

## TIC-1000

### Timing & Ignition Control Module

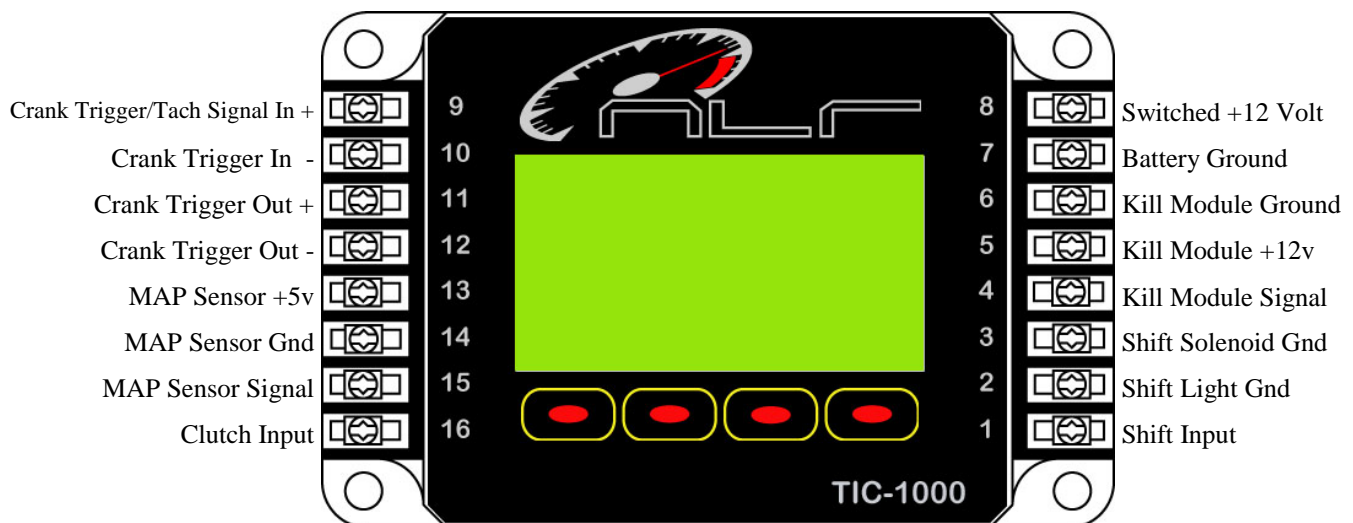
#### Overview

The TIC-1000 has been designed to control the Ignition Timing of late model Sport Bikes and also offers additional features. A built in Launch RPM (2-step) and Programmable Ignition Kill feature is available if the Optional IKM-001 Ignition Kill Module is installed with the TIC-1000.

Other features include, Timing Retard based on MAP Sensor Input (Boost Retard), Timing Retard based on Gear Position, Anti-Lag Timing Retard that is active while the 2-step is active, Shift Lite output, Launch Lite, Shift Solenoid output. Please see individual sections for more information on each feature.

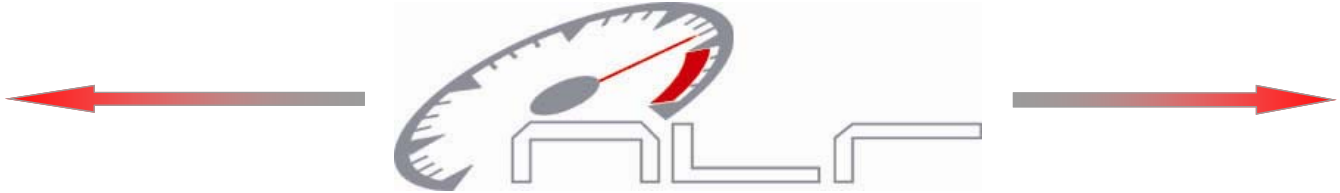
A Graphical user interface has been developed to aid the user in setting up and using the TIC-1000. Drop down menus are provided as well as 2-D Graph editing. A built in Help Wizard is provided to aid the user. This Help feature can be turned ON/OFF by the user.

A custom Crank Shaft Trigger setup option is also available to the user. This allows the user to configure the TIC-1000 to work with motorcycles that are not listed in the Make, Model Setup menus. Please see the “Configure TIC-1000” section in the Setup Menu for more information.



**Important**—Always turn power Off and then back On after configuring the TIC-1000 for a New Make and/or Model. This insures that a full Hardware and Software Reset is applied.

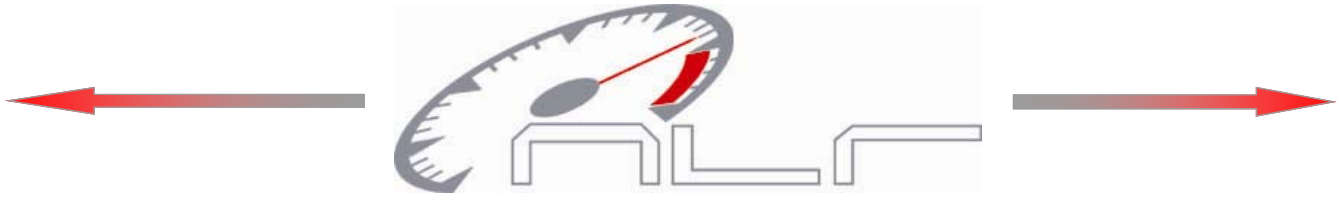
**Important**—Always Return to the Main Screen after changing any settings. The TIC-1000 MUST be on the Main Screen for proper operation!



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## Quick Start Guide

1—Install the TIC-1000 as outlined in the Installation Section.

