WxS8800-21E0J7
LoRaWAN NDIR CO2 Gas Smart Sensor & RTU 2-in-1 Terminal

Product Highlights

- ❖ LoRaWAN NDIR CO2 Gas Smart Sensor & RTU 2-in-1 Terminal
- ❖ 2-in-1 smart sensor(s) and RTU terminal product
- ❖ Optional DC 5V power supply
- ❖ Optional Battery power supply (ER34615H 19,000mAh/ER34615M 13,500mAh)
- ❖ CO2 concentration can be monitored (0-2,000ppm), with high sensitivity, high resolution and fast response time
- ❖ Expandable with additional Polysense PSS sensors
- ❖ Expandable with 2 of 14 types PSS gas sensors with aluminum Sleeve enclosure
- ❖ Up to 8 working simultaneously including sensors and controllers; Customization needed if more than 8 working at the same time
- ❖ RTU controlling signal and interfaces OD/PWR triggered by sensor(s) data or OTA command for solenoid valve or other devices
- ❖ Optional (Public/Private) IoT cloud platform PolySuite iView and LoRaWAN network iServer
- ❖ LoRaWAN Compliance

Products includes following parts:

- ❖ WxS8800 LoRa Smart IoT and RTU 2-in-1 Terminal
- ❖ ENC-102003 WxS Series 4.0 High Poromeric Enclosure(φ145x90x70mm)
- ❖ PSS-21E0J7 NDIRCO2 Gas Sensor (Range:0-2,000PPM, Resolution:1PPM),LP 3.3V

Configuration Tool

- ❖ iEdge4.0 WxS IoT Terminal products can be configured with PolySuite software-visual based Configuration Tool or CLI interface command or OTA via IoT platform, such as PolySuite PaaS platform iView.
- ❖ Download link http://ota.polysense.online/wincc/ConfigurationTool.rar

Product Image

- ❖ The shell is WxS Series 4.0 High Poromeric Enclosure(φ145x90x70mm), as shown in the figure below
- ❖ The sensor is externally connected. See the following document PSS-21E0J7 for the sensor picture

WxS8800

LoRa Smart IoT and RTU 2-in-1 Terminal

Related Products

Product .	Interf.	Descriptions
WxS8800	11MPI+RS485+OD*2+PWR*2	LoRa Smart IoT and RTU 2-in-1 Terminal (Inc. WxS88xx, PSM-xx00, PSB-BD01, & Enclosure)
WxS8801	RS485+OD*2+PWR*2	LoRa Smart IoT and RTU 2-in-1 Terminal (Inc. WxS88xx, PSM-xx01, PSB-BD01, & Enclosure)
WxS8802	0-20mA*1+OD*2+PWR*2	LoRa Smart IoT and RTU 2-in-1 Terminal (Inc. WxS88xx, PSM-xx02, PSB-BD01, & Enclosure)
WxS8803	0-20mA*4+OD*2+PWR*2	LoRa Smart IoT and RTU 2-in-1 Terminal (Inc. WxS88xx, PSM-xx03, PSB-BD01, & Enclosure)
WxS8804	0-3.3V*2+OD*2+PWR*2	LoRa Smart IoT and RTU 2-in-1 Terminal (Inc. WxS88xx, PSM-xx04, PSB-BD01, & Enclosure)
WxS8805	0-3.3V*4+OD*2+PWR*2	LoRa Smart IoT and RTU 2-in-1 Terminal (Inc. WxS88xx, PSM-xx05, PSB-BD01, & Enclosure)
WxS8806	0-10V*2+OD*2+PWR*2	LoRa Smart IoT and RTU 2-in-1 Terminal (Inc. WxS88xx, PSM-xx06, PSB-BD01, & Enclosure)
WxS8807	0-10V*4+OD*2+PWR*2	LoRa Smart IoT and RTU 2-in-1 Terminal (Inc. WxS88xx, PSM-xx07, PSB-BD01, & Enclosure)
WxS8808	PT100*1+OD*2+PWR*2	LoRa Smart IoT and RTU 2-in-1 Terminal (Inc. WxS88xx, PSM-xx08, PSB-BD01, & Enclosure)
WxS8809	PT100*5+OD*2+PWR*2	LoRa Smart IoT and RTU 2-in-1 Terminal (Inc. WxS88xx, PSM-xx09, PSB-BD01, & Enclosure)
WxS880A	Switch*1+OD*2+PWR*2	LoRa Smart IoT and RTU 2-in-1 Terminal (Inc. WxS88xx, PSM-xx0A, PSB-BD01, & Enclosure)
WxS880B	Switch*5+OD*2+PWR*2	LoRa Smart IoT and RTU 2-in-1 Terminal (Inc. WxS88xx, PSM-xx0B, PSB-BD01, & Enclosure)
WxS880C	Unibus*1+OD*2+PWR*2	LoRa Smart IoT and RTU 2-in-1 Terminal (Inc. WxS88xx, PSM-xx0C, PSB-BD01, & Enclosure)
WxS880D	Unibus*18+OD*2+PWR*2	LoRa Smart IoT and RTU 2-in-1 Terminal (Inc. WxS88xx, PSM-xx0D, PSB-BD01, & Enclosure)
WxS880E	IIC*1+OD*2+PWR*2	LoRa Smart IoT and RTU 2-in-1 Terminal (Inc. WxS88xx, PSM-xx0E, PSB-BD01, & Enclosure)
WxS880F	SPI*1+OD*2+PWR*2	LoRa Smart IoT and RTU 2-in-1 Terminal (Inc. WxS88xx, PSM-xx0F, PSB-BD01, & Enclosure)
WxS880G	Uart*2+OD*2+PWR*2	LoRa Smart IoT and RTU 2-in-1 Terminal (Inc. WxS88xx, PSM-xx0G, PSB-BD01, & Enclosure)
WxS880H	Uart*3+OD*2+PWR*2	LoRa Smart IoT and RTU 2-in-1 Terminal (Inc. WxS88xx, PSM-xx0H, PSB-BD01, & Enclosure)
WxS880J	Uart*1+RS485+OD*2+PWR*2	LoRa Smart IoT and RTU 2-in-1 Terminal (Inc. WxS88xx, PSM-xx0J, PSB-BD01, & Enclosure)
WxS8850	Ai/Ao/Di/Pi/Ro/IIC/SPI/Ci + RS232/485/Ro/RJ45	LoRa Smart RTU

