

Novagas2 Compact Infrared Gas Module

Novagas2 is an innovative gas sensor designed to measure concentrations of CO₂, CO, CH₄, HC, and N₂O gases, featuring automatic temperature compensation. It can be seamlessly integrated into existing measurement systems or monitoring instruments according to customer requirements. This smart sensor incorporates an original chip equipped with wireless transmission capabilities, a charging system, energy recovery functions, and built-in fault diagnosis features.



technical data

detection mode	Dual channel non-dispersive infrared (NDIR)
size	See the specific sensor model (gas and range type)
Source drive frequency	1 ~ 2Hz
Data refresh rate	5 ~ 10 seconds
Response time (90)	15 ~ 40s @20°C ambient and @1l/min
preheating time	<30s @20°C operational <30 minutes @20°C (full spec)
going	temperature 0°C ~ 50°C linear compensation
	humidity 0-95% RH (non-condensable) no compensation
	pressure 800-1150hPa no compensation
Pressure dependency	+1.5% reading per kPa deviation from normal pressure of 100kPa
analog output	4-20mA, 0-5V
analog input	2 available for third-party devices
figure I/O	4 OUT: Open collector, ground referred, protected 4 IN: 0-5 V protected up ~ 24Vdc
Pipeline connections	For tube with diameter $\phi 4/\phi 2.5$ mm
interface connection	UART (TTL level), baud rate: 9600 (default) - 19200 - 38400
source	9-24V DC, reverse protected
Power compensation	max 90mA @ 9VDC, excluding pump power absorption

Type of connector	Power Supply:	<u>On module connector</u> Weidmüller SL3.5/2/ 180G3.2 Weidmüller	<u>Mating connector</u> Weidmüller BL 3.5/2
	Analog I/O:	SL3.5/2/180G3.2 Weidmüller SL3.5/2/	Weidmüller BL 3.5/6
	Pump:	180G3.2	Weidmüller BL 3.5/2
	Digital I/O:	TE Connectivity* 215307-5	TE Connectivity 826656-5
	Analog Out (0-5V):	TE Connectivity* 8-215464-6	TE Connectivity 8-215079-6 TE
	Power Supply & UART TTL level (0-5V):	TE Connectivity 7-215464-6	Connectivity 7- 215079-6
storage temperature	-40°C to 85°C		
MTBF	> 5 years		

* not mounted, available on request

Specifications

gas	range *	accuracy * *	Res. (ppm)	Full range response	Repeatability of zeros (ppm)	Full range repeatability (ppm)	model
CO ₂	0-1000ppm****	±1% FS	1	1% FS	±5	±10	NG2-A-7
	0-2000ppm	±1% FS	1	1% FS	±10	±25	NG2-A-8
	0-5000ppm	±1% FS	1	2% FS	±10	±50	NG2-A-1
	0-1%	±2% FS	1	2% FS	±25	±200	NG2-A-9
	0-5%	±2% FS	1	2% FS	±25	±250	NG2-A-6
	0-10%	±2% FS	1	2% FS	±25	±250	NG2-A-2
	0-25%	±2% FS	1	1% FS	±50	±500	NG2-A-3
	0-100%	±1% FS	1	1% FS	±1000	±5000	NG2-A-4
	0-100% biogas***	±1% FS	1	1% FS	±1000	±5000	NG2-A-11I
CO	0-2000ppm	±1% FS	5	1% FS	±10	±70	NG2-B-1
	0-4000ppm****	±1% FS	5	1% FS	±20	±70	NG2-B-3
	0-2%****	±1% FS	5	1% FS	±20	±400	NG2-B-4
	0-5%****	±1% FS	5	1% FS	±20	±600	NG2-B-5
CH ₄	0-2000ppm	±4% FS	5	4% FS	±15	±100	NG2-C-1
	0-4000ppm****	±4% FS	5	4% FS	±20	±100	NG2-C-6
	0-100% LEL	±2% FS	15	4% FS	±50	±500	NG2-C-2
	0-100% vol. biogas***	±2% FS	500	2% FS	±1000	±5000	NG2-C-3I
	0-100% vol.****	±2% FS	300	2% FS	±500	±3000	NG2-C-4

HC	0-2000ppm	±4% FS	5	4% FS	±15	±100	NG2-D-1
	0-100% LEL	±2% FS	15	4% FS	±50	±500	NG2-D-2
N ₂ O	0-100ppm	±2% FS	1	2% FS	±3	±3	NG2-F-3
	0-2000ppm	±1% FS	1	1% FS	±10	±20	NG2-F-1

