



OEM Digital NDIR Methane Sensor, Flow Through Gas Cell, Full Scale from 0-100% CH₄

Model 2015SPI-4-N

The **VALTRONICS** Model 2015SPI-4-N is an OEM NDIR CH₄ 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 (CH₄)
- Range: 0-100% CH₄ 16 bit A/D converter: Delta-Sigma Conversion Method
- CAUTION:** **Lower Explosive Limit (LEL)** is **5.0 %** CH₄ by volume in air
 **Upper Explosive Limit (UEL)** is **15%** CH₄ by volume in air
- Note:** CH₄ 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% CH₄ and 5% of reading from 5.0 to 100% CH₄ .
- Resolution / Repeatability : ±0.1% CH₄ (challenge with same gas sample multiple times & assure zero)
- Stability: Short term < 0.1% CH₄ 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

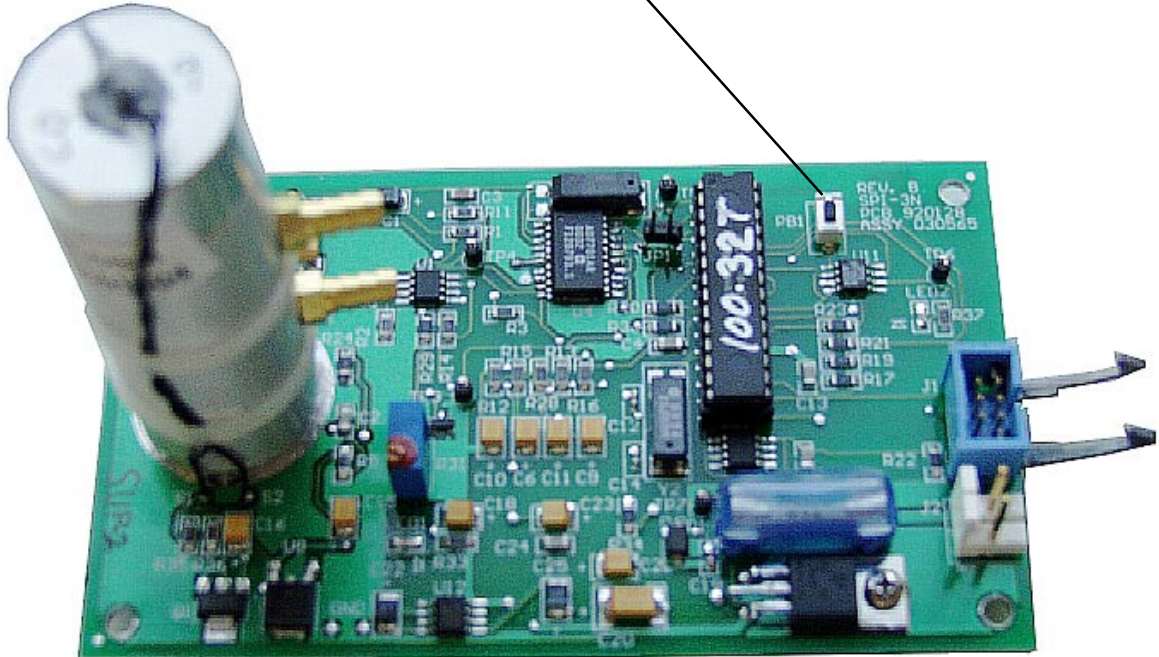


J1: I/O connector: Thomas & Betts 501-6-27ESR a 6 pin keyed header with ejector latches. See **Application Note A75** for interface connector part numbers

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



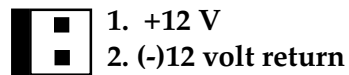
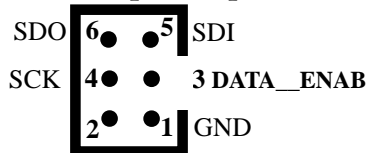
See **Application Note A67** for gas conditioning requirements and information about gas sample pumps and filters. Use a **Hydrophobic Filter** immediately in front of gas inlet hose barb. **Push** gas through the gas cell at a rate between 0.3 to 1.0 liter per minute.