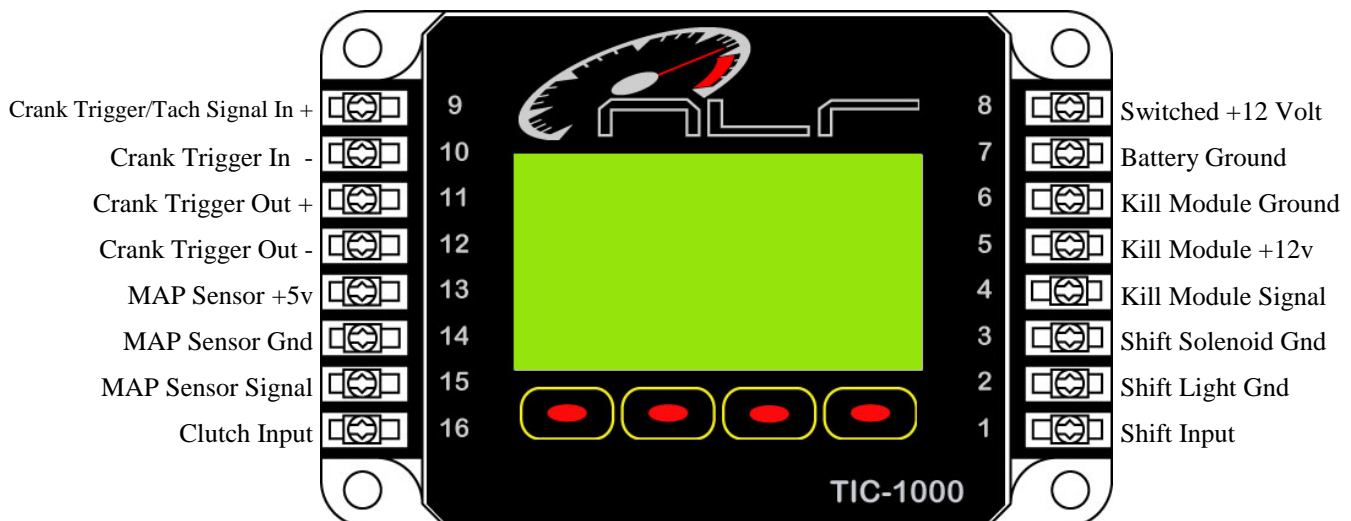
2—Turn on the TIC-1000.

3—The TIC-1000 will default to the Help Wizard screen the first time it is powered up. Use the Scroll buttons to read the help text and follow the on screen instructions to select your make and model.

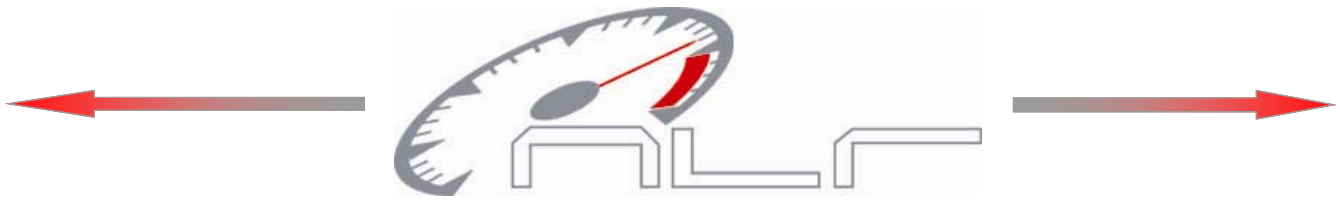
**Note**—If your make and model is NOT listed then you will need to Manually Configure the TIC-1000. Please see the “Configure TIC-1000” section in the Setup Menu for more information.

4—By default the TIC-1000 Help Wizard is ON. When selecting from the user menus you will be prompted to view Help Messages for the current selection. You may select Yes to view help, No to bypass the help screen, or Off to disable the Help Wizard.

**Note**—The Help Wizard can be turned ON/OFF using the Setup Menu.



**Important**—Always Return to the Main Screen after changing any settings. The TIC-1000 MUST be on the Main Screen for proper operation!



**Setup Menu**—Note, always turn power Off and then back On after configuring the TIC-1000 for a New Make and/or Model. This insures that a full Hardware and Software Reset is applied.

### **Configure TIC-1000**

**Select from List**—Use this to select your Make-Model-Year of motorcycle and/or Manually configure the TIC-1000 as needed. The TIC-1000 needs to know how many Pulses Per Revolution the Crank Trigger has and if there are any Missing Pulses. If your Make-Model-Year is NOT listed then you Must manually configure the TIC-1000.

#### **Manually Configure—Crankshaft Trigger Input Mode**

**PulseCount**— This is the number of Crankshaft Trigger signals per revolution. If there are Missing pulses these must included with this setting. Example - The trigger wheel has 22 positions and there are 2 positions with no trigger(missing pulses). The correct Pulse-Count would be 24. Only adjust this setting if your motorcycle is NOT listed and you must Manually Configure the TIC-1000.

**MissingPulseCount**—This is the number of Missing pulses on the Crankshaft Trigger wheel. Typical settings are 0 for 8 pulse triggers, 1 or 2 for 24 pulse triggers.

**StartTriggerLevel**—This sets the minimum voltage level for the Crankshaft Trigger input. Example - .25 would equal .25 volts or 250mV signal level during startup. The Crankshaft Trigger voltage will rise with engine RPM and the Starting and Running voltages are programmable. These are adjustable so that electrical noise can tuned out. Valid Range is .10 volts to .50 volts.

**RunningTriggerLevel**—This sets the maximum voltage level for the Crankshaft Trigger input when the engine is running. Example - .50 would equal .50 volts or 500mV signal level while running. The Crankshaft Trigger voltage will rise with engine RPM and the Starting and Running voltages are programable. Valid Range is .50 volts to 3.00 volts.

**TriggerAdjustRpm**—This is the Rpm when the Crankshaft Trigger voltage switches from the Start level to the Run level. Valid Range is 500 Rpm to 2,000 Rpm.

#### **Manually Configure—Tach Signal Input Mode**

**TachPulseCount**—This is the number of Tach signal input pulses per revolution of the engine. Valid Range is 1 to 4 pulses per revolution.

