INSTALLATION GUIDE

O-Zone-Tech II™

IMPORTANT

Before attempting the installation of the **O-Zone-Tech II™**
Thoroughly read and understand the instructions and steps in this guide.

WARNING

IMPORTANT

This document provides all the necessary information to allow your **O-Zone-Tech II**^{TM} system to be properly and safely installed.

Before beginning the installation and/or operation of your new product, the installation technician and operator must read this manual completely.

Important information is contained herein that could prevent serious injury or damage.

The **O-Zone-Tech II**^{TM} system from Zone Technologies is entirely programmable.

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GENERAL OVERVIEW

Zone Technologies is proud to present the second generation of its "IDLE reduction module". Packed with powerful features, the module is designed to stop a vehicle engine when no operation is done and no accessories are activated. One of the key features of the **O-Zone-Tech II™** module is the battery monitoring function. The module continuously monitors the battery and restarts the engine for a predetermine time if the voltage goes below a programmable value and then cycles back to the battery monitoring state.

The **O-Zone-Tech II™** system also includes an option that will restart the engine when the passenger compartment temperature goes beyond a programmable value (high or low). When a temp limit is reached, the engine is restarted to bring passenger compartment temperature back to a comfortable level for occupants and/or sensitive electronic equipment.

WIRING SPECIFICATIONS

Many components are directly connected to the **O-Zone-Tech II™** system therefore it is crucial that all connections are properly wired in accordance with automotive industry specifications.

Important connections:

1. The negative (-) connection of the **O-Zone-Tech II™.**
2. Power source (+12V on power terminal).
3. Ignition (+12 V)
4. All connections required for accessory and ignition signal deactivation.

Please ensure that all power wires are protected by appropriate fuse or circuit breaker.

*** Note that an optional set of heavier gage wires is available to match the ignition harnesses of certain vehicles.

C1 (harness only):	ASY-CBLOZTC-C1-P
Kit (with internal temperature option):	ASY-KITOZTC-PS
Kit (w/o internal temperature option):	ASY-KITOZTC-P0

TECHNICAL SPECIFICATIONS

Voltage input:		10 to 18Vdc
		(optional: 10 to 28Vdc)
Operating temperature:		-40°F to 167°F (-40°C to 75°C)
Electrical consumption:	Before engine stop:	15mA
	After engine stop:	175mA
	Without Ignition signal:	4mA
Constant power per output:	4 Relays (N.C.):	25A maximum
	(N.O.):	25A maximum
	2 positive outputs:	500mA
	2 negative outputs:	200mA

MECANICAL SPECIFICATIONS

Dimensions:	5.625″ X 3.25″ X 1.15″ (142.9mm X 82.6mm X 29.2mm)
Weight:	0.6 lbs (0.268 Kg)

INSTALLATION

O-ZONE-TECH II^{TM} MODULE

WARNING
Failure to follow these safety precautions and instructions could result in damage to the product or vehicle and/or serious injury to you and your passengers! Proper installation of this product requires the installer to have a good understanding of automotive electronics, systems and procedures. For this product to operate at optimum efficiency, protect all electrical and mechanical components including proper routing of all wiring. Once the installation is completed, verify all systems functions and test all vehicle systems to ensure all is conformed to standard specifications.

MECHANICAL INSTALLATION

Be sure the area selected will not allow the unit to be exposed to water. Do not select a location where the unit will be exposed to potential damage from any unsecured or loose equipment in the vehicle.

The module is capable of resisting variable temperatures from -40°F to 167°F (-40°C to 75°C).

The unit has its own base which allows a variety of installation possibilities, even up-side down..

Important notice: Units equipped with wireless option <u>must</u> be installed vertically.

ELECTRICAL INSTALLATION

Please install all wiring required for the system and its components. Verify the installation options to ensure all connections are accounted for. Install all supplied fuses and fuse holders as close as possible to the battery. All wiring penetrating the fire wall must be protected by a rubber or plastic grommet.

When routing the wires, it is important to choose a path that will keep these wires away from excessive heat and from any vehicle equipment that could compromise the integrity of the wires (ex. Trunk lids, door jams, etc.). Follow all wiring recommendations as explained in this guide

Special note to the reader: Pin identification in this manual will be used as follow:
C2.8 = pin #8 from connector C2.
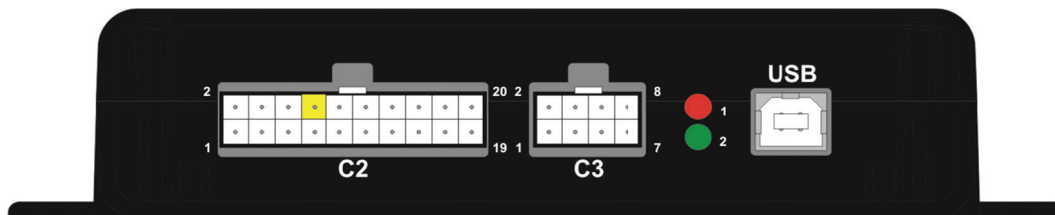
Example : Pin C2.8 (highlighted in yellow)

WARNING**: Before attempting module installation, disconnect the vehicle battery. Failure to follow theses procedure and basics of vehicular electronics may result in fire and/or personal injury. Wait until all electrical connections have been tested and completed before reinstalling the battery.**

WIRING TABLE

CONNECTOR	PIN	WIRE COLOR	DESCRIPTION		
USB	-	-	USB comm. link between **O-Zone-Tech II™** and Computer		
C1	1	RED/ BLACK	Battery input#2	On ignition connector	
	2	GRAY / BLACK	Relay #4 (N.C.)	Ignition or Accessory	(Key Side)
	3	BLUE	Starter (N.O.)	On start signal	
	4	GRAY	Relay #4 (COM)	Ignition or Accessory	(Away from Key)
	5	BLACK	Starter (N.C.)	Used in MULTIPLEX mode	
	6	WHITE / BLACK	Relay #3 (N.C.)	Ignition or Accessory	(Key Side)
	7	RED	Battery input #1	On ignition connector	
	8	WHITE	Relay #3 (COM)	Ignition or Accessory	(Away from Key)
	9	ORANGE	Relay #1 (COM)	Ignition or Accessory	(Away from Key)
	10	GREEN / BLACK	Relay #2 (N.C.)	Ignition or Accessory	(Key Side)
	11	ORANGE / BLACK	Relay #1 (N.C.)	Ignition or Accessory	(Key Side)
	12	GREEN	Relay #2 (COM)	Ignition or Accessory	(Away from Key)
C2	1	BLACK	System Ground		
	2	RED	System 12Vdc battery feed		
	3	BLACK	Temperature sensor #2 (Internal), ground signal		
	4	RED	Temperature sensor #2 (Internal), positive signal		
	5	BLACK	Temperature sensor #1 (External), ground signal		
	6	RED	Temperature sensor #1 (External), positive signal		
	7	PURPLE / BLACK	PARK analog input		
	8	PURPLE	Neutral analog input		
	9	WHITE / BLACK	Tachometer signal input		
	10	RED	Ignition signal		
	11	BLACK / BLUE	Programmable auxiliary output #5 (negative output)		
	12	BLACK	Programmable auxiliary output #6 (negative output)		
	13	YELLOW	Keyless mode switch input (un-available in current version)		
	14	YELLOW / BLACK	Negative input (reserved)		
	15	WHITE	INP4 (Programmable input #4)		
	16	BROWN	INP5 (Programmable input #5)		
	17	GREEN	INP2 (Programmable input #2)		
	18	GRAY	INP3 (Programmable input #3)		
	19	BLUE	INP0 (Programmable input #0)		
	20	GRAY / BLACK	INP1 (Programmable input #1)		
C3	1	LIGHT GREEN	Programmable resistor (Multiplex mode)		
	2	BROWN/WHITE	INP6 (Programmable input #6)		
	3	LIGHT GREEN / BLACK	Programmable auxiliary output #4 (positive output)		
	4	PINK	INP7 (Programmable input #7)		
	5	ORANGE	Programmable auxiliary output #3 (positive output)		
	6	BLACK/YELLOW	Programmable auxiliary output #2 (negative output)		
	7	BLUE/BLACK	N/C (reserved)		
	8	GREEN/YELLOW	Programmable auxiliary output #1 (negative output)		

CONNECTIONS OVERVIEW

Function	Connection	Signal identification	DESCRIPTION
Power source	C1.1, C1.7	Bypass relays power source	Ignition switch battery and accessory signals. (C1.1 = Battery input #2, C1.7 = Battery input #1)
	C2.1, C2.2	OZTII power inputs	O-Zone-Tech II™ module power inputs. (C2.1 = Negative (GND) signal, C2.2 = 12Vdc)
Module communication	USB	USB 2.0 connector	O-Zone-Tech II™ to PC communication port
	C2.14	N/C	N/C (reserved)
Inputs	C2.3 to C2.6	TEMPERATURE SENSORS	Temperature sensor input signals. - Internal temperature sensor = Optionnal - External temperature sensor = Standard
	C2.7, C2.8	PARK AND NEUTRAL	Analog inputs for PARK and NEUTRAL transmission signals. If no valid signal is available, a limit switch must be installed to detect transmission lever position. Both inputs can be used to monitor auxiliary battery voltage.
	C2.9	TACHOMETER	Tachometer input signal (Must be connected to a fuel injector or an ignition coil signal)
	C2.10	IGNITION	Ignition input signal (1A fuse protection required).
	C2.13	KEYLESS MODE	Keyless mode activation input. A negative signal generated by a momentary switch is required to activate this mode.
	C2.15 to C2.20, C3.2, C3.4	PROGRAMMABLE INPUTS (0 TO 7)	These inputs are normally used to prevent engine deactivation. Can be programmed to start the engine. Programmable signal activation (positive or negative signal).
Outputs	C3.3, C3.5	POSITIVE OUTPUTS	500mA positive outputs
	C3.6, C3.8	NEGATIVE OUTPUTS	200mA negative outputs
	C2.11, C2.12	NEGATIVE OUTPUTS	200mA negative outputs
	C3.7	N/C	N/C (reserved output)

DETAILED WIRING DESCRIPTION

USB CONNECTOR

The USB connector on the module makes it possible to connect to the computer using a USB cable.
This will only work when you have connected:
- C2.1 (Ground)
- C2.2 (12Vcc)
- C2.10 (Ignition)

To make communication possible via the computer, the vehicles key must be in the RUN position. It is not necessary to have the engine running.

