Venus3 Product Information

Venus3 is a low-cost Engine Control Unit (ECU) which is compatible with our older range products. It is backwards compatible with Titan, Venus, Venus2, Pluto and Pluto2 No changes in harnesses is required. It may also be used in most Saturn Products where the extra two GP outputs were not used. It has negative HV coil drivers to cover most applications and reduce costs. It can connect to most sensors found on engines. The biggest advantage is that it has a bootloader and firmware can be downloaded with the tuning cable. No special firmware programmer is required.

Venus3 Overview

This versatile Automotive Controller is designed to be a low-cost durable effective replacement for high tech Vehicle Electronic Units. It can be used on most engines and other products in the motor vehicle industry. It uses unique and easy features which are easy to install and tune. It is designed with the novice and professional installer in mind.

This universal South African made product can easily be customized for various engines etc. It can be used for many applications such as racing engines, vehicle conversions, custom built vehicles, replacement parts for production vehicles etc. It is a compact reliable system which can be epoxy filled to make it rugged and water tight for harsh environments and is easy to mount in the driver's compartment.

The Venus3 can be reprogrammed remotely by a software bootloader. No need for expensive equipment like programmers or separate cables. This will allow a dealer to have less inventory on his floor and customize this product on demand. This product is also sold in different classes which makes it more viable to use for smaller applications. It may also be bought at reduced prices in un-activated status. This will allow the dealer to have better control over his cash flow management in his business. Activations of features can be done over the internet making the unit viable to keep in stock at dealers. Activation will then require the rest of the unpaid amount.

The Venus3 unit is designed to connect directly to most sensors and drive units that is found on engines and other products. No need to modify them. It consists of the latest in high-speed micro controllers with surface mount technology. These units are machine soldered to minimize human error.

The Venus3 cover features like Lambda control, idle control, launch control, Anti-Lag Control, Flat Shift control, Rapid Fire Exhaust Control, cam control, stepper motor control, throttle by wire control and lots more. It can drive basic coils, injectors, solenoids, throttle by wire motors etc. directly. Due to the versatility some devices may require external resistors or diodes which is supplied with the Venus3. It can read signals from sensors like water & air temperature, throttle position, manifold pressure, crank angles, cam angles, lambda etc. directly.

The Hyperspace tuning software is user-friendly and makes all the above features customizable by the tuner. This makes the Venus3 adaptable for most applications on site.

Venus3 Features

Note that these are all the current features covered by the Venus3. There are some on the charts that is in the process to be developed in the future. The hardware has the capability for it. Also note that not all of the features may be included on the same unit as there are a limited number of drivers available. Some of the hardware classes may not include certain features due to the price range. See the selection chart for the ability of the different classes.

Fuel Delivery
- Accurate fueling such as Batch, Split Batch, Split Sequential and Full Sequential injection gives better performance and fuel consumption due to constant atomization on each cylinder.
- Fueling is done in graph or matrix method for the tuner's preference.
- All graphs or matrix data are interpolated to smooth fuel calculation accuracy for best performance though the operating ranges.
- Fuel is calculated with MAP sensor or TPS sensor versus RPM signals or a combination of the two. This will accommodate most engines ranging from street to racing and from economy to performance.
- Other sensors that are used to alter the fuel mixture are Water, Air, Altitude, Lambda, Battery Volts and throttle response.
- Fuel injection timing is adjustable on gear type crank angle sensors as low as 12 pulses per revolution.
- Adjustable MAP sensor reading angle on gear type crank angle sensors for multiple throttle body systems.

Ignition Spark & Timing
- The ECU can do Single, Wasted Spark Coil pack and Coil On Plug (COP) Full Sequential Spark Systems
- It uses the standard coil packs on the engine.
- Can be connected to basic coils directly. Pull-up resistors are required for Smart Coils.
- Very accurate ignition timing especially with the gear type triggers.
- Timing is calculated with MAP sensor or TPS sensor versus RPM signals or a combination of the two. This will accommodate most engines ranging from street to racing.
- Other sensors that are used to alter the Ignition Timing is Water, Air and Altitude.
- Battery Volts is used to compensate for coil charge time.