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.

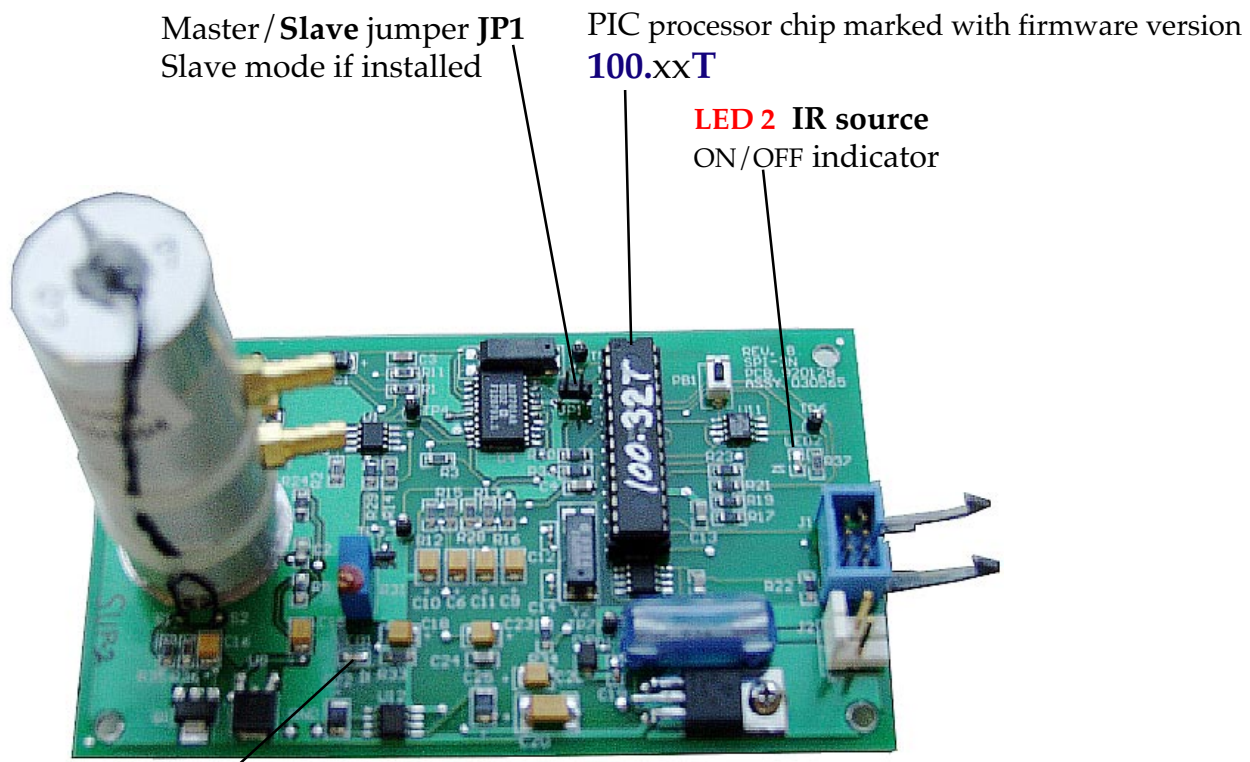


See **Application Note A75** for interface connector part numbers. Keep **J1** interface cable shorter than 18 inches. See **Application Note A64** for 16 bit serial digital output timing diagram. See **Note A59** for input control.

