



立達電通科技股份有限公司  
IC Leader Technology Corporation

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# **EZECU® - EzSpark® TI ECU Standalone 3D Programmable Transistorized / Inductive Ignition Computer for EFI and Carburetor Engines**

**User's Manual**

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**July, 2011**

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## Contents

Revision History .....	vi
1 Introduction .....	1
1.1 Product Package List of the EzSpark® TI ECU .....	1
1.2 Product Features .....	2
1.3 Product Specifications .....	3
2 Wiring Diagrams .....	5
2.1 Connectors and LED .....	5
2.2 Wiring Diagram .....	5
2.3 Replacing CDI Systems for Carburetor and Other Engines .....	9
3 Application Software .....	10
3.1 Overview .....	10
3.2 Ignition Map and Firmware Operations .....	12
3.3 TPS Voltage Calibration .....	13
3.4 Real-Time Engine Status .....	15
3.5 Crankshaft Flywheel Type and TDC Angle Setting .....	16
3.6 Ignition Advance Angle Table .....	21
3.7 Mini Bar .....	25
3.8 Dynamic Track Mode .....	26
3.9 Full-Screen Engine Status Monitoring .....	26
3.10 Solenoid On/Off Control Table .....	27
3.11 PWM/Servo Motor Control Table .....	28
3.12 Base Ignition Maps .....	30
3.13 About EZECU® .....	31
Appendix Main Connector Signals .....	32

## List of Figures

Figure 2-1	Wiring Diagram of the EzSpark® TI ECU .....	6
Figure 2-2	Transistorized/Inductive Ignition Coil Wiring Diagram of the EzSpark® TI ECU .....	7
Figure 2-3	Open-Collector Output Wiring Diagram of the EzSpark® TI ECU.....	8
Figure 3-1	Overview of EzSpark® TI ECU Application Software (Unconnected) .....	10
Figure 3-2	Overview of EzSpark® TI ECU Application Software (Connected) .....	11
Figure 3-3	Ignition Map Operation Buttons .....	12
Figure 3-4	Firmware Operation Buttons.....	12
Figure 3-5	TPS Calibration Buttons .....	13
Figure 3-6	Real-Time Engine Status .....	15
Figure 3-7	Crankshaft Flywheel Type and TDC Angle Setting .....	16
Figure 3-8	18-1 Teeth/Notches Crankshaft Flywheel Type.....	17
Figure 3-9	12-1 Teeth/Notches Crankshaft Flywheel Type.....	17
Figure 3-10	24-1 Teeth/Notches Crankshaft Flywheel Type.....	17
Figure 3-11	12-2 Teeth/Notches Crankshaft Flywheel Type.....	18
Figure 3-12	12-3 Teeth/Notches Crankshaft Flywheel Type.....	18
Figure 3-13	24 Teeth/Notches Crankshaft Flywheel Type.....	18
Figure 3-14	1 Tooth/Notch Crankshaft Flywheel Type .....	19
Figure 3-15	Ignition Advance Angle Table with 250 RPM Resolution.....	21
Figure 3-16	Ignition Advance Angle Table with 500 RPM Resolution.....	22
Figure 3-17	Ignition Advance Angle Table with 1,000 RPM Resolution.....	23
Figure 3-18	Mini Bar of EzSpark® TI ECU Application Software.....	25
Figure 3-19	Dynamic Track Mode on the Mini Bar of EzSpark® TI ECU Application Software	26
Figure 3-20	Full-Screen Engine Status Monitoring of EzSpark® TI ECU Application Software	26
Figure 3-21	Solenoid On/Off Control Table of EzSpark® TI ECU Application Software .....	27
Figure 3-22	3D PWM/Servo Motor Control of EzSpark® TI ECU Application Software .....	28
Figure 3-23	EZECU® Product Information Window.....	31

## List of Tables

Table 3-1	Crankshaft Flywheel Types for Scooter/Bike Brands and Models.....	19
Table 3-2	File Names for Referenced Base Ignition Maps .....	30
Table A-1	Main Connector Pin Numbers.....	32
Table A-2	Main Connector Signals.....	32

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## Revision History

Date	Revision	Description
28, April 2010	0.10	Initial draft
25, June 2010	0.11	Descriptions for newly supported flywheel types
12, July 2010	0.12	Add base 3D ignition maps for YAMAHA Cygnus and KYMCO Racing
08, September 2010	0.13	Modify the maximum characteristic angle to 70 degree for single tooth flywheel
29, April 2011	1.00	Updated for EzSpark® TI ECU Rev.A ans software snapshots
01, July 2011	1.10	Updated for EzSpark® TI v1.6.0 software
15, July 2011	1.11	Corrected for typo errors

## 1 Introduction

With the gradually increasing trend of electronic fuel injection engines, the EZECU® – EzSpark® TI (Transistorized/Inductive Ignition) ECU (Engine Control Unit) developed by IC Leader Technology Corporation in Taiwan is announced for replacing the transistorized/inductive ignition portion of the factory ECU to program ignition advance angles from 0° through 60° BTDC (Note: TDC can be set to any degree within 0° through 359° if a multi-teeth crankshaft flywheel is adopted). This product is a standalone transistorized/inductive ignition computer which can work well with or without the factory ECU. For carburetor engines, this product can also be applied if the CDI coil is replaced by the transistorized/inductive ignition coil.

### 1.1 Product Package List of the EzSpark® TI ECU

Thank you for purchasing the EzSpark® TI ECU designed and manufactured by our company in Taiwan. When you open the product package, all contained accessories are listed below.

- 1 × EzSpark® TI ECU
- 1 × Aluminum housed power resistor heat sink wire (required only when the factory ECU exists)
- 1 × main wiring harness
- 1 × accessory wiring harness (optional)
- 1 × USB A-type male to B-type male cable
- 1 × CD containing the USB driver and the application software

## 1. Introduction

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### 1.2 Product Features

EzSpark® TI ECU is a high-technology after-market product for both electronic fuel injection and carburetor engines with features as listed below:

- Standalone ignition ECU dedicated for transistorized/inductive coils
- High energy ignition output design
- Remove fire-cut revolution limit of factory ECUs
- Supports 12-1/18-1/24-1/12-2/12-3/1/24 teeth crankshaft flywheel types
- Support up to 15,000 RPM
- Programmable 0 ~ 60 degree BTDC ignition advance angles with 1 degree resolution
- Programmable 0 ~ 359 degree TDC setting with 1 degree resolution
- Ignition advance angle 3D table with 60x10 cells and 250/500/1,000 RPM resolutions
- Solenoid on/off 3D table with 60x10 cells for output driving control
- PWM/servo motor 3D table with 60x10 cells for output driving control
- Support one fuel pump driving output
- Programmable 1xignition and 2xignitions within two engine revolutions
- Up to 10 customizable throttle position voltage levels
- Semi-auto detection for both fully-closed and fully-opened TPS calibration voltages
- Table uploading and downloading while engine is running
- Dynamic tracking of referenced cell within ignition advance angle 3D table
- Graphical 2D curve for displaying ignition advance angles
- Graphical gauges and meters for real-time engine status monitoring via standard USB interface
- Fast table uploading within 2 seconds
- Adopt water-proof metal case sealed by epoxy/silicon or equivalent
- Support languages: Traditional Chinese and English
- Support Microsoft Windows 2000/XP/Server 2003/Vista/7 32-/64-bit Operating Systems



## 1.3 Product Specifications

- Power supply input
  - 8 ~ 20VDC
  - 40VDC Max. reverse protection
  
- Sensor inputs
  - TPS (Throttle Position Sensor) signal with an analog voltage ranging from 0 to 5VDC
  - MAP (Manifold Absolute Pressure) sensor signal with an analog voltage ranging from 0 to 5VDC
  - CPS (Crankshaft Position Sensor) signal with an analog voltage ranging from  $\pm 3$  to  $\pm 120$ VAC with 18-1/12-1/24-1/12-2/12-3/24/1 teeth per revolution
  
- Dummy coil circuit
  - Connects to the transistorized/inductive ignition driver output of the factory ECU
  - Built-in circuits to eliminate the error/warning code of coil malfunction of the factory ECU
  - External heat sink aluminum housed power resistor
  
- Transistorized/inductive ignition driving output
  - Direct driving of the transistorized/inductive ignition coil with resistance greater than  $2\Omega$
  - Suggested transistorized/inductive coil: YAMAHA 1P500 or equivalent
  - **DO NOT connect to a CDI coil or the warranty is void**
  - Max. transient voltage: 400VDC
  - Max. current: 20ADC
  - Programmable TDC angle:  $0^\circ \sim 359^\circ$  (multi-teeth crankshaft flywheel) /  $0^\circ \sim 60^\circ$  (single-teeth crankshaft flywheel)
  - Programmable  $0^\circ$ BTDC ~  $60^\circ$ BTDC ignition advance angles
  - Supports either 1 $\times$  ignition or 2 $\times$  ignitions within two engine revolutions
  
- Fuel pump driving output
  - Open-collector direct driving of the fuel pump with resistance greater than  $4\Omega$
  - Max. voltage: 20VDC
  - Max. current: 6ADC



## 1. Introduction

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- Solenoid on/off driving output
  - Open-collector direct driving of the solenoid with resistance greater than  $4\Omega$
  - 3D programmable table control with  $60 \times 10$  cells
  - Max. voltage: 20VDC
  - Max. current: 6ADC
  