The system USB du communication is compatible with any USB 2.0 port on a computer. Details of the communication capabilities will be discussed in the programming section.

C1 – KEY SWITCH BYPASS CONNECTOR
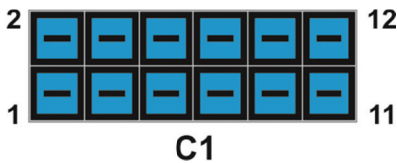
Connector C1 is the blue Key Switch Bypass Connector of the system. Wires on this connector will interact with the ignition's controls to simulate key operation at the ignition barrel. This connector will interact with the IGNITION, ACCESSORIES, STARTER and POWER wires of the Key Switch.

All relay of this Key Switch bypass system can be used as either IGNITION or ACCESSORY relays. Both relay #3 and #4 can also be used as a START relay in an installation requiring MULTIPLEX capability. This will be discussed in a later section.

All relay functionnalities must be programmed using the computer interface.

A complete installation will have to take into account the possibility that the vehicle may be equipped with some type of passive anti-theft system. Although this will not be discussed in this manual, it is the installer's responsibility to bypass systems such as GM's Passlock, V.A.T.S., Passkey III, Passlock II, Passlock I or Ford P.A.T.S. and similar systems found on different makes and models.

As it was discussed in the wiring specification section, the module may be sold with the adequate bypass system if specified during purchase. An optional C1 connector with larger wires may be purchased with the

system to cope with vehicles that have ignition harness with larger wires.

Most of the individual descriptions of the wires of this connector will refer to the following diagram:
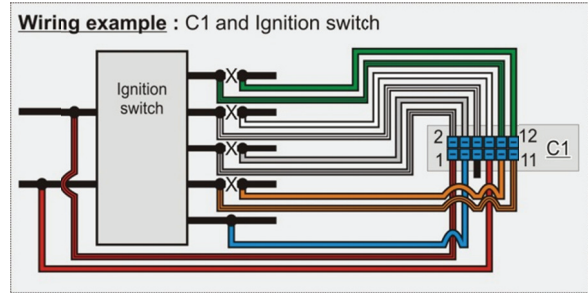
Ignition switch wiring
(Non-multiplex circuit only)

C1.1 – Battery input #2

Battery input #2 is to be used as a secondary feed line for the internal relays (#3, #4 and START) controlling the Key Switch. It must be connected to the POWER feed line that goes to the Key Switch. This input is secondary to Battery input#1, but it must always be tapped to the second POWER input of the Switch, if available. Otherwise, if only one POWER input to the Switch is available, both Battery input #1 and 2 must be tapped on this same wire.

Important: If installation is done on a multiplexed circuit, do not connect this wire. The power for relays #3, #4 and START will be provided via C3.1 (BCM input). Protection for this input is provided by the ignition switch fuse.
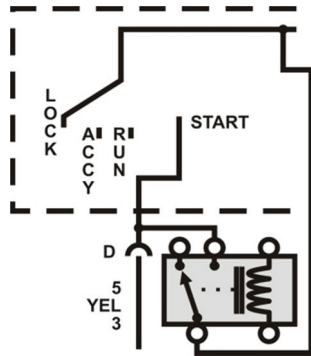
C1.2 – Relay #4 (N.C.)

It is commonly used as an ACCESSORY relay but it can also be programmed as a START relay. The Normally closed (NC) contact of the relay has to be installed on the Key Switch side of the opened accessory wire. An accessory wire is only "live" when the key is in the ACCESSORY or RUN position.
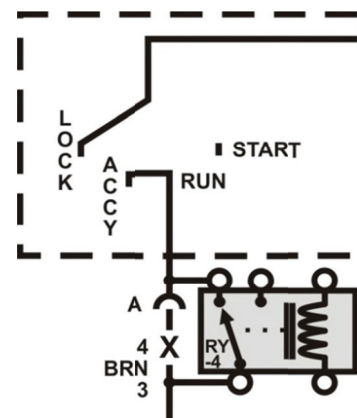
C1.3 – Starter (N.O.)

The starter relay normally opened (NO) output must be tapped to the start ouput wire of the Key Switch. This wire is recognizable by the fact that it is "live"only when the key is in the start position.

In the case of a system needing multiplex capability, this output is not used.

C1.4 – Relay #4 (COM)

It is commonly used as an ACCESSORY relay but it can also be programmed as a START relay. The common (COM) side of the relay has to be connected away from the Key Switch of the opened accessory wire.
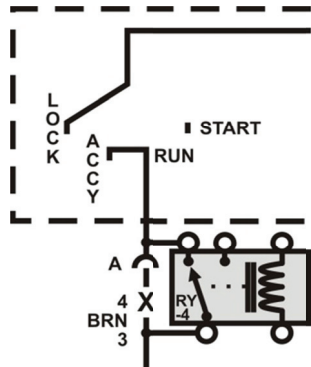
C1.5 – Starter (N.C.)

It is only used in keyless and MULTIPLEX mode to simulate the ignition key.

C1.6 – Relay #3 (N.C.)

It is commonly used as an IGNITION relay but it can also be programmed as a START relay. The normally closed (NC) contact of the relay has to be installed on the Key Switch side of the opened ignition wire. An ignition wire is "live" when the key is in the RUN or START position.
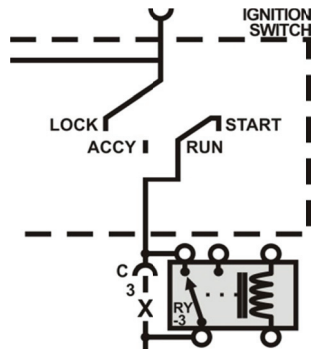
*C*1.7 – Battery input #1

Battery input #1 is to be used as a primary feed line for the internal relays controlling the Key Switch. It must be connected to the POWER feed line that goes to the Key Switch. This input is responsible for feeding relays #1 and 2.
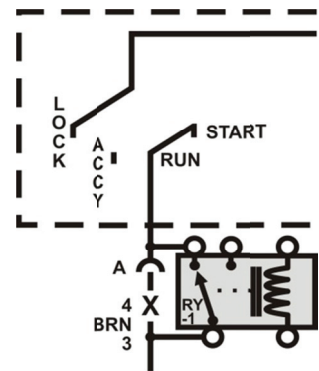
C1.8 – Relay #3 (COM)

It is commonly used as an IGNITION relay but it can also be programmed as a START relay. The common (COM) contact of the relay has to be installed away from the Key Switch of the opened accessory wire. An ignition wire is "live" when the key is in the RUN or START position.
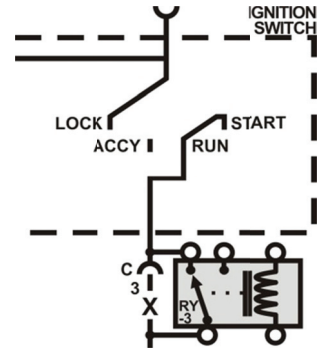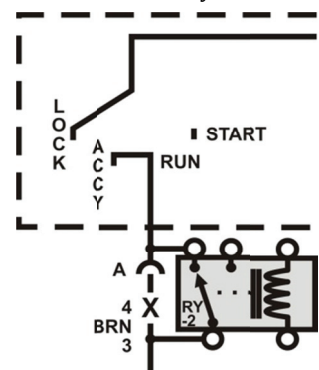
C1.9 – Relay #1 (COM)

It is commonly used as an IGNITION relay. The common (COM) contact of the relay has to be installed away from the Key Switch of the opened accessory wire. An ignition wire is "live" when the key is in the RUN or START position.
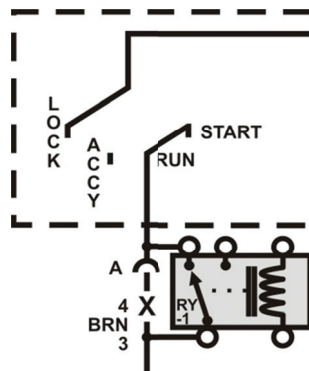
C1.10 – Relay #2 (N.C.)

It is commonly used as an ACCESSORY relay but it can also be programmed as a START relay. The normally closed (NC) contact of the relay has to be installed on the Key Switch side of the opened accessory wire as shown in the diagram in the C1 section. An accessory wire is "live" when the key is in the ACCESSORY or RUN position.

C1.11 – Relay #1 (N.C.)

It is commonly used as an IGNITION relay. The normally closed (NC) contact of the relay has to be installed on the Key Switch side of the opened ignition wire. An ignition wire is "live" when the key is in the RUN or START position.
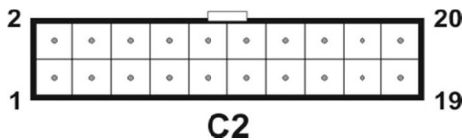
C1.12 – Relay #2 (COM)

It is commonly used as an ACCESSORY relay but it can also be programmed as a START relay. The common (COM) contact of the relay has to be installed away from the Key Switch of the opened accessory wire as shown in the diagram in the C1 section.
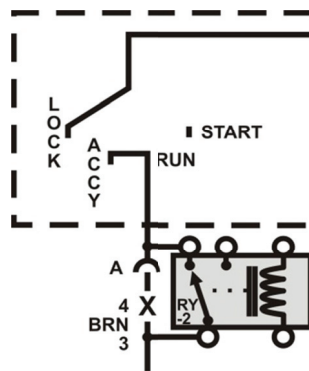
C2 – MAIN CONNECTOR

This connector holds the main functionalities of the module. 12V (Battery), Ground and Ignition wires must absolutely be connected otherwise the module will not power up.