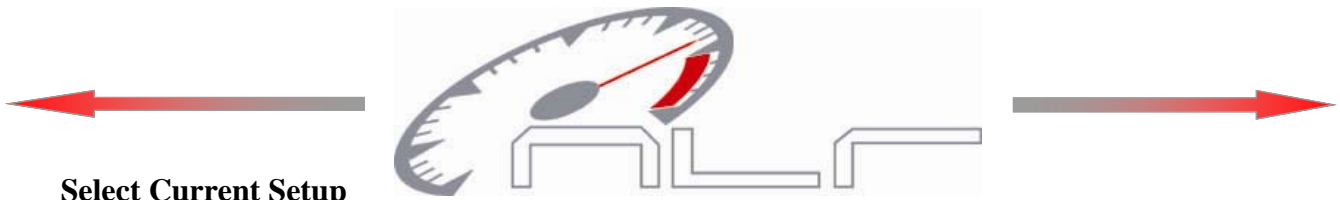
**TachTriggerLevel**—This sets the trip voltage for the Tach input signal. Valid Range is .10 volt to 3.00 volts.

#### **Select Input Mode**

**CRANKSHAFT TRIGGER**—Select this input mode if you are using the Timing Control Features and the TIC-1000 is connected to the Crankshaft Trigger.

**TACH SIGNAL**—Slect this input mode if you are NOT using any of the Timing Control Features and the TIC-1000 is connected to a Tachometer Signal.

**Important**—Always Return to the Main Screen after changing any settings. The TIC-1000 **MUST be on the Main Screen for proper operation!**



## Select Current Setup

There are 3 Data Setups available. All user settings (except Make/Model) will be saved when selecting a New Data Setup from the list. This way multiple User Setups can be stored and recalled at a later time. Example - you have a Setup that is working well, you decide that you would like to try a few different settings. You could then Select and Copy all current Setup Data to a New Setup and make changes without losing the original setup.

When Selecting a different Setup from the List you will be asked if you would like to copy the Current Setup. If you select Yes then the current setup will be copied into the new Setup Data. If you choose No then the new selection will not be altered.

## Help Wizard ON/OFF

Use this selection to turn the Help Wizard ON/OFF.

## TIC-1000 Pinout

Use this selection to display the Terminal Strip Pinout. This can be used as a quick reference when the User Manual is not available.

## Wiring Diagrams

Use this selection to view basic Wiring diagrams. This can be used as a quick reference when the User Manual is not available.

## Screen Configuration

Three different Screen displays may be selected. These are Default Screen, Tachometer, and Map-Psi. After selecting a NEW screen the system will Re-Boot and apply the change.

## Activation Switch Polarity

The Clutch and Shift Input Polarity may be set for +12V or GROUND Activation. This allows the TIC-1000 to be configured to work with existing switches and/or wiring.

## MAP Sensor Style

There are two MAP Sensors that the TIC-1000 can be configured to use. These are a GM 3-Bar (0-30 psi) MAP sensor and a SSI 4-Bar (0-60 psi) Sensor. You must have the correct MAP Sensor connected or all readings from the MAP Sensor Input will be wrong! The MAP Sensor data is used by the Boost Retard function. The Ignition timing can be retarded based on the amount of Boost being developed. This allows higher levels of boost to be obtained with stock or aftermarket EFI systems.

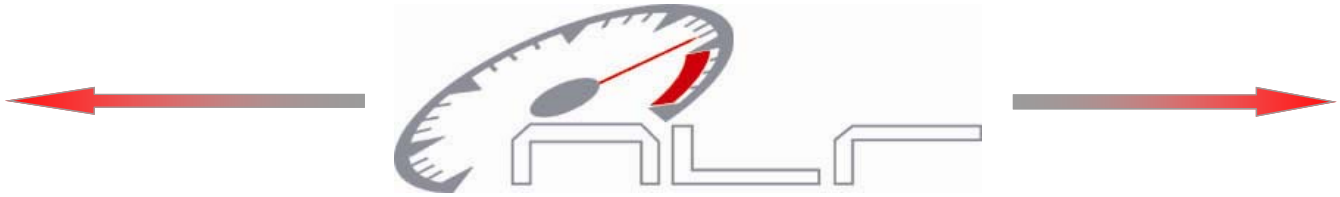
## LCD Display Contrast

Use this Setting to adjust the LCD Display contrast.

## Factory Reset

Factory Reset - When a Factory Reset occurs the TIC-1000 will be restored as it was new from the Factory. All Settings will set to the Factory Default!"

**Important**—Always Return to the Main Screen after changing any settings. The TIC-1000 MUST be on the Main Screen for proper operation!



## Launch Menu

### Launch RPM Settings

**Launch RPM**—or 2-Step RPM is Active when the Clutch Input is ON. When the 2-Step is Active the engine RPM will be limited to the 2-Step RPM setting. The Clutch Input is usually connected to a Switched Clutch Lever or Normally Open push button switch. Valid Range is 3,000 to 16,000 RPM. If a setting lower than 3,000 RPM is entered this Function will be OFF.

**IMPORTANT**—This setting will only function if the **IKM-001 external kill module is installed!**

**Launch Lite On/Off Rpm**—This setting can be used to turn a Shift Lite On/Off between two RPM set points. This allows the rider to keep the Engine Rpm constant between runs. This setting is more commonly used when the 2-Step function is NOT used. Valid Range is 3,000 to 16,000 RPM with a minimum Window of 500 RPM. If a setting lower than 3,000 RPM is entered this Function will be OFF and the On/Off RPM's will be set at 0.