- PWM/servo motor driving output
  - Open-collector direct driving output with the loading resistance greater than  $4\Omega$
  - PWM cycle: 1ms ~ 100ms with 1 ms step
  - PWM duty: 0% ~ 100% with 1% step (0% and 100% can be used to emulate this output as the second solenoid output)
  - Servo motor: 0 ~ 100 position steps (50: middle; 0: leftmost; 100: rightmost)
  - 3D programmable table control with  $60 \times 10$  cells
  - Max. voltage: 20VDC
  - Max. current: 6ADC
  
- Indication LED
  - 1× blue LED for power good indication
  
- USB interface
  - Standard USB B type female connector
  
- Form factor of EzSpark® TI ECU
  - Length: 79 mm (without including the connectors)
  - Width: 69 mm
  - Height: 22 mm
  - Net weight (without including wiring harness):  $235 \pm 10$  gram

## 2 Wiring Diagrams

### 2.1 Connectors and LED

There are three connectors on the EzSpark® TI ECU. The first one is a 10-pin main connector. The second one is a 2-pin connector for the external aluminum housed power resistor heat sink wire. This 2-pin connector is used for emulating a dummy coil for the factory ECU of an EFI engine to prevent the FI error light from being turned on caused by the absence of the original ignition coil. For carburetor engines, this 2-pin connector can be left empty. The third one is a B-type USB connector. The EzSpark® TI ECU also provides one power good indication LED.

### 2.2 Wiring Diagram

The 10-pin main connector shown in [Figure 2-1](#) is used for connecting the EzSpark® TI ECU with your EFI/carburetor engine. Please connect each wire with CARE AND PATIENCE. Any fault can cause either the product or any part of the bike/scooter to be damaged permanently. If you are not familiar with this procedure, you should ask expert engine technicians for wiring these signals.

2. Wiring Diagrams

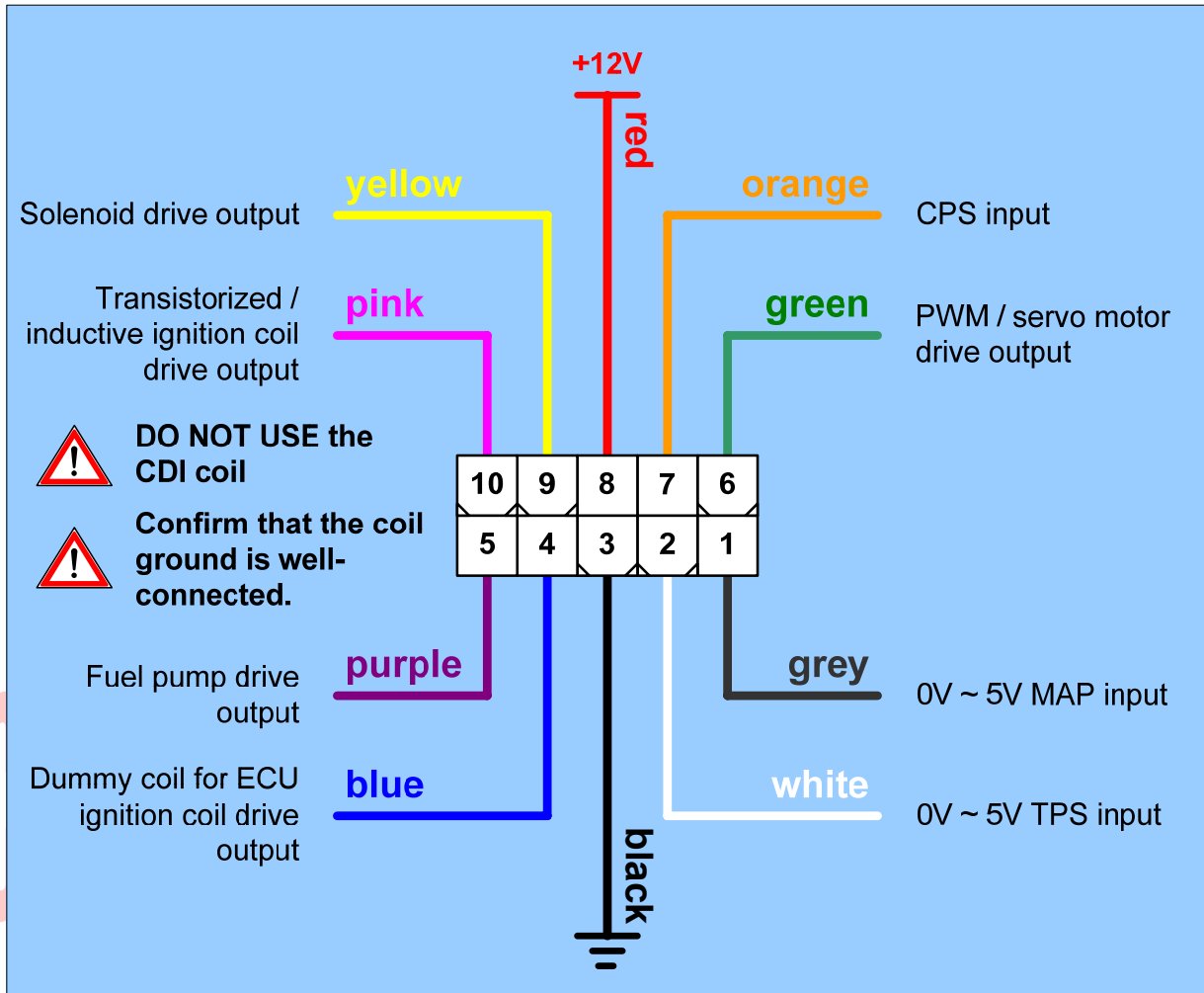


Figure 2-1 Wiring Diagram of the EzSpark® TI ECU

The ignition output of EzSpark® TI ECU is of the transistorized/inductive type which is different from the CDI (Capacitor Discharge Ignition) type. Please make sure the Pin 10 output is connected to the transistorized/inductive ignition coil instead of the CDI coil. Wrong coil type will cause PERMANENT DAMAGE to the EzSpark® TI ECU and the warranty is void. Furthermore, three wires should be connected for the transistorized/inductive ignition coil instead of two wires used in CDI coil. You must confirm that the transistorized/inductive ignition coil ground is well-connected. Please refer to [Figure 2-2](#) to see the wiring diagram for connecting with the transistorized/inductive ignition coil.

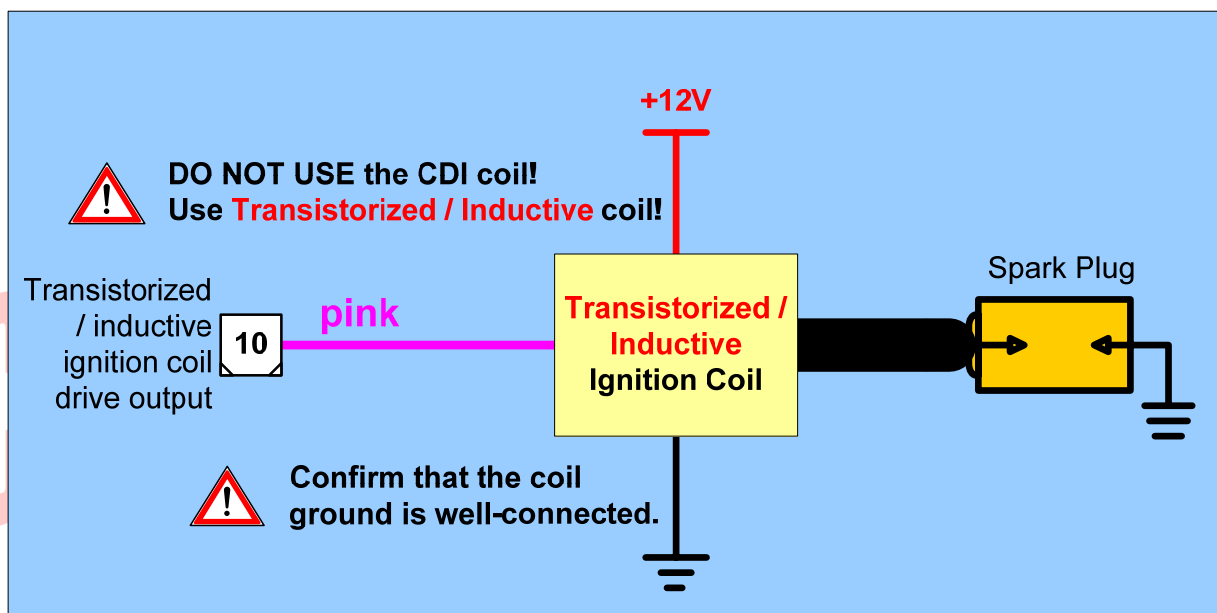


Figure 2-2 Transistorized/Inductive Ignition Coil Wiring Diagram of the EzSpark® TI ECU

For those open-collector outputs like fuel pump drive output (pin 5), PWM / servo motor drive output (pin 6), and solenoid drive output (pin 9), please refer to [Figure 2-3](#) for wiring connections. Note that each inductive or resistive loading (shown in dashed boxes) should meet the electrical specification aforementioned in [Section 1.3](#).



