Nebula Signal Converter Manual

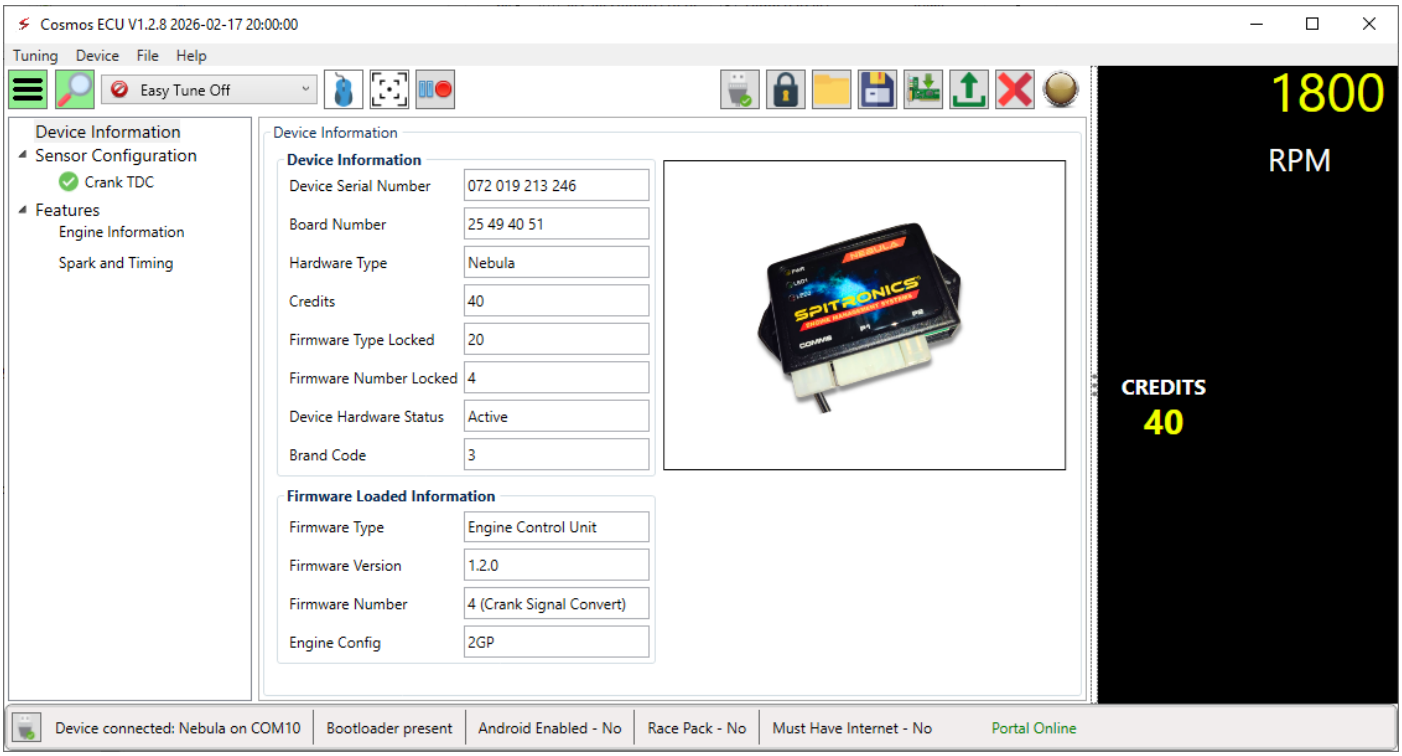
This product will generate crank and cam signal patterns for different engines. This is used mostly in conversions where another engine type is fitted in a car, and the original ECU requires the crank and cam sensors to keep the body computer or dash board alive, so that other functions are still operating. This is all done by electronics and there is no need to fit trigger wheels on the crank and cam plates. This product can be used with any management system.

The Nebula signal converter uses the EZ42B ECU hardware with reduced components. It can work with any combination RPM signal and generate a signal pattern for specific engine signals. Example, if you connect a 36-1 Ford signal to the signal converter it can generate a Jeep 6Cyl crank and cam signal pattern for their original ECU. This will then make the Tacho gauge working correctly.