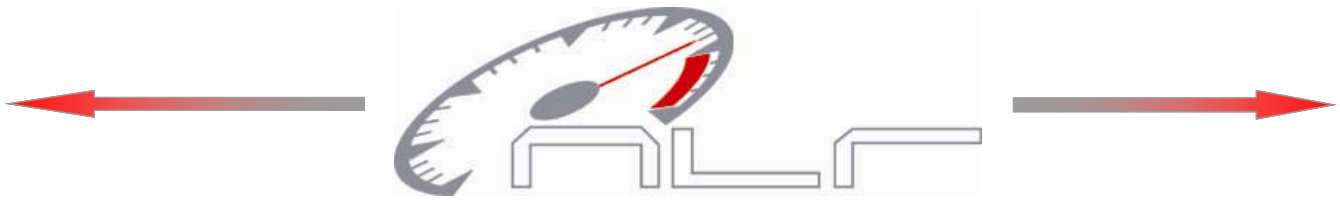
### Launch RPM Adjust

This setting allows the Actual Launch RPM to be adjusted +/- 800 Rpm in 100 Rpm increments. This allows the Launch limiter to be adjusted for different engine combinations and maintain the desired Rpm. Valid Range is -800 to +800 Rpm.

### Launch Reset Timer

This setting determines the Hold or Lockout time of the CLUTCH Input after a launch. The Hold Timer will ONLY begin if a System Reset has occurred. This setting allows the rider to feather the clutch after launch without Resetting the System. Example - Reset Hold Timer is set to 2.50, the CLUTCH Input will be ignored for the first 2.5 seconds of the run. Valid Range is 0.00 to 9.99 seconds.

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## Timing Menu

### Boost Retard

This setting allows the Ignition Timing to be adjusted based on Boost Pressure readings taken from the MAP Sensor. Up to 15 degrees of Boost Retard can be applied in .1 degree increments. The Boost Retard will ONLY be applied when TIC-1000 is NOT in Launch Mode. When the TIC-1000 is in Launch Mode (System Reset with Clutch Input ON) the Anti-Lag Retard function will be active.

To EDIT the Boost Retard settings use the < > arrow buttons to select a MAP Psi or Boost pressure setting. Press the EDIT button. Use the Up, Down arrow buttons to adjust the Boost Retard for the selected PSI. Press the ENTER button to accept the new setting. A Edit Point will be saved and marked with a X on the graph. You can then select another set point and all of the points between the 1st edit point and the 2nd will auto fill. You may also use the MENU button to open a drop down list that allows you to Exit and Optionally save changes, Clear any Edit Points, View the Previous setup, and Restore the Previous setup data.

### Anti-Lag Retard

This setting allows the Ignition Timing to be adjusted based on Engine RPM while the TIC-1000 is in Launch Mode. Up to 15 degrees of RPM controlled Retard can be applied in .1 degree increments. This setting allows the Ignition Timing to be Retarded while the Clutch Input is Active to Help build more boost. There is also a Anti-Lag Timer that controls the rate of Anti-Lag retard Turn OFF.

To EDIT the Anti-Lag Retard settings use the < > arrow buttons to select a RPM setting. Press the EDIT button. Use the Up, Down arrow buttons to adjust the Anti-Lag Retard for the selected RPM. Press the ENTER button to accept the new setting. A Edit Point will be saved and marked with a X on the graph. You can then select another set point and all of the points between the 1st edit point and the 2nd will auto fill. You may also use the MENU button to open a drop down list that allows you to Exit and Optionally save changes, Clear any Edit Points, View the Previous setup, and Restore the Previous setup data.

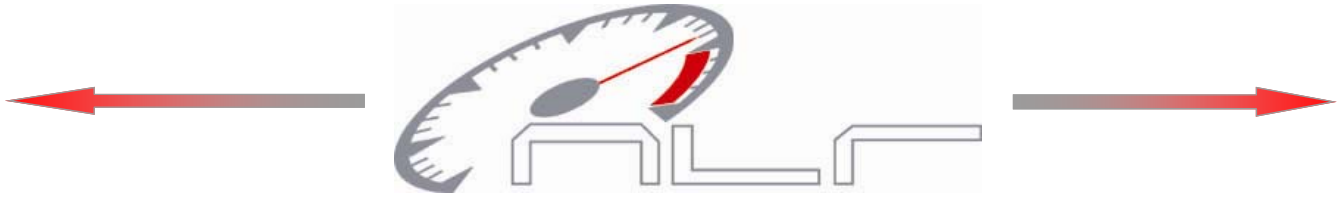
### Anti-Lag Retard Timer

This setting controls the Time and/or Rate that the Anti-Lag Retard is disabled. The Anti-Lag retard can be removed very quickly or over time if needed. Valid Range is 0.00 to 9.99 seconds.

### Gear Position Retard

This controls the amount of Timing Retard OFFSET applied for each gear position. A total of +/- 10 degrees of timing control can be applied for each gear position. This allows fine tuning of Boost Retard for each gear. This setting also allows timing retard without the use of a MAP(boost) Sensor for low boost applications. Valid Range is -10 to +10 degrees.

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## Shift Menu

### Shift Count

This setting determines the total number of Shift Counts. Example - Set the Shift Count at 5 for a Six Speed Transmission. Each gear position has a Shift Rpm and Kill Time. These values MUST be entered for each Gear Position. The Shift Count will increment each time a Signal is received on the SHIFT Input Terminal. Once the Shift Count is at the top gear position it will NOT continue. The last Shift RPM/Kill Time will be used for all remaining Shifts until a System Reset occurs.

### Shift Light RPM(s)

This setting determines the RPM to turn the shift light ON for each gear position and also controls the Shift RPM for each gear if the Auto-Shift Feature is ON. Valid Range is 3,000 to 16,000 RPM and all Shift RPMs must be +/- 1,000 RPM of the 1st Shift RPM.

### Kill Time(s)

Kill Time - This setting determines the Ignition Kill time for each gear change. The Ignition Kill function is generally used with an Air Shifter system. Valid Range is 0.00 to 0.150 second.

**IMPORTANT**—This setting will only function if the IKM-001 external kill module is installed!

### Kill Delay

This setting determines the Delay Time after the Shift Solenoid is turned ON. This delay allows the air cylinder to begin the shift before the actual ignition kill is applied. This allows adjustment for long air lines and different air shifter combinations. Valid Range is 0.000 to .075 second.