2. Wiring Diagrams

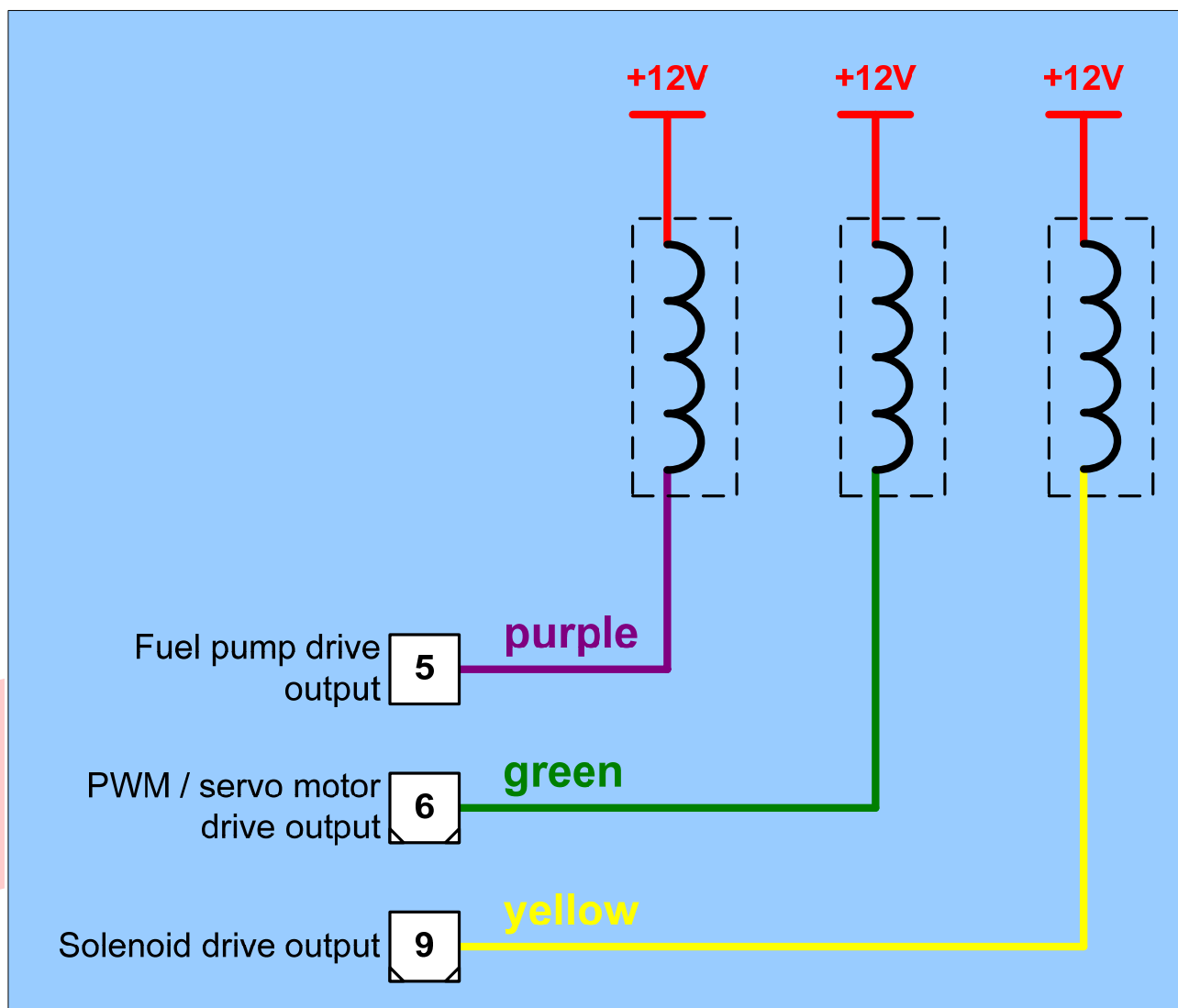


Figure 2-3 Open-Collector Output Wiring Diagram of the EzSpark® TI ECU

### 2.3 Replacing CDI Systems for Carburetor and Other Engines

For carburetor and other engines using CDI (Capacitor Discharge Ignition) systems, you must replace the CDI coil by a TI (Transistorized/Inductive Ignition) coil for the EzSpark® TI ECU. The suggested TI coil is YAMAHA 1P500 or equivalent. Note that the TI coil must be grounded well as shown in [Figure 2-2](#). Either adopting wrong coil type or unreliable TI coil grounding will cause PERMANENT DAMAGE to the EzSpark® TI ECU.

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3. Application Software

3 Application Software

The application software can be installed on Intel 80x86 compatible computers with Microsoft Windows 2000/XP/Server 2003/Vista/7 32-/64-bit operating systems. At least one USB 1.1/2.0 compatible interface port is required to communicate with the EzSpark® TI ECU. The screen resolution requirement is at least 1024 × 768 and the memory requirement is at least 1,024 MB.

3.1 Overview

The first screen of the application software is shown in Figure 3-1. Buttons on the left top corner are responsible of semi-detection of TPS (Throttle Position Sensor) voltages. Buttons on the middle-bottom are responsible for ignition map and firmware file open, save, save as, upload and download operations. On the right half portion, three sub-pages are used for setting ignition advance angles, solenoid on/off control, and PWM/servo motor control.

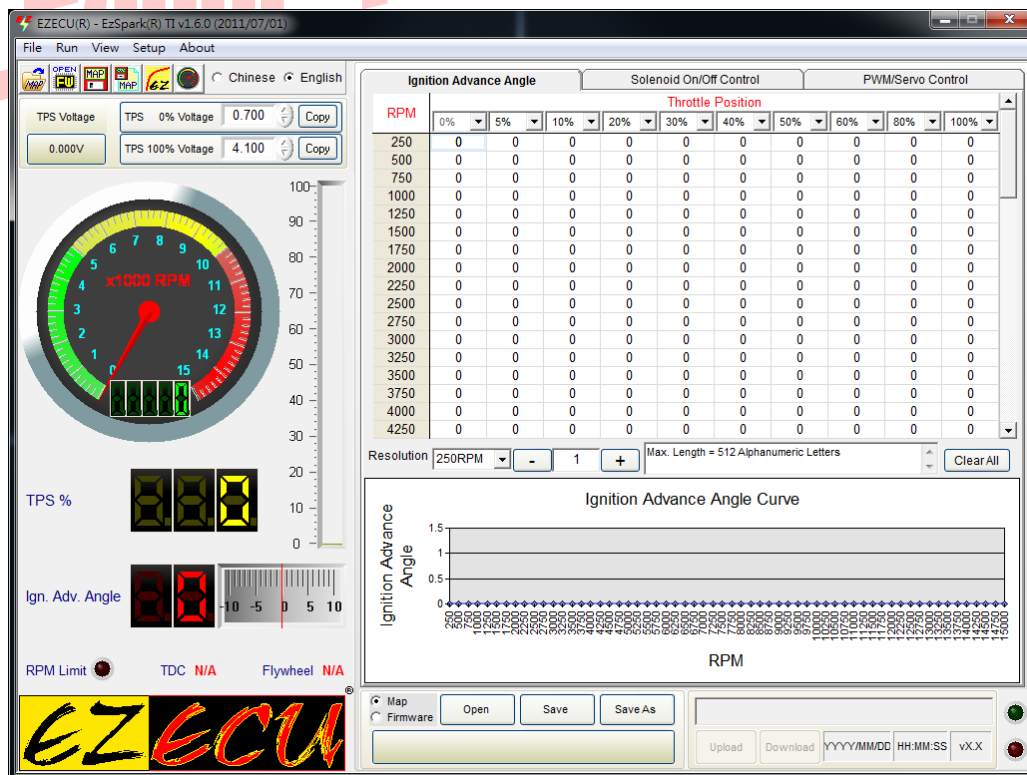


Figure 3-1 Overview of EzSpark® TI ECU Application Software (Unconnected)



If the EzSpark® TI ECU is powered on and connected to PC, the engine status gauges on the left side of the software will be updated as shown in Figure 3-2. Besides, the green LED on the right-bottom corner will be activated to indicate that the connection is ready.