The signal converter can except a magnetic or hall signal as an input. It will generate 2 open collector signals for the crank and cam signal. Should you require a square wave signal you may add a 1K pullup resistor to the output. I you require a magnetic output signal you may require a Capacitor and 2x1K pullup resistors per output. See the drawings for the modifications further below.

Setting up of the Nebula Signal Converter

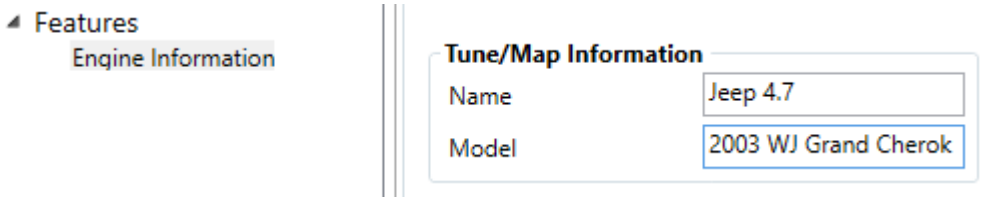
The setup part of the signal converter uses the Cosmos ECU 1.2 Software.



Under the Sensors Configuration tab, you will see The Crank signal active. This is the only input to the Signal Converter. It can be edge selected in case the firmware requires it.

Under the Timing settings you will see this screen.

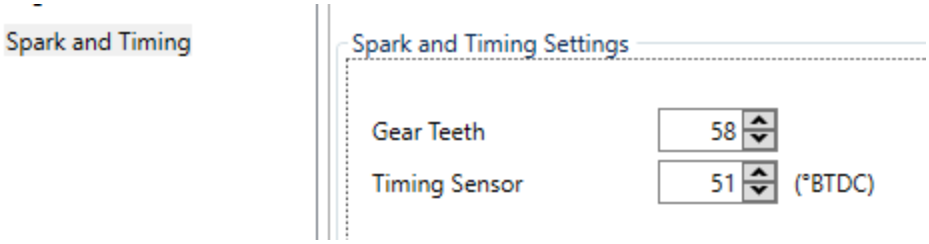
Information Block



This part is a text block for the tuner as to remind him what the signal converter was setup for. It is not used in the firmware.

Settings

The signal converter use the ECU software to adjust between RPM calibration and select a signal pattern for your engine.



Gear Teeth is the number of pulses per engine revolution. In this example is a 60-2 teeth gear. This means there are 58 pulses per revolution.

This is the RPM reading according to your pulse setting. Your dash should show the same RPM when it is connected. This signal is electronically calibrated and must be stable when your car is idling. If you have interference or an erratic signal, it means the SC does not read your signal correctly.

Timing Sensor is the program that is required. In this example program 51 is selected which is for the Jeep 4.7 Limited Addition signals. See the example below.

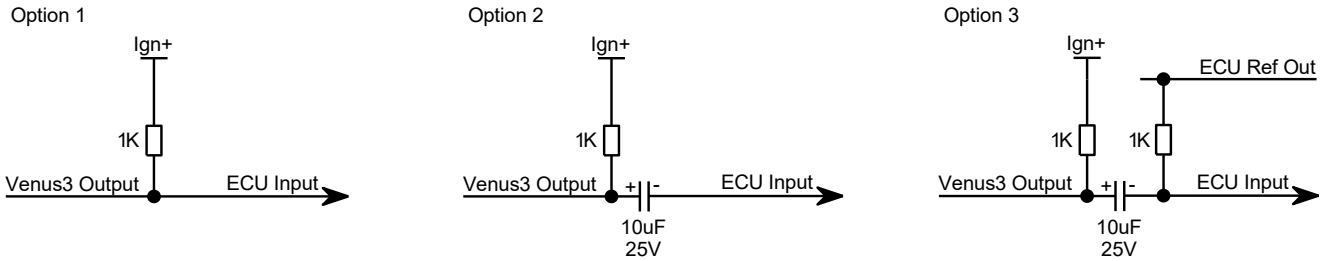
Program List

This list is popular signals that was requested before. Contact us if your pattern is not in the system. We may require scope signals on difficult types.