** Other products of other ranges can be provided as required;** * Calibration accuracy does not include the tolerance of ±1% of the calibration gas;

*** Gas chamber corrosion resistance; **** Delivery time depends on gas availability and order quantity.

Sensor Dimensions

model	Volume (length* width* height)
NG2-A-1, NG2-A-2, NG2-A-4, NG2-A-6, NG2-A-7, NG2-A-8, NG2-A-9, NG2-A-11I, NG2-C-2, NG2-C-3I, NG2-C-4, NG2-D-2	56mm x 48mm x 38mm
NG2-B-1, NG2-B-3, NG2-B-4, NG2-B-5, NG2-C-1, NG2-C-6, NG2-D-1, NG2-F-1, NG2-F-3	306mm x 48mm x 43mm
NG2-A-3	56mm x 48mm x 43mm

Option

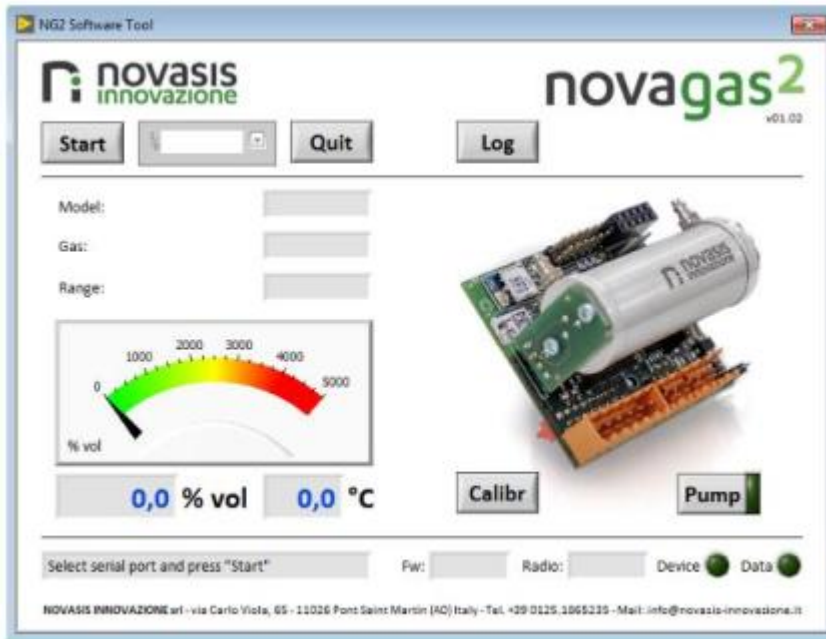
Connector kit and USB connector cable

To accelerate sensor integration, the NCK WIRED connector kit provides convenient power supply for sensors and enables connection to PCs via a UART-TTL-USB interface cable through the Network Interface Card (NIC). For calibration convenience, the Novagas NCAL kit is recommended, which includes: NIC components, a pneumatic pump (0.5 L/min), two flexible polyurethane tubes (6 mm outer diameter, 4 mm inner diameter), two additional flexible polyurethane tubes (4 mm outer diameter, 2.5 mm inner diameter), and connectors with diameters ranging from 6 mm to 4 mm.

Selecting accessories	code name
Novagas interface cable (USB)	NIC
Novagas wiring connector kit	NCK WIRED
Novagas calibration kit	NCAL

NG2 software tools

Novasis Innovazione has developed a user-friendly software tool specifically designed for rapid testing and calibration of Novagas2 sensors. It automatically identifies sensor models and allows users to read concentration values, with customization available upon request.



□ Wireless TX connection

The NOVAgas2 sensor module integrates a surface-mount device (SMD) module containing RF transceiver chips optimized for low-power wireless applications. Featuring an RF connector, it supports various antennas with certified near-omnidirectional or directional front/back patterns. Through NOVAgas2's analog input capabilities, the sensor board can also broadcast data outputs from other sensors.

