



# OEM Digital NDIR Methane Sensor, Flow Through Gas Cell, Full Scale from 0-100% CH<sub>4</sub>

## Model 2015SPI-4-N

The **VALTRONICS** Model 2015SPI-4-N is an OEM NDIR CH<sub>4</sub> sensor with digital signal processing and temperature compensation. The SPI (Serial Peripheral Interface) is described in Note A59 & A64. Each serial numbered sensor is individually gas calibrated and temperature compensated at the factory. **RS-232 Test Board** for field gas calibration (See **Application Note A66** ).

### Model 2015SPI-4-N Specifications:

- Method: ..... NDIR with Digital Signal processing and temperature compensation
- Gas: ..... Methane (CH<sub>4</sub>)
- Range: ..... 0-100% CH<sub>4</sub> 16 bit A/D converter: Delta-Sigma Conversion Method
- CAUTION:** ..... **Lower Explosive Limit ( LEL )** is **5.0 %** CH<sub>4</sub> by volume in air
- ..... **Upper Explosive Limit ( UEL )** is **15%** CH<sub>4</sub> by volume in air
- Note:** CH<sub>4</sub> levels near or above the LEL, unit should be enclosed in an **explosion proof housing** with flame arrestors in the gas path.
- Input Power: ..... +12 VDC (@ 0.250 amp max., 0.135 amp typ, 16.0 volts max, 8.0 volts min)
- Accuracy: ..... 0 to 5.0±0.25% CH<sub>4</sub> and 5% of reading from 5.0 to 100% CH<sub>4</sub> .
- Resolution / Repeatability : ..... ±0.1% CH<sub>4</sub> (challenge with same gas sample multiple times & assure zero)
- Stability: ..... Short term < 0.1% CH<sub>4</sub> in 20 sec .at constant temperature
- ZERO Temperature Stability: ..... Less than 0.1% of full scale per degree C change from calibration temperature
- Output/Input Signals: ..... Digital SPI (16 bit Serial Digital): See Notes A59 & A64
- Optional **RS232 Test Board:** ..... PCB for terminal com. with any PC , see **Application Note A66**
- LED** Indicators: ..... **IR** Source ON/OFF Indicator, Power ON indicator
- Operating Temperature Range: ..... 0 to 50°C (32° to 122°F) see **Application Note A12**
- Ambient Relative Humidity: ..... 0 to 95% RH non-condensing: see **Application Note A30**
- Storage Temperature range: ..... -40 to +70°C (-40 to +158°F)
- Weight: ..... Less than 0.25 pound (<0.11 kilogram )
- Clearance Dimensions:** PCB Card: 5.75 inch x 3.0 inch x 3.25 inch vertical see page 3 for mounting

**Hose barbs** for 1/8 inch ID tube, **push** gas into cell at a rate between 0.3 to 1.0 LPM. Use **Hydrophobic Filter** immediately in front of inlet hose barb.

