

**APEXi** ELECTRONICS TECHNOLOGY  
by APEXERA

# AUTO TIMER For NA & Turbo

## Instruction Manual

Thank you for purchasing this product.. Please read all of this manual to ensure proper usage. Also, please keep this manual in a safe place for future reference. Be sure to provide this manual to the next user in case of ownership change.

Part Name	APEX AUTO TIMER
Part Code	405-A011
Purpose	Engine After-Idling unit
Application	DC12V Body Ground Autos

**CAUTION** Vehicles that cannot use the A/F function

- Titanium type O<sub>2</sub> sensor vehicles (BNR32 Skyline GT - R, (R)PS1 3 Silvia/180S X ( 91.1 - 93.10 ) etc)

Vehicles that cannot utilize the auto idling feature

- Vehicles that cannot use the A/F function
- Vehicles that do not read an A/F near 14.6 during idle
- O<sub>2</sub> sensors that warm up slowly ( reads " --- " in display )

### Version Information

No.	Print Date	Instruction Manual Ver.	#	Notes
1	8-25-2000	7407-0260-00	1	
2	3-10-2004	7407-0260-01	2	
3	5-20-2005	7407-0260-02	3	

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## 1 Safety Precautions

For safe use of this product, be sure to read the Safety Precautions. Keep the manual in a safe place after use for future reference. We have included these warnings to protect the user and dealer from unnecessary harm. These points have been marked throughout this manual by SIGNAL WORDS. Please refer to the table on the left for a glossary of term meanings.

### GLOSSARY

Display	Meanings
<b>WARNING</b>	Failure to do so may result in death or severe injury to the user and others.
<b>CAUTION</b>	Failure to do so may result in light injury to the user and others or product and engine damage.
<b>PLEASE</b>	Failure to do so may result in product and engine damage.

### WARNING

This product should ONLY be installed by a professional installer.

Installation requires past experience to prevent damage to the unit and vehicle.

Do not use this product for any other purpose than the one listed in this manual.

We are not responsible for any damages or injuries incurred from improper usage of this product.

Discontinue use of this product immediately if any unusual odor or smoke comes from the unit.

Failure to do so may result in electrical shorts and potential engine fire.

Never operate this unit while driving.

Failure to do so may lead to accidents.

Never disassemble or tamper with this unit.

This could lead to serious injury.

Do not leave the engine running in closed garages or sealed areas.

Failure to do so may lead to exhaust fume poisoning.

### WARNING

Be sure to shut off the engine when sleeping inside the vehicle

Failure to do so may result in exhaust poisoning

Never leave the vehicle while the engine is running

This could lead to accidents

This product is designed for domestic use only. It must not be used in any other country.

### CAUTION

Be sure to secure this unit in a safe location away from the driver.

Failure to do so may lead to accidents.

Do not expose the unit to excessive shock.

This could lead to unit malfunction.

Never use this unit on a vehicle that is not intended for use.

We cannot guarantee proper operation of this unit on non application vehicles.

Always connect the hand brake wire.

Failure to do so may lead to accidents.

Please in tall with our recommended harness.

If you have any inquiry for the harness please contact to your shop.

Be sure that the unit has been properly connected when selling the vehicle. Also, be sure to provide the instruction manual to the new user.

## Considerations

Remote Door Lock Systems and Adjustable Steering Columns may not function properly after installation of this unit.

Be sure to turn AUTO LIGHT systems OFF. Failure to do so may cause the lights to stay on after the engine has been shut off. This may kill the battery.

Be sure to test unit operation and safety wire operation after installation.