C2.1 – Ground

Proper connection of the ground wire is essential for your module to function properly. This wire should always be connected to a clean unpainted metal surface. For example, it could be connected directly on the firewall or in the kick panel. It is highly advised that you cover your connection with anticorrosive grease or paint after tightening. The proper connection of this wire is crucial to the well functioning of the tachometer signal sensor.

C2.2 –12V Battery power

This is the power input to the controller. It must be tapped to a permanent 12Vdc power source and protected with the 5A fuse supplied with the module. The battery or the Key Switch power wires are good locations for this connection.
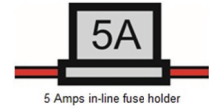
C2.3 – TMP2 INT (reference, negative)

This is the negative signal for the internal temperature sensor. This optional sensor is included with the harness kit C2 (ASY-KITOZTC-PS).

C2.4 – TMP2 INT (temperature signal)

This is the positive signal for the internal temperature sensor. This optional sensor is included with the harness kit C2 (ASY-KITOZTC-PS).

The internal temperature sensor must be installed in the vehicles' cockpit: ideally the sensor should be placed under the dash away from any ventilation, heat source, chassis or moving parts.

The main idea is to have complete control of the cockpits temperature, both heat and AC can be controlled with this device. Please see programing guide for complete details.

C2.5 – TMP1 EXT (reference, negative)

This is the negative output for the external temperature signal. This sensor is standard on all O-Zone-Tech II™ kits.

C2.6 – TMP1 EXT (temperature signal)

This is the positive signal for the external temperature sensor.

This sensor must be installed on the exterior of the vehicle; ideally the sensor should be placed near the rear bumper beam away from any heat source (exhaust or sun), or moving parts.

Default threshold is set at 0°C, but it can be modified with the computer interface. The system will only allow engine cut off when temperature is above the set parameter. It is important to set this temperature adequately to maximize the systems fuel saving ability.

Note: This feature will not function in keyless mode. See C2.13 for keyless mode activation.

0°C default threshold

Colder | Idle control
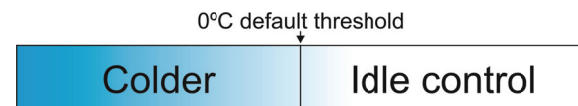
C2.7 – AINP0 PARK

This wire must be connected to the park signal on the vehicle. It is an Analog input. Using the computer interface it can be mad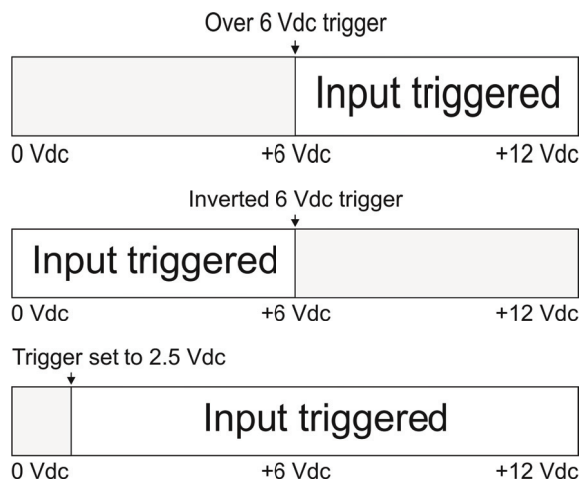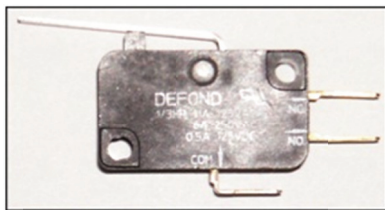e a positive or negative trigger and the threshold at which it is triggered may also be set anywhere between 0V and 12V. Details of the programming functionalities will be discussed in the programming section. This versatility will be needed on certain types of vehicles that use variable voltage values to determine park sense. On these exceptions, you might have to modify the voltage threshold preset in the module via the computer interface. An external pull-up or pull-down resistor might also be needed to be able to pull a reading from the park sense wire.

Note: This input can also be used to monitor voltage on an auxiliary battery bank. Please refer to the programming section for further explanation.

Over 6 Vdc trigger

	Input triggered
0 Vdc	+6 Vdc	+12 Vdc

Inverted 6 Vdc trigger

Input triggered	
0 Vdc	+6 Vdc	+12 Vdc

Trigger set to 2.5 Vdc

	Input triggered
0 Vdc	+6 Vdc	+12 Vdc

On rare exceptions there might not even be a park sensing wire on the vehicle. You will then have to install a limit switch positioned to be triggered by the shifter being in he park position. Positioning this limit switch will probably require you building a bracket of some sort, but it is still the simplest solution.

Picture of a typical limit switch

C2.8 – AINP1 NEUTRAL

The neutral wire signal can be used in certain installations. It is an Analog input. With the computer interface it can be made a positive or negative trigger and the threshold at which it is triggered may also be set anywhere between 0V and 12V. This versatility will be needed on certain types of vehicles that use variable voltage values to determine Neutral sense.

This input can also be used to monitor voltage on an auxiliary battery bank. Using the computer interface, it is possible to set this option and also its trigger voltage.. The system will restart the vehicle if the battery's power drops below a set voltage limit.

The NEUTRAL signal detection was included to prevent any user to bypass the idling reduction system by leaving a vehicle running with the transmission lever set in NEUTRAL position thus relying on parking brakes only for vehicle immobilisation.

Minimal voltage limit

| Batt. charging	Batt. monitoring
+10 Vdc	+12 Vdc	+14 Vdc
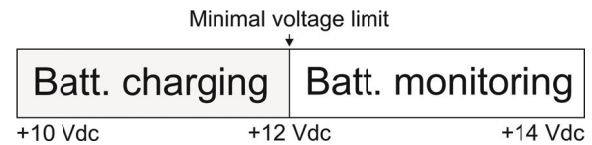
C2.9 – Tachometer signal

This input is used to monitor the tachometer reference signal. On some vehicles, a direct access to the tachometer signal is available. Otherwise, it is preferable to use a fuel injector signal.

C2.10 – Ignition Signal

This input monitors ignition position of the Key Switch. It is possible to use one of the wires on connector 1 (C1) that is already connected to one of the ignition wires, but you must use the one that is connected to the key side.

Protect the ignition signal with a 1 Amp fuse mounted as close as possible to the junction point.

1A

1 Amp in-line fuse holder
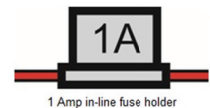
C2.11 – Output #5 (negative)

This programmable output is used for the BY-PASS mode. The functionnality of this mode of operation will be explained later in the programming section.

C2.12 – Output #6 (negative)

This programmable output is used for the BY-PASS mode. The functionnality of this mode of operation will be explained later in the programming section.

C2.13 – Keyless mode switch

A negative momentary impulse on this input will activate the keyless operation mode.

To activate this secondary mode of operation, the key must be taken out of the ignition switch before initiating the negative impulse. A momentary normally opened switch set to chassis ground must be used to activate this mode.
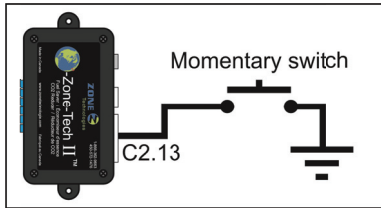
While in Keyless mode, the module can monitor and control passenger compartment temperature, battery monitoring/recharge (OEM and/or AUXILIARY) and perform accessory activation such as an electrical heater or other equipment.

C2.15 – Input #4 (INP4)

The functionnality of inputs INP0 to INP7 is identical. The main purpose of these inputs is to prevent engine shut down. However, they can also be programmed to start the engine if required. All inputs can be configured to respond to a negative or positive signal. They are normaly used to detect a signal from a door or hood pin switch, an electrical or mecanical system activation switch or for monitoring certain key equipment that could not function properly if the vehicles' engine is not in operation.

C2.16 – Input #5 (INP5)

This digital input shares the same characteristics described for Input #4. Refer to C2.15.

C2.17 – Input #2 (INP2)

This digital input shares the same characteristics described for Input #4. Refer to C2.15.

C2.18 – Input #3 (INP3)

This digital input shares the same characteristics described for Input #4. Refer to C2.15.
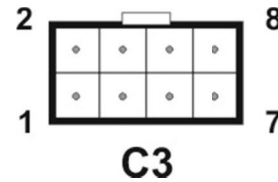
C2.19 – Input #0 (INP0)

This digital input shares the same characteristics described for Input #4. Refer to C2.15.

C2.20 – Input #1 (INP1)

This digital input shares the same characteristics described for Input #4. Refer to C2.15.

C3 – SECONDARY CONNECTOR

This connector groups includes various options to add functionalities to the system.

C3.1 – BCM input

When using the multiplex mode of operation, (which is required by some type of vehicles to execute a start sequence) this wire will need to be tapped on a reference of either 0V or 5V from the BCM.

When activating multiplex, the module will put a starting resistor in the circuit. This resistor will have to be set accordingly to your vehicles' key switch internal resistor. It will mimic the correct key sense resistance to allow cranking of the vehicle.

Note: Go to programming section for indications on how to configure the programmable resistor value.

C3.2 – Input #6 (INP6)

This digital input shares the same characteristics described for Input #4. Refer to C2.15.

C3.3 – Output #4 (+)

Output #4 is a positive programmable output. It is rated at 500mA.

It can to use for:

- Reproduce relay#1 activation signal
- Generate an ignition signal
  (relay, external modu activation)
- Reproduce the internal LED activation for easy system status visualisation
- Unlock doors
- Generate an alarm signal before engine start or low battery voltage detection
- Activate an ignition BY-PASS module
- Activate a climate control unit
- Indicate when keyless mode is activated
- Activate an external heater
- Generate a signal used to control a fast idle
- Generate an engine start or stop signal

C3.4 – Input #7 (INP7)

This digital input shares the same characteristics described for Input #4. Refer to C2.15.