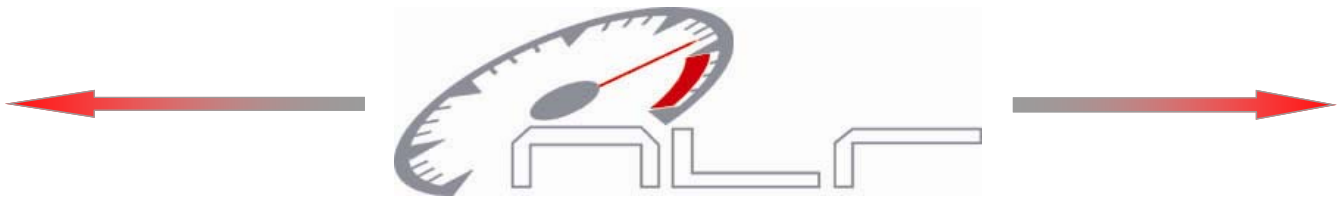
### Auto Shift ON/OFF

This setting determines if the Auto-Shift feature is On or Off. Never operate with Auto-Shift On unless an Arming switch is installed.

### Auto Shift 1-2 Delay

This setting determines the Delay Time for the 1-2 Shift when the TIC-1000 is configured for AutoShift. The Delay starts when the Clutch Input is released. This delay timer is used to prevent unwanted shifts due to wheel spin during initial launch. Valid Range is 0.00 to 1.00 second."

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## Installation & Wiring Diagrams

### Installation Overview

The TIC-1000 can be installed with or without the optional IKM-001 Ignition Kill Module. If the IKM-001 is NOT installed the 2-Step and Ignition Kill features will not be available!

The TIC-1000 may also be installed using only a Tach Signal as the RPM Input signal. Using only a Tach Input signal will disable all of the Ignition Timing control features. As noted the 2-Step and Ignition Kill features will not be available if the IKM-001 is not installed.

Please use the Wiring Diagram that corresponds to the desired installation method.

### Installation Notes

1—Always connect the Main Battery Ground wire first. It is very important to install the TIC-1000 ground wire directly to the Battery Negative terminal. Do not rely on engine or frame ground points!

2—Use the proper crimping tools for terminal installation. It very important to get a good crimp. Poor connections will cause problems that are difficult to find at a later date.

3—Use shrink wrap to seal crimped connections. This will prevent corrosion of the crimped terminals.

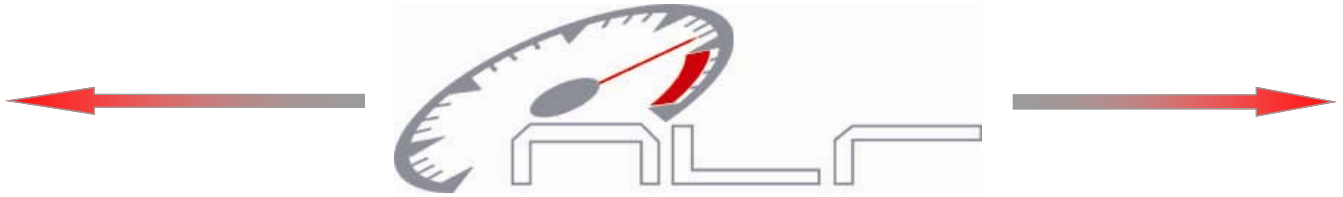
4—If soldering the wire to the crimped terminals do NOT allow the solder to travel up the wire under the insulation. This will make the wire brittle and actually weakens the connection. A soldered connection is best if the solder is not allowed to extend beyond the terminal. Just a small section should be soldered as far away from the wire end of the terminal as possible.

5—Route wires away from hot components and any moving parts.

6—Keep electrically noisy wires separated from other low voltage signal wires. An example would be to keep the Coil Negative wires in a separate harness away from other wiring.

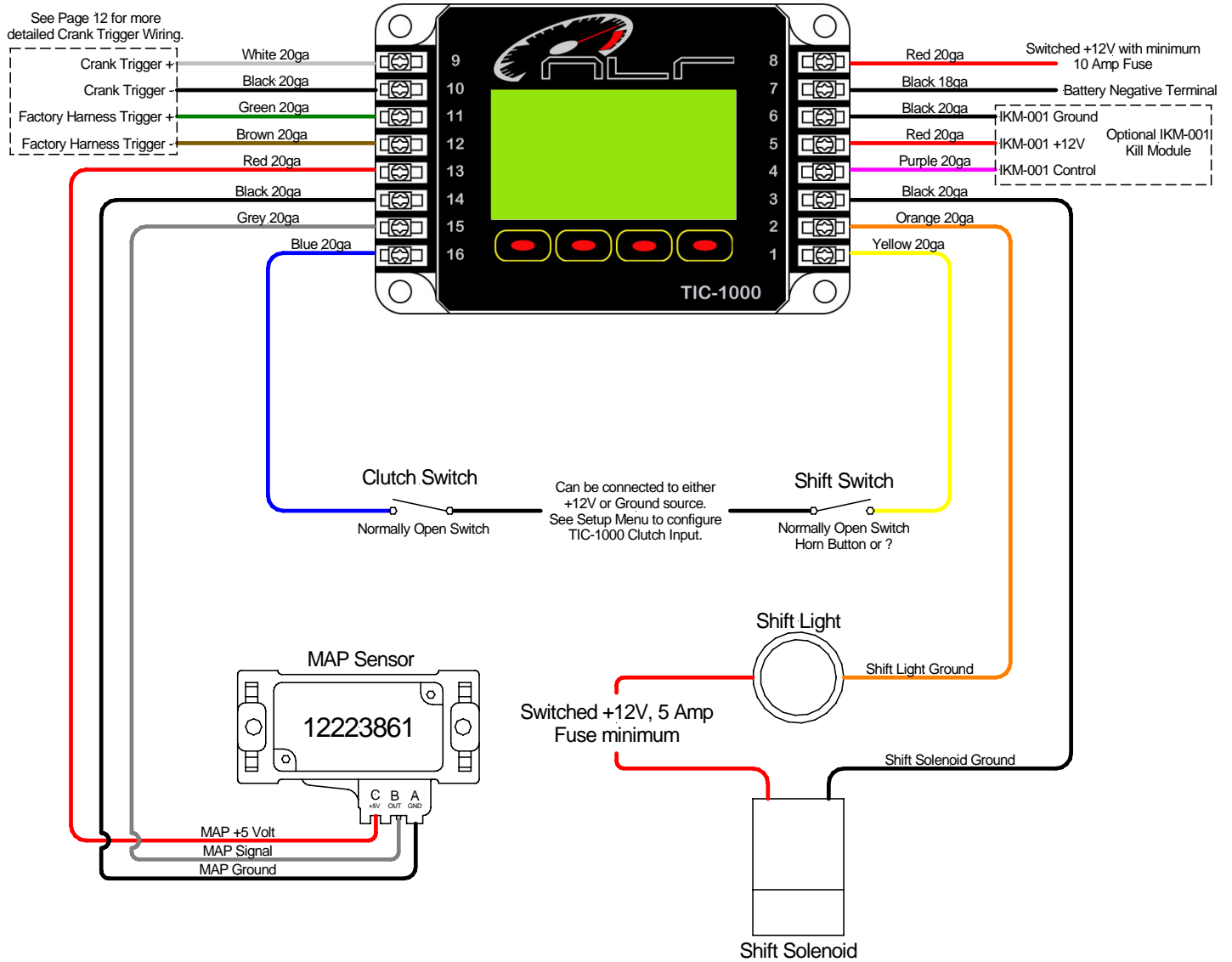
7—The TIC-1000 has been designed to be as rugged as possible. However, it is an Electronic Device that can be damaged if NOT properly installed. If you do not understand the installation instructions or have the proper tools please seek professional help.

