



# SPTRONICS

Spark Performance Electronics

Installation Instruction for SEM002  
Standalone Engine Management

# Warning

The SEM002 allows for total flexibility in engine tuning, misuse of this product will destroy your engine

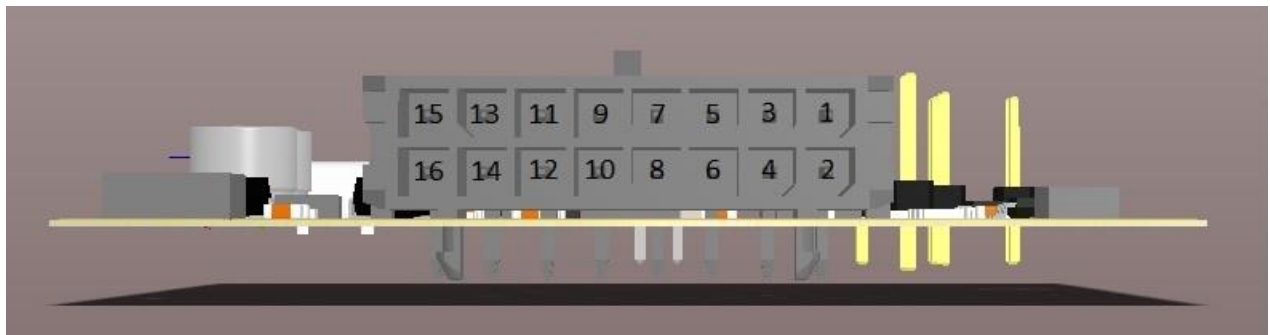
SPTRONICS holds no responsibility for any engine damage that may results from the misuse of this product

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## SEM001 Specifications:

Trigger Inputs:	1 x Differential Inputs Hall, VR and Opto
Injector Drivers:	2 x Saturated (8 ohm minimum, <b>High Impedance Only</b> )
Coil Drivers:	2 x 0-5V/12V Falling Edge Fire ( <b>do not connect directly to coil primary</b> )
Fuel Pump Output	1 x Low Side Output
Throttle Position Input	1 x 0-5V
Manifold Pressure Sensor	1 x 0-5V
Coolant Temperature Sensor	1 x analog
Inlet Air Temperature Sensor	1 x analog
O2 Sensor	1 x 0-5V
USB	1 x PC Communication
5 Volt Reference	1 x

## Wiring Diagram:



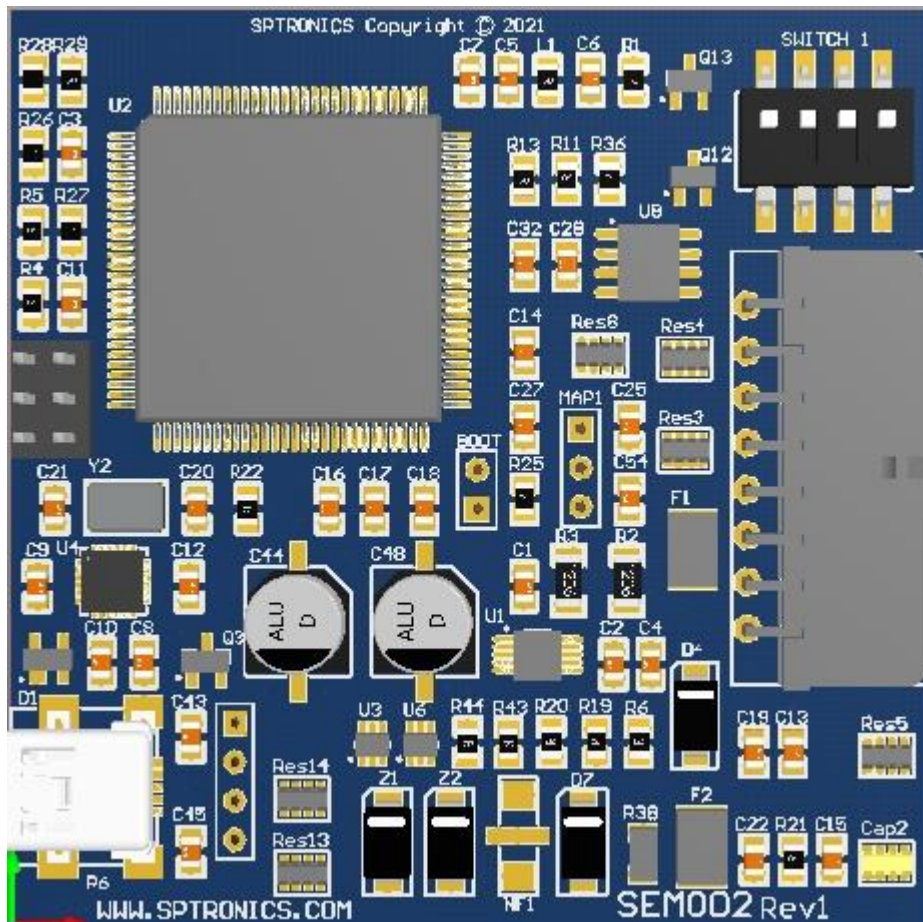
Looking at PCB connectors

## Connector 1:

Pin	Name	Wire Color	Comment
1	Injector 1 output	Orange	
2	Injector 2 output	Orange	
3	Fuel pump output	Brown	
4	GND	Black	
5	Ignition output 1	Green	
6	Ignition output 2	Green	
7	Crank input +	Yellow	
8	Crank input -	Black	

9	Sensors Reference Voltage (+5V)	Blue	
10	Throttle position input	White	
11	Coolant temperature input	White	
12	Intake air temperature input	White	
13	MAP/MAF input	White	
14	O2 sensor input	White	
15	Switched +12V	Red	
16	GND	Black	

## PCB view:



## Switch Settings:

Switch 1: to select ignition volt, Off is 5V and On is 12V

Switch 2: To enable pull up resistor on Crk+ input.