C3.5 – Output #3 (+)

Output #3 is a positive programmable output. It is rated at 500mA.

This digital output shares the same characteristics output #4. Refer to C3.3.

C3.6 – Output #2 (negative)

Output #2 is a negative programmable output. It is also rated at 200mA.

It can be used to:

- Reproduce relay#1 activation signal;
- Generate an ignition signal;
  (relay, external module activation);
- Reproduce the internal LED activation signal;
- Unlock doors;
- Generate an alarm signal before engine start;
- Activate an ignition BY-PASS module;
- Activate a climate control unit;
- Indicate when keyless mode is activated;
- Activate an external heater;
- Generate a signal used to control a fast idle.

C3.7 – Brake signal output

The Brake signal output is a negative programmable output. It is rated at 200mA.

Note: Not currently used (For future expansion)

C3.8 – Output #1 (negative)

Output #1 is a negative programmable output. It is also rated at 200mA.

This digital input shares the same characteristics output #4. Refer to C3.3.

PROGRAMMING

SYSTEM FUNCTIONNALITY

The **O-Zone-Tech II™** module is an eco-friendly automotive fuel saving and CO_2 reduction system. It functions primarily on a timer that counts down idling time. During an idling period, after countdown is finished, the system will shutdown the engine on the assumption that fuel is being wasted. The system may void the countdown of the timer if certain conditions aren't meat. These conditions may vary between temperature settings, various activated switches, available battery power and online equipment that may require the vehicle to be left running.

The following steps will show you how to use and setup these various conditions and also how to setup the automated restart of the vehicle.

1. SOFTWARE OVERVIEW

The **O-Zone-Tech II™** software supplied with the module is required to program the operating parameters of the module such as engine RPM value, time delay before engine stop, engine start conditions, etc. It also gives the ability to visualise, in real time, the status of the signals that are connected to the module such as: battery voltage, RPM, etc.

The configuration file created by the software can be saved on a computer fot future usage or consultation.

As an added feature, an integrated data (idling time) upload function can be used to export stored information from the module to an EXCEL file format, providing easier visualisation of fuel saved (calculated by the software) per vehicle.

2. SOFTWARE INSTALLATION

IMPORTANT NOTICE:
Proceed with software installation before connecting the module to a USB port.

Insert the CD into the CD-ROM drive of your computer. The CD should start automatically

If the installation menu does not start, go to "Start"➔ "Run" and type in *d*:\setup.exe (where *d*: is your CD-ROM drive) and follow installation procedure.

When the software installation is completed, connect the module to the computer using a USB cable (the module must be powered and supplied with an IGNITION signal). Once the module has been detected, select "Manually select drivers" and click on the folder named "DRIVER" on the installation CD.

ATTENTION :   WINDOWS WILL ASK TO INSTALL THE DRIVERS TWICE. PROCEED WITH THE SECOND INSTALLATION.

Once « DRIVERS » are installed, start the O-Zone-Tech II™ configuration program and make sure the module is properly powered (battery power and ignition signal).

From the menu bar, select the « Ports » drop down menu under the « Configuration » tab to set the communication port required. Once done, press the « Connect » tab to establish communication with the module. The connection status (bottom left) of the program should change to « Connected ». Signal values like RPM (If engine is running), battery voltage or any activated inputs should be displayed in the software.

If no communication can be established, first try to disconnect and reconnect the USB cable, verify computer port settings and USB cable integrity.

Once connected, the program will ask to upload module data onto the computer. Click « YES » to synchronise the module with the software. You are now able to set all the required working parameters for your vehicle.

3. PROGRAM DESCRIPTION

O-ZONE-TECH II™ SOFTWARE MAIN PROGRAMMING WINDOW
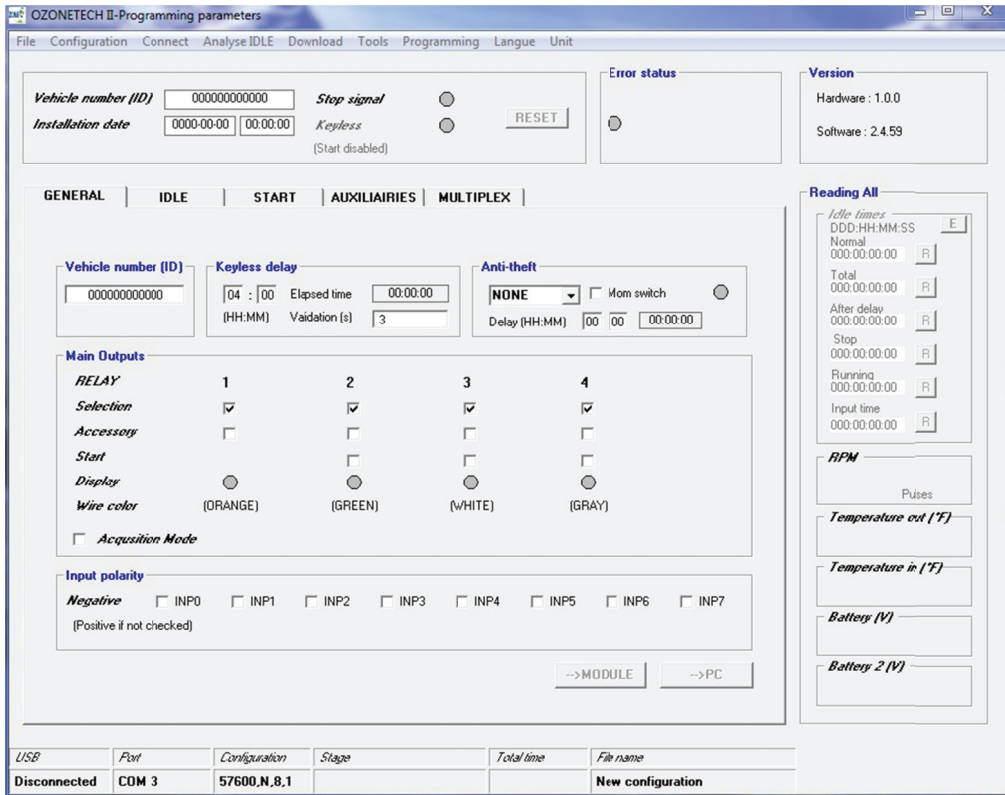
Menu description:
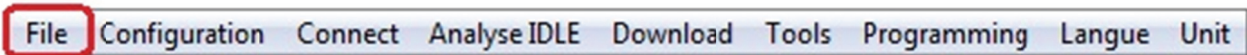
This tab lets you manage your setup files (*.ozt) within your computer. You can save, load and create new setup files.

The « Configuration » tab is used to select which USB port you want to use for communication.

The « Connect » tab from the top menu is used to initiate communication with the module.

File   Configuration   Connect   **Analyse IDLE**   Download   Tools   Programming   Langue   Unit

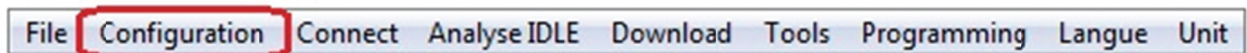The « Analyse IDLE » selection tab is used to access the files generated by the module internal timers. The values gathered by the module can be exported to an EXCEL file format.

File   Configuration   Connect   Analyse IDLE   **Download**   Tools   Programming   Langue   Unit

Download to PC : Download a setup file from the module to the computer for viewing.

Upload …………: Upload the current setup file to the module.

File   Configuration   Connect   Analyse IDLE   Download   **Tools**   Programming   Langue   Unit

- **Calibration:**

  - *Voltage:*

    Battery voltage calibration measured by the module.

    Calibration is needed when there is a voltage offset between the battery voltage measured from module and the one measured directly at the battery. Required when offset is too important.

    To perform calibration: Measure the voltage directly at the battery therminals. In the calibration window, insert the measured voltage in the « New » box. Once entered, click the « Program » button to adjust the voltage measured by the module.

  - *RPM:*

    RPM calibration of the module's tachometer pulse input.

    Calibration is required when the difference of the measured RPM and the actual engine RPM value is too important. (The RPM value measured by the module doesn't necessarely represent the real engine RPM. It depends on where the signal is coming from.)

    To perform calibration: Write the value displayed by the tachometer (while the engine is idling) in the « New » field of the « RPM calibration » window. When entered, a click on the « Program » button will adjust the displayed value to the real engine RPM.

  - *Temperature:*

    Tempereature calibration of both the internal and external temperature sensor.

    Calibration is required when offset is too important.

    Top perform calibration: Using a thermometer placed near the system temperature sensors, write the measured value in the corresponding temperature calibration box (external or internal sensor). When the temperature is entered, click « PROG. » to calibrate the corresponding temperature reading. Both sensor can be calibrated using this method.

  - *Voltage (Analog inputs):*

    Analog inputs (Park, Neutral & Starter (N.O.)) calibration.

    An analog signal input calibration is needed when an offset between the voltage measured by the module and the voltage measured directly at the source is too important.

To perform calibration: Measure signal voltage as close as possible to the source using a voltmeter. When the new voltage is entered in the corresponding calibration box, click « PROG. » to adjust voltage.

▪ **Installation date:**

This function is used to set the file creation date for a vehicle.

▪ **Manual interface: (reserved)**

Engineering development tool. Used to send output control commands or information request to the module. This tool should be used by experienced users only.

▪ **État module: (Module State)**

Mudule information window used to regroup module information found in the lower status field of the O-Zone-Tech II software and voltage input from battery 1 and 2. This window was required for laptop users before software scrollbar implementation. (No longer required: Will be removed from future software reversion)
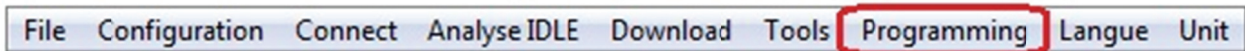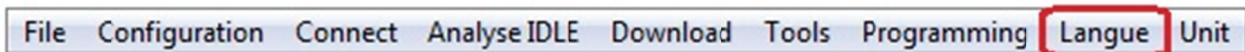

This tab is used to update the **O-Zone-Tech II™** firmware.

