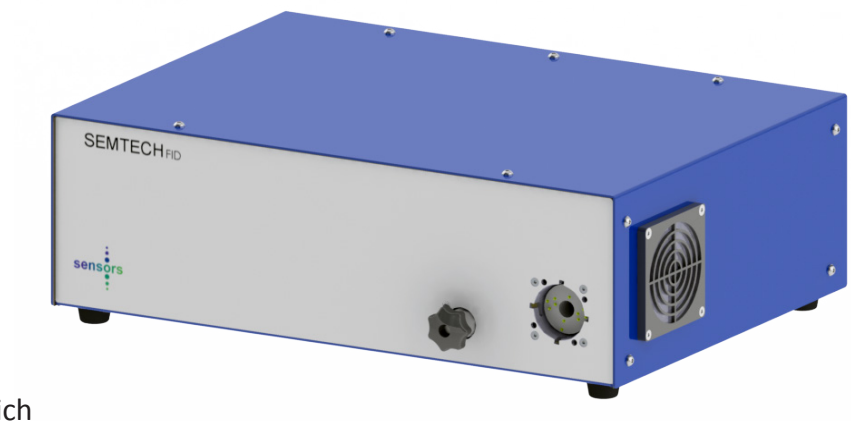
Emissions
Measurement
Solutions

SEMTECH® FID

Real-Time THC Measurement

Innovation.

Built on Experience.



The **SEMTECH**® Flame Ionization Detector (FID) measures Total HydroCarbons (THC) using a vacuum flame ionization detection unit.

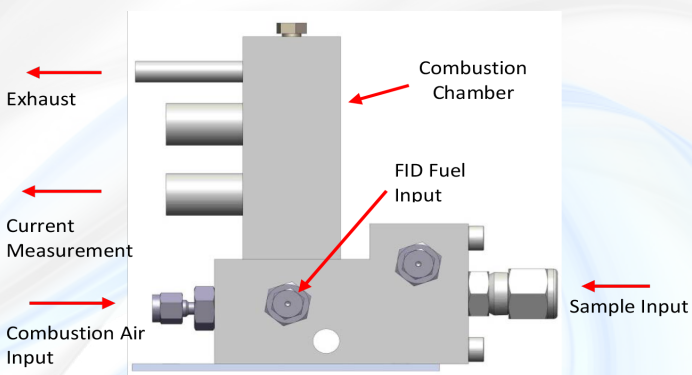
The system is designed to minimize the loss of hydrocarbons prior to analysis by maintaining the required temperature through the use of a heated filter, heated sample line and stainless steel fittings, which all have low gas adsorption characteristics.

Principle of Operation: The **SEMTECH**® FID uses a Flame Ionization Detector for the measurement of Total HydroCarbons. The FID chamber must first be heated to 191°C. Warm up time is approximately half an hour. Once the FID reaches temperature, the flame automatically ignites.

The valve is then opened to allow FID fuel and air into the chamber, and the flame ignites automatically. The exhaust sample can then be injected in the sample port. The FID fuel, air, and exhaust sample are mixed together at the bottom of the detector's flame jet, and are burned on the flame's tip.

As the hydrocarbons burn, they form positively charged ions. These ions are repelled by the jet's nozzle head, which has a positive bias voltage. The positive ions are then attracted to the negatively charged collector plate, creating a current which is then measured.

User-selectable measurement ranges ensure accuracy for a wide variety of test applications.



Flame Ionization Detector

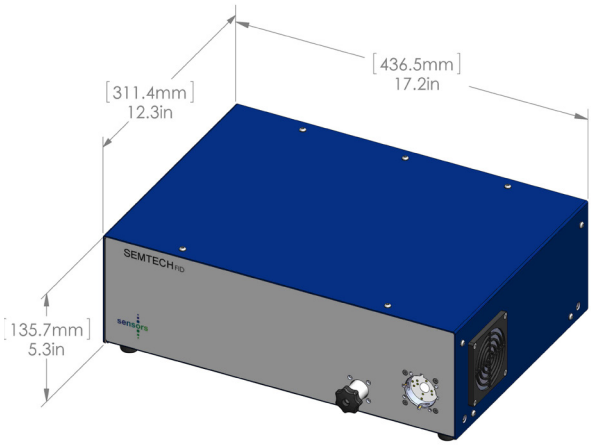
The FID Module offers the following benefits:

Automatic Flame Ignition: the FID flame will light automatically after approximately 30 minutes of warm-up time.

Measuring Range: the **SEMTECH®** FID has 4 user-selectable measurement ranges between 0-100 and 0-30000 ppmC_1.

Sample Handling: water trap and Nafion dryer are integrated into the SCS module. A heated sample line (various lengths) delivers the sample to the FID chamber at 191°C. Particulate matter is removed using a built-in disposable filtering system.

Combustion Air: the system includes a catalytic converter, enabling the use of room air as combustion air for the FID flame.



Compliance: the **SEMTECH®** FID is compliant for gases regulated under the rules of UN-ECE. R.49 and Commission Regulation (EU) No. 582/2011 and of US EPA 40CFR, Part 1065.

Heated Line: Sensors has developed an innovative, low powered heated line that controls and maintains the temperature of the exhaust sample at 191 ± 5 °C.

GAS REQUIREMENTS & CONSUMPTION		
Gas Use	**Description**	**Consumption**
FID fuel	H_2 40% Bal. He [< 0.1 ppm THC]	150 ccm @ 300 kPa
Span Gas	C_3H_8	~1.5 LPM@ 150 - 200 kPa
Zero Gas	Purified N_2 or Purified Synthetic Air	~1.5 LPM @ 150 - 200 kPa
Total Sample Flow		< 1.0 LPM @ 100 kPa

ANALYTICAL SPECIFICATIONS	
Parameter	**THC**
Supported Ranges	30000 ppmC_1, 10000 ppmC_1, 1000 ppmC_1 and 100 ppmC_1
Linearity (all ranges)	$\lvert x_{min} \times (a_1 - 1) + a_0 \rvert \leq 0.5\%$ of selected range Slope a_1 between 0.99 and 1.01 Standard Error of Estimates (SEE) ≤ 1% of selected range Coefficient of Determination $r^2 \geq 0.998$
Accuracy	≤ ± 2% of reading or ≤ ± 0.3% of full scale of selected range, whichever is greater
Repeatability	≤ ± 1% of point or < ± 1% of selected range, whichever is greater
Precision	≤ 1% of selected range
Noise	≤ 2% of selected range
Zero Drift	≤ ± 1 % of full scale of selected range over 1 hours
Span Drift	≤ ± 2 % of full scale of selected range over 8 hours
Rise Time (T_{10-90})	≤ 2.5 seconds
System Response Time (T_{10-90})	≤ 10 sec with rise time ≤ 2.5 seconds
Data Rate	5 Hz

SPECIFICATIONS	
Power requirements	12 V
Warm up time	30 minutes minimum; 60 minutes to meet performance specifications
Storage temperature	Dry –10 to 60 °C ambient
Operating environment	-10 to 45 °C ambient
Power Usage	< 300 Watts
Dimensions (W x D x H)	43.6 x 31.1 x 13.5 cm 17.2 x 12.3 x 5.3 in
Weight	11.2 kg 24.6 lb.
Data transmission	Ethernet
Electromagnetic interference and susceptibility	CE Standards: IEC 61326: 2002-2

NOTE: Specifications are subject to change without notice. While due caution has been exercised in the production of this document, possible errors and omissions can occur.