

User Manual

NDIR CO₂ Sensor Model PCL0A

PCL0A is one of the general NDIR CO₂ gas modules, which adopts the NDIR principle and consists of an advanced light chamber, precise electric circuit and intelligent software. With the help of a single light source, a single channel detector, and a microprocessor, PCL0A can perform the gas concentration signal in different ways. In this product, temperature compensation has been realized as well as correction of nonlinearity. PCL0A has the function of self-calibration every 24 hours. It carries all the advantages of NDIR products, such as good selectivity, high sensitivity, long life, and independence to O₂.

PCL0A is suitable for a wide range of applications including indoor air quality monitoring, ventilation system controls, automobile airflow management, etc.



1. Technical Specifications

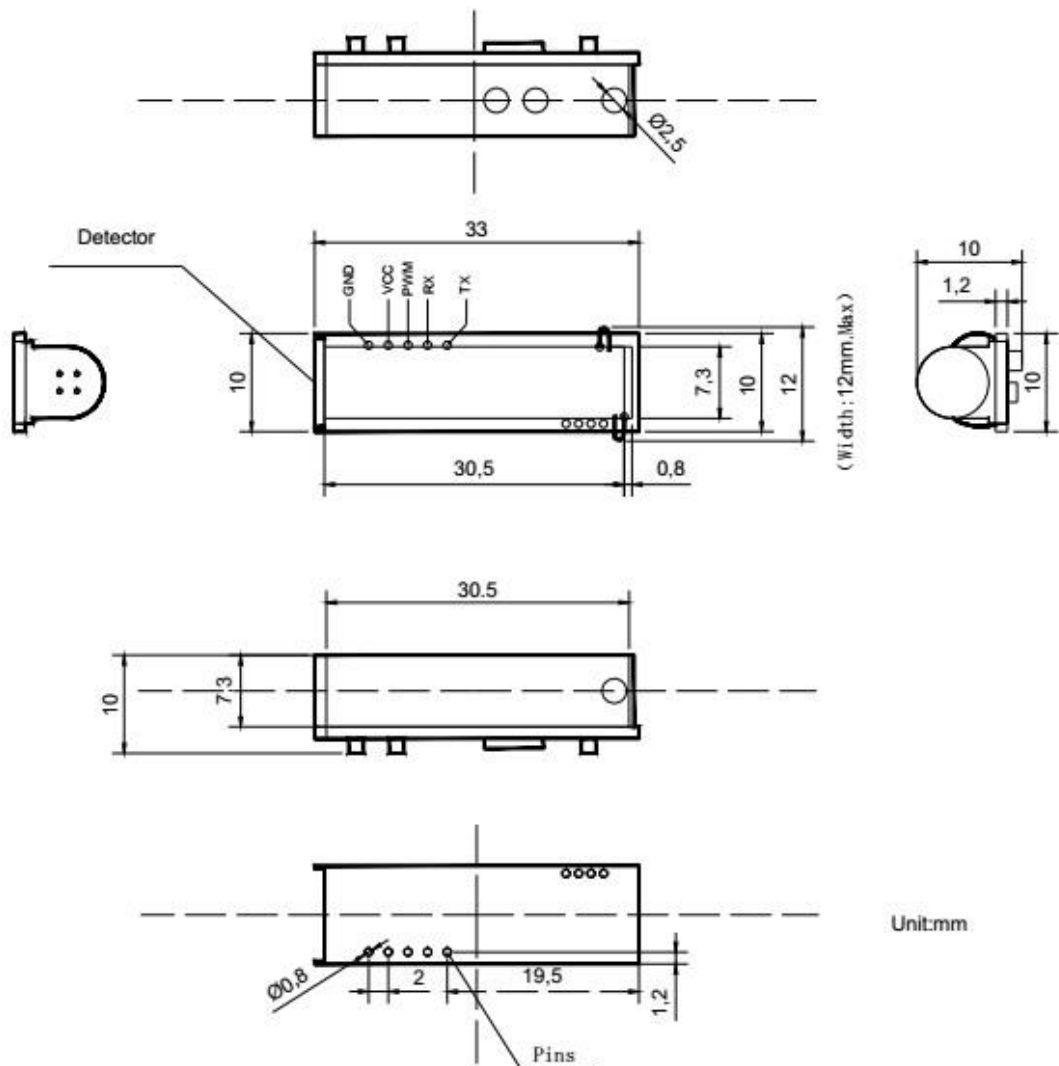
1.1 Working conditions

Description	Symbol	Value	Unit
Storage temperature	T _{stg}	-40 to +70	°C
Working temperature	TA	-10 to +60	°C
Working humidity	HA	0 to 95 (no condensation)	% RH
Working voltage	VDC	5±0.5	V
Working current	I _{average}	75	mA
	I _{peak}	140	mA

1.2 Performance

Description		Parameter	Unit
Working principle		NDIR	
Detection range		0-5000	ppm
Detection accuracy		±50ppm±5% reading	
Response time T90		< 2	Min
Warm-up time	Set to work	< 30	Sec
	precision reached	< 5	Min

1.3 Mechanical



2. Signal Output

The output modes of this sensor include UART and PWM.