- Firmware updates can be downloaded from **www.zonetechnologie.com**.

At the Firmware update window:

- Click « File » and select « Open » from the menu.

- Select the « *.hex » file previously downloaded from web site and click on the « Load » button.

Note: Updating the firmware will not overwrite the module setup file.

Software language selection. (French and English)
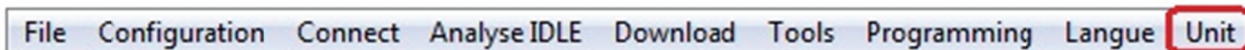
Tab used to select between metric and US unit system.

Box → Vehicle information

| Vehicle number (ID) | 000000000000 | Stop signal | ◯ | RESET |
| Installation date | 0000-00-00 00:00:00 | Keyless (Start disabled) | ◯ | |

Vehicle identification and module installation date.

The virtual « Stop signal » LED change from grey to green when the module detects a stop condition. A stop condition resets the main timer.

The virtual « Keyless » LED change from grey to green when the keyless mode is activated.

Box → Error status

Error Status: The virtual « Error status » LED change from grey to green when the module fails to start the engine. (When programmed engine start retry as been reached)
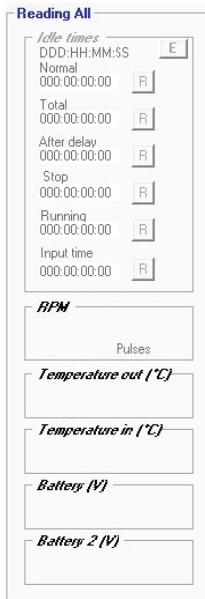
Box → Version

Version:

Used to identify hardware (module Firmware) and software revision.

Hardware : Indicates the firmware version programmed in the module.
Software   : Indicates O-Zone-Tech II computer software version.

Box → Reading All:

Reading All:

- **Idle times :** ....Real time display in days, hours, minutes and seconds of the five idling timers and the input timer. A click on « E » button will reset all timers and a click on « R » button will reset the associated timer (positioned to the left of it).
- **RPM :** ....Real time display of the engine RPM. Estimated from the tachometer signal pulses.
- **RPM (Pulses) :** ....Real time display of the tachometer pulse frequency. The displayed signal format is: Pulses/sec.
- **Temperature out (°C) :** ....Real time display of outside temperature. (In °C or °F depending on the system of units selected)
- **Température in (°C) :** ....Real time display of inside temperature. (In °C or °F depending on the system of units selected)
- **Batterie (V) :** ....Real time voltage display of OEM battery (V).
- **Batterie 2 (V) :** ....Real time voltage display of auxiliary battery (V).

Bottom system status field:

USB	Port	Configuration	Stage	Total time	File name
Disconnected	COM 3	57600,N,8,1			New configuration

- **USB :** .... USB port status display (connected or disconnected).

- **Port :** .... Virtual communication port identification display.

- **Configuration :** .... Virtual communication port configuration display.

- **Stage :** .... Current system status display.
    - **IDLE CONTROL :** ..... The system is monitoring engine idling.
    - **CHARGING :** .... Following a low battery voltage detection or if passenger compartment temperature exceeds programmed range set (if programmed), the system restarts the engine for the recharge period.
    - **MONITORING :** .... Following engine shutdown by the module, the system monitors the battery voltage.
    - **START :** .... The system restarts the engine to recharge the battery for the programmed time.

- **TOTAL TIME:** ... Engine stop main timer display.

- **FILE NAME :** ..... Displays the name of the configuration file being used.

CONFIGURATION TABS

G E N E R A L :

The General tab allows you to perform the following configurations :

- **Vehicle number (ID) :**

  Case d'identification du véhicule (caractères alphanumériques).

- **Keyless delay :**

  Maximum time allowed for « Keyless mode » system operation.

- **Anti-theft :**

  Maximum time allowed for « ANTI-THEFT » mode.

- **Main Outputs :**

  Outputs relay activation selection.

  - **Selection :**................. « Ignition mode » relay activation check box.

  - **Accessory :**............... « Accessory mode » relay activation check box.

  - **Start :**........................ Relay activation on engine Start signal (Relay #2, #3 and #4 only).

  - **Display :**.................... Visual display of relay activation (grey= deactivated, green= activated).

  - **Wire color :**.............. Wire color identification for each output relays.

  - **Acquisition Mode :**.. Operating mode used to count useless idling without engine shut down. Allows to know how much engine idling would have been saved if the stop engine mode was activated (Delay timer).

▪ **Input polarity :**

These check boxes are used to set the activation signal polarity for each digital inputs. When checked, the corresponding input is activated with a negative signal, otherwise the input is activated by a positive signal.

I D L E :

The « IDLE » selection tab is used to set engine stop parameters

When an input is activated, the associated virtual LED indicator switches from gray to green. These entries serve as conditions to prevent the module to stop the engine. When an input is activated, the counter stop is reset and the motor does not stop.

▪ **Inputs configuration :**

- **RPM** : .... Idling setpoint. If the value of the engine RPM is above the setpoint, the motor does not stop and stop the counter is reset.

- **Total time before stopping :** .. Maximum period of time allowed to leave the engine idling. When all conditions are met, the system activates the timer. Once the time limit is reached, the system (module) stops the engine. The default factory value for this period was set at 15 seconds for testing during installation. Once installation is complete, change this value to suit your needs (usually set to 3 minutes).

▪ **Input-Excluding RPM :**

Digital input selection (INP 0 to 7) used to cancel engine RPM detection. When an input is selected, its activation will force the module to overlook the actual engine RPM and consider it to run at idling speed.

▪ **Digital inputs :**

Digital inputs configuration.

- **Selection :** .... Activates its associated input.
- **Inversion :** ... Selecting this option will activate the input only when there is no signal applied to it.
- **Stop :** .... A signal detection will reset the module.
                            (Keyless mode only)
- **Display :** ...... Visual display of digital inputs activation (grey=deactivated, green=activated).
- $\boxed{\text{v}}$ **:** .... Activates the menu that brings up the input selection to reset the fast idling option output (Reset F. Idling). To activate this button, the fast idling option must be selected in the « Auxiliary Outputs » menu (OUT1 to OUT4).

▪ **Analog inputs** :

Same functionality as for digital inputs, but activation is triggered by the input voltage going below the programmable setpoint.

It is possible to configure these inputs to monitor the voltage of an auxiliary battery.

(Consult « Engine start : Condition 2 »

- **Selection :** .... « PARK and NEUTRAL » analog input activation check boxes.
- **Inversion :** ...... Used to invert signal detection logic. If not checked, a signal input voltage over the programmable limit will trigger the input detection, if checked, the signal detection will be triggered when the signal is below the programmable voltage limit.
- **Limit (v) :** .... Voltage limit for signal detection.
- **Stop :** .... Module reset check boxes.
                            (Keyless mode only)
- **Display :** .... Visual display of analog inputs activation (grey=deactivated, green=activated). The boxes located to the right of both virtual LED are used to display signal input voltage.

▪ **Imputs combination :**

AND gate type input logic combination. Both selected inputs will have to be triggered for valid signal activation.

▪ **Counter on :**

Associates the « Input time » timer to the selected input. This feature is used to display activation time of the selected input.

▪ **Door open Detect :**

One of the digital inputs connected to a door switch is used to activate the START or STOP counter.

▪ **Outside Temperature (°C or °F) :**

Prevents engine shut down when temperature is below programmable value.
- **Enable 2nd time :** .... New database downtime when the outside temperature is below the setpoint.

S T A R T :

Enable starting the vehicle (STARTER):

This option must be activated to allow automatic engine restart. « Starting Configuration » menu will only be available if this check box is activated.

Starting Configuration :

▪ **Start Output :**

« OUT1 to OUT4 » output selection. Output activation will be synchronised with « STARTER » signal.

▪ **Anti-Starting (Hood) :**

Digital input selection used for Hood pin detection. Will prevent engine startup if the signal is detected.

The reset check box is used to prevent engine shut down when hood is opened.

▪ **Input STARTER NO :**

STARTER signal input detection setup used to reset the module when the engine is restarted by the user.

The « Inversion » check box is for vehicle with a starter requiring a ground activation signal.

A voltage threshold can be programmed to detect engine start by the user. (The box located at the right of the input voltage limit is for displaying actual input signal voltage)

▪ **Conditions :**

- **V. BATT. VEH. (V) :** ....Low voltage threshold. The engine is restarted to recharge battery when voltage drops below this programmable value.

- **Temperature in Min (°C) :** ....Low temperature setpoint. The engine is restarted when temperature drops below programmable value to reheat passenger compartment. (An optional temperature sensor is required)

- **Temperature in Max (°C) :**.............High temperature setpoint. The engine is restarted when temperature goes beyond programmable value to cool down passenger compartment.
(An optional temperature sensor is required)

- **Hystérésis (+) :**...............................Temperature setpoint for engine shut down. After an engine restart caused by a low temperature detection, the engine will be shut down when temperature reaches this programmable setpoint.

- **Hystérésis (-) :**................................Temperature setpoint for engine shut down. After an engine restart caused by a high temperature detection, the engine will be shut down when temperature drops below this programmable setpoint.

- **With T. out (°C) :** ....Temperature setpoint used to disable engine restart when the passenger compartment reaches « Temperature in MAX. ». Required for vehicle equipped with an auxiliary heater.

▪ **Conditions (Input for Battery 2) :**

Auxiliary battery voltage monitoring.

- **Input for Battery 2 :**..........« PARK » or « NEUTRAL » input selection for auxiliary battery voltage monitoring.