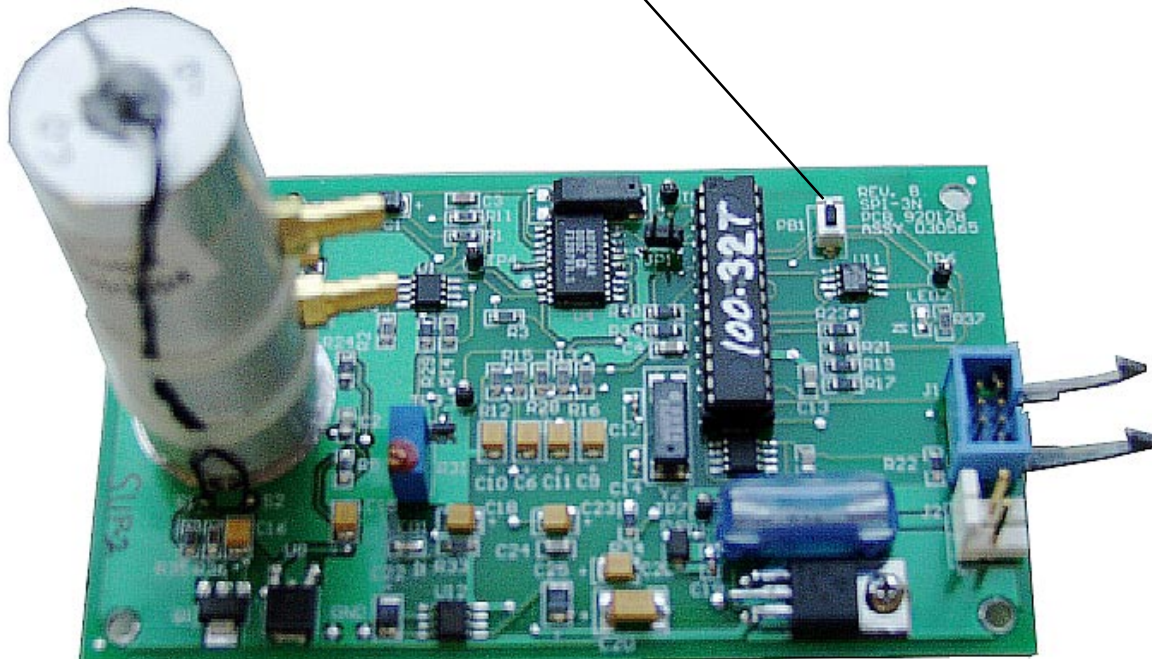
**Model # & Serial # label** on gas cell



**J1: I/O connector:** Thomas & Betts 501-6-27ESR a 6 pin keyed header with ejector latches. See **Application Note A75** for interface connector part numbers

**J2:** 12 VDC input power 2 pin, 0.156 inch center header

**Note:** If JP1 is installed the sensor will go into **SLAVE** mode after a power on reset or the **RESET** switch is pressed



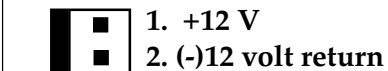
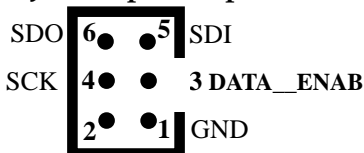
See **Application Note A67** for gas conditioning requirements and information about gas sample pumps and filters. Use a **Hydrophobic Filter** immediately in front of gas inlet hose barb. **Push gas through the gas cell at a rate between 0.3 to 1.0 liter per minute.**

**Important Note:** Digital ground **Pin# 1** MUST be directly connected to the Master Microprocessor's digital ground, **NOT** just connected via the DC power supply common.