J1: Output / Input



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



Master/Slave jumper **JP1**
Slave mode if installed

PIC processor chip marked with firmware version
100.xxT

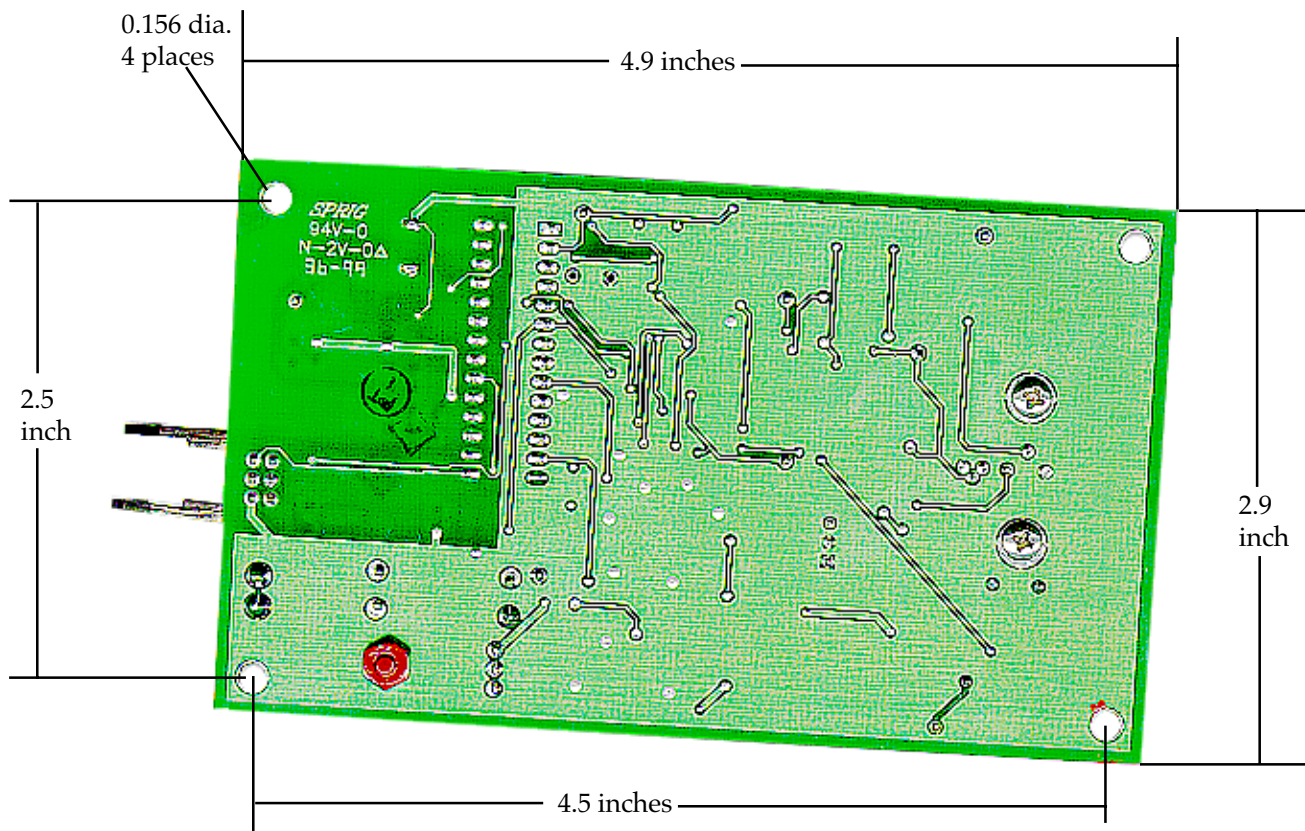
LED 2 IR source
ON/OFF indicator

LED 1 Power indicator

TP7 signal ground

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% CH₄ (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:

<u>Gas</u>	<u>Chemical formula</u>	<u>LEL</u>	<u>% that produces a full scale response</u>	<u>Relative response</u>
Methane	CH₄	5.0 % in air	5.00 % CH ₄	1.00
Propane	C ₃ H ₈	2.1 % in air	1.50 % C ₃ H ₈	3.33
Butane	C ₄ H ₁₀	1.8 % in air	0.75 % C ₄ H ₁₀	6.67
Ethane	C ₂ H ₆	3.0 % in air	1.79 % C ₂ H ₆	4.21
Ethylene	C ₂ H ₄	2.7 % in air	2.37 % C ₂ H ₄	2.11
Hexane	C ₆ H ₁₄	1.2 % in air	0.75 % C ₆ H ₁₄	6.67

response accuracy is not specified for compounds other than methane.

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