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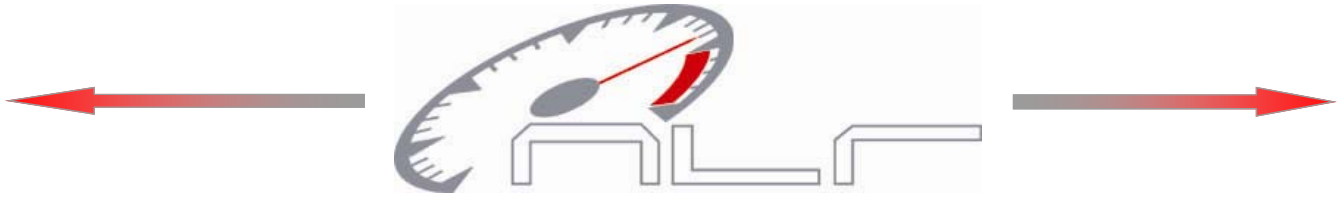


## TIC-1000 Installation using Crankshaft Trigger

**Important**—The TIC-1000 must be configured for Crankshaft Trigger Input mode when connected as outlined below. See “Configure TIC-1000” in the Setup Menu.

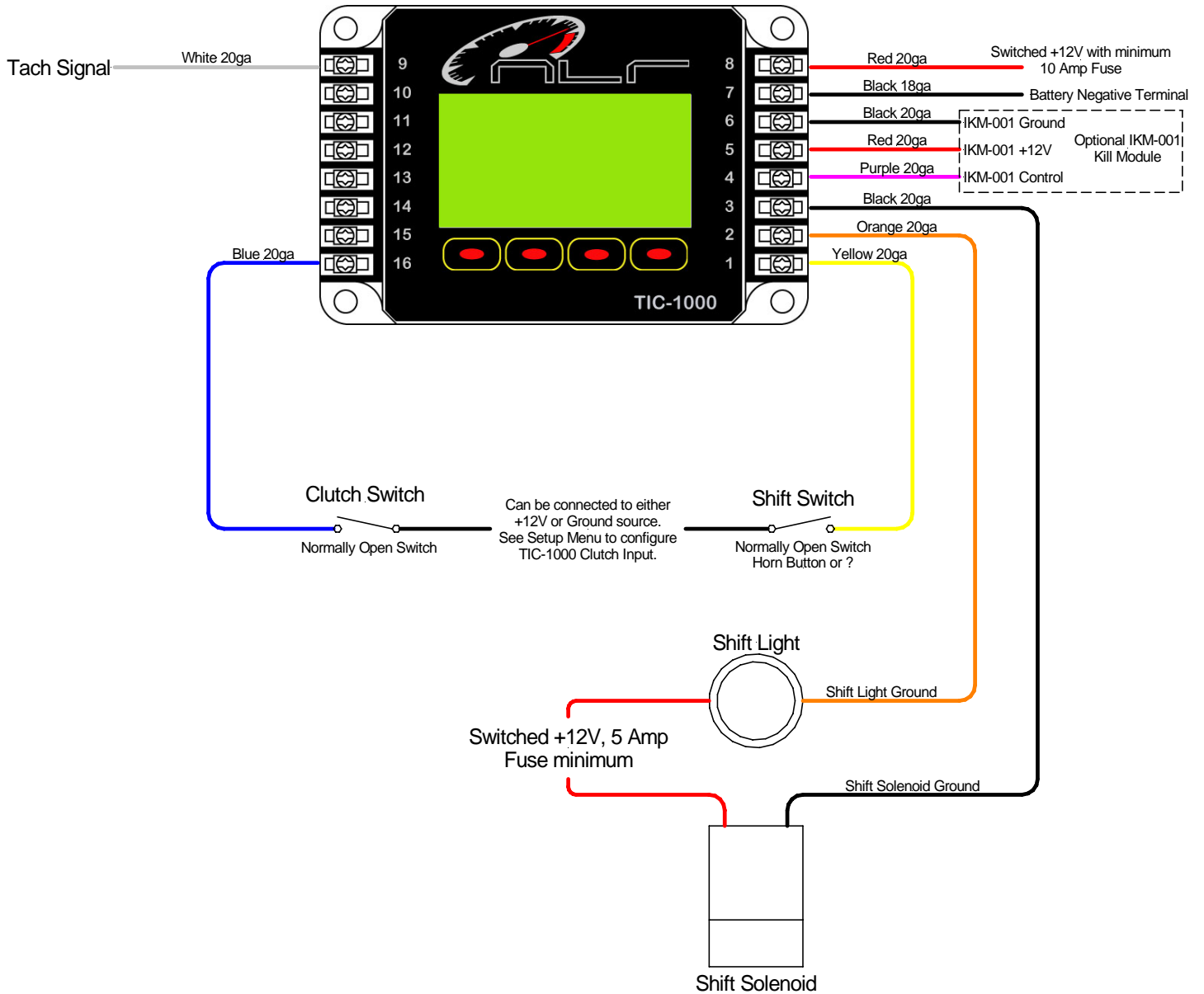


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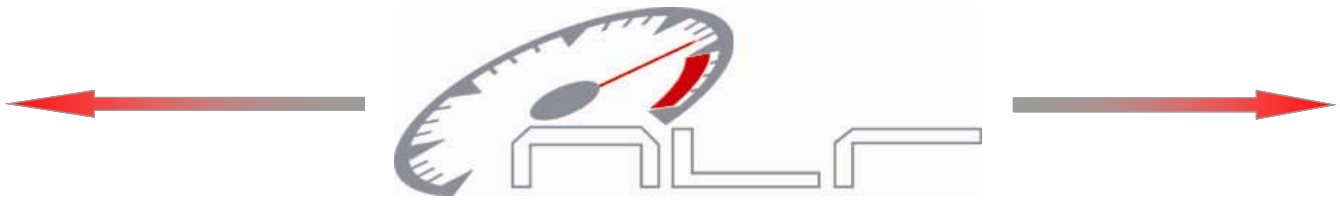


### TIC-1000 Installation using Tach Signal Input

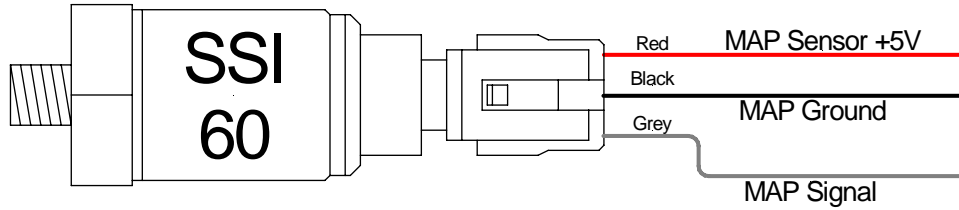