Program No	Description
9	36-1 Crank Sensor
12	60-2 Crank Sensor
14	Mitsubishi V6 3xCrank 4xHome Signal
19	18-6 (4-2, 4-2, 4-2) Crank Sensor + Cam Home Jeep 6Cyl
21	36-6 Crank + Cam Nissan 350Z
23	60-4 (Very Rare)
31	24+TDC (24xCrank pulse and 2xCam pulse in 2 Revolutions) Toyota
45	36-6 (36-2-2-2) Subaru
50	20-4+1 Pajero PI-D Diesel
51	Jeep 4.7 V8 16pulse Crank 16pulse Cam
52	3,2 Pajero Triton Diesel
53	Jeep Liberty 4.7L 12 Crank 12 Cam
54	Amarok 2L TDI 4Cyl 60-1-1 Crank 5 pulse Cam
55	60-2 Jeep Wrangler (JK) 2007-2018 Engine code: ERB V6 3.6L
56	60-2 Ford Ranger 3.2 T6 2011 to 2022
57	60-2 Ford Ranger 2.2 T6 2011 to 2022
58	60-2 Navara 2.3 - Renault M9T 16V 2.3

Signal Outputs

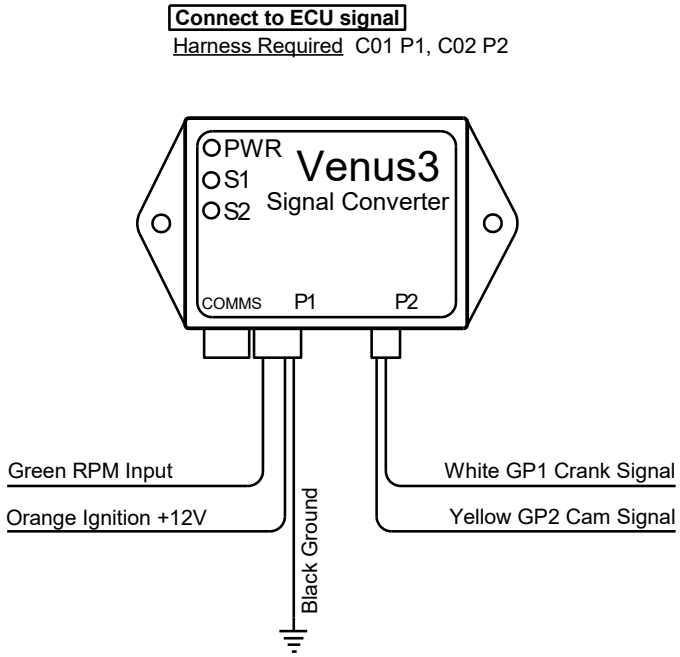
HV Negative 1 is the Crank signal pattern and HV Negative 2 is the Cam1 signal pattern. Some engines like Jeep requires more outputs for multiple cam sensors. LV Negative 1 is the Cam2 signal and LV Negative 2 is the Cam3 signal.
Below are different connection options if you do not get the OEM ECU to respond. Do this for both outputs of the Nebula. Option1 will convert the open collector signal to square wave. Option2 will convert the square wave to magnetic or reductor signal. Option3 will convert the magnetic signal level to the required level of the OEM ECU.