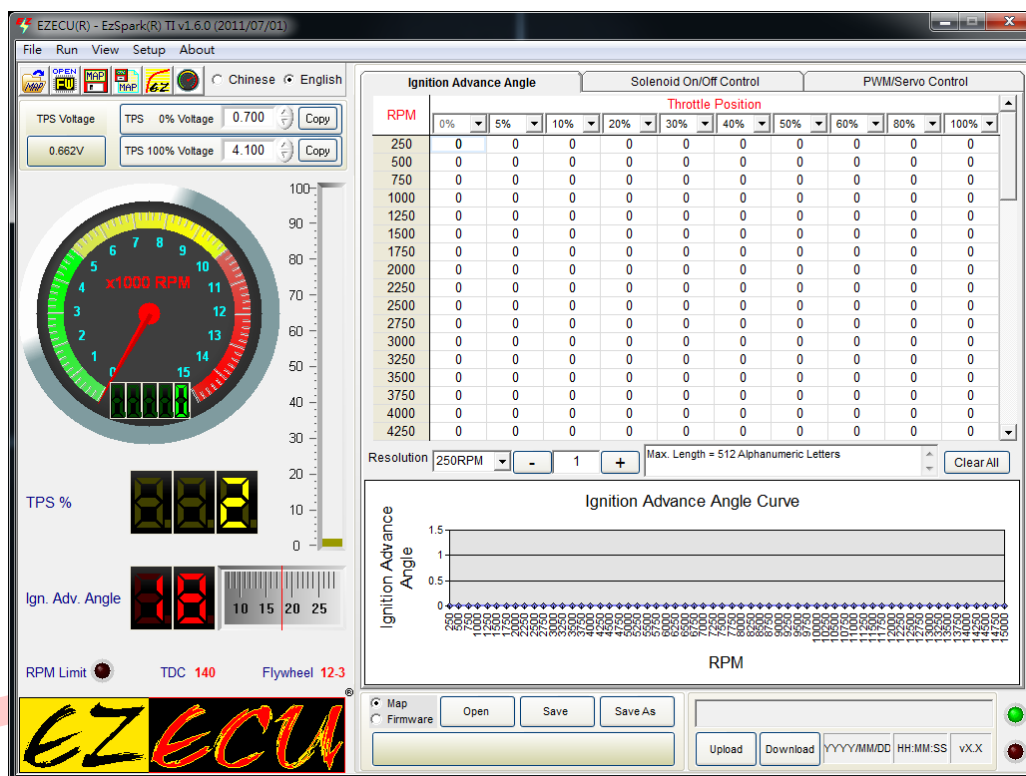


Figure 3-2 Overview of EzSpark® TI ECU Application Software (Connected)

### 3. Application Software

## 3.2 Ignition Map and Firmware Operations

As shown in [Figure 3-3](#) and [Figure 3-4](#), file operations for the ignition map and the firmware are slightly different. The ignition map file can be opened, saved, and saved as another file name. However, the firmware file can be opened only.

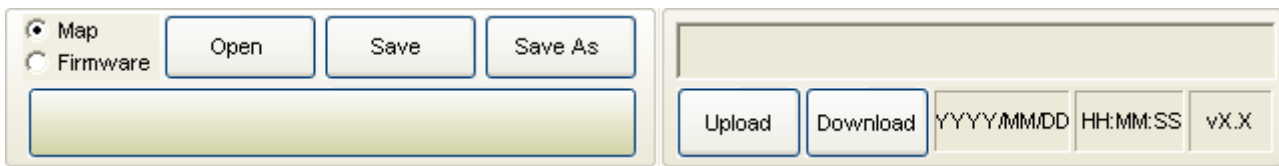


Figure 3-3 Ignition Map Operation Buttons

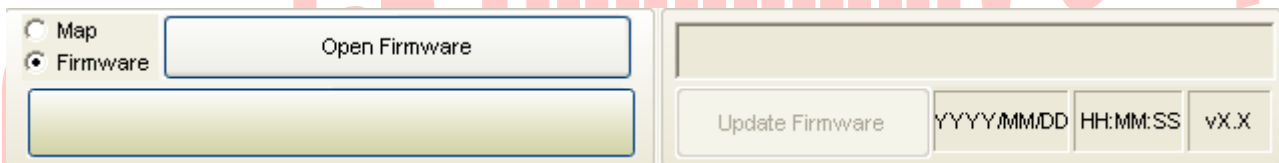


Figure 3-4 Firmware Operation Buttons

Before pressing the upload/download button, please make sure that the USB cable is correctly connected between your computer and the EzSpark® TI ECU. Finally, please confirm the power good LED is turned on. You can press either the “Upload” or the “Download” button even if the engine is running still. However, you must stop engine before pressing the “Update Firmware” button. When programming is in progress, the application software will show current programming progress. After uploading, downloading or updating, the application software will have a pop up window to indicate that the operation is completed.

### 3.3 TPS Voltage Calibration

The voltage values of TPS for each bike/scooter should be calibrated before operating correctly because the fully-closed and fully-opened throttle may be mapped to different voltages for different TPS models. For example, some TPS outputs 0V through 3.1V to represent the fully-closed through the fully-opened throttle, while some TPS outputs 0.7V through 4.1V to represent the fully-closed through the fully-opened throttle. Consequently, the application software provides semi-auto detection and manual input for the TPS calibration values.

As shown in Figure 3-5, there are two “Copy” buttons and two fields for inputting the voltage values corresponding to fully-closed (0%) and fully-opened (100%) throttle, wherein two “Copy” buttons are responsible for the semi-auto input function and two fields are responsible for the manual input function.

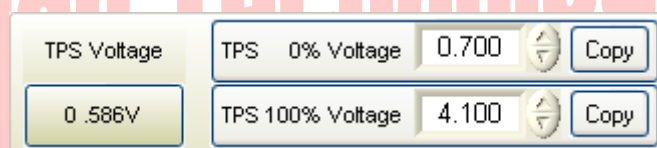


Figure 3-5 TPS Calibration Buttons

At first, the semi-auto input function is introduced as the following steps:

- Step 1 Connect the EzSpark® TI ECU with your bike/scooter;
- Step 2 Connect the USB cable between the EzSpark® TI ECU and your computer;
- Step 3 Execute the application software;
- Step 4 Turn on the bike/scooter power but do not start the engine and confirm the blue power LED on the EzSpark® TI ECU is lighted;
- Step 5 Press the upper “Copy” button to copy TPS voltage of 0% (fully-closed) throttle;
- Step 6 Rotate the bike/scooter’s throttle to 100% (fully-opened) and hold, press the lower “Copy” button to copy TPS voltage of 100% throttle; and
- Step 7 Close the bike/scooter’s throttle.

Since the TPS is made of resistor, the voltage output may vary according to different working temperatures. Consequently, we suggest to *increase the fully-closed TPS voltage by 0.1V* and to *decrease the fully-opened TPS voltage by 0.1V*.

### 3. Application Software

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In this manner, the TPS mapping range for your bike/scooter can be detected. Both TPS setting values can be saved into the ignition map file. If user wants to update the ignition map again, the TPS calibration process can be skipped by reloading the saved TPS setting values.

Finally, user may also use a precise voltage meter to measure TPS voltage values corresponding to 0% and 100% throttle and then fill the measured voltage values into the TPS calibration fields.

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### 3.4 Real-Time Engine Status

As shown in Figure 3-6, real-time engine status includes a RPM gauge, a TPS % display and a corresponding meter, an ignition advance angle display and a corresponding meter, a RPM limit indication LED, a TDC (Top Dead Center) angle display, and a magnet flywheel type display.

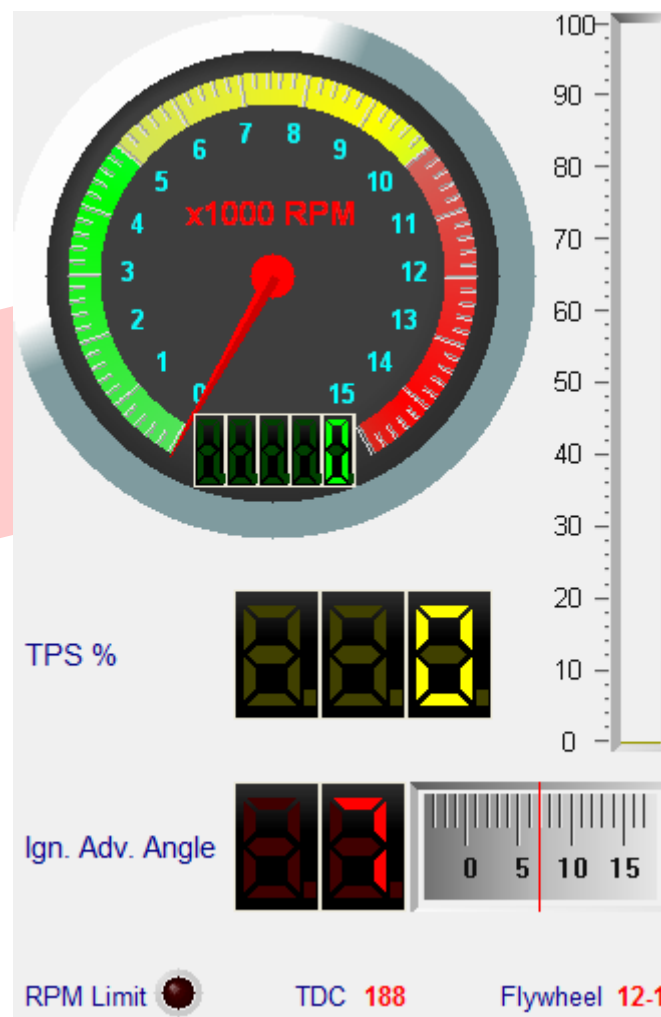


Figure 3-6 Real-Time Engine Status

The “RPM Limit” indication LED will be lighted when the engine RPM exceeds 15,000 RPM. The TDC shows the programmed angle for TDC. The crankshaft flywheel type shows one of 18-1, 12-1, 24-1, 12-2, 12-3, 24 and 1 tooth/notch.



### 3. Application Software

## 3.5 Crankshaft Flywheel Type and TDC Angle Setting

The crankshaft flywheel type and TDC angle setting window can be activated by pressing the “Setup” on top-left menu as shown in Figure 3-7.