Sensors
- The ECU use most standard sensors on the engine No need to do modifications on distributors or converter boards.

- Custom Bolt-On Timing Gears may be used for older engines that run carburetors or engines with incorrect setups. Gear type triggers do make timing more accurate and responsive during blip conditions. This is the preferred method for racing applications.
- Sensors can be calibrated to accommodate the different types found on the engines.

Idle Control & Cold Start - These functions will ease with starting a cold engine and keep the RPMs constant when air conditioners or automatic transmissions draw power from the engine. Idle control is included on board for one and two wire idle valves. The Spitronics stepper control units can be connected to control quad and bipolar stepper motors.

Launch Control - This feature will increase boost pressure during pull-off to eliminate *Turbo Lag*. Various methods are available to activate launch like buttons clutch switches TPS position etc.

Launch Delay Recover – This feature will restore full power with an increasing ramp delay which will help the vehicle with traction control during launch.

Dual Injectors – The Venus3 can run dual injectors for 4-cylinder engines. Fuel can be added by Ratio or graph.

Anti-Lag – During deceleration this feature will retain boost pressure to be readily available for accelerating again. It uses the same principle as Launch control except it also has an output to activate a bypass valve for the task.

Rapid Fire – This feature will make a bang-bang sound in the exhaust for excitement during the launch features. The frequency is adjustable for different sound effects.

Flat-Shift - This feature will momentarily cut spark to allow faster shifting of gears.

Dual Maps - This ECU can be tuned for 2 different fuel and performance setups. Ideal for the weekend racing enthusiast. On TCU there is 4 maps available.

Map Change on the fly – This feature will allow the driver to change to a different map during driving.

General Purpose Outputs - This can be used for injectors, fan control, shift light, Aircon Cut-Out on Pull-Off or Up-Hill etc. The amount of GP outputs varies between firmware and features activated on the device. All drivers that are not used by the firmware will be available as General Purpose Outputs.

Connection Layout Print – This feature will allow the dealer to print a layout of the connections of the Venus3 after he set it up in software. It will help new customers to finish their wiring with less time.

Standard Harness - No need to keep several harnesses in stock for different engines. There are however custom harnesses for certain engines that will ease installation time. All the input wiring harnesses use screened cables for neatness of installation and to prevent electromagnetic interference which may cause erratic behavior of the ECU.

Internal 3Bar Map Sensor – This optional sensor can be added to use as Altitude sensor or internal Map sensor. It may save cost and time to do connections to an external map sensor.

Compact Electronics - This will make the Venus3 easy to install under the dashboard as it takes very little space. It is also very suitable for Motor Cycles and boats.

Complete Kits for Most Engines.

Cost Effective - No need to buy expensive systems as all the necessary features are included with the Venus3.

Rotary Systems - The 2 rotor engines are covered by the Venus3.

Dynamic Injection Angle – This feature is for Rotary engines where the injection angle is adjusted during rpm change. It has 2 graphs for 360° for Primary and Secondary injectors to adjust separately.

External Map Sensor is easy to change between 1Bar, 2.5Bar, 3Bar & 4Bar configurations External sensors are used to reduce the delay in the vacuum signal. It makes the ECU more versatile to adapt to standard MAP sensors found on engines. OEM map sensors can be used and calibrated under the Custom selection.

Altitude Compensation - This feature is important as the ECU will automatically compensate for differences in pressure. The Sensor is optional and must be soldered on the board when it is ordered.

Critical Settings Warning – With Venus3 all the settings that may change wiring connections are now protected by a warning so that the tuner may not accidently change the setup of the device.

Standardized Tuning Software - The ECU features that are not used or allowed in the tuning software will be blanked out.

Easy DIY Instructions - Save a lot of money on installation if you are a person who is up to the challenge.

Start-Up Maps included - This will make for easy start-up & tuning with the help of a Lambda sensor

User Friendly - Tuning Software which is extensively explained in the manual.

Tuning map can be locked to prevent tampering. Useful for engine builders who give guarantees.

