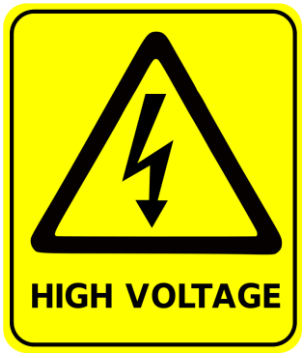

WARNING: HIGH VOLTAGE!

DISCONNECT THE BATTERY BEFORE INSTALLING OR SERVICING ANY IGNITION SYSTEMS COMPONENTS.

Failure to follow these instructions and the vehicle owners' handbook and shop manual could result in serious personal injury, death and or damage to property. This part is designed to be installed by a mechanic that is familiar with European automobiles and safety standards.

Caution

The programmable function of this ignition module is intended for off road motor sport use only. Perma-Tune makes no warranties, whether written or oral, expressed or implied. Perma-Tune specifically disclaims implied warranties of merchantability and fitness for a particular purpose and disclaims any liability from accident, misuse or damage to property as a result of using this ignition system.

The Model 90506 Bluetooth Antenna is designed to connect your engine to your smart phone using Perma-Tune Advanced Ignition Technology®. It is compatible with any Bluetooth enabled device. Smart phone Apps are free and programming is easy to learn.

Download Smart Phone Application

Any terminal emulation application that is designed to work with Bluetooth can be used. Use the default terminal settings. We recommend Sena brand BTerm software. It is available free from Google Play. Here is a link:

https://play.google.com/store/apps/details?id=com.sena.bterm&hl=en

Perma-Tune to Bluetooth Connection

Perma-Tune Advanced Ignition Technology need only be paired to your smart phone once. After that, the connection is automatic. These are the instructions for the initial communications set up between your Perma-Tune and smart phone.

Installing the Antenna on the 911 and 911SC

The 90506 Bluetooth Antenna must be mounted away from the Perma-Tune and outside the engine bay if possible. The ideal mounting place would be inside the cabin of the vehicle. On street cars, it could be mounted on the rear window dash, on race cars, it can be mounted on the aft roll bar support. The Perma-Tune antenna wire can be routed behind the relay panel where the Perma-Tune is mounted. The antenna wire will fit between the Perma-Tune and the relay panel so no holes need to be drilled.

The maximum line-of-sight operating range between the Perma-Tune antenna and another Bluetooth antenna is about three hundred feet. The antenna can be mounted just about anywhere on the car. However, the operating range will be less than the line-of-sight range depending on how difficult it is for the Perma-Tune antenna to reach another Bluetooth antenna.

Initializing the Bluetooth Connection

Plug the Perma-Tune 9506 Antenna into the programming port of the Perma-Tune: it is keyed to connect only one way. Plug the Perma-Tune into the vehicle harness but do not bolt the Perma-Tune to the engine bay yet: leave it in the engine bay so that the LED indicators can be seen while standing clear of the engine bay.

Reconnect the battery terminal. Turn the ignition switch to ON but **do not start the engine**: programming will not initiate if the Perma-Tune detects that the engine crankshaft is moving. The green status LED should begin to flash and the coil discharge LED should not illuminate at all.

DANGER: Remain clear of the engine bay while the battery is connected: high Voltage may be present at the ignition coil. Failure to stay clear of the engine bay may result in serious personal injury, death and or property damage.

Open the terminal emulation software on your smart phone. These instructions assume the Sena BTerm application is running on a Samsung Galaxy phone.

Press: **Menu** Key on your smart phone

Press: Bluetooth Management

Press: Connect to

Press: Select

Select: Inquiry Scan (default selection)

Press: Start Scan

Reads: MAC identification number appears after “NAME-XXXX” on the screen.

Select: MAC number that appears on the screen.

Press: Connect

At this time may be asked to accept the default PIN or it may ask you to enter the PIN. If the default PIN is already displayed, then select OK. If it asks for the PIN, enter 1234 as indicated as follows:

Display: Bluetooth Pairing Request

For MAC XXXX

Enter the PIN

Enter: 1234

Select: OK

Select: Enter

Display: ? for help>

Select: ?

Delect: Enter:

At this time the help menu should be displayed on the screen. Proceed to the “Programming Instructions” section.

When programming is complete, disconnect the battery terminal. Remove the 90506 from the Perma-Tune and then securely bolt the Perma-Tune to the car.