- **V. BAT. AUX. (V) :** ....Auxiliary battery low voltage setpoint. When reached, the engine is restarted to recharge the auxiliary battery.
(Engine is restarted when 1 battery reaches its setpoint (OEM or auxiliary))

▪ **Starter :**

Engine cranking setup parameters. (With glow plug delay, for diesel engines)

- **Delay (sec) Max. 60 secs :**.... Delay in seconds, before engine cranking, after ignition signal activation.

- **Duration max (sec) :**............ Maximum duration (in seconds) of starter signal.

- **Number of trials :**................ Number of trials allowed to restart the engine.

- **Period between trials (sec) :** Delay (in seconds) between each engine restart attempt.

▪ **Charging (min) :**

Time (in minutes) that the system leaves the engine running to recharge the battery.

▪ **Starting pulses :**

RPM signal frequency required to consider the engine to be running. Usually programmed to half the value at idle when the engine is hot. Increment the value if the engine does not crank long enough, otherwise reduce.

▪ **Reset to start :**

Resets the module to idle control upon selected input activation (Reset).

The « Inversion » check box will reset the module when there is no signal.

▪ **Input-Start :**

Select one digital input (INP0 to INP7) in this box to force the engine to Start when an activation signal is present on it. For example, a vehicle whose engine is stopped can be started as soon as the driver's door is opened or a brake pressure is detected.

A U X I L I A I R I E S :
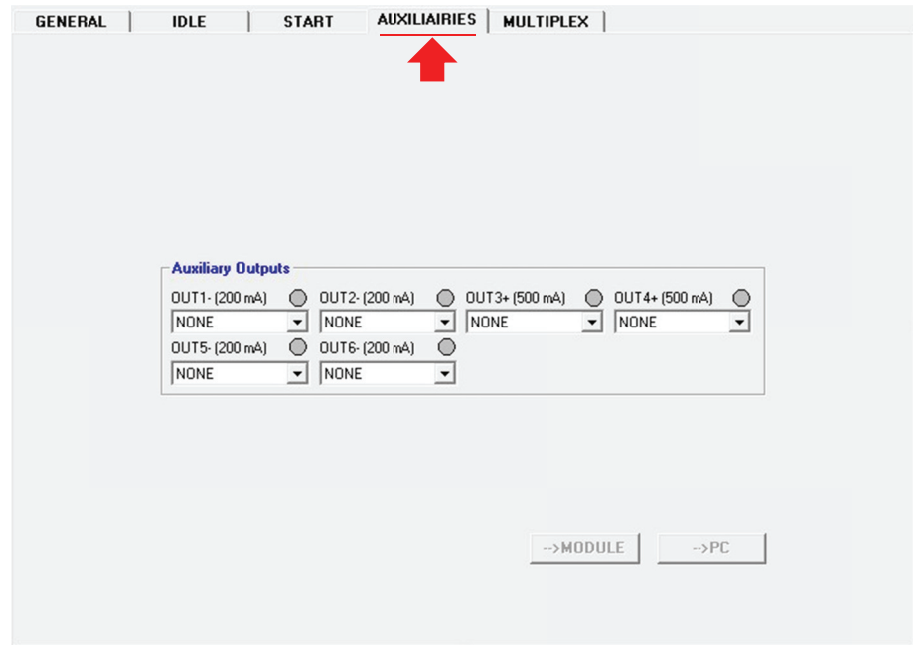
Outputs **1**, **2**, **5** and **6** are negative outputs **(200mA max.)**. **Outputs 3** and **4** are positive outputs **(500mA max.)**. These outputs are not protected by fuses. The installer must take necessary precautions to protect these outputs.

Output (OUT1 à OUT4) configuration :

- **RELAY1 :**

  The output will be identical to the activation signal of relay # 1 (from « General » tab).

- **IGNITION :**

  In keyless mode, the output will simulate the ignition signal. Otherwise the activation will follow the ignition signal generated by the ignition key.

- **EXT. LED :**

    - **Internal LED :** ..Le signal de sortie reproduit l'état de la DEL verte du module. Comme le module est fréquemment monté sous le tableau de bord, une DEL supplémentaire facilite l'inspection visuelle de l'état du module.
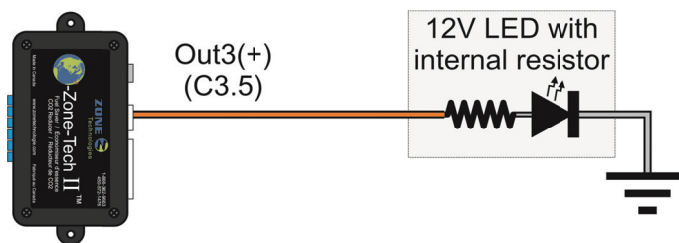
Wiring example of a 12V LED connected to OUT3+ set to EXT. LED.

- **Off Engine status :** .... The output will be active when the system stops the engine.
- **Stop signal status :** .... The output will be active if a stop signal is detected.
- **Keyless only :** .... The output will be active if the module goes in keyless mode.

- **DOOR-UNLOCK :**

    Some vehicles are equipped with an automatic door lock feature when the engine is shut down. To prevent a user from being locked out, a door unlock signal is generated after the engine has been shut down and the programmed signal delay has expired.

    - **Delay before signal out (sec) :**......Delay before door unlock signal activation.
    - **Signal duration (sec) :** ....Pulse signal duration, in seconds, for door unlock.

- **ALARM :**
    Alarm signal to warn that the engine will restart.
    If there is no scheduled engine start, the output is activated when the battery voltage is low.

- **BYPASS :**

    The output is activated to start a vehicle equipped with a smart key (works in keyless mode only). See « Connection diagrams » section for wiring example about « BYPASS » connections for the « PASSLOCK » circuit. Requires a « BYPASS » module.

- **CLIMATE :**

    This output configuration allows the use of an auxiliary heating or air conditioning system.

- **KEYLESS :**

    The output is active when « Keyless mode » is activated.

- **HEATER :** (Auxiliary heating system activation.)

    The output activates when the engine stops.

- **F. IDLING :**

    Signal used to activate a fast idling module. The vehicle must be equipped with an idling acceleration module.

- **AUT. STOP :**
    The system will activate the auxiliary output one second before the engine is shut down.
    (For powering accessories before turning off ignition signal)

- **STPSTR PULSE :**

    International 7500 (2011) « STOP-START » control signal. On these vehicles, no IGNITION, ACCESSORY or STARTER wire is available.

M u l t i p l e x :

The « MULTIPLEX » mode is used when the vehicle is equipped with a multiplexed ignition system (the ignition signal voltage varies between 0 and 5V, depending on ignition key position). These vehicles require a specific voltage on the ignition wire to be able to start the engine. The procedure requires to apply a resistor on the ignition wire when cranking the engine. The module is equipped with a programmable internal resistance that can reproduce the voltage needed to start this type of vehicle. **To use this option, it is important to make no battery connections to C1 (Batt2). If the installer fails to observe this notice, the module will suffer damage not covered by warranty.** To function, the « PCM » input from connector C2 (position #1) must be connected to the vehicle chassis (ground) or the « BCM » reference signal (5vdc). (Depending on the vehicle type, see connections diagram examples in the ELECTRICAL WIRING SCHEMATIC section.)
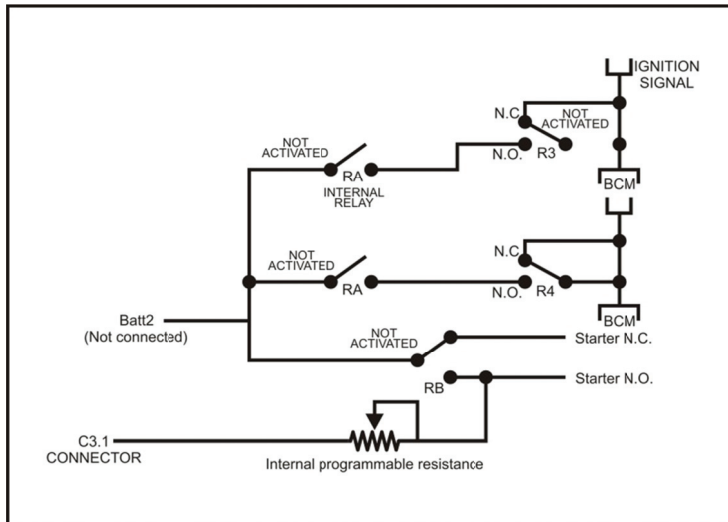
WITH IGNITION KEY				WITHOUT IGNITION KEY			
	RB	RA	R3/R4		RB	RA	R3/R4
START	ON	ON	ON	START	ON	ON	ON
STOP	OFF	OFF	OFF	STOP	OFF	OFF	OFF
IGN	OFF	OFF	OFF	ING	OFF	ON	ON

O-ZONE-TECH II™ WIRING DIAGRAM

Wiring example : C1 and Ignition switch

Ignition switch

Connectors must be mounted as shown

C1 wire list (upper):
- #2: 12V Batt. (Red 18AWG)
- #4: T2, TMP2 INT., (2)(+), Red (Sensor), 6'
- #6: T1, TMP1 EXT., (2)(+), Red (Sensor), 14'
- #8: AINP0, PARK in (Purple 22AWG)
- #10: Ignition (Red #22AWG)
- #12: OUT6 (-), (Black #22AWG)
- #14: Not connected
- #16: INP5 (Brown 22AWG)
- #18: INP3 (Grey 22AWG)
- #20: INP1 (Grey/Black 22AWG)
- #19: INP0 (Blue 22AWG)
- #17: INP2 (Green 22AWG)
- #15: INP4 (White 22AWG)
- #13: Autonomus mode switch (Yellow 22AWG)
- #11: OUT5 (-), (Black/Blue 22AWG)
- #9: RPM in (White/Black 22AWG)
- #7: AINP1, NEUTRAL signal (Purple/Black, #22AWG)
- #5: TMP1, Ext (1)(GND), Sensor wires (X2), (Black)
- #3: TMP2, INT (1)(GND), Sensor wires (X2), (Black)
- #1: GND (Black #18AWG)

