program can be found under: Start > All Programs > Accessories > Communications > HyperTerminal.
6. A prompt will appear to give this connection setup a name. It's recommended to use something meaningful such as "ITC Config".

The next window will prompt to select the COM port to setup the connection on. Typically, the highest numbered COM port will be the InterMotive Communication cable.

Note: This can be double-checked on Windows XP by right-clicking on 'My Computer' and selecting 'Properties.' From this window select the 'Hardware' tab and click on 'Device Manager.' In the Device Manager window, expand the 'Ports' menu and the download cable will display as 'USB Serial Port.'

In the next window, several of the default parameters for the Port Settings need to be changed: Change the Bits per second to: **57600**, Data bits: **8**, Parity: **None**, Stop bits: **1**, and Flow control: **None**. HyperTerminal setup is now complete.

1. Turn the vehicle key to the ON position. The ITC805 module will wakeup and text will display on the open HyperTerminal window.
2. If text does not appear, unplug the 6 pin connector from the ITC805 module, wait several seconds and plug the connector back in.
3. If text still does not appear, go to File > New Connection and try re-configuring the HyperTerminal as described above. If un-successful, contact InterMotive for further assistance.
4. With communication established, type in the characters **cfg** (followed by the enter key) and the screen will look like Screen Shot 1.



Screen Shot 1

5. Enter the number (1,2,3, or 4) for the parameter you wish to change.
6. Follow the screen instructions to make changes. Changes are stored in non-volatile memory, so they will only need to be made once.
7. Press ESC key when the parameters are set correctly.
8. When finished, Key Off ignition and disconnect the communications cable.

Low Voltage Alert/Shutdown

The ITC805 monitors vehicle battery Voltage (VBAT) at all times. There are two programmable Voltage settings that are used to control two different operational functions: One is for when the engine is running, and the other is for engine not running. The two Voltage settings come set from the factory, but with the use of a USB-to-Serial cable and a laptop computer (See previous section), the settings can be modified in the field.

Engine Running - When the setting is reached, one or two audible beeps approximately every 15 seconds continuously will be heard.

Engine not Running - When VBAT reaches approximately 0.2V above the shut-down Voltage, one or two audible beeps approximately every 15 seconds will be heard as a way to alert that shutdown is imminent. When shutdown Voltage is reached, the Power Relay contacts (if installed) will be opened, thus removing power to the attached loads. Returning power to these loads requires a manual reset activation.

Post Installation Check List

Idle Timer:

NOTE: To do the checkout below, you need to put the module into it's diagnostic mode (See Step 1). While in this mode you will observe LEDs which verify that certain events are taking place. LED9 is important because it indicates the ITC countdown is in progress. If LED9 is OFF, the count is inhibited, and other LEDs will indicate why. If LED9 is ON, the count is proceeding and other LEDs will indicate progress.

1. Place key in the RUN position and put module into Diagnostic mode by shorting the 2 test pads together. When LED 2 illuminates (rapid flashing), the ground connection can be removed from the module. LED 2 illuminating indicates the module is receiving data.
2. Apply the Parking brake and Start the engine.
3. As long as the vehicle is in Park or Neutral and running (and ITC not inhibited), the idle timer starts counting down (this can be verified by LED9 and LED8 turning On. The default countdown time with Park Brake applied is set for 5 minutes. After one minute has elapsed, LED 8 will turn Off and LED 7 will turn On. This will continue down to 30 seconds left before engine shut down (LED 3 being On) at which point the warning beeper (if installed) will start beeping and LED 9 will start to flash. After 30 seconds, the engine shuts down.
4. Turn the key to the Off position then back ON and attempt to start the engine; it should start.
5. While observing the countdown (e.g. wait for LED 6 to come On), apply and release the Service Brake and verify the idle timer resets. This is evidenced by LED 8 and LED 9 coming back On indicating that the full shutdown time has been reloaded.

Post Installation Check List cont.

6. The module has three ways to inhibit the ITC countdown. When each is implemented, LED8 will turn on and LED9 will turn OFF. Perform each one and verify proper LED action, then reverse the action and verify LED8 & LED9 come back ON indicating a reset/continuation of countdown.
    a. Apply +12 VDC to pin4 (blunt cut Green wire)
    b. Apply a ground to pin5 (blunt cut Blue wire)
    c. Raise the engine RPM above 1500 by pushing accelerator pedal

VBAT Power Relay Option (if installed):

1. Put the key in the Run position (engine not running), and turn On as many loads as you can to start bringing the battery Voltage down.
2. When VBAT gets to within 0.2V of shutting down, the warning beeper will "beep" every 15 seconds until the relay is deenergized (target voltage reached).

If the ITC805 fails any step in this checklist, review the installation instructions and check all connections. If necessary, call Intermotive Technical Support at (530) 823-1048.

Leave in vehicle
Operating Instructions Idle Timer Controller - ITC805
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Overview

The ITC805 system is an idle timer engine shut off system. It automatically stops the engine (after a set amount of time) if the vehicle is left idling, in Park or Neutral, without operator input.

A custom timer length and minimum engine warm-up temperature may be set by the vehicle manufacturer. When that time expires and the engine is above warm up temp (default 150° F) the engine will shut off.

