Operating Instructions

DE-4000 Series Configurable Safety Shutdown and Control System

Form DE-4000 OCM 02-22

altronic



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This manual contains information on the operation and configuration of a DE-4000 Safety Shutdown and Control System. This manual supplements the DE-4000 Safety Shutdown and Control System Installation Instructions, Form DE-4000 II.

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Operating Instructions

1. OVERVIEW

The NGI-5000 Logic Module Legacy Mode is designed to be a drop in replacement. While the screens are different and updated, the functions and set up of the system should be familiar. Benefits to the new logic module offer increased availability of information using high resolution LCD screens, upgraded EEPROM storage, web based technology for viewing with no proprietary downloaded tools, state of the art computing power, and flexibility for future applications.

2. LOGIC MODULE USER INTERFACE

Using the logic module consists of two screens on the module, top for quick view, bottom for dynamic viewing, and the ability to log into the unit with any ethernet based host device such as a PC. All technology being viewed is browser based and therefore needs no proprietary installation of tools. It also

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allows for configurability of the screens for external viewing and launching a new view on the top and bottom module screens.

A customer based ethernet port is available inside the NGI-5000 logic module. Open the enclosure door use the port that is in the lower left corner.
Viewing any AWI on the device using the customer ethernet port is at IP address is **192.168.1.3:3000**
Accessing the Engine Configuration Tool while connected to the customer ethernet port is available at IP address **192.168.1.3** notice there is no port 3000 at the end.

Click here for AWI CONNECTION AND INTERFACE MANUAL for information on configuring your host device with the correct port setting to be able to interface with the NGI-5000 logic module

3. UPDATING HOME SCREENS

Updating the home screens can be accomplished in two different ways.

- A connected host device (which is the fastest way)
- Using the device itself with a mouse and/or keyboard

3.1 CONNECTED HOST DEVICE

In order to launch a new page a few steps must follow:

- Get the AWI program of interest from https://github.com/Altronic-LLC/Altronic-Public-Files/tree/main/Altronic-Web-Interfaces
- Modify the AWI to a desired look and feel
- Eject the application auto connect and dashboard only with the name of TOP or Bottom
- Connect to the module at the correct port to bring up the AWI landing page with all available AWI's
- Choose file from your PC for the AWI that was ejected
- Make sure the old TOP or BOTTOM was removed from the module



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3.2 THROUGH THE DISPLAY

- Click the gear icon found in the connection settings on the device screen itself
- Open the latest full version of the AWI
- Modify the AWI to a desired look and feel
- Eject the application auto connect and dashboard only with the name of TOP or Bottom
- Save it in the directory with the other AWI's