C2 / C3 wire list (left):
- #8: OUT1 (-), (Green/Yellow 22AWG)
- #6: OUT2 (-), (Black/Yellow 22WG)
- #4: INP7 (Pink 22AWG)
- #2: INP6 (Brown/White #18AWG)
- #1: PCM in (GND or 5V), (Light green 22AWG)
- #3: OUT4 (Light green/Black 22AWG)
- #5: OUT3 (Orange 22AWG)
- #7: Brake output (Blue/Black 22AWG)

O-Zone-Tech II™
Fuel Saver / Économiseur d'essence
CO2 Reducer / Réducteur de CO2
ZONE Technologies
1-866-362-9663
450-572-1475
www.zonetechnologie.com
Made in Canada   Fabriqué au Canada

USB   C3   C2   C1

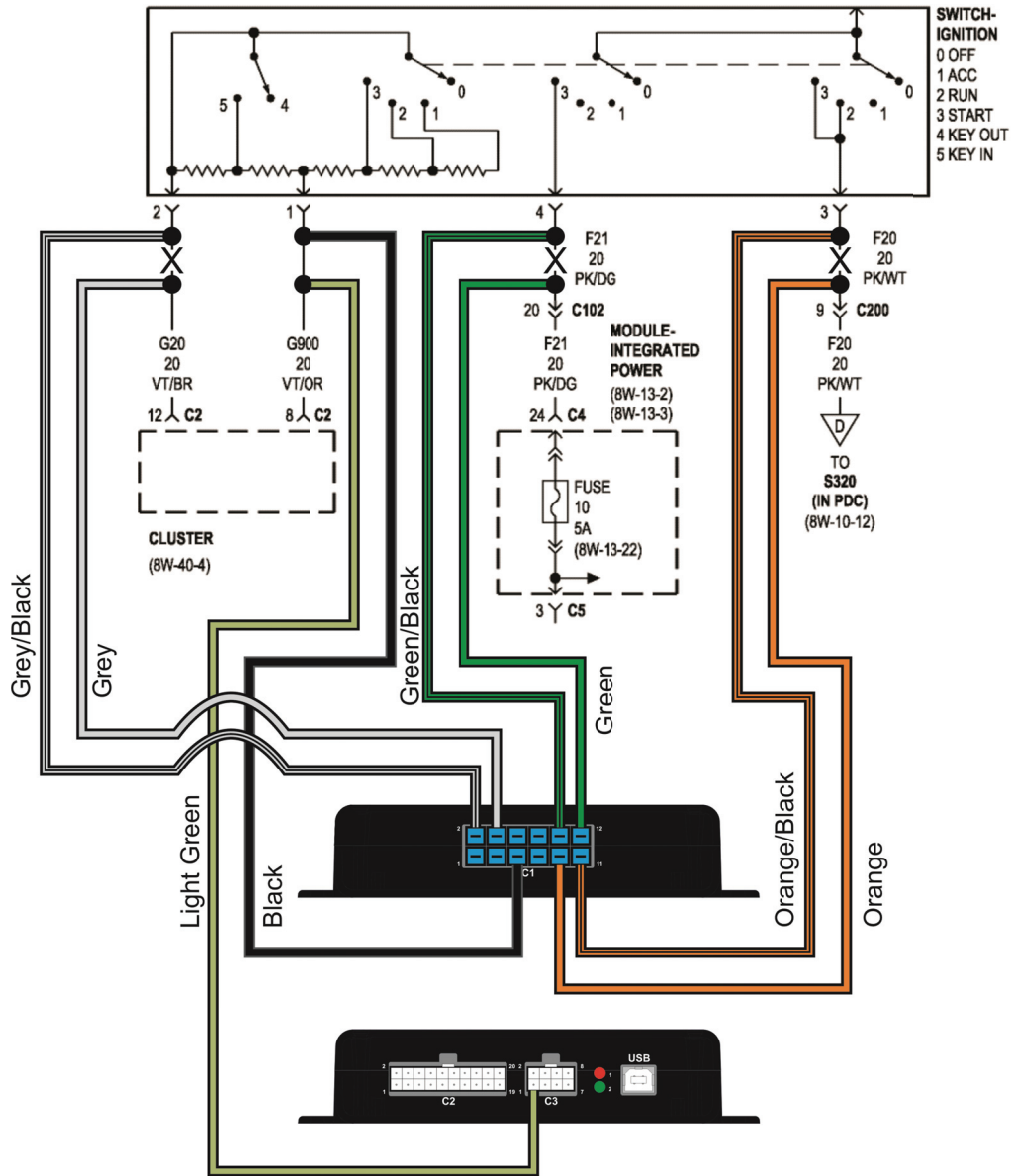|	HD	ST
#12: REL2 (COM), (Green)	(12AWG)	(18AWG)
#10: REL2 (NC), (Green/Black)	(12AWG)	(18AWG)
#8: REL3 (COM), (White)	(12AWG)	(18AWG)
#6: REL3 (NC), (White/Black)	(12AWG)	(18AWG)
#4: REL4 (COM), (Grey)	(12AWG)	(18AWG)
#2: REL4 (NC), (Grey/Black)	(12AWG)	(18AWG)
#1: 12V (Batt. 2), (Red/black)	(12AWG)	(16AWG)
#3: Starter (NO), (Blue)	(12AWG)	(18AWG)
#5: Starter (NC), (Black)	(12AWG)	(18AWG)
#7: 12V (Batt. 1), (Red)	(12AWG)	(16AWG)
#9: REL1 (COM), (Orange)	(12AWG)	(18AWG)
#11: REL1 (NC), (Orange/Black)	(12AWG)	(18AWG)

« Passlock » circuit « Bypass » wiring example for
Chevrolet Express **(2003 to 2007).**

Theft Deterrent System Schematics

Note: The steps to determine the resistance value to be applied are:
1- Start the engine
2- Cut the yellow wire
3- Measure the resistance value
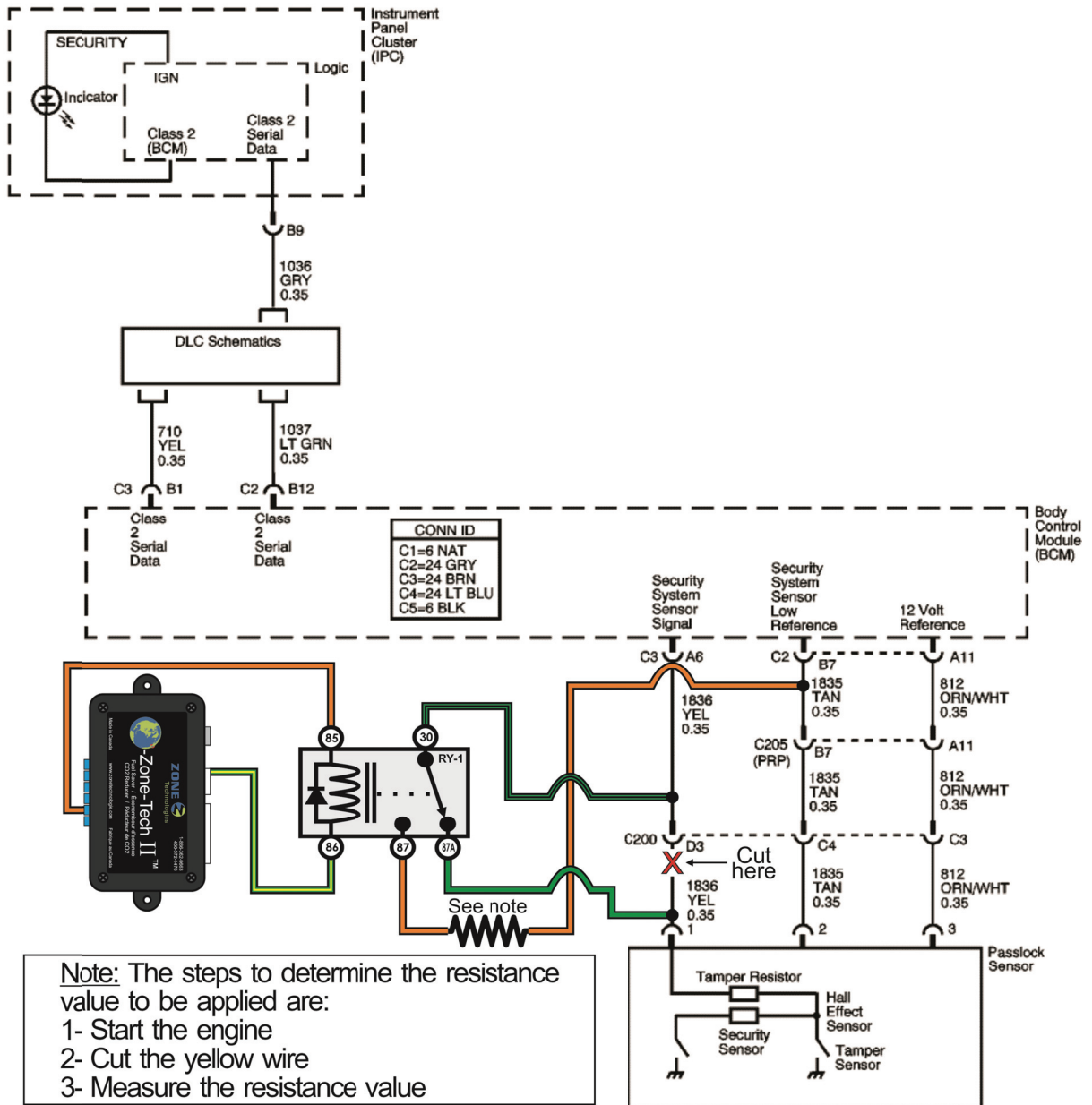
Multiplexed ignition switch wiring example (Dodge Charger 5.7, 2006)

Multiplexed ignition and accessory wiring example :

A multiplexed signal is a wire which we use to make several functions according to the voltage applied to it.