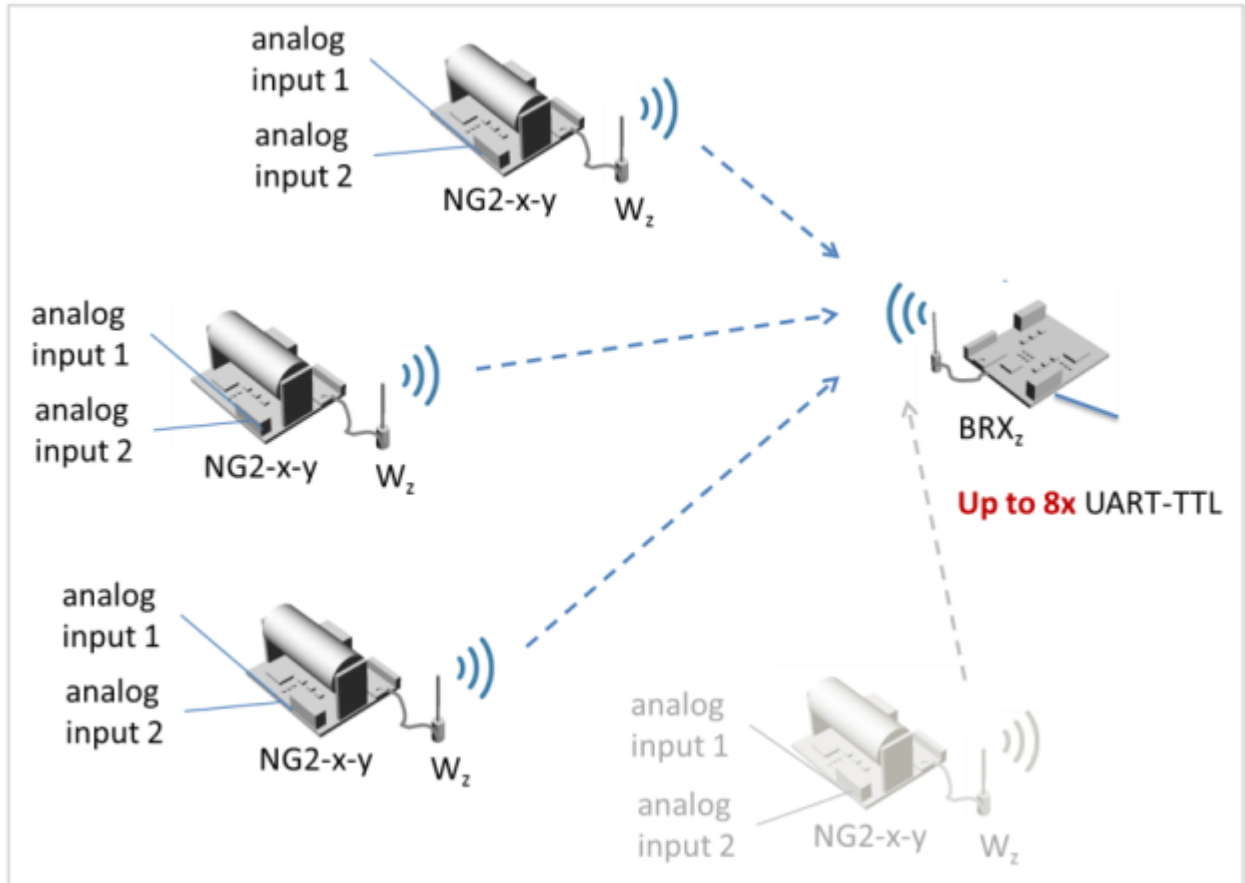
RF transceiver frequency	antenna	model
433MHz	Single pole whip, two pole, or dir- ectional	WTX1
868MHz		WTX2
915MHz		WTX3
2.4GHz		WTX4

□ Wireless RX connection (gateway)

The receiver unit (or gateway) enables users to set up wireless sensor networks. The gateway is a specially programmed NOVAgas2 electronic board designed as a host. It can receive wireless data from 1 to 8 NOVAgas2 sensors and connect to other devices via its UART interface port.

RF transceiver frequency	antenna	model
433MHz	Single pole whip, two pole, or dir- ectional	BRX1
868MHz		BRX2
915MHz		BRX3
2.4GHz		BRX4

The following figure shows an example of a network topology based on the NOVAgas2 sensor.



□ Energy harvesting power management

The NOVAgas2 sensor integrates a switching-mode battery charging controller for photovoltaic, wind, and piezoelectric energy harvesting. The controller provides input voltage regulation and energy storage. A standard configuration features 12V solar panels and rechargeable lithium-ion batteries (with a maximum output of 8.4V at 0.5 A).

solar panel	cell	model
5W about 200x200mm	PCM 7.4V 2600mAh	S

□ gas supply

Depending on the customer's application, the NOVAgas2 sensor module can be operated through natural gas diffusion or using a sampling pump.

pump	strainer	model
Diaphragm 0,5 l/min	Water repellency 1um (aperture) 5um (aperture) automatic drainage port	DPH

Note: This document provides only basic information and may be changed at any time without notice. Changes may be made according to customer requirements.

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