## 2 Product Features

This unit will work on any 12V vehicle.  
O<sub>2</sub> sensor voltage · A / F value can be displayed.  
Displays A/F ratio as RICH or LEAN via 2 colors LED  
Displays battery voltage .Also warns of extremely LOW battery voltages.  
16 way adjustment of Count down timing from 0-10 minutes.  
Automatic countdown feature. In order to ensure the most optimum

countdown setting from the widest array of vehicles, the user can choose from 144 different settings.  
First Timer to utilize O<sub>2</sub> sensor voltage when calculating count down time. Compared to timers that only use vehicle speed and RPM, this TIMER can set the most accurate after idling time possible.  
Control Unit... 1 Parking Brake safety switch

## 4 Installation Procedures

### Relay and Control Unit Installation

#### Please

This product is designed to install with harness which we recommended. It is harness any our recommended harness when install.

#### Installing the Relay

1. Disconnect the negative terminal of the battery.
2. Pull the harness coming from the key cylinder. (In some vehicles, the whole key cylinder is a harness)
3. Insert the installation harness between the cylinder and harness .
4. Connect the 3 prong Timer harness to the relay.
5. Splice the black ground wire from the relay into the Engine ECU ground wire. ( Please refer to the vehicle specific wiring diagram. ) When not using the O<sub>2</sub> sensor, A/F ratio monitor, and automatic after idling functions, connect the ground wire connector to the chassis.
6. Splice the white wire from the relay ( O<sub>2</sub> sensor signal ) into the O<sub>2</sub> sensor wire from the ECU. ( Refer to diagram charts. )
7. Splice the gray parking brake wire from the relay to the parking brake switch. ( With the IG key ON, be sure to check that the parking brake switch reads 0 V when the parking brake is up, and 12V when the brake is down.)

### CAUTION

Do not mount the unit near high temperatures, dust, or under direct sunlight.

When mounting with double sided tape, take care not to damage the case when relocating.

#### Please

Be sure to remove all oil and debris from unit before mounting.

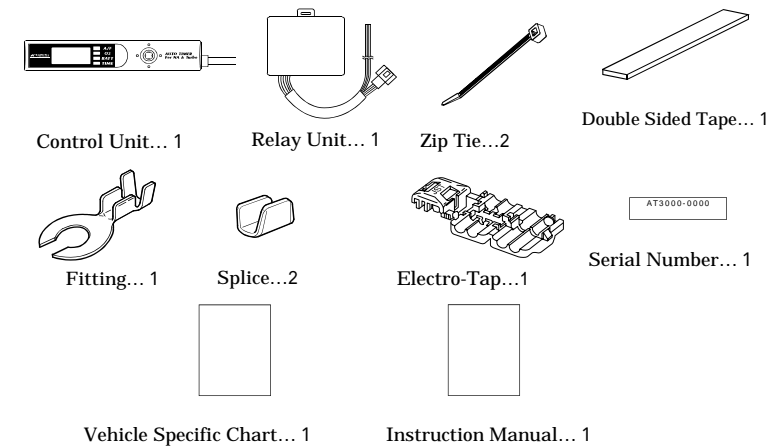
Never pull hard on any connectors or harnesses.

#### Mounting the Control Unit

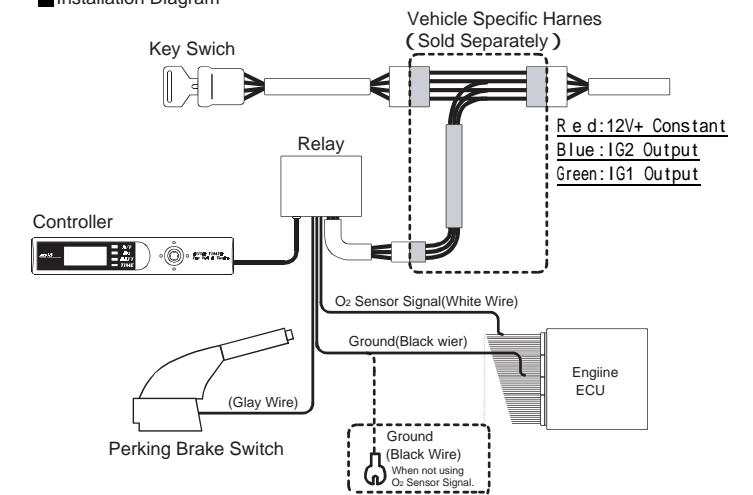
1. Use the included double sided tape to mount.
2. Mount in a location that does not interfere with driving.
3. Reconnect battery.