No Dyno Required - Tune your own vehicle and save some more money. Just following the instructions in the manual carefully with the use of the Hyperspace Data logger.

(Note that the last four points are for the person who is handy with tools and understand wiring and operation of an engine. If you are not sure, download the software, Map, manual and drawing and experiment with it first. It's free of charge!)

Venus3 Specifications

Power Supply
12V Ignition power 200mA, filtered by reverse polarity Diode, 700mA Poly switch and 25V Tranzorb
2.5mm2 Earth Strap

Fixed Inputs
2x Digital Inputs for Magnetic, Hall or Optic sensors. (Jumper selectable)

3x Analog Input 0-5V (May be used by firmware as digital)
1x Built in 3 Bar MAP Sensor input 0-5V (Optional. Sensor is sold Separately)
1x Water Temperature Input 2K NTC Resistance Sensor with 1K pull-up resistor Jumper selectable
1x Air Temperature Input 10K NTC Resistance Sensor with 7K5 pull-up resistor Jumper selectable
3Pin USB D-Bug Connection

Fixed Outputs
6x 18A 500V Ground / Floating output
3x 3.5A 40V Ground / Floating Current Limit
1x 3.5A 40V Ground / Floating Current Limit, 1K pull-up resistor to 12V Fixed
5V 600mA Power Output for TPS & Map Sensor and Magnetic Pickups

Communication
Software UART Connection via USB2 converter cable
Bootloader installed for firmware programming via the USB cable

Dimensions
Size 95 x 60mm x 21mm
Weight 72g
3 x Connector Type Plastic Molex 12, 10, 6

* This unit can be resin filled. Weight will increase depending on the type of resin.

Venus3 ECU Selection

Note that the classes that are not used by the ECU firmware is not displayed to simplify the chart. If firmware is developed, they will be added.

Venus3 Hardware	**STD**	**INT**	**ADV**	**ULT**	
Hardware Inputs					
External Map Sensor	1	1	1	1	
Built In Map Sensor (optional)	1	1	1	1	
TPS Sensor	1	1	1	1	
Water 2K NTC	1	1	1	1	
Air 10K NTC or Tap-In	1	1	1	1	
Lambda Narrow or Wide Band	1	1	1	1	Note 1
Battery Volts	1	1	1	1	
Crank Trigger Pulse	1	1	1	1	
TDC/Home Pulse		1	1	1	
UART Comms Port	1	1	1	1	
USB/Programmer 3Pin PCB Con	1	1	1	1	
Bootloader	1	1	1	1	

Hardware Outputs					
Low Volt Negative Drivers	2	2	2	2	
High Volt Negative Coil Drivers	6	6	6	6	Note 2
General Purpose Output	2	5	5	5	Note 3
Features					
Graph Tuning MAP	1	1	1	1	
Matrix Tuning MAP or TPS	1	1	1	1	
Altitude Compensation	1	1	1	1	Note 4
Idle Control	1	1	1	1	Note 5
Dual Maps	1	1	1	1	Note 6
Split Sequential Injection	1	1	1	1	
Full Sequential Injection (4Cyl)				1	
V-Tech /Vanos Cam Control	1	1	1	1	Note 7
VVTI Cam Control (Open Loop)		2	2	2	
Launch Control				1	
Launch Delay				1	
RapidFire	1	1	1	1	
Anti-Lag control				1	
Flat-Shift control				1	
RPM Calibration	1	1	1	1	
Power Management					
Can be Epoxy filed	1	1	1	1	

Notes

Note 1 - Wideband requires external electronics to provide 0-5V signal

Note 2 - These drivers share the same Micro driver and cannot be used separately

Note 3 - All drivers that is not used by the firmware become GP outputs

Note 4 - Requires the optional on-board MAP sensor

Note 5 - Stepper motors require the external Idle2 Controller

Note 6 - These drivers share features and may not be available

Note 7 - This feature operates in Open loop as there is no cam sensor inputs available

NB! Some of the firmware may still be under development. This is merely indicating the capabilities of the different classes. Make sure if such firmware is available before buying or quoting your customers