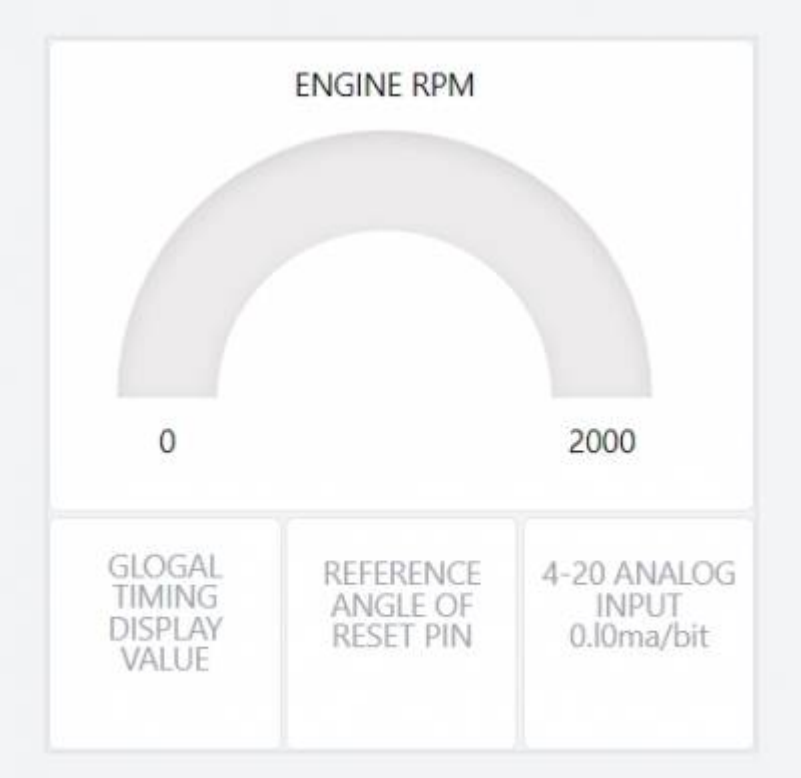
4. DESCRIPTION OF OUTPUT SWITCHES

Three output switches provide a means of communicating the current ignition status to other systems. These switches have isolated outputs and share one common return path which is not referenced to engine or power ground. They will be in the open condition when the unit is unpowered. A typical application would be as a relay or solenoid coil driver. - The FIRE-CONFIRM OUT switch is closed to signal that the ignition is running with no faults or ignition warnings. Warnings identified by the Diagnostic Module do not effect this output. Note: Switch is not opened for warnings with firmware version 2.1. - The SHUTDOWN OUT switch is closed to signal that the ignition has detected no faults which would result in a self shutdown. Upon detecting a fault that would result in a selfshutdown of the ignition, this switch will open. - The ALARM OUT switch is closed to signal that no un-acknowledged faults or warnings are present. Upon detection of a fault, ignition warning or a diagnostic warning, this switch will open. This output is designed to control an alarm indicator or sounding device.

5. UNDERSTANDING THE HOME SCREEN

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5.1 TOP SCREEN



A top screen is for a view of information and can be changed if other quick view information is desired.

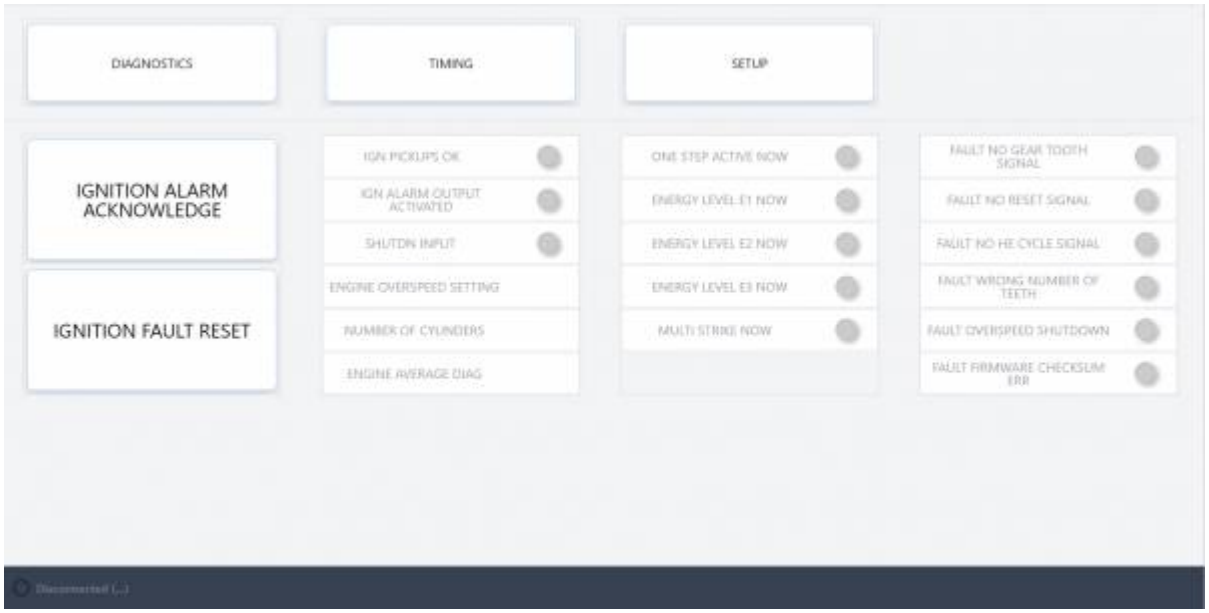
The FIRING message is displayed when the ignition begins firing. Additional data is provided on this screen to describe the selected mode of operation for the ignition. The energy mode (E1,E2,E3) and the single-strike / multi-strike type (S or M)

The STALLED message is displayed when a loss of rotation is detected after the ignition is firing and neither a SHUTDOWN or FAULT has occurred. This signifies that the engine has stopped without any detected cause from the ignition system.