## 3 Parts List

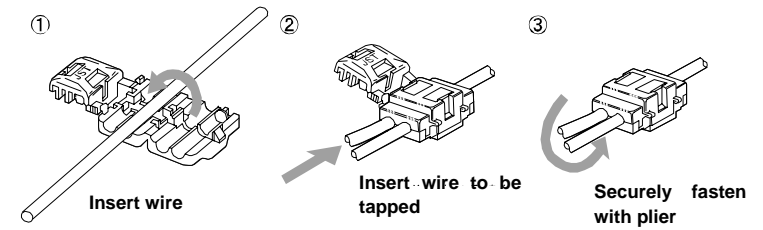
Be sure to check the contents before attempting installation. Please notify your dealer of purchase for any missing or broken parts BEFORE attempting installation.



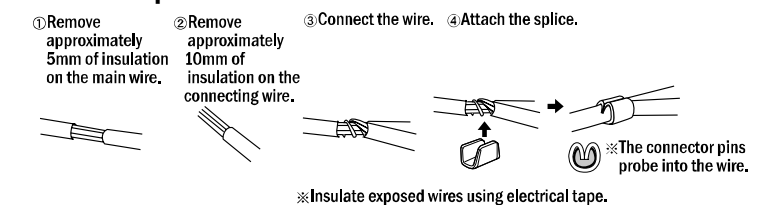
### Installation Diagram



#### How to use the Electrotaps (Parking Brake Switch)



#### How to Splice the Wire



### CAUTION

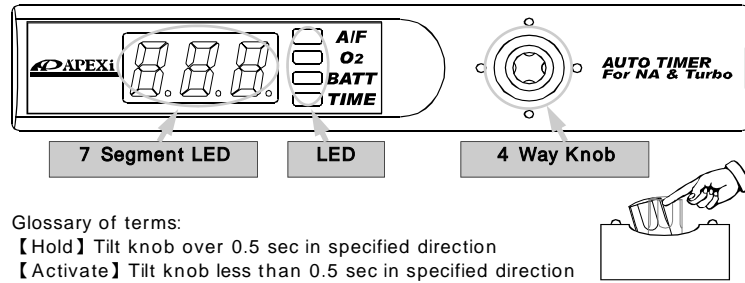
Be sure to use a proper tools when splicing. Failure to do so may lead to faulty connections.

#### Checking the Safety Switch ( Parking Brake Switch )

1. Pull the parking brake, start the engine, and make sure the IG key is ON.
2. Set the Timer to a random setting above 30 seconds.
3. Turn the IG key OFF to activate the Timer countdown.
4. Release the parking brake during the countdown process.
5. Be sure the engine shuts completely off.

# 5 Operation

## Part Names and Functions



Glossary of terms:  
 【Hold】 Tilt knob over 0.5 sec in specified direction  
 【Activate】 Tilt knob less than 0.5 sec in specified direction

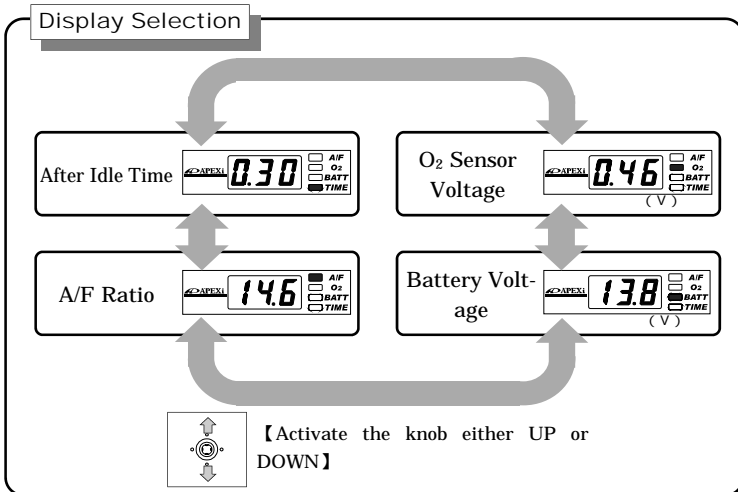
## Display

Turning the IG key ON will activate the display mode.  
 (Power must be on)  
 Contents may be checked through flashing lights