Product Highlights

❖ Interfaces supported:

   o MPI:(AIN(0-20mA)*2, PT100*1, VIN(0-10V/0-3.3V)*2, Switch*1 ,Unibus*1, IIC *1，SPI*1, Uart(3.3V TTL)*2), RS485*1
   o RTU interfaces
      ▪ OD*2 output for external devices controlling
      ▪ PWR*2 output for external devices/sensors power supply or customization usage

❖ 2-in-1 DC(5V/12V)+Battery(3.6V Li-SOCl2 ER34615H/M) Power Supply, DC in priority
❖ Up to 8 working simultaneously including sensors and controllers; Customization needed if more than 8 working at the same time
❖ Built-in sensor options including:

   o PSS-403011 IIC   Temperature and Humidity Sensor (Indoor)
   o PSS-403012 RS485   Temperature and Humidity Sensor (Indoor)
   o PSS-403013 IIC   Temperature and Humidity Sensor (IP67,Outdoor)
   o PSS-403014 RS485   Temperature and Humidity Sensor (IP67,Outdoor)
   o PSS-403015 IIC   Temperature and Humidity Sensors (Indoor)
   o PSS-403016 RS485   Temperature and Humidity Sensors (Indoor)

- o   PSS-403017   IIC   Temperature and Humidity Sensors (IP67,Outdoor)
- o   PSS-403018   RS485   Temperature and Humidity Sensors (IP67,Outdoor)
- o   PSS-403019   IIC   Temperature and Humidity Sensors (Indoor)
- o   PSS-40301A   RS485   Temperature and Humidity Sensors (Indoor)
- o   PSS-40301B   IIC   Temperature and Humidity Sensors (IP67,Outdoor)
- o   PSS-40301C   RS485   Temperature and Humidity Sensors (IP67,Outdoor)
- o   PSS-403021   IIC   Temperature + Humidity + Barometric Pressure Sensors(Indoor)
- o   PSS-403022   RS485   Temperature + Humidity + Barometric Pressure Sensors(Indoor)
- o   PSS-403023   IIC   Temperature + Humidity + Barometric Pressure Sensors (IP67,Outdoor)
- o   PSS-403024   RS485   Temperature + Humidity + Barometric Pressure Sensors (IP67,Outdoor)
- o   PSS-33B011   RS485   illumination Sensor(Indoor)
- o   PSS-423011   Uart   AQI(PM2.5/10, SO2,NO2, O3, CO,Temp,Humidity) PPM Level Sensors
- o   PSS-423031   Uart   IAQ(PM2.5/10, CO2, HCHO, Temp,Humidity) Sensors
- o   PSS-423041   Uart   IAQ(PM2.5/10, CO2, TVOC, Temp,Humidity) Sensors
- o   PSS-423051   Uart   IAQ(PM2.5/10, CO2, HCHO, TVOC,Temp,Humidity)Sensors
- o   PSS-318711   Uart   GPS/Beidou Positioning Sensor
- o   PSS-318712   RS485   GPS/Beidou Positioning Sensor
- o   PSS-319311   0-3.3V   Tilt / Inclination Sensor (SHM