The SHUTDOWN screen will supersede all other home displays if the shutdown input is grounded or if the shutdown input was grounded and the engine has not stopped rotating. This screen indicates that the ignition is not firing because the shutdown input was activated to shutdown the engine. The Fire Confirm Out switch will change state (switch opens) and the other outputs will function as described above based on the existence of faults or warnings.

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5.2 BOTTOM SCREEN



Interfacing with the bottom screen is dynamic with a touch interface. Buttons are available to open additional windows, and to activate different features, as well as the ability to scroll on the screen.



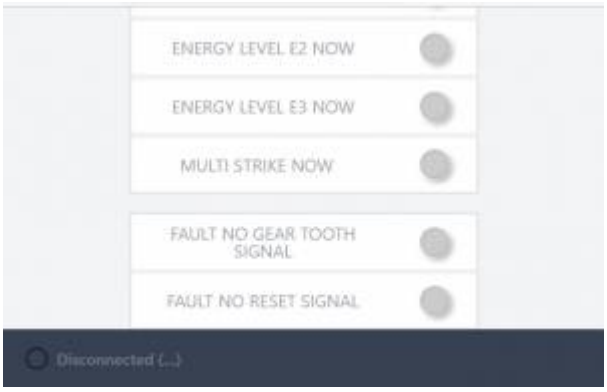
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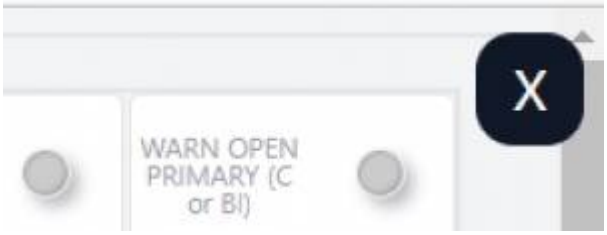
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6. CLOSING ADDITIONAL SCREENS

Clicking on the Diagnostic, Timing, or Setup buttons open up new screen that allow for viewing and interaction for its specific functions. With every window that opens a close out “X” will be in the upper right hand corner.



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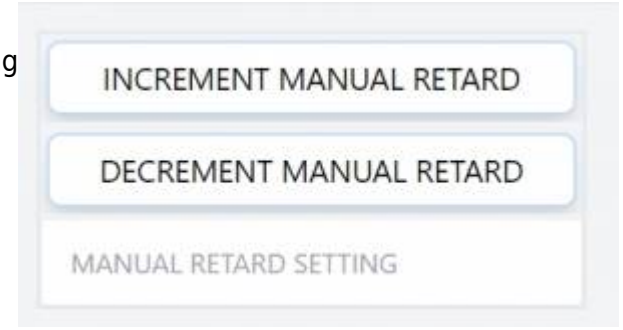
7. ADJUSTING GLOBAL RETARD

Global retard is an adjustment affecting the timing of all cylinders equally. This adjustment can be equated to the manual timing switch of the Altronic II-CPU system. Adjustments made as described below will be in effect until another adjustment is made.





The increment of timing change is dependent on the number of holes or teeth being sensed. The minimum timing change is equal to “90/N” where N = no. of holes or teeth. EXAMPLE: For 360 holes, the minimum timing change increment is 90/360 = 0.25 degrees.