Wiring

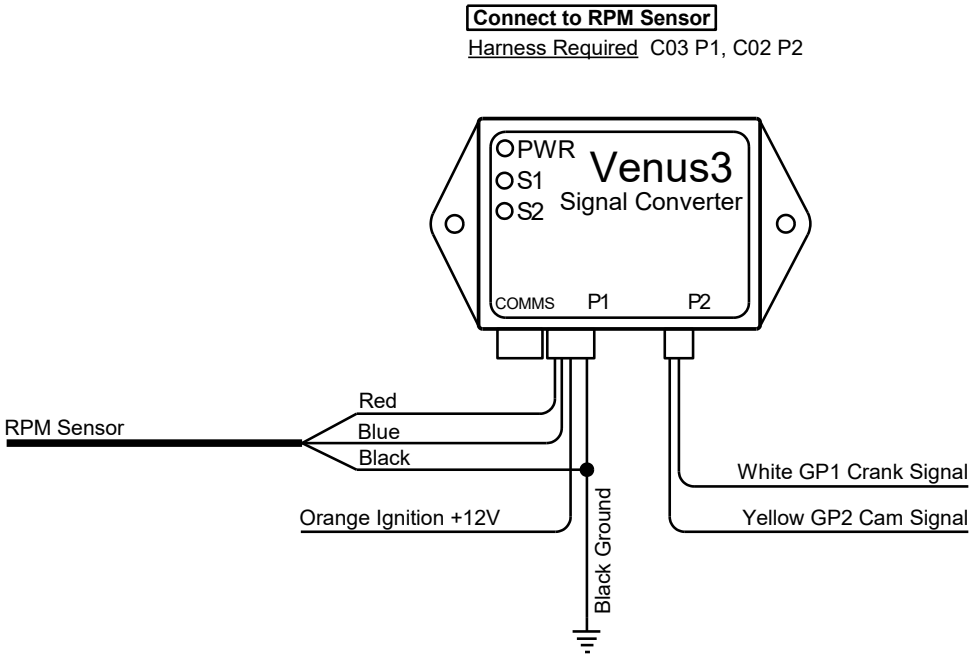
Connecting to an ECU setup

This option is using minimum wires. On Spitronics ECU's there is already a green output RPM signal wire that can connect to the Green RPM Input wire. You can tap into the orange Ignition wire.



Connecting to an RPM sensor

This option is normally used where diesels and carburettor engines are used. It includes a screened wire into the engine bay that will supply power and ground to the sensor. Note that wiring differs between hall and magnetic sensors. Also ensure that the jumper settings are on the right positions.