2.1 Pinout

- 1 TTL TXD
- 2 TTL RXD
- 3 PWM Output
- 4 +5 VCC
- 5 GND



2.2 UART Protocol

Baud rate: 19200bps, 8 bytes, first byte is stop, no check byte.

The reading and return data is hexadecimal.

Concentration uploaded automatically in ASCII with the format:

32	32	x	x	x	x	x	32	p	p	m	\r		\n
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For example: output of 12345 ppm

		1	2	3	4	5		p	p	m
0x20	0x20	0x31	0x32	0x33	0x34	0x35	0x20	0x70	0x70	0x6d

2.3 PWM Output

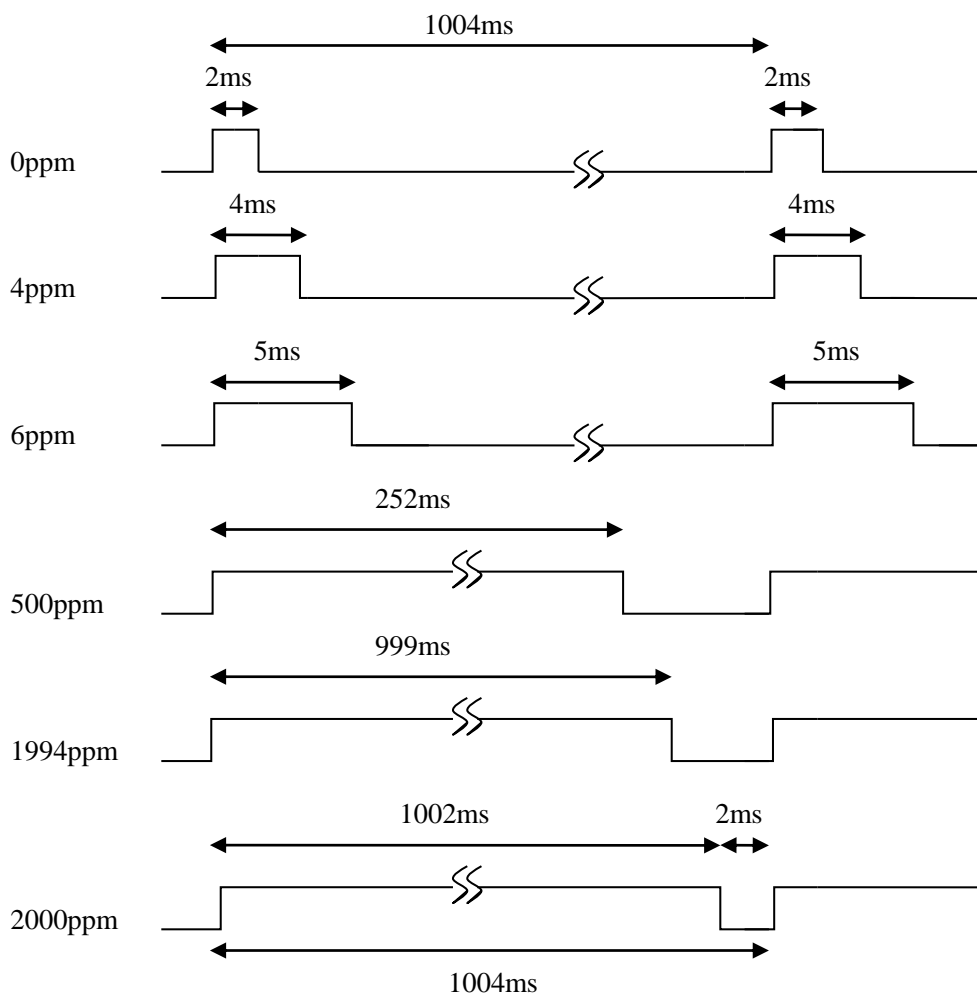
PIN 3 is the PWM output with the following definition:

Concentration range: 0-5000ppm CO₂

Cycle: 1004 ms \pm 5%

How to calculate the positive pulse width of PWM based on CO₂ concentration:

$$\text{The positive pulse width} = (\text{PPM concentration} / 2) + 2\text{ms}$$



PWM OUTPUT

3. Installation instructions

The distance between the installation holes is 2 mm. Connect the module to a client through the single-row socket with a connection distance of 2 mm.

4. Maintenance and storage

The module should not be working in a dusty environment for a long time to avoid reducing sensor lifespan. The power supply should be in a proper range per specifications.