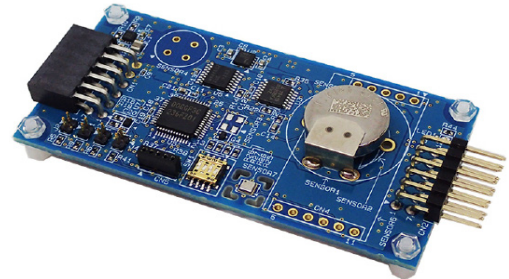


# PDEM Series Gas Sensor Evaluation Module

## Features:

- \* Available with Figaro MOS/EC/Catalytic/NDIR sensor
- \* Pre-calibrated by typical target gas
- \* Realtime monitoring of gas concentration, temp. /hum.
- \* Digital (I2C/PMOD™) and analog output
- \* Temp. and hum. compensation of gas sensor raw signal
- \* Compatible with Renesas Quick-connect IoT system



Model PDEM5141

## Description:

The PDEM series evaluation module is designed to facilitate the evaluation of the MOS, electrochemical, catalytic and NDIR types of Figaro gas sensors. Every PDEM module is individually pre-calibrated in the Figaro factory and can provide digital (I2C) or analog output of gas concentration data (or IAQ index data by air quality sensors). Thanks to an integrated Renesas temperature and humidity sensor HS4001, the module includes a temperature and humidity compensation function for the raw gas sensor output signals, and is capable of simultaneous ambient temperature and humidity monitoring.

※The mounted sensor is not replaceable at customer's end.

Quick-Connect IoT Platform:

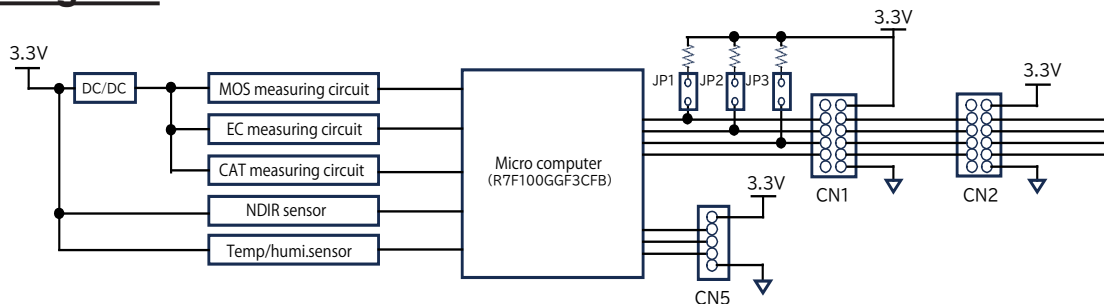
Quick-Connect IoT is a modular prototype development platform offered by Renesas Electronics Corp.

The Quick-Connect compatible hardware and software products from Renesas Electronics facilitate the prototyping of IoT systems comprising of microcontrollers, sensors, and wireless communication modules.

※For more details about Quick-connect IoT, please refer to the following web site

<https://www.renesas.com/jp/ja/software-tool/quick-connect-iot-platform>

## Block diagram:



•JP1/JP2/JP3 are pull-up jumpers for serial communication. For single board usage, the jumpers should be shorted.

•JP4 is for factory calibration, please do not make a short at user side.

### Pin assignment (CN1/CN2)

Pin#	Name	Description	Pin#	Name	Description
1	IRQ#	for PMOD	7	BUSY#	for PMOD
2	RES#	for PMOD	8	ENABLE	for PMOD
3	I2C SCL	for PMOD/I2C	9	POWER ON	for PMOD
4	I2C SDA	for PMOD/I2C	10	GPIO4	for PMOD
5	GND	Ground	11	GND	Ground
6	VDD	3.3V	12	VDD	3.3V

### Pin assignment (CN5)

Pin#	Name	Description
1	VDD	3.3V
2	TOOL	-
3	REST	-
4	GAS CONC.	Analog output
5	GND	Ground