- Display Parameters**
- A/F ratio
  - O<sub>2</sub> Sensor Voltage
  - Battery Voltage
  - Countdown time

## Choose Display Parameter

To toggle between A/F ratio, O<sub>2</sub> Sensor Voltage, Battery Voltage, After Idling Time,  
 【Activate the knob either UP or DOWN】



## Set the unit

While in display mode and while the parking brake is activated,  
 【Hold the knob to the RIGHT】 This will activate the Setting mode for that parameter.  
 The LED will flash to confirm setting mode.  
 During Setting Mode 【Hold the knob to the LEFT】 to end.

- Parameters that can be Set**
- A/F ratio according to O<sub>2</sub> Sensor Voltage
  - O<sub>2</sub> Sensor Voltage according to A/F ratio
  - Minimum Battery Voltage Warning
  - Countdown Time

## Setting the Minimum Battery Voltage Warning

To activate Setting Mode...  
 While battery voltage is being displayed,  
 【Hold the knob to the RIGHT】  
 BATT will flash indicating that the setting mode has been activated

After setting...  
 【Hold the knob to the LEFT】  
 This will return to the Display Mode

When actual battery voltage attains lower than set voltage point, the indicator starts flashing.

**How to Set**

【Activate the knob either UP or DOWN】  
 Set the minimum warning battery voltage  
 Choose between 10.0V - 15.0V in 0.1V increments

## Setting the After Idling Time

To activate Setting Mode...  
 While After Idling is being displayed,  
 【Hold the knob to the RIGHT】  
 TIME will flash indicating that the setting mode has been activated

For Calculation Mode... (Manual or Auto)  
 After Idling times can be selected through Manual or Auto modes.  
 To toggle between Manual or Auto mode,  
 【Hold the knob to the RIGHT】

After setting...  
 【Hold the knob to the LEFT】  
 This will return to the Display Mode

**How to Set**

Select Calculation Mode  
 【Hold knob to the RIGHT】

**Manual Mode**

If display looks like below, The unit is in 【Manual Mode】

“Minute” “Second”

0 sec
1 0 sec
2 0 sec
3 0 sec
4 0 sec
5 0 sec
1 min
1 min 3 0 sec
2 min
2 mi 3 0 Sec
3 min
4 min
5 min
6 min
8 min
1 0 min

【Activate the knob either UP or DOWN】 to select After Idling Times  
 Range: 0 sec - 10 min in 1 6 increments

**Auto Mode**

If display looks like below, The unit is in 【Auto Mode】

MAX Countdown Value	Auto Calculation Rate	MIN Countdown Value
This sets the maximum amount of idle time.	This sets the auto calculation rate of the Timer.	This sets the minimum amount of idle time.
Value denotes MINUTES. Please choose between 1 min ~ 8 min	There are three modes, "H" High "n" Normal "L" Low	The vehicle will always idle for at least this amount of time.
		Choose between 0-60 seconds in 10 second increments.