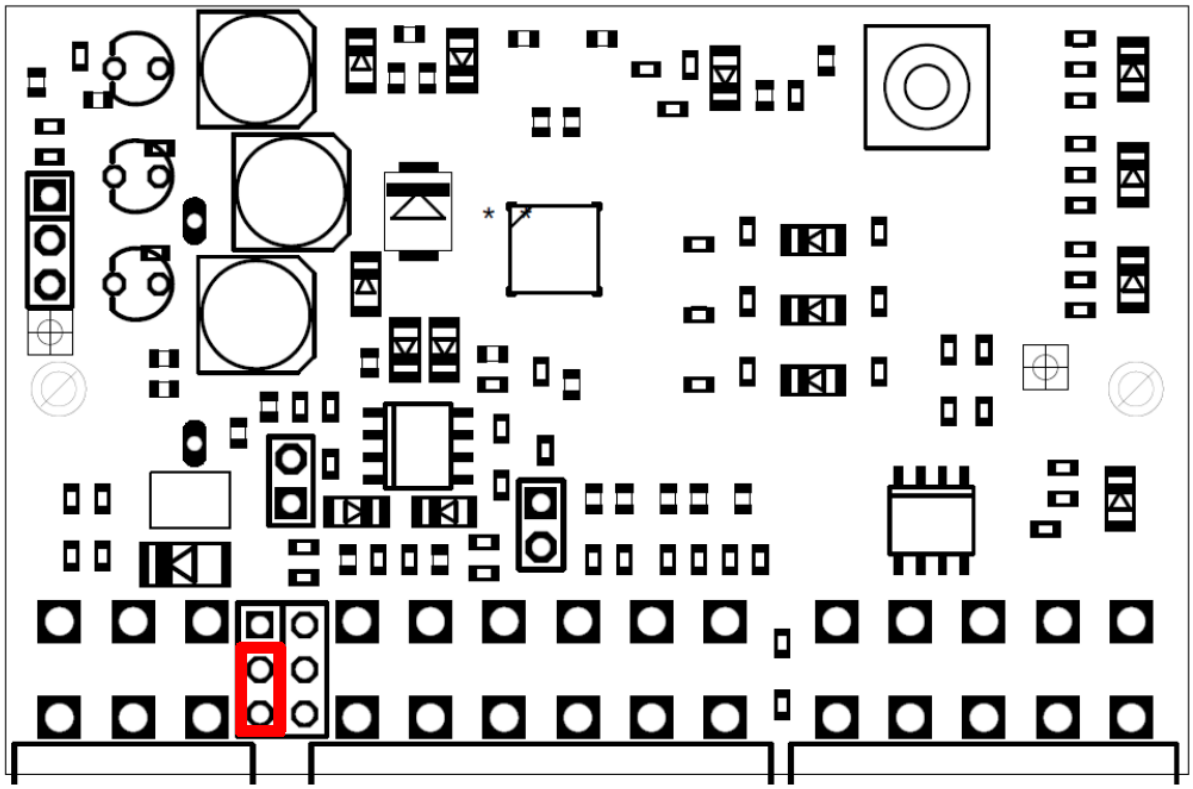


RPM Sensor Connection

EZ42B Jumper Settings 1xMagnetic Sensor

Last Changed: 27/09/2025

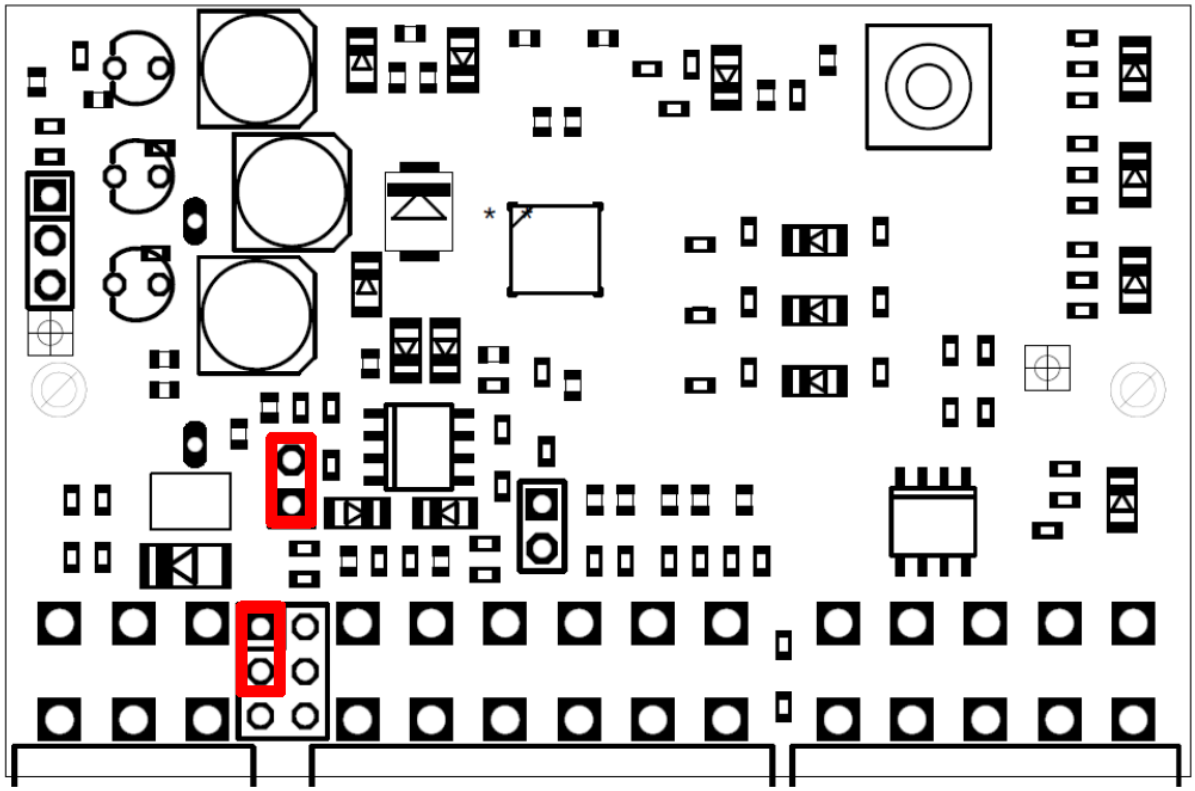
Front



EZ42B Jumper Settings 1x Hall Sensor

Last Changed: 27/09/2025