**Important**—The TIC-1000 must be configured for Tach Input mode when connected as outlined below. See “Configure TIC-1000” in the Setup Menu.



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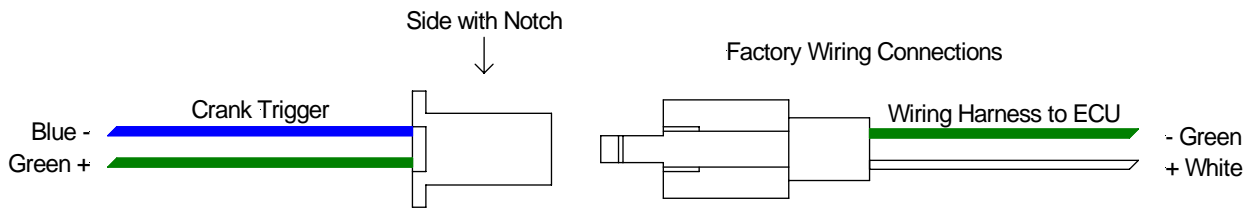
### Optional SSI 5-Bar MAP Sensor Wiring



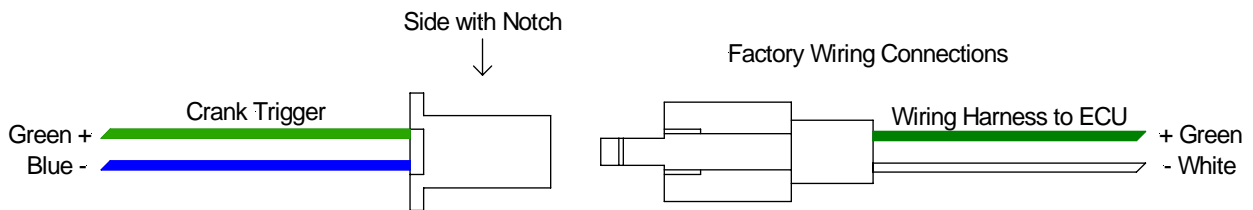
### Common Crank Trigger Wiring Diagrams

If your Make and Model is not listed below or your application does not match the Diagrams you must consult the Factory Service Manual for proper wiring connections.