【Tilt the knob either to the RIGHT or LEFT】 to select parameters  
 【Tilt the knob either UP or DOWN】 to change values

【Hold knob to the LEFT】 to return to Display Mode

## A / F value, O<sub>2</sub> Sensor Voltage Setting

This product contains various A/F and O<sub>2</sub> Sensor values.  
 The values range between A/F value(1) - O<sub>2</sub> sensor voltage (1) .....A/F value(8) - O<sub>2</sub> sensor voltage(8)  
 Please use the chart below when changing the setting A/F - O<sub>2</sub> sensor voltage data

Table 1 A/Fvalue-O<sub>2</sub> sensor voltage data chart

A/F	10.0	12.0	14.0	14.6	15.0	16.0	18.0	20.0
O <sub>2</sub> Sensor V	960	900	820	450	100	060	040	020

## Setting the A / F Value

To enter the setting mode...  
 While displaying A/F  
 【Hold the knob to the RIGHT】  
 A/F will flash indicating setting mode

How to set...  
 The A/F and O<sub>2</sub> sensor voltage will alternately display (A/F will display longer)  
 Input the A/F data corresponding to the displayed O<sub>2</sub> sensor voltage  
 The O<sub>2</sub> sensor data can be changed in the next section  
 Once setting is complete...  
 【Hold knob to the LEFT】  
 This will return to the Display Mode

**Procedure**

【Tilting knob to RIGHT or LEFT】 will change the range of A/F, O<sub>2</sub> data (see Table1)  
 A/F and O<sub>2</sub> will alternately display (A/F will display longer)

A/F Value  
 【Tilting knob either UP or DOWN】 will allow setting of desired A/F value.

## O<sub>2</sub> Sensor Voltage Setting

To enter the setting mode...  
 While displaying O<sub>2</sub> sensor voltage (mV)  
 【Hold the knob to the RIGHT】  
 O<sub>2</sub> will flash indicating setting mode

How to set...  
 The O<sub>2</sub> sensor voltage and A/F will alternately display (O<sub>2</sub> will display longer)  
 Input the O<sub>2</sub> sensor voltage corresponding to the displayed A/F data  
 The A/F sensor data can be changed in the previous section  
 Once setting is complete...  
 【Hold the knob to the LEFT】  
 This will return to the Display Mode

**Procedure**

【Tilting knob to RIGHT or LEFT】 will change the range of A/F, O<sub>2</sub> data (see Table1)  
 O<sub>2</sub> and A/F will alternately display (O<sub>2</sub> will display longer)

O<sub>2</sub> sensor voltage (mV)  
 【Tilting knob either UP or DOWN】 will allow setting of desired O<sub>2</sub> value.

## To turn OFF the Auto Timer

Turn the TIMER OFF when not in use.  
 To turn the TIMER OFF...  
 During display mode,  
 【Hold the knob to the LEFT】  
 The 7 segment LED will read "OFF" shutting OFF the unit

To turn the TIMER back ON...  
 While the unit is OFF,  
 【Hold the knob to the LEFT】  
 Or,  
 【Hold the knob to the RIGHT】  
 It return to the Display Mode

## Other...

To turn engine OFF during a TIMER countdown...  
 During countdown,  
 【Hold the knob to the LEFT】  
 Or,  
 【Hold the knob to the RIGHT】  
 This will turn the TIMER OFF thereby shutting the engine OFF.  
 (Ignition key must be removed)

Changing the after idling time during TIMER countdown...  
 During TIMER countdown,  
 【Tilt knob UP】 to increase time  
 【Tilt knob DOWN】 to decrease time.

## About the A/F ratio values...

This unit calculates a theoretical A/F value based upon the factory installed O<sub>2</sub> sensor. O<sub>2</sub> sensor voltage output characteristics follow the chart to the right, where rich conditions produce a near 1V signal while a lean condition produces a near 0.1 V signal. Although the A/F value is calculated off of this O<sub>2</sub> sensor voltage, factors such as exhaust temperature prevent the O<sub>2</sub> sensor from producing a stable and constant reading. Please use this feature only to determine rich or lean conditions. Also, different O<sub>2</sub> sensors will produce different voltage readings.

Fig #1. O<sub>2</sub> Sensor Output Characteristics

If the O<sub>2</sub> sensor has not warmed up enough,  
 A/F will flash red and green.  
 Once the O<sub>2</sub> sensor warms up, the display mode will initiate.

When the A/F reaches over 10.0,  
 A/F will flash red.

When the A/F goes under 20.0,  
 A/F will flash green.