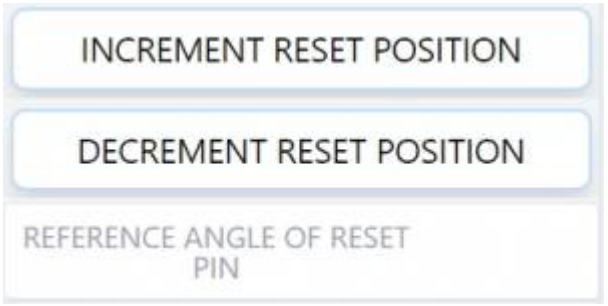


8. SELECTION OF GLOABL TIMING MODES

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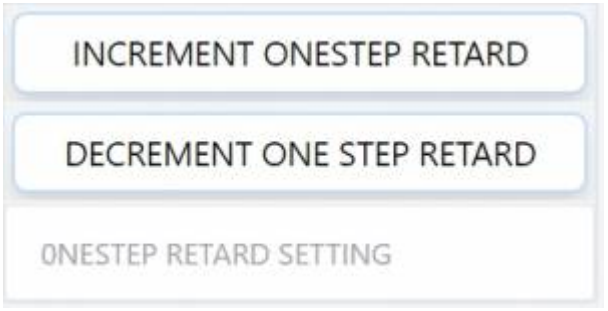
Several options exist with regard to global timing modes. Once the global timing mode menu is entered as described below, the status of each option can be viewed and changed.





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selection can increase or decrease the one-step retard value. The default configuration selects one step retard to be controlled by the Misc Input terminal. The additional retard would be implemented when the input is grounded.



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e selection can enable or disable the pre-configured retard curve controlled internally by engine RPM.



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selection can enable or disable the pre-configured retard curve controlled by the 4-20 mA current loop input. The choices are ON and OFF,



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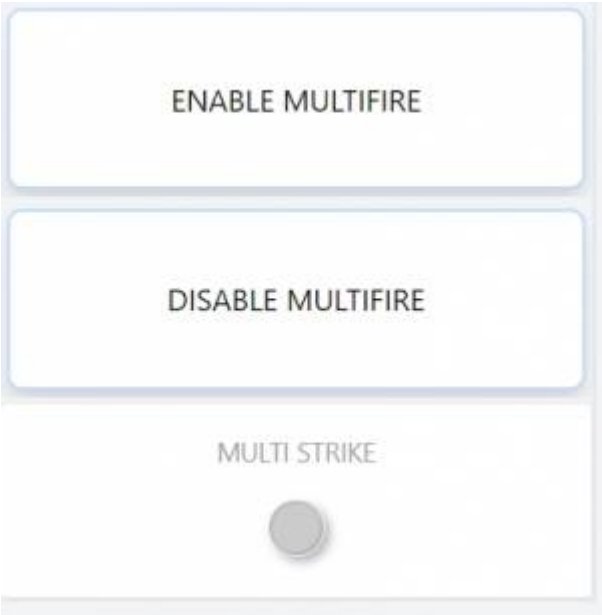
selection can enable or disable the additional retard value controlled by the serial port.