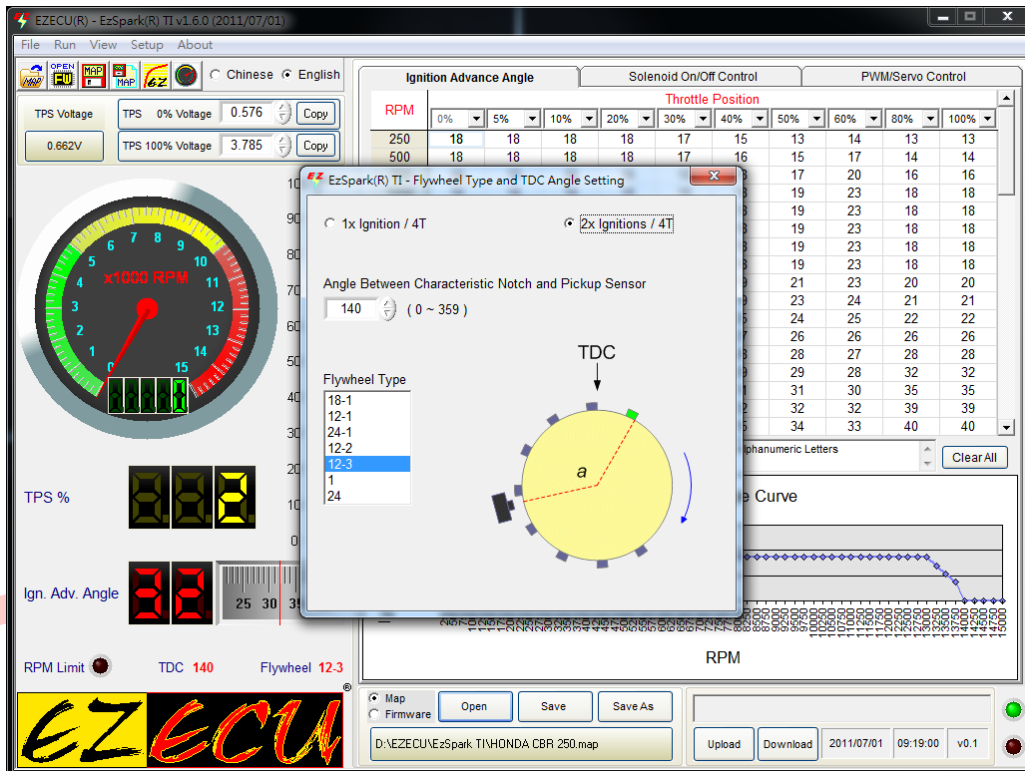


Figure 3-7 Crankshaft Flywheel Type and TDC Angle Setting

In the setting window, users can program the ignition mode for either 1× ignition or 2× ignitions within two engine revolutions. Note that if 1× ignition within two engine revolutions is selected, you must confirm that the MAP sensor signal is fed into the EzSpark® TI ECU. For 2× ignitions within two engine revolutions (known as the wasted ignition), the MAP sensor signal input pin 1 can be ignored.

Currently, the EzSpark® TI ECU supports seven different crankshaft flywheel types as shown in Figure 3-8 through Figure 3-14.

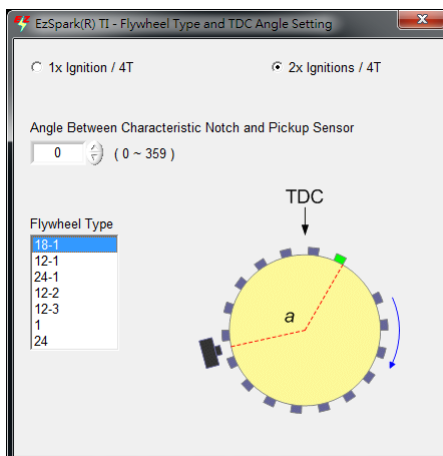


Figure 3-8 18-1 Teeth/Notches Crankshaft Flywheel Type

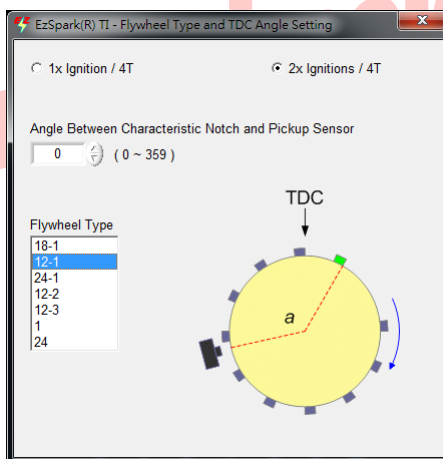


Figure 3-9 12-1 Teeth/Notches Crankshaft Flywheel Type

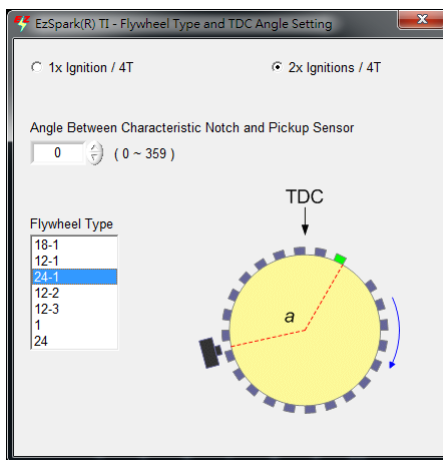


Figure 3-10 24-1 Teeth/Notches Crankshaft Flywheel Type

3. Application Software

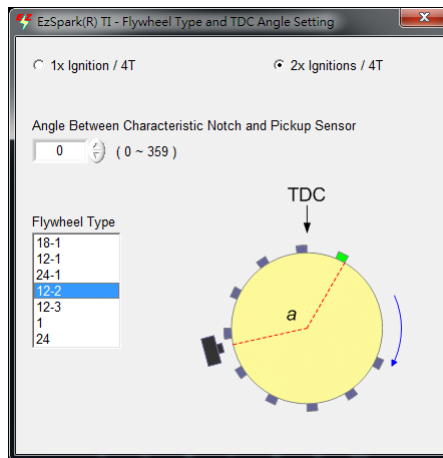


Figure 3-11 12-2 Teeth/Notches Crankshaft Flywheel Type

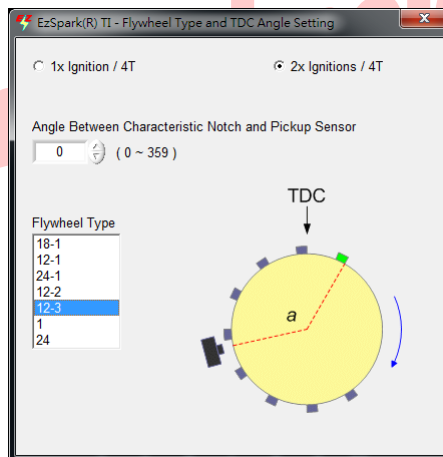


Figure 3-12 12-3 Teeth/Notches Crankshaft Flywheel Type

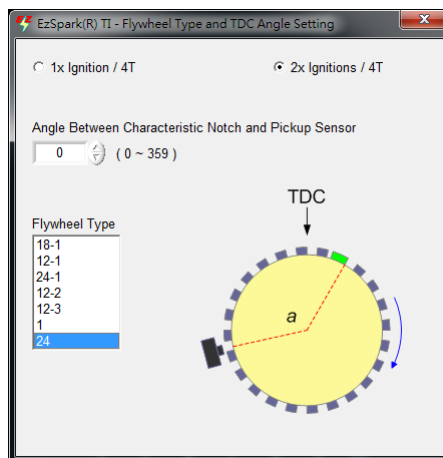
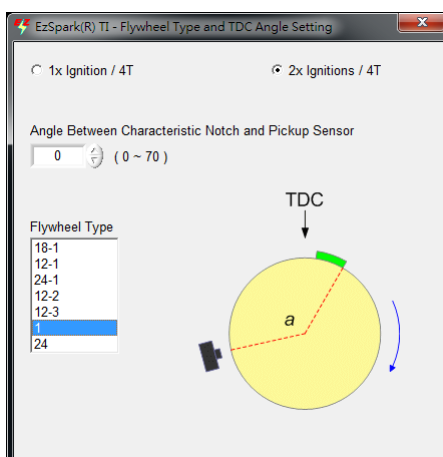


Figure 3-13 24 Teeth/Notches Crankshaft Flywheel Type





**Figure 3-14 1 Tooth/Notch Crankshaft Flywheel Type**

Some crankshaft flywheel types and corresponding scooter/bike brands and models are listed in [Table 3-1](#). If your brands/models are not included in this table, please contact your dealer or professional technicians to find out the correct magnet flywheel type.