Impala 2009

**Resistance 1.3K = Starting
No resistance = accessory
5 volts reference from BCM**
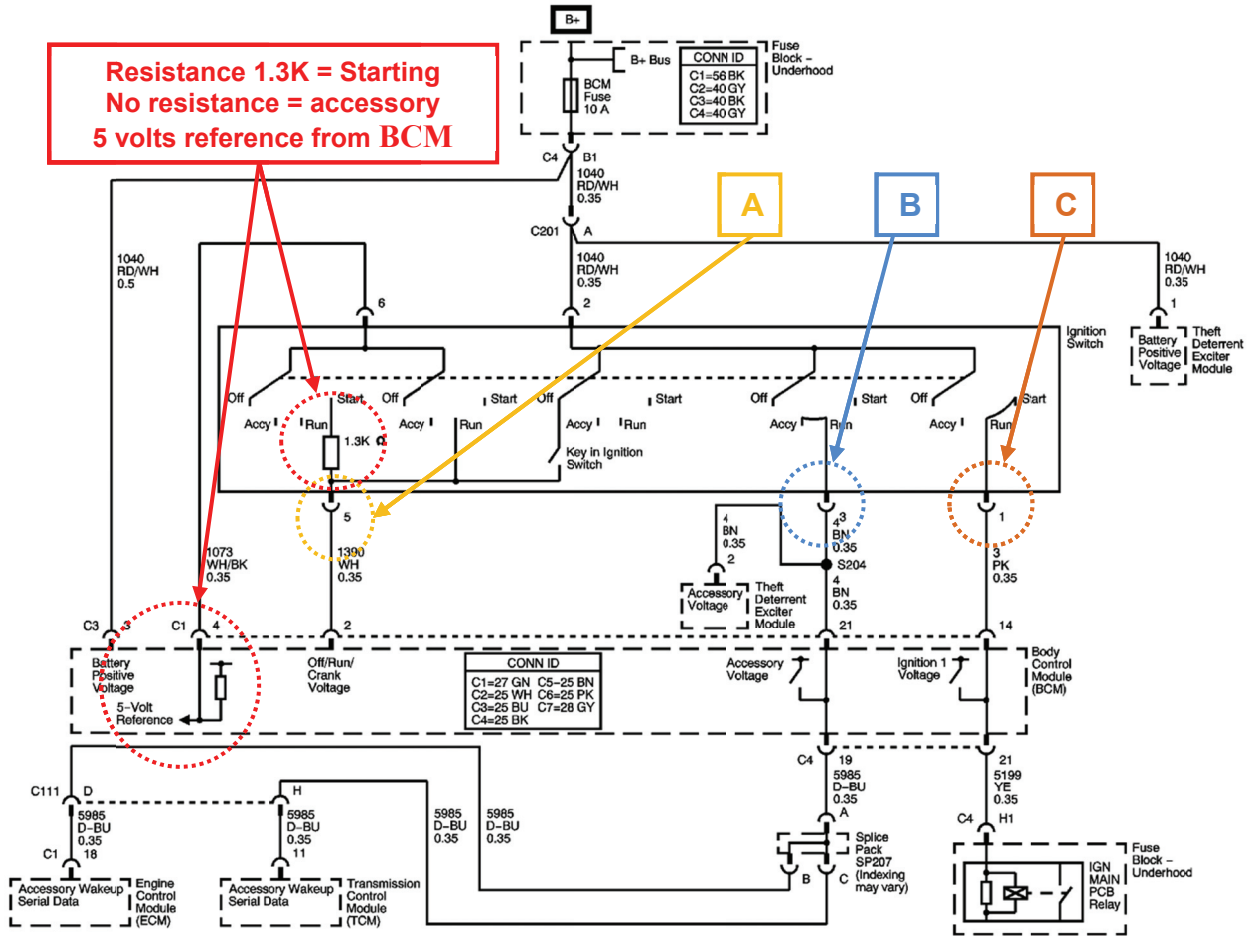
When you test these wires with a multimeter, with regard to the mass, you should have the following readings:

	Position key:				CIRCUIT
	OFF	**ACC**	**RUN**	**START**	
🟨	12V	0V	5V	2.3V	**Multiplexed**
🟦	0v	12v	12v	0v	**Accessory**
🟧	0v	0v	12v	12v	**Ignition**
🟥	To measure the resistance when starting the engine, cut the *white* wire and measure the resistance (in Ohms) between the *white* wire (key side) and the *black/white* wire (BCM reference).				

Multiplexed start and accessory wiring example with 12Vdc start signal :

Dodge Caravan 2005
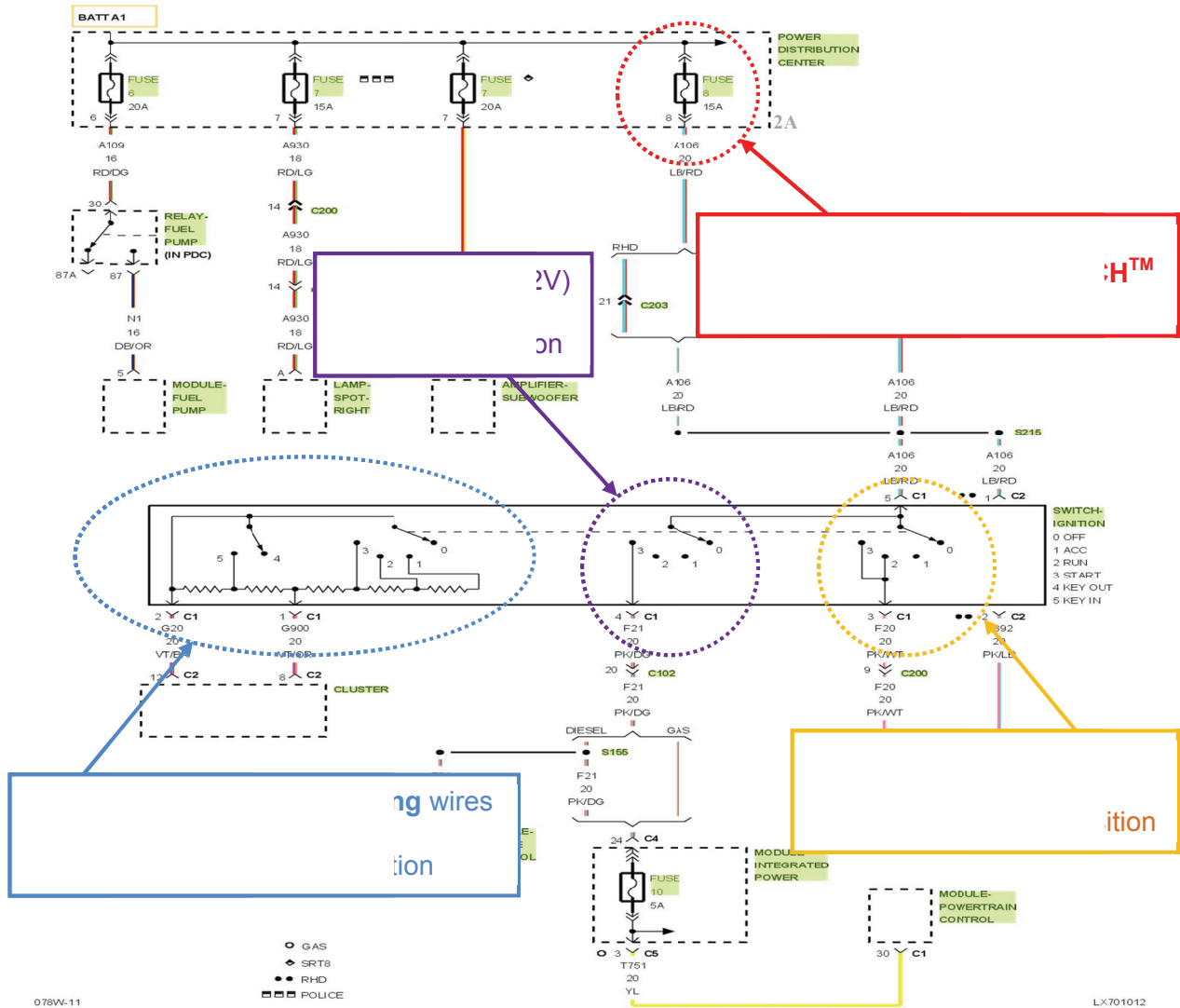
To measure the resistance value, you have to cut the *violet/brown* wire and measure (in Ohms) the resistance between the *violet/brown* wire (key side) and the *violet/orange* wire with the ignition key in "*START*" position.

If using the keyless mode, you have to measure the resistance value in the "*RUN*" also. Install the equivalent resistance value read in the "*RUN*" position between the black wire (**O-Zone-Tech II™**: C1, pin #5) and the reference (purple/orange wire).

NOTES

NOTES

LIMITED WARRANTY

Zone Technologies guarantees its O-Zone-Tech II™ system for duration of 24 months from the date of purchase or the date of delivery. Zone Technologies products are tested inspected and certified free of manufacturing defects. Zone Technologies guarantees all internal components for duration of 24 months.

During this 24-month period, any product deemed defective will be repaired at *Zone Technologies* facilities, or replaced.

Inappropriate use, incorrect installation, tampering, or any other procedure that does not conform to the manufacturer's guidelines, automatically voids this warranty.

Zone Technologies declines responsibility for any damages due to misuse, negligent behaviour, or repairs attempted or carried out by third parties. No warranty, written or otherwise, will be recognized.

Zone Technologies reserves the right to repair or replace a faulty product, at its own discretion. *Zone Technologies* accepts no responsibility for removal or installation fees for the product requiring maintenance and/or repairs.

Zone Technologies **states clearly that it will not be bound by any other warranty (whether expressed or implied) for intrinsic quality, merchandising quality, or efficacy for a particular purpose.**

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