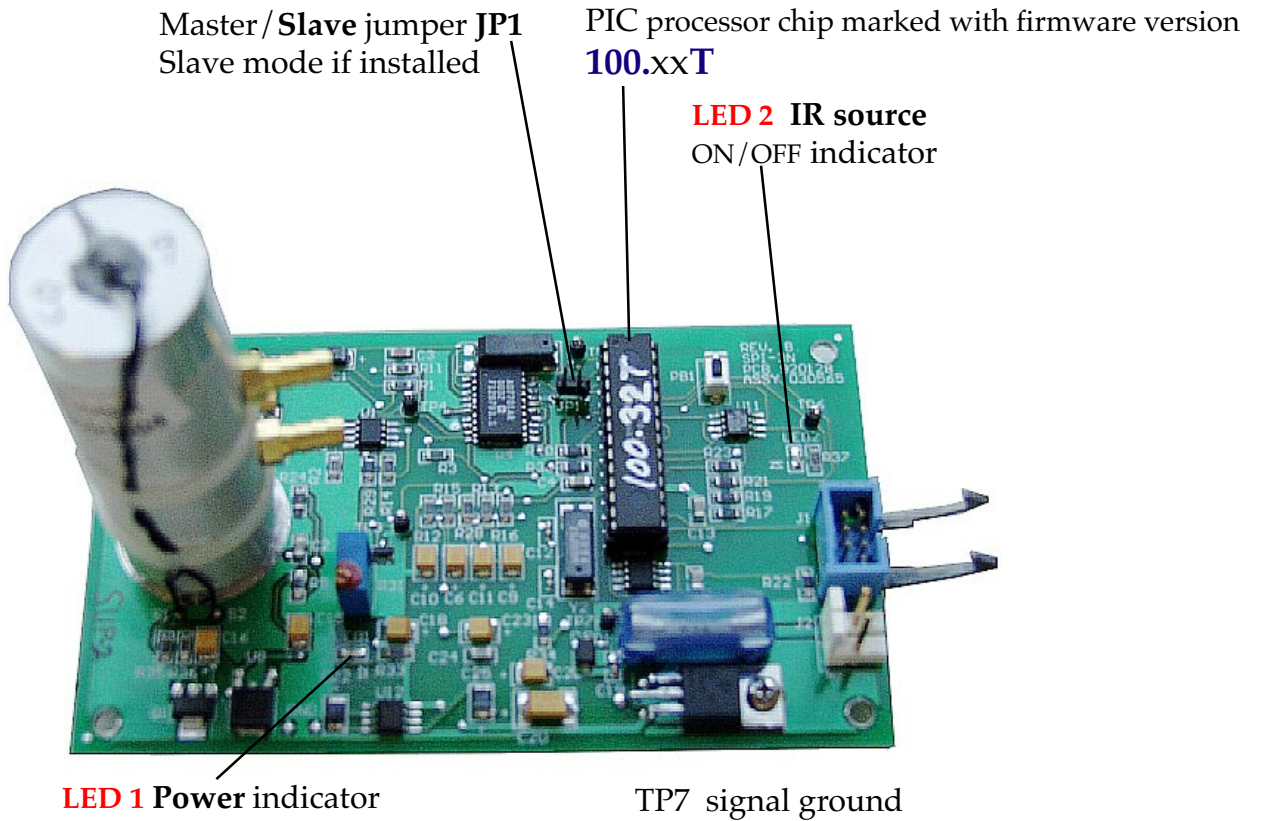
See **Application Note A75** for interface connector part numbers. Keep **J1** interface cable shorter than 18 inches. See **Application Note A64** for 16 bit serial digital output timing diagram. See Note A59 for input control.