**Table 3-1 Crankshaft Flywheel Types for Scooter/Bike Brands and Models**

Crankshaft Flywheel Types	Brands	Models
12-1	YAMAHA	T-MAX 500
		V-Ixion 150
		Majesty 125/250
		New Cygnus X 125
		Cygnus X 125
		BW'S 125
		GTR Aero 125
		Jog Chao 115
		Jog CUXI 100
		RS-Z 100
Vino 50		
24-1	KYMCO	NIKITA 300
		Xciting 250/500
		Dink 180
		KTR 150
		Quannon 150
		G5 125/150



### 3. Application Software

Crankshaft Flywheel Types	Brands	Models
		Racing 125/150 GP125 VJR 50/100/110 Many 50/110
		RV 180/250 T1 150 Fighter 125/150 Jet Power 125 tini 100 GR 125 GT 125
24-1	SYM	CO-iN 125
24-1	HARTFORD	Mini 125 FI
12-2	SUZUKI	Address V125G Address Z125 Address V125S / Tekken
12-3	HONDA	CBR 250
24-2	KAWASAKI	Ninja 250R EFI
18	KAWASAKI	KLX 250
18-1	SYM	iRX 115
24	KYMCO	Xciting 250/500
24	SUZUKI	NEX 125 GSR 125
24	PGO	G-MAX 220
36-2	PGO	TIGRA 125
1	HONDA	GY6 (Carburator)

The TDC (Top Dead Center) angle is defined as “the angle between the characteristic tooth/notch (the green tooth shown in figures) and the pickup sensor when the piston is moved to the topmost position”. For multi-teeth crankshaft flywheels, the TDC angle can be set to any degree from 0° through 359°. For the single notch/tooth crankshaft flywheel, the TDC angle can be set to any degree from 0° through 70°.

### 3.6 Ignition Advance Angle Table

The ignition advance angle table with 250 RPM resolution is shown in Figure 3-15.

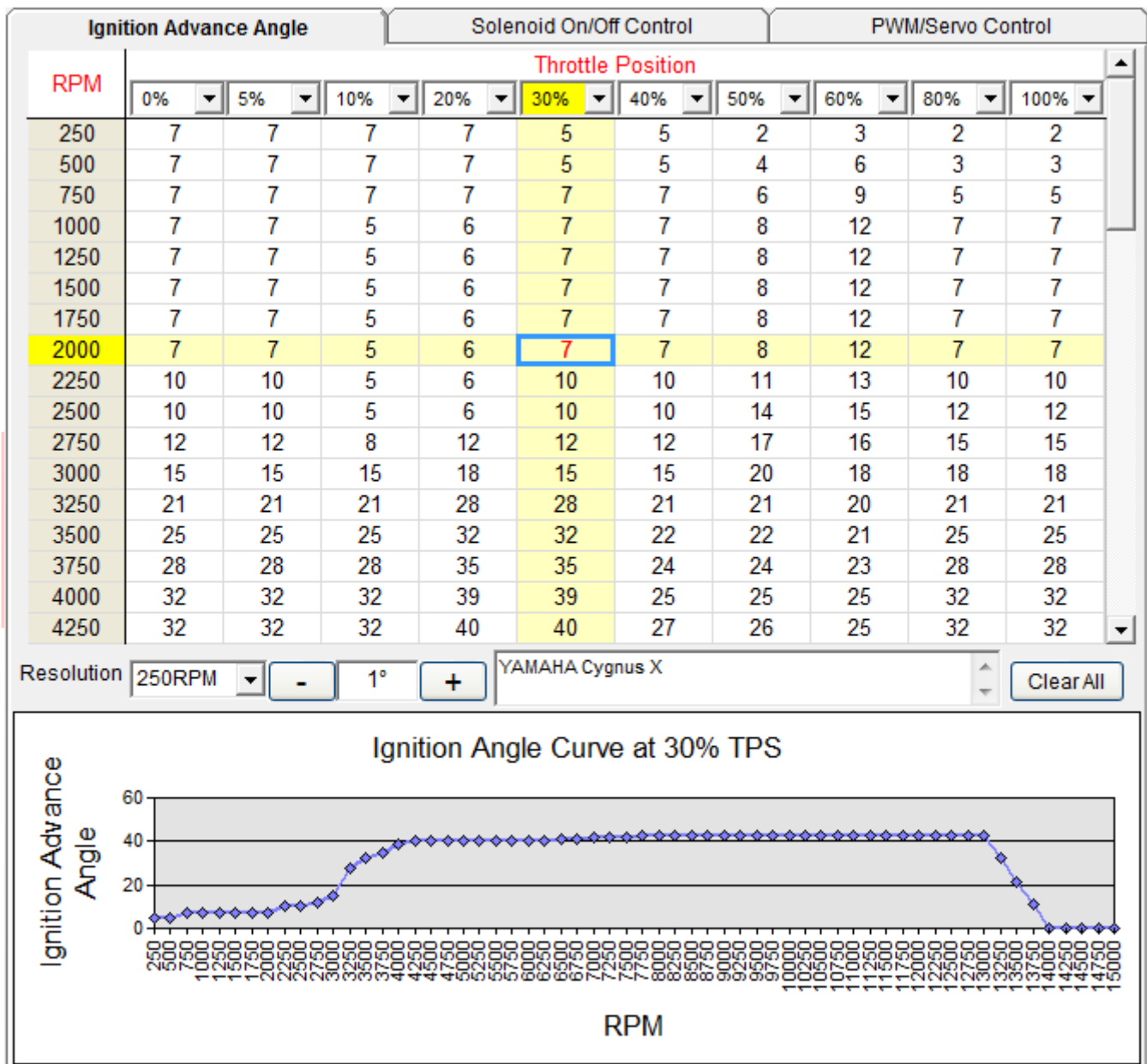


Figure 3-15 Ignition Advance Angle Table with 250 RPM Resolution

### 3. Application Software

The EzSpark® TI ECU provides an ignition advance angle table with 250 RPM through 15,000 RPM by programmable 10-level TPS resolutions with 1% step (the default TPS levels are 0%, 5%, 10%, 20%, 30%, 40%, 50%, 60%, 80%, and 100%). The 250 RPM through 15,000 RPM can be set by selecting the RPM resolution as one of 250 RPM, 500 RPM and 1,000 RPM. Ignition advance angle tables with 500 RPM and 1,000 RPM resolutions are shown in Figure 3-16 and Figure 3-17, respectively.