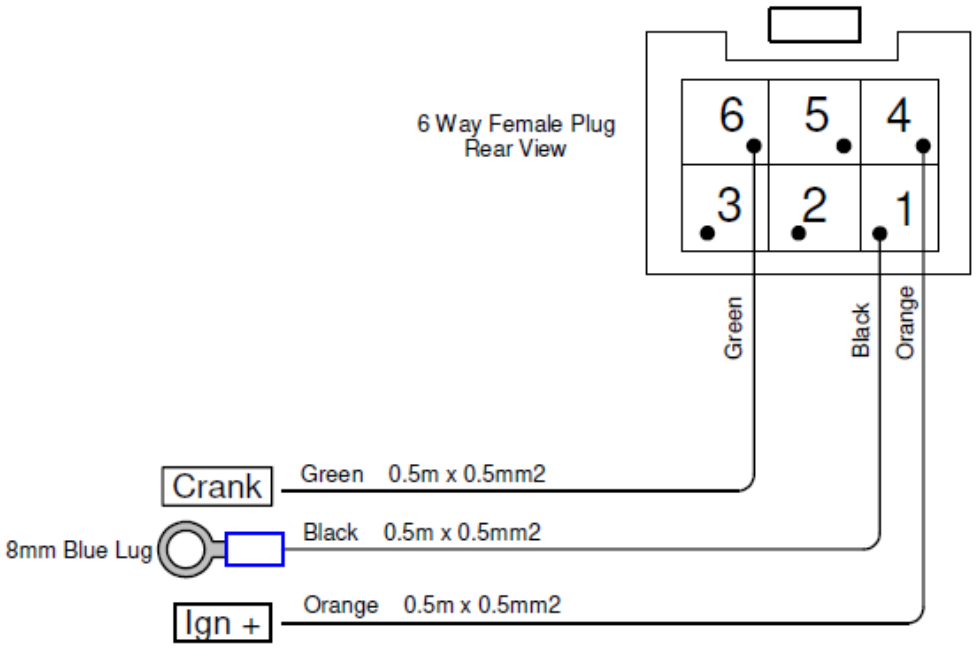
Front



Harnes Options

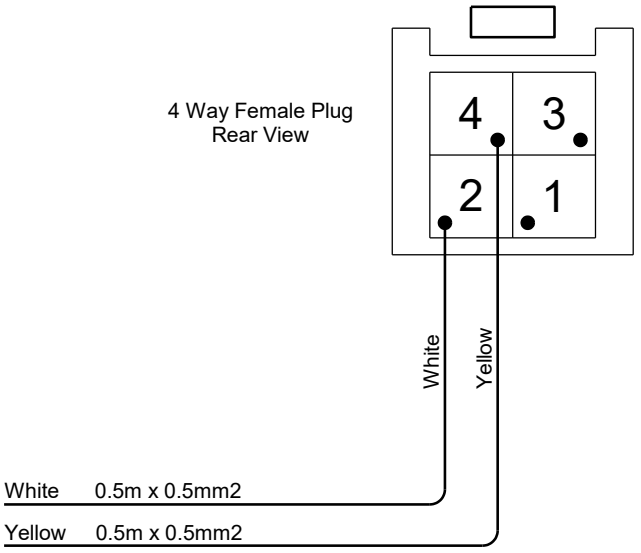
C01 P1 Input Harness – ECU Option

This harness is used when this product is used with and ECU where the rpm signal is found under the dashboard.