**J1: Output / Input**



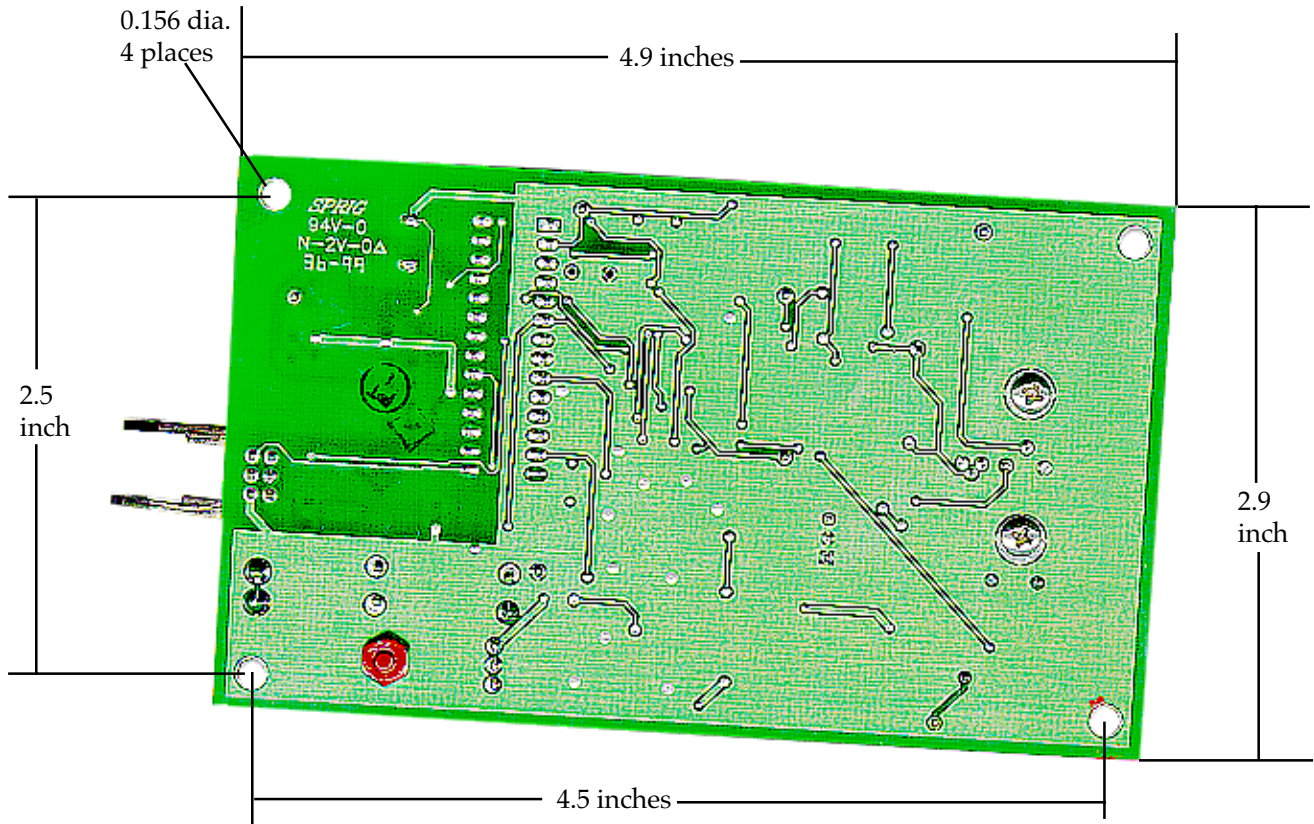
**J2:** 12 VDC input power, 2 pin, 0.156 inch center header Panduit MLSS156-2-D-B.





Clearance Dimensions: 5.75 inches x 3.0 inches x 1.5 inches

**Note:** Provide **clearance** for the output hose barb, input flow adjust needle valve and an additional **0.75 inch** clearance for connector **J1** latches



## Model 2015SPI-4-N 0-100% CH<sub>4</sub> (methane)

See **Application Note A67** for information about gas conditioning and parts for filtering the gas and preventing water droplets from entering the gas cell. A **hydrophobic filter** in front of the gas inlet hose barb is required as a minimum to prevent particles & droplets from getting into the gas cell.

Equivalent Full scale % of some hydrocarbon compounds that the 2015SPI-4-N will respond to:

<i>Gas</i>	<i>Chemical formula</i>	<i>LEL</i>	<i>% that produces a full scale response</i>	<i>Relative response</i>
<b>Methane</b>	<b>CH<sub>4</sub></b>	5.0 % in air	5.00 % CH <sub>4</sub>	<b>1.00</b>
Propane	C <sub>3</sub> H <sub>8</sub>	2.1 % in air	1.50 % C <sub>3</sub> H <sub>8</sub>	3.33
Butane	C <sub>4</sub> H <sub>10</sub>	1.8 % in air	0.75 % C <sub>4</sub> H <sub>10</sub>	6.67
Ethane	C <sub>2</sub> H <sub>6</sub>	3.0 % in air	1.79 % C <sub>2</sub> H <sub>6</sub>	4.21
Ethylene	C <sub>2</sub> H <sub>4</sub>	2.7 % in air	2.37 % C <sub>2</sub> H <sub>4</sub>	2.11
Hexane	C <sub>6</sub> H <sub>14</sub>	1.2 % in air	0.75 % C <sub>6</sub> H <sub>14</sub>	6.67

response accuracy is not specified for compounds other than methane.

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