- If the optional low VBAT latching power relay is installed, it will be automatically deenergized if/when the vehicle battery Voltage drops to the programmed limit.

Ignition Power Restore and Restart

The ITC805 switches off Ignition power to stop the engine. Ignition power is restored once the key is moved from the Run position to the Off position.

When ITC805 has switched off Ignition power, there is still a small power draw from the battery. This draw could potentially drain the battery if left in this state for an extended period of days. For this reason, as well as to prevent theft, the key should always be removed from the Ignition once the operator has finished with the vehicle.

Optional Shutdown Indicators

If an optional warning buzzer is connected to the indicator output, it will sound repeatedly during the final 30 seconds prior to Shut Off.

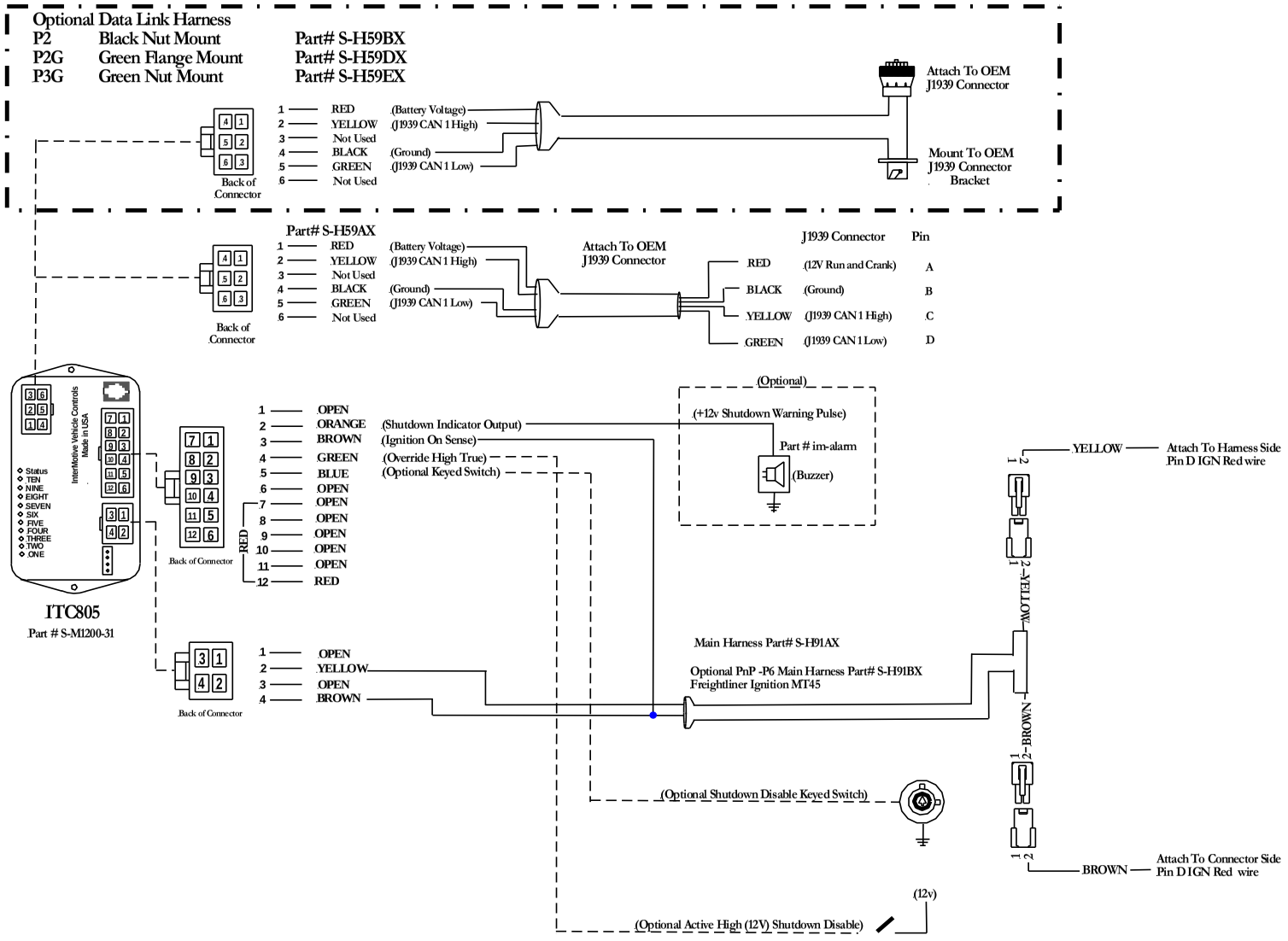
Timer Override Inputs

The shut off timer will reset if the driver applies the Service Brake .

Timer Override inputs are provided to allow vehicle equipment (PTO, compressor, etc….) to disable the shut off timer when equipment is in use.

The ITC function will also be overridden if the engine speed exceeds 1500 RPM - this would indicate the vehicle is in the regen mode and will not shut down until regen is disengaged.

Once the optional equipment is switched off, the ITC805 will resume Idle Timer sequence.



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If the ITC805 fails any step in the Post Installation Check List, review the installation instructions and check all connections. If necessary, call InterMotive Technical Support at (530) 823-1048.