Warning: Do not fail to disconnect the battery before bolting the Perma-Tune to the car: high Voltage may be present at the ignition wiring and or coil. Failure to disconnect the battery from the car may result in serious personal injury, death and or property damage.

Caution: Do not start the engine until the Perma-Tune has been correctly programmed and bolted to the car. Do not neglect to reconnect the ground wire between the mounting bracket and the vehicle chassis.

Note: When you close the BTerm App or shut off the Perma-Tune for the first time, the Bluetooth connection will be automatically ended and the connection settings saved. To reconnect to the Perma-Tune, turn the engine ignition key to **ON** and open the BTerm App on your smart phone. Then press: **ATD Enter** on the phone key board. The phone will automatically sync to the Perma-Tune without pressing additional keys. Simply select **Enter** on the phone keyboard to resume programming your engine.

Programming Instructions

Introduction

Refer to the program settings that came with your Perma-Tune. The settings in the instructions below are for demonstration only and may not be the correct settings for your vehicle.

Help Menu

Press the Enter key on your computer. You should now see this on the Hyper Terminal programming window: **? for help>**

Type in the **?** mark and then press Enter. You should now see the left side of the chart in the Hyper Terminal programming window:

Programming Window	Function
? for help>?	Input prompt: Type in your command after the >.
2: Set 2S RPM	RPM at which the double strike will revert to single.
3: Set 3S RPM	RPM at which the triple strike will revert to double.
A: Set adv. point	Advance curve settings in crankshaft degrees.
D: Settings	Displays all current settings.
F: Set F-delay, 600 max us	Mechanical points de-bounce setting.
I: Set type Elec=0, Mech=1	Magnetic pulse or points input setting.
N: Set #of cyl	Number of engine cylinders, 4, 6, 8 or 12.
P: Set PW, 1600 max us	Spark power setting in micro seconds.
R: Set max RPM	Soft RPM limiter setting.
S: Set serial #	Identification serial number setting.
T: Set Transition type Neg=0, Pos=1	Triggering on the positive or negative going signal.
V: Set Vacuum adv	Enables or disables the vacuum advance function.

Using the Functions

After entering the function code, press the enter key on the computer. More information about the function will appear in the programming window. The commands must be entered quickly or the input prompt will appear which will then require you to re enter the command. **Note: All communications functions are automatically locked out when the engine is running.**

? = Displays the single digit codes for accessing the programmable functions.

2 = Sets the double strike function, this will appear in the window: **2: Set 2S RPM**
Enter a number and press return. When this function is used, the Perma-Tune will produce a spark on command from the distributor and then another within 2.5 mS after the first spark. This will occur from zero RPM to whatever RPM is entered into this function. The discharge indicator LED will appear to dim slightly at the transition from double strike to single strike. **Caution: In general, this setting should not exceed 2,000 RPM. Setting this RPM too high will cause engine knock and or pinging and could result in serious damage to the engine.**

3 = Sets the triple strike function, this will appear in the window: **3: Set 3S RPM**
When this function is used, the Perma-Tune will produce a spark on command from the distributor and then two more within 2.5 mS of each other after the first spark. This will occur from zero RPM to whatever RPM is entered into this function. In the case of overlapping 2 and 3 strike functions, the three strike function is dominate. The discharge indicator LED will appear to dim slightly at the transition from triple strike to double strike. **Caution: In general, this setting should not exceed 1,000 RPM. Setting this RPM too high will cause engine knock and or pinging and could result in severe damage to the engine.**

A = Sets the RPM versus degrees of crankshaft advance, this will appear in the window**: Enter point:** Enter a number between 0 and 15. Entering zero will set the advance point between zero and 499 RPM. Entering one will set the advance point between 500 and 999 RPM. Entering two will set the advance point between 1000 and 1499 RPM and so on up to 8000 RPM. After entering a number, this will appear in the window: **Enter Advance (Deg) :** Enter a number between zero and 30. Repeat the process until all points are entered. **Caution: If this function is not used, all advance settings must be set to 30 degrees. To use this function, the distributor must be mechanically locked to the 30 degree position.**

D = Displays the current program settings, these settings will be different for the type of engine your Perma-Tune is installed in. For illustration, here are the pre-set program settings for the 911SC905 Perma-Tune that should appear in the window for the stock, 2.7 L Porsche 911SC engine:

-----Settings-----
Ver : PA1
Serial# : 0123456789
Type : Elec
Transition : NEG
F-delay : 500 us
PW : 1200 us
#Cyl : 6
Max RPM : 7000 RPM
2S RPM : 150 RPM
3S RPM : 100 RPM
Vacuum adv : Disabled
Advance curve:
RPM 0, ADV 30
RPM 500, ADV 30
RPM 1000, ADV 30
RPM 1500, ADV 30
RPM 2000, ADV 30
RPM 2500, ADV 30
RPM 3000, ADV 30
RPM 3500, ADV 30
RPM 4000, ADV 30
RPM 4500, ADV 30
RPM 5000, ADV 30
RPM 5500, ADV 30
RPM 6000, ADV 30
RPM 6500, ADV 30
RPM 7000, ADV 30
RPM 7500, ADV 30

F = Sets the mechanical points de bounce delay, this will appear in the window: **F: Set F-delay, 600 max us** Points bounce occurs at high RPM with mechanical points when the points bounce back open for an instant after closing. This condition causes the ignition timing to become unstable at high RPM. It can be compensated for by using the Perma-Tune controller to ignore any rising signal resulting from points bounce for a pre determined amount of time after the points close. This setting determines how long the Perma-Tune controller will wait after the points close before it will accept the signal from the points opening. In most cases, 500 uS will allow plenty of time for the signal to stabilize before the points open. If the distributor points dwell time is very low, then this time may be too long and the controller may ignore the points opening signal. To remedy this, reduce the de bounce time. This setting is only active if the engine uses breaker points and so is ignored by the 90506 Perma-Tune.

I = This setting determines the type of triggering being used, this will appear in the window: **I: Set type Elec=0, Mech=1** Elec means electronic distributor like the 911SC, Mech means breaker points like the 356 and 911. The triggering circuitry for the electronic distributor is automatically set for zero crossing triggering. For the Porsche 911SC Perma-Tune, this must always be set to 0. **Note: The Perma-Tune controller will ignore the trigger signal if this is set to 1 and so will not function.**

N = Sets the number of cylinders, this will appear in the window: **N: Set #of cyl**
This can be set to 4, 6, 8 or 12 cylinders and will always be set to 6 for the Porsche 911SC Perma-Tune. **Caution: Changing this setting to 8 or 12 cylinders will cause the RPM limit to be far higher than expected which may result in severe engine damage.**

P = Sets the internal pulse width charge time of the Perma-Tune, this will appear in the window: **P: Set PW, 1600 max us**
The pulse width determines how much Voltage will be delivered to the coil primary circuit. On some dual plug distributors, this setting must be lowered to prevent flash over inside the distributor cap. The standard setting is 1200 uS and should not be changed. **Caution: Increasing this setting may cause distributor flash over in the distributor cap which can cause severe engine damage.**

R = Sets the maximum RPM limit, this will appear in the window: **R: Set max RPM**
You may enter any number between 6,000 and 10,000 RPM. When the engine reaches the RPM set here, the Perma-Tune controller will begin to randomly drop ignition pulses, thus causing the RPM limit to be "soft" rather than just shutting off the ignition pules. If the RPM exceeds the limit, (as can happen with a missed shift) then the controller will increase the number of dropped ignition pulses. If the RPM continues to increase above the pre set limit, at 3% above that limit the Perma-Tune controller will shut off the ignition pulses completely. **Caution: the correct cylinder number must be programmed into the Perma-Tune or the RPM limit may be higher than expected and could result in severe engine damage**.

S = Sets the serial number of the Perma-Tune, this will appear in the window: **S: Set serial #**
This serial number is set at the factory and should not be changed. **Note: Changing the serial number will void your warranty and will prevent you from installing software updates.**

T= Sets the triggering on the negative or positive going of the distributor signal. This will appear in the window: **T: Set Transition type Neg=0, POS=1**
Entering 0 will cause the triggering to occur on the negative going signal and 1 will cause the triggering to occur on the positive going signal. For the Porsche 911SC Perma-Tune this setting should always be negative. **Note: Setting this to positive will cause the ignition timing to be off by about 30 degrees.**

V = Enables or disables the vacuum advance function this will appear in the window: **V: Set Vacuum adv 0 = disable 1 = enable**
The default setting is **disabled**. The **enabled** setting is only used in conjunction with the timing advance function. When the vacuum advance sensor wire is grounded, the timing will automatically adjust to 30 degrees advance regardless of engine RPM.