### Specifications:

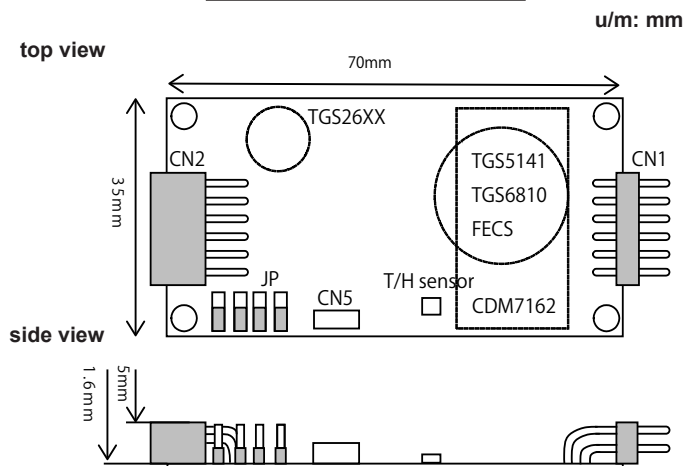
Product name	PDEM seris sensor evaluation module
Input voltage	3.3VDC
Operating conditions	0~40°C
Output specification	Gas concentration(ppm or IAQ index)
	Tempearature(-40°C to 125°C) <sup>※1</sup>
	Humidity(0% to 100%RH) <sup>※1</sup>
Interface(Digital)	I2C <sup>※2</sup> and Pmod Type6A <sup>※3</sup>
Interface(Analog)	0~3.3V
Dimensions	Approx. 70 × 35 × 6.6mm(without sensor)

※1 Specification of HS4001 (Renesas Electronics)

※2 Please refer to PDEM communication specification

※3 Conform to Digilent's Pmod Type6A(Extended I2C)  
[pmod-interface-specification-1\\_3\\_0.pdf](http://pmod-interface-specification-1_3_0.pdf) (digilent.com)

### Structure and Dimensions



### Product number/Output specifications:

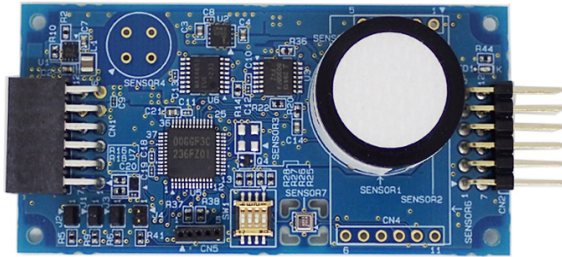
Module P/N	Mounted sensor	Target gas	Sensr type	Target concentration	Output range (Analog)	Board ID in Renesas web site
PDEM42-20	FECS42-20	NO <sub>2</sub>	EC	0~30ppm	0~3.3V	QCloT-Figaro-FECS42-20
PDEM43-20	FECS43-20	SO <sub>2</sub>	EC	0~30ppm	0~3.3V	QCloT-Figaro-FECS43-20
PDEM44-100	FECS44-100	NH <sub>3</sub>	EC	0~150ppm	0~3.3V	QCloT-Figaro-FECS44-100
PDEM44-1000	FECS44-1000	NH <sub>3</sub>	EC	0~1500ppm	0~3.3V	QCloT-Figaro-FECS44-1000
PDEM50-100	FECS50-100	H <sub>2</sub> S	EC	0~150ppm	0~3.3V	QCloT-Figaro-FECS50-100
PDEM5141	TGS5141	CO	EC	0~150ppm	0~3.3V	QCloT-Figaro-TGS5141
PDEM2600	TGS2600	IAQ	MOS	Index0~500	0~3.3V	QCloT-Figaro-TGS2600
PDEM2602	TGS2602	IAQ	MOS	Index0~500	0~3.3V	QCloT-Figaro-TGS2602
PDEM2603	TGS2603	IAQ	MOS	Index0~500	0~3.3V	QCloT-Figaro-TGS2603
PDEM6810	TGS6810	CH <sub>4</sub> •H <sub>2</sub>	Catalytic	0~10000ppm	0~3.3V	QCloT-Figaro-TGS6812
PDEM7162	CDM7162	CO <sub>2</sub>	NDIR	0~5000ppm	0~3.3V	-

### NOTE:

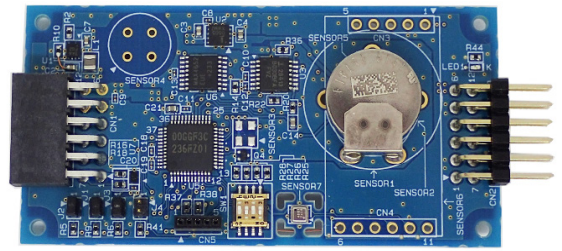
- Please do not adjust on-board DIP switch
- PDEM module board is designed for evaluation purpose. (Its reliability and durability are NOT verified.)

All sensor characteristics shown in this brochure represent typical characteristics. Actual characteristics vary from sensor to sensor. The only characteristics warranted are those in the Specification table above.