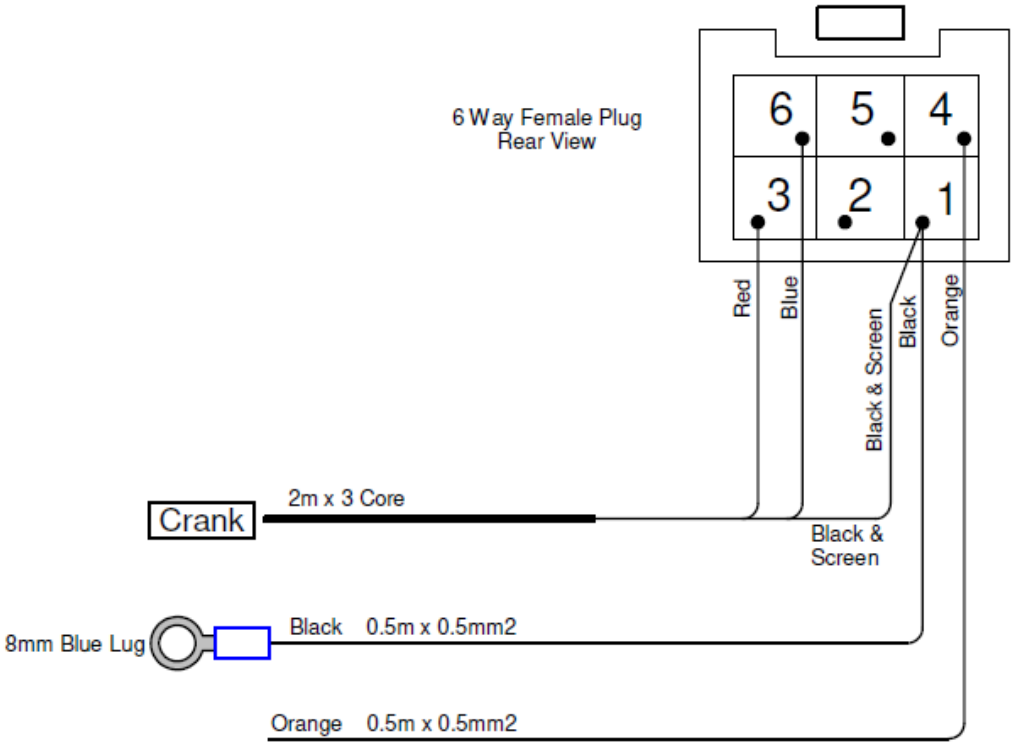
C02 P2 Output Harness

This is the output harness. Some ECU's require 1 signal and others may require 2 signals. Should there be more signals required the Venus3 Signal Converter can Output up to 4 patterns.



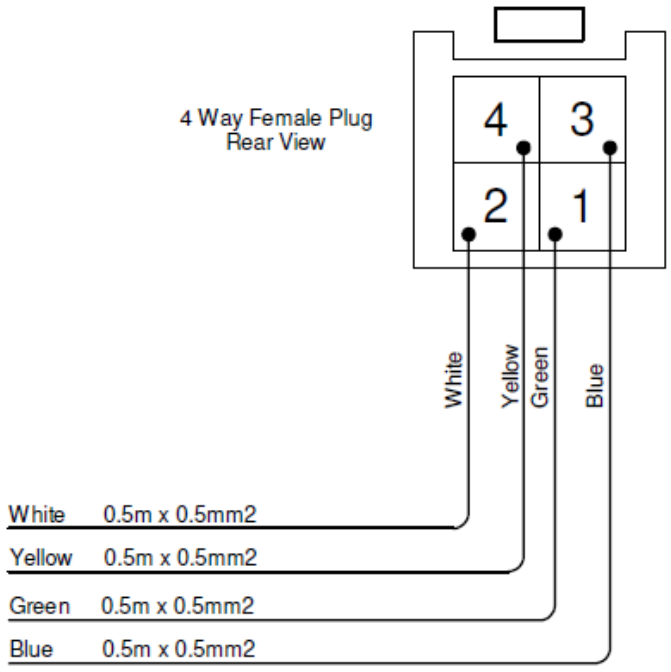
C03 P1 Input Harness – Standalone Option

This harness is used when this product is used without an ECU where the rpm signal is found in the engine bay on a sensor.



C04 P2 Output Harness 4 Signals

This is the output harness. Some ECUs require may require 4 signals. The Nebula Signal Converter can create up to 4 patterns.



Nebula Pin Layout

Nebula Signal Converter

EZ42B SC Layout

Wire Colors		Sim leds	Connection	Pin Name			Pin Name	Connection	Sim leds	Wire Colors	
	C01_P1			P1 - 12 Way Input						C01_P1	
	Orange		Ignition In	.+12 Volt Ign	4	1	GND	Sensors GND		Black	
				TDC Sensor	5	2	TDC Power				
	Green		Crank Sensor	Crank Sensor	6	3	Crank Power	Crank Sens +			
C02_P2	C04_P2			P2 - 10 Way Output						C04_P2	C02_P2
	Blue	RPM	Cam 3 Signal	LV Negative 2	3	1	LV Negative 1	Cam 2 Signal	Relay	Green	
Yellow	Yellow	GP2	Cam 1 Signal	HV Negative 2	4	2	HV Negative 1	Crank Signal	GP1	White	White
	USB			6 Way USB						USB	
					4	1					
	Yellow			Receive	5	2	Transmit			Green	
	Red			.+5 Volt Out	6	3	GND			Blue	

GP3 & GP4 = LV Negative driver 100 Volt 8 Amp Drivers SO8
GP1 & GP2 = HV Negative Drivers 450 Volt 42 Amp Drivers D-Pack

Components Included C02_P2
4x 1K Resistors
2x 10uF 16V Capasitors
2x Jumpers

Components Included C04_P2
8x 1K Resistors
4x 10uF 16V Capasitors
2x Jumpers