Switch 3: To enable pull up resistor on CLT input.

Switch 4: To enable pull up resistor on IAT input.

# Installation:

## Grounding:

The ECU must have an electrically secure ground connection, which means that the battery negative must be properly grounded to the chassis AND engine. The ground wire, whether it is from the battery or to the chassis and engine, must have perfect electrical conductivity. This means that there must not be any paint or rust under the wire terminal. Make sure that when you install the ground wire there is bare metal exposed where the wire contacts the vehicle component. Both of black wires should be connected to secure ground and we also recommend that the ground wire be as short as possible.

## Power Requirement:

The SEM002 requires a minimum supply voltage of 10V or greater to run. We recommend that the ECU be supplied with 13.8V nominal operating voltage. Ensure that the vehicle's charging system is in perfect operating condition prior to installation. The red wire should be connected to ignition switched and fused to the battery source.

## Sensors Reference Voltage:

The SEM002 has one 5V sensor voltage supply that will be needed during standalone installation. The pink wire output has resettable fuse rated at 0.5A max

## Trigger Inputs:

SEM002 has one differential trigger input crank input+ and crank input-. It one has an option to be connected as differential or as single input. The following table summarize trigger connection:

Mode	Connection
Opto Input	<ul style="list-style-type: none"><li>• Input Signal to Input+</li><li>• Leave Input- unconnected.</li></ul>
VR Sensor	<ul style="list-style-type: none"><li>• Connect VR Sensor to Input+/Input- for Standalone connection</li><li>• Connect VR+ Sensor to Input+ and leave Input- unconnected for Piggyback connection.</li></ul>

Hall  
Input

- Connect Hall sensor (Collector/Drain) to Input+, Close CRK UP jumper for pull-up resistor for standalone connection.
- Connect Hall sensor to Input+ for piggyback connection.
- Leave Input- unconnected.

There are a jumper for the trigger input, the CRK UP jumper is for connect the input signal to 10K ohm pull up resistor.

## Throttle Position Sensor (TPS):

Name	Wire	Color	
+5.0 volts, Vcc	Connector 9	Blue	<b>5V Sensor Reference Voltage</b>
TPS Signal	Connector 10	White	TPS 0-5V signal
Ground	GND	Black	Connect to GND

## MAP Sensor:

Name	Wire	Color	
+5.0 volts, Vcc	Connector 9	Blue	<b>5V Sensor Reference Voltage</b>
MAP Signal	Connector 13	White	MAP 0-5V signal
Ground	GND	Black	Connect to GND

## Air Temp Sensor (IAT):

Name	Wire	Color	
IAT Signal	Connector 12	White	IAT 0-5V signal
Ground	GND	Black	Connect to GND

IAT UP jumper connects the IAT Signal to pull up resistor 2.49K ohm that will be needed in standalone setup.

## Coolant Temp Sensor (CLT):

Name	Wire	Color	
CLT Signal	Connector 11	White	CLT 0-5V signal
Ground	GND	Black	Connect to GND

CLT UP jumper connects the CLT Signal to pull up resistor 2.49K ohm that will be needed in standalone setup.

## O2 Sensor:

Name	Wire	Color	
O2 Signal	Connector 14	White	O2 0-5V signal
Ground	GND	Black	Connect to GND

## Injectors:

Name	Wire	Color	
Injector 1	Connector 1	Orange	
Injector 2	Connector 2	Orange	

Two low side output each rated at 3A.

## Ignition:

Name	Wire	Color	
Ignition 1	Connector 5	Green	
Ignition 2	Connector 6	Green	

Two logic level 5V or 12V outputs, only high impedance igniter should be used. Do not connect to coil directly.

## Fuel Pump:

Name	Wire	Color	
FP	Connector 3	Brown	Low side output connected to fuel pump relay

## Warranty

SPTRONICS warrants to the consumer that all High Performance products will be free from defects in material and workmanship for a period of twelve (12) months from date of the original purchase. Products that fail within this 12-month warranty period will be repaired or replaced at SPTRONICS's option, when determined by SPTRONICS that the product failed due to defects in material or workmanship.

This warranty is limited to the repair or replacement of the SPTRONICS part. In no event shall this warranty exceed the original purchase price of the SPTRONICS part nor shall SPTRONICS be responsible for special, incidental or consequential damages or cost incurred due to the failure of this product. Warranty claims to SPTRONICS must be transportation prepaid and accompanied with dated proof of purchase. This warranty applies only to the original purchaser of product and is non-transferable. All implied warranties shall be limited in duration to the said 12-month warranty period. Improper use or installation, accident, abuse, unauthorized repairs or alterations voids this warranty. SPTRONICS disclaims any liability for consequential damages due to breach of any written or implied warranty on all products manufactured by SPTRONICS.

SPTRONICS will not be responsible for electronic products that are installed incorrectly, installed in a non-approved application, misused, or tampered with.

Any SPTRONICS electronics product can be returned for repair if it is out of the warranty period.

There is a minimum charge of \$20.00 for inspection and diagnosis of SPTRONICS electronic parts. Parts used in the repair of SPTRONICS electronic components will be extra.

SPTRONICS will provide an estimate of repairs and receive written or electronic authorization before repairs are made to the product.