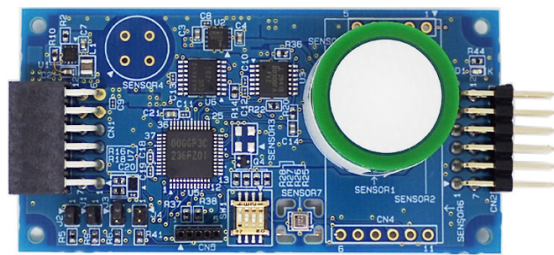
**FIGARO ENGINEERING INC.**  
 1-5-11 Senba-nishi  
 Mino, Osaka 562-8505 JAPAN  
 Phone: (81)-727-28-2045  
 URL: [www.figaro.co.jp/en/](http://www.figaro.co.jp/en/)



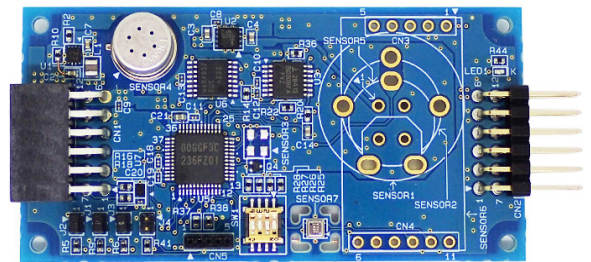
PDEM42-20



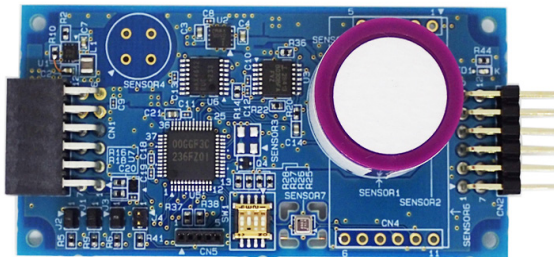
PDEM5141



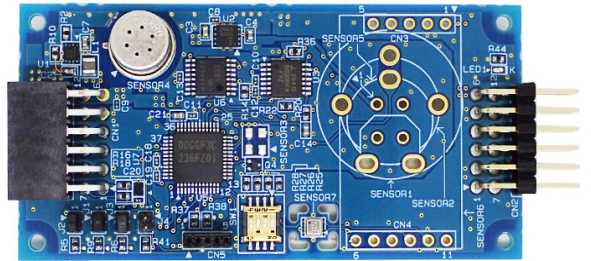
PDEM43-20



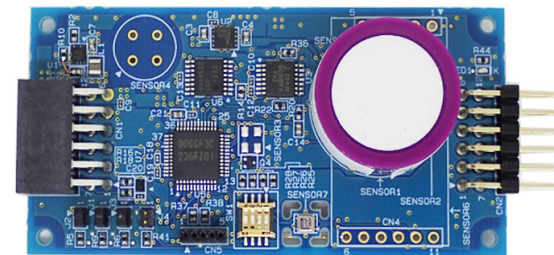
PDEM2600



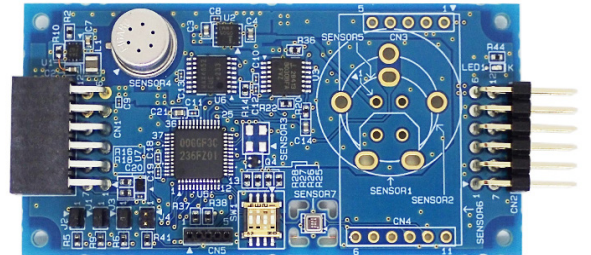
PDEM44-100



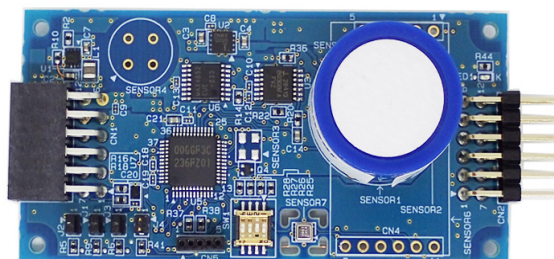
PDEM2602



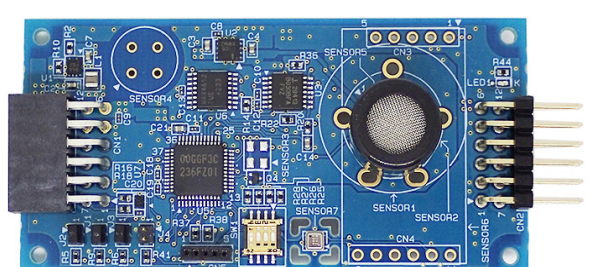
PDEM44-1000



PDEM2603

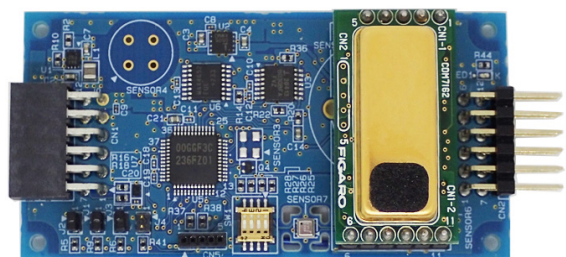


PDEM50-100



PDEM6810





PDEM7162