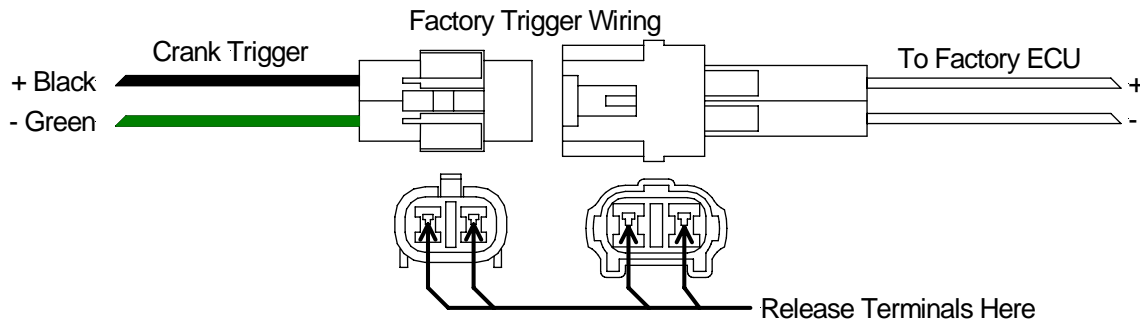
#### GSXR-1300 1999 to 2001



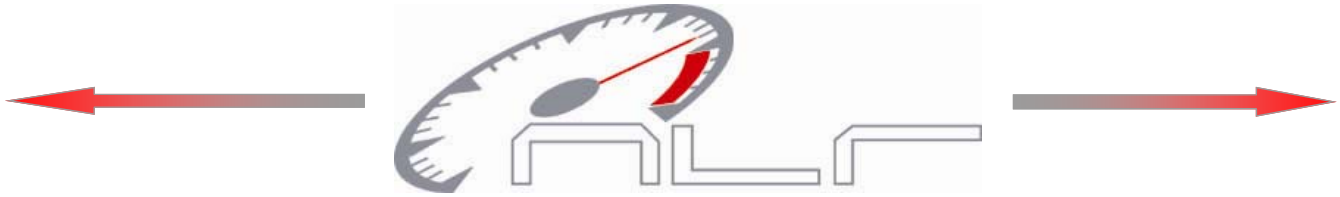
#### GSXR-1300 2002 to 2006



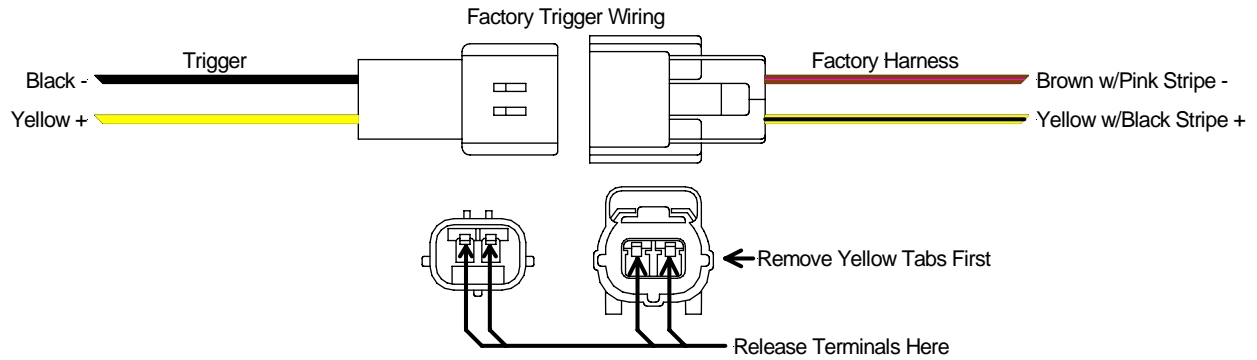
#### GSXR-1000 Early and Late Models



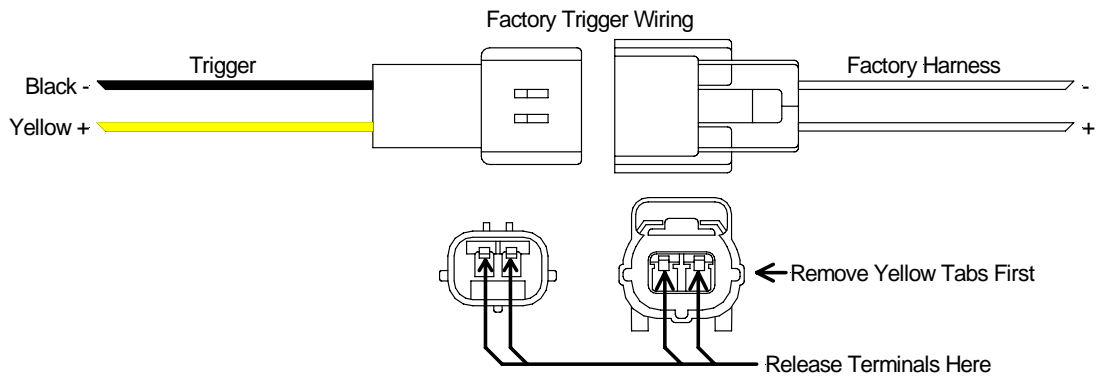
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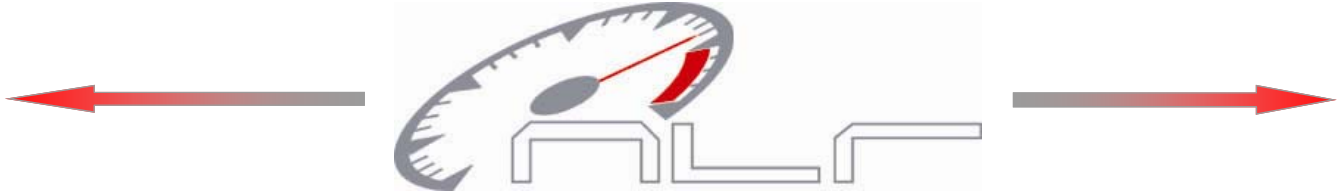
### ZX-12 Early Models



### ZX10 2004+ & ZX14 2006+



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## **Warranty Information**

NLR warrants to the original purchaser that the IKM-001 Controller Shall be free from defects in parts and workmanship under normal use for 6 months from the date of purchase.

NLR obligation under this warranty is limited to the repair or replacement of any component found to be defective when returned postpaid to NLR.

The Controller must be returned with evidence of place and date of purchase or warranty will be void. The warranty will not apply if the IKM-001 Controller has been installed incorrectly, repaired, damaged, or tampered with by misuse, negligence or accident.

## **Contact Information**

For more information on the IKM-001 Ignition Kill Module and/or to purchase please contact NLR.

[www.nlrsystems.com](http://www.nlrsystems.com) or  
Phone 334-741-7100

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