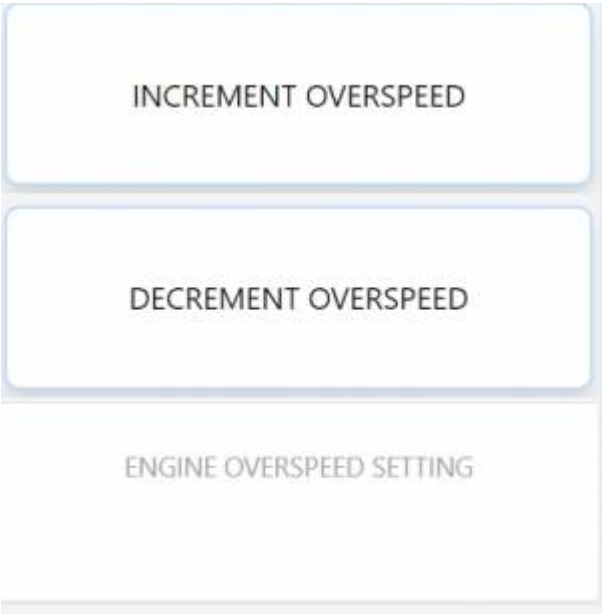


9. SETUP CONTROL OPTIONS

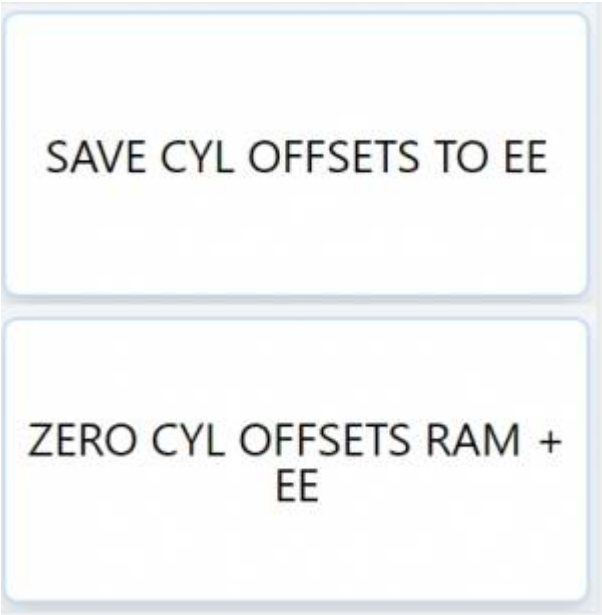


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10. NGI-5000 DIAGNOSTICS

11. UNDERSTANDING AND USING THE SECONDARY SPARK DIAGNOSTICS

The spark reference number is a unitless number which correlates with voltage demand at the spark plug and is calculated for every firing of each cylinder. As the voltage increases, the reference number also increases. The number is non-linear and will increase faster at higher voltages (above 20kV). The usefulness of the number lies not in its absolute value, but rather in how the number changes over time as the spark plugs erode. With a little experience, the engine operator will be able to tell when spark plugs require changing. Abnormal conditions in the ignition system, such as open or short circuits in the primary and secondary wiring, can also be detected.

The following spark reference numbers are available in the CPU-2000 system: INSTANTANEOUS (INST): The numbers read back from the system in real time. VARIATION (COV): The variation in values for the cylinder being viewed. CYL. AVERAGE (CAVG): The average value for the cylinder being viewed. MINIMUM VALUE (MIN): The minimum CAVG value since the last time reset. MAXIMUM VALUE (MAX): The maximum CAVG value since the last time reset. NOTE: The above values are available on a per cylinder (or per coil/spark plug) basis. ENG. AVERAGE (EAVG): The average value for all cylinders of the engine. or GROUP AVERAGE (1AVG): The average value for all outputs of connector group 1. GROUP AVERAGE (2AVG): The average value for all outputs of connector group 2. NOTE: The (EAVG) average value indicates the average conditions of the entire engine.

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The spark reference number will have a characteristic range depending on the type of coil used. There are known differences between the various types of Altronic coils, and slight variations are normal between coils of the same type. In order to maximize the usefulness of the cylinder spark reference number, it is recommended that all coils be of the same type and vintage (production date). The typical ranges to be expected in normal operation with new spark plugs are:

In addition to the diagnostic flags, the spark reference numbers can also be used for predictive purposes: A. As the numbers increase toward the preset HI SPARK VOLTAGE threshold the operator knows that a change of spark plugs should be scheduled. With this information, spark plug replacement can be determined on an actual need basis rather than a predetermined schedule. Also, unexpected engine misfiring or shutdowns can be avoided by tracking the reference numbers on a routine basis. B. The reference numbers can provide an early warning of a difference in operation in a given cylinder(s). A reading higher or lower than other cylinder tells the operator of a potential problem. This allows further troubleshooting and evaluation to take place before an unexpected operational problem develops.

The spark energy setting has only a small effect on the spark reference number if the spark plug fires correctly. Therefore, the high and low voltage thresholds should hold across energy setting changes if the spark plugs continue to fire normally. On the other hand, a worn plug may not fire consistently on energy setting E1 but will on energy setting E2; in this case there will be a significant difference in the reference number when the energy setting is changed.

Operators may be able to increase spark plug life by using the automatic energy adjustment feature of the CPU-2000 system. In this mode, the system uses the spark reference numbers to establish the lowest required energy level to minimize spark plug erosion rates. To use this feature, the basic setup energy should be set to E1.

The secondary spark diagnostics will operate with either one or two coils connected to each system output lead. Optimum operation is obtained when only one coil is connected to each output lead; in this case, only one spark plug condition effects the spark reference number for that output. When two coils are wired in parallel to a common output lead, the spark reference number will tend to be an average of the condition at the two spark plugs. While deviations between cylinders will be somewhat harder to detect, most of the benefits of the spark reference number can still be realized.

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