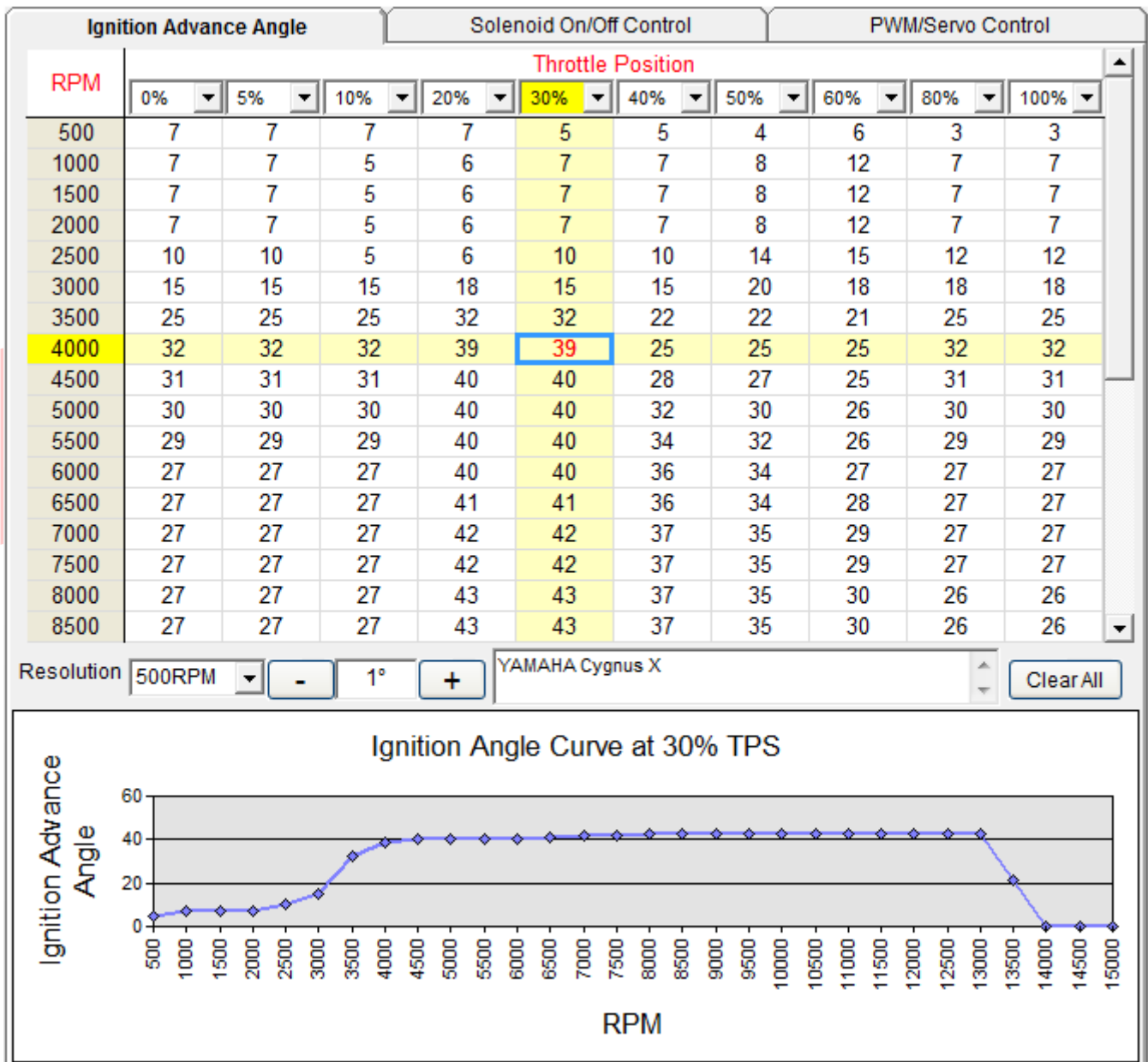


Figure 3-16 Ignition Advance Angle Table with 500 RPM Resolution

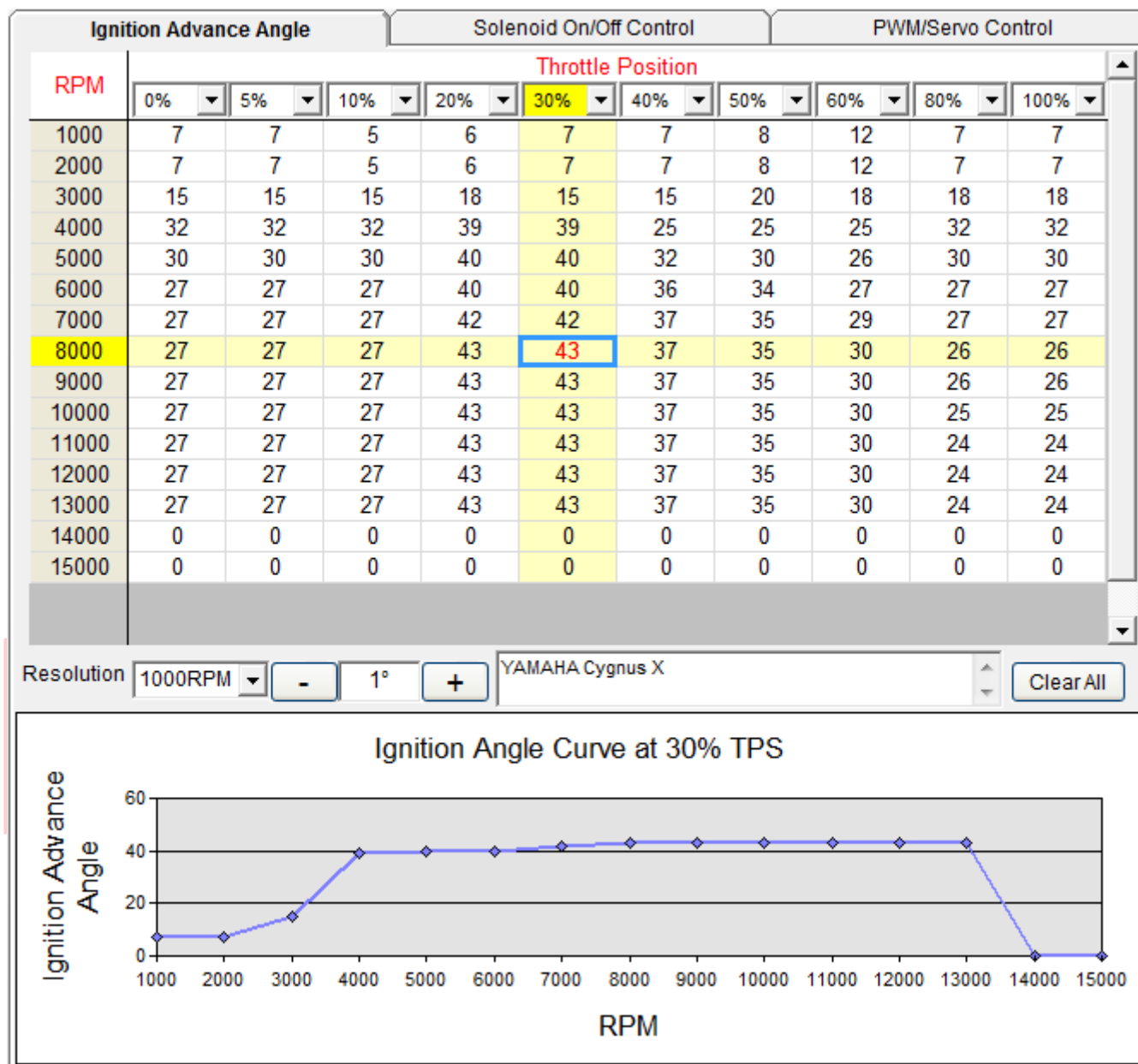


Figure 3-17 Ignition Advance Angle Table with 1,000 RPM Resolution

In general, the 1,000 RPM resolution is recommended as a startup basis. The ignition advance angle table with 1,000 RPM resolution is formed as a 15 by 10 table. Since there are fewer cells, it is easier for roughly tuning the ignition table. The application software will average and interpolate the ignition advance angles into each cell of the 250 RPM ignition advance angle table. User does not need to worry about losing control precision due to selecting the 1,000 RPM resolution.

### 3. Application Software

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If user wants to increase resolution for the ignition advance angle table, the 500 RPM resolution can be selected. The ignition advance angle table with 500 RPM resolution is formed as a 30 by 10 array. Since there are double cells as compared to the 1,000 RPM resolution, user may tune the ignition advance angle in a more detailed order. The application software will average and interpolate the ignition advance angles into each cell of the 250 RPM ignition advance angle table. User does not need to worry about losing control precision due to selecting the 500 RPM resolution.

The maximum resolution is to set as the 250 RPM resolution. The ignition advance angle table with 250 RPM resolution is formed as one 60 by 10 array. Since there are double cells as compared to the 500 RPM resolution, user may tune the ignition advance angle in a most detailed order.

When editing the ignition advance angle table, user may mark an area to perform addition/subtraction/clear all by pressing corresponding buttons below the ignition advance angle table. The addition/subtraction button will add/subtract each cell inside the marked area by the value of the addition/subtraction value field. The clear all button will reset each cell of the ignition advance angle table to 0.

### 3.7 Mini Bar

On the left-top corner of the application software, there is a mini bar shown in [Figure 3-18](#) to provide quick accesses to functions.



Figure 3-18 Mini Bar of EzSpark® TI ECU Application Software

Functions for buttons on the mini-bar from left to right are listed below:

1. Open Ignition Map
2. Open Firmware
3. Save Ignition Map
4. Save As Ignition Map
5. Dynamic Track Mode
6. Full-Screen Engine Status Monitoring

The first four buttons have same functions as aforementioned in [Section 3.2](#). The dynamic track mode and the full-screen engine status monitoring are described in [Section 3.8](#) and [Section 3.9](#), respectively. The display language options are also shown on the mini bar.



### 3. Application Software

#### 3.8 Dynamic Track Mode

When the “Dynamic Track Mode” button on the mini bar is pressed as shown in Figure 3-19, the EzSpark® TI ECU will report which cell inside the ignition advance angle table has been referenced. This will be helpful for technicians who are tuning engines.



Figure 3-19 Dynamic Track Mode on the Mini Bar of EzSpark® TI ECU Application Software

#### 3.9 Full-Screen Engine Status Monitoring

When the “Full-Screen Engine Status Monitoring” button on the mini bar is pressed, the application software of EzSpark® TI ECU will switch to the screen as shown in Figure 3-20. This may be helpful for longer distance observing. Press the same button on the mini bar again will switch back to the original screen.

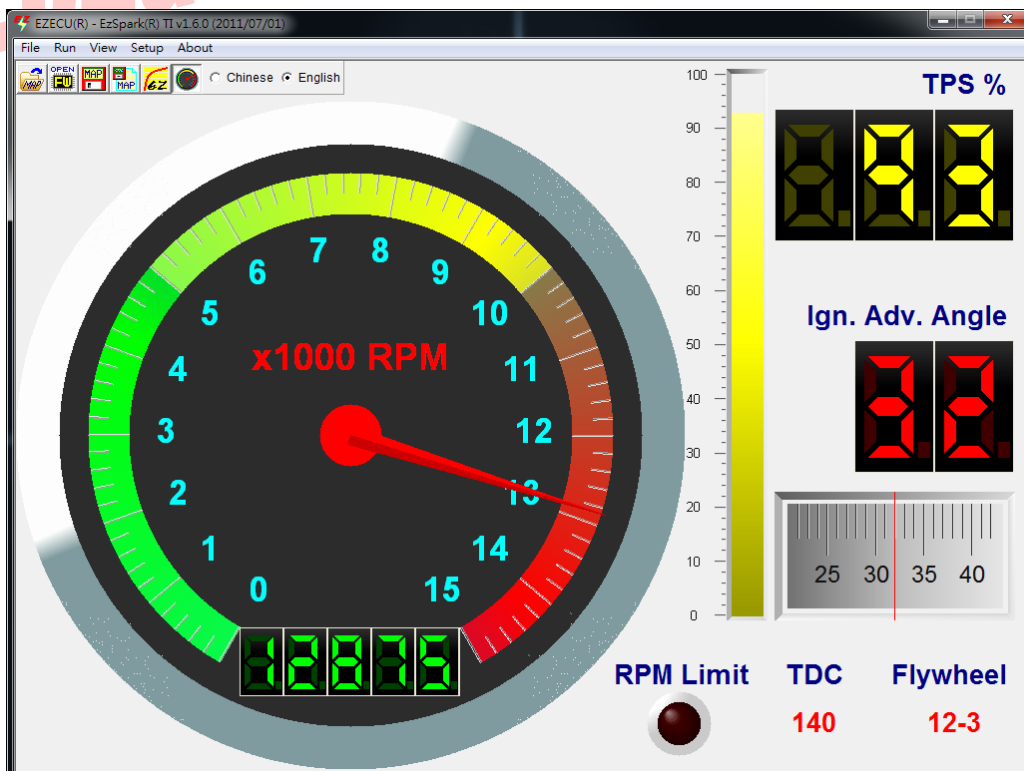


Figure 3-20 Full-Screen Engine Status Monitoring of EzSpark® TI ECU Application Software



### 3.10 Solenoid On/Off Control Table

The second page of 3D tables is the solenoid on/off control table as shown in Figure 3-21. Users can use this 3D table to control the NOS, intake valve, exhaust valve, etc. The resolution of this 3D table is the same as the ignition advance angle table with 60×10 cells. The programmable 10-levels for TPS can be modified only on the ignition advance angle page. Users may mark any area of editable cells and use buttons below to achieve the on/off control. Output inversion for all cells is also provided by simply check the inversion box below the table. The color definition for on/off will be changed and displayed also once the inversion box is checked or unchecked.

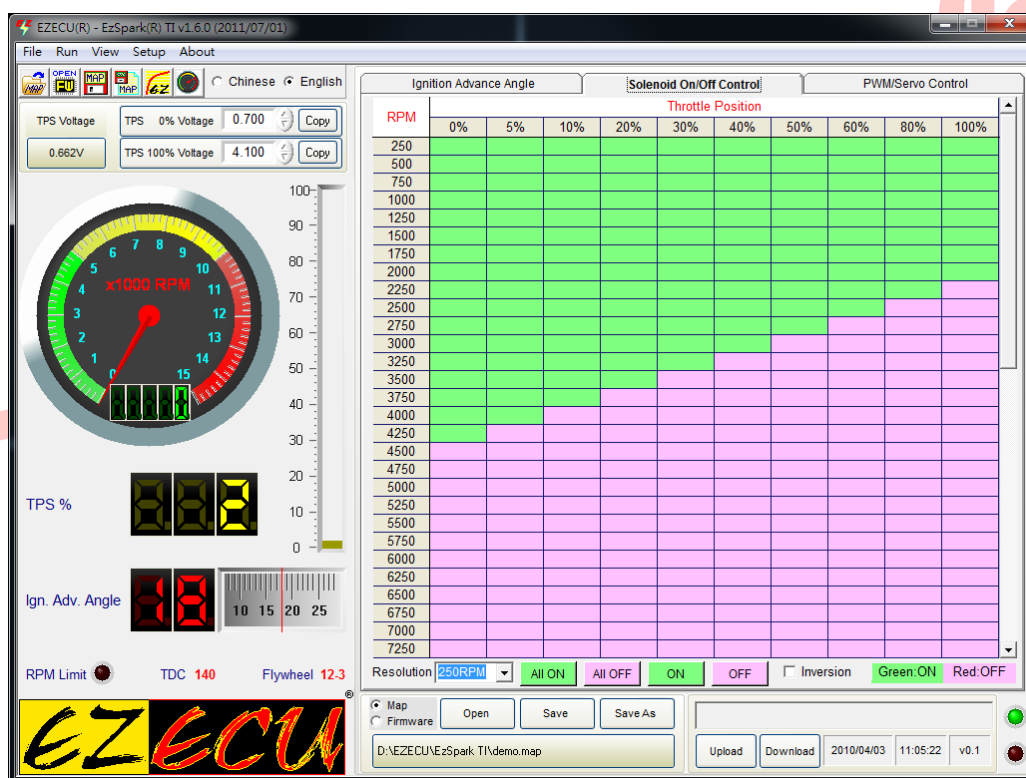


Figure 3-21 Solenoid On/Off Control Table of EzSpark® TI ECU Application Software



### 3. Application Software

#### 3.11 PWM/Servo Motor Control Table

The third page of 3D tables is the PWM (Pulse Width Modulation) / servo motor control as shown in Figure 3-22. Users can use the PWM mode of the 3D table to control the NOS, intake valve, exhaust valve, etc. The resolution of this 3D table is the same as the ignition advance angle table with 60×10 cells. The programmable 10-levels for TPS can be modified only on the ignition advance angle page. Users may mark any area of editable cells and use buttons below to add/subtract the percentage. Output inversion for all cells is also provided by simply check the inversion box above the table.

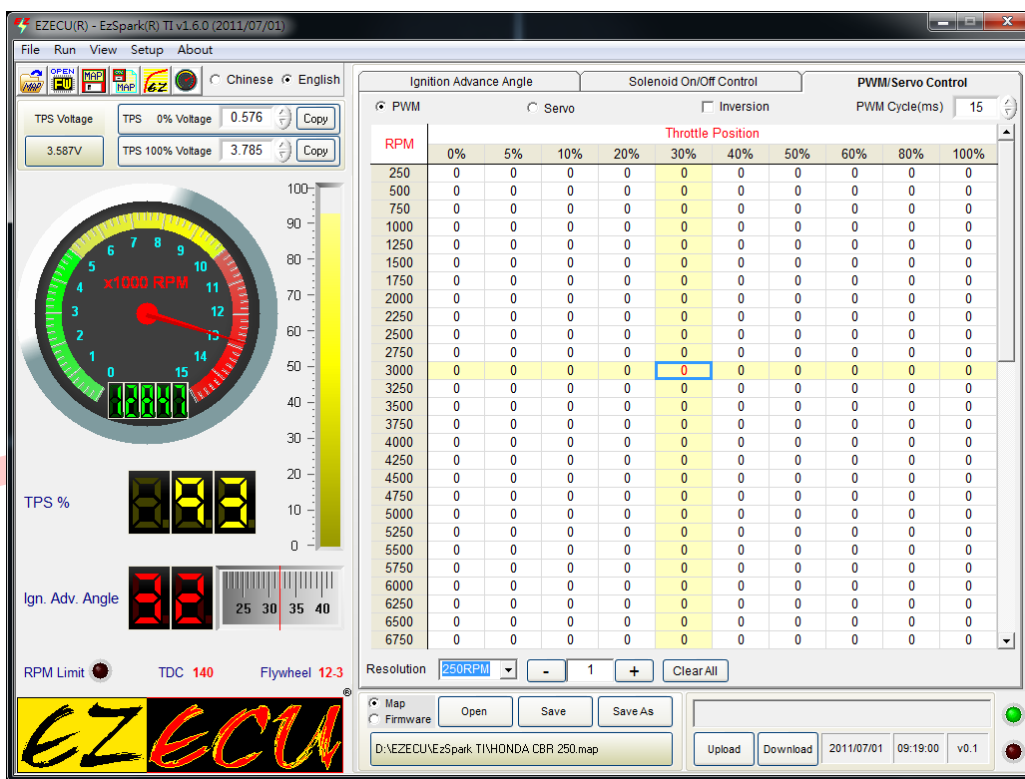


Figure 3-22 3D PWM/Servo Motor Control of EzSpark® TI ECU Application Software

For the PWM mode, the valid range for the PWM cycle starts from 1ms through 100ms with 1ms step. The valid PWM percentages are from 0% through 100% with 1% step. 0% means that the PWM output is turned off at all time. 100% means that the PWM output is turned on at all time. 50% means that the PWM output is turned on half-time and turned off half-time within the PWM cycle. If users need a second solenoid output, fill the tables with either 0% or 100% to achieve off or on control, respectively.

For the Servo mode, this output can be connected to a general PWM controlled servo motor. The value inside the 3D table will control the rotation direction and position of the servo motor. Values from 0 through 49 will let the servo motor to rotate left with 0 being the leftmost position. Value 50 will hold the servo motor at the center position. Values from 51 through 100 will let the servo motor to rotate right with 100 being the rightmost position. The Servo mode can be used for controlling the variable intake valve, variable exhaust valve, etc.

IC Leader Technology Corp.

### 3. Application Software

#### 3.12 Base Ignition Maps

While installing EzSpark® TI application software by using the CD, four base ignition maps for YAMAHA Cygnus and V-Ixion 150, KYMCO Racing, and HONDA CBR 250 will be installed also. The file names are listed in the following table:

Table 3-2 File Names for Referenced Base Ignition Maps

Brand	Model	File Name
YAMAHA	Cygnus	YAMAHA Cygnus.map
YAMAHA	V-Ixion 150	YAMAHA V-Ixion 150.map
HONDA	CBR 250	HONDA CBR 250.map
KYMCO	Racing	KYMCO Racing.map

It should be noted that the TPS (Throttle Position Sensor) voltage should be re-calibrated while loading the base map. Please refer to [Section 3.3](#) for the TPS voltage calibration procedures.

### 3.13 About EZECU®

The information about EZECU® series products and our company can be found by clicking the “About” menu. The following window with trademarks and URL will appear.



Figure 3-23 EZECU® Product Information Window

## Appendix Main Connector Signals

Table A-1 Main Connector Pin Numbers

10	9	8	7	6
5	4	3	2	1

Table A-2 Main Connector Signals

Pin No.	Signal Description	Wire Color
1	MAP (Manifold Absolute Pressure) Input	Grey
2	TPS (Throttle Position Sensor) Input	White
3	Power Ground	Black
4	Dummy Coil Output (to Factory ECU)	Blue
5	Fuel Pump Drive Output	Purple
6	PWM/Servo Motor Drive Output	Green
7	CPS (Crankshaft Position Sensor) Input	Orange
8	+12V Power	Red
9	Solenoid Drive Output	Yellow
10	Transistorized/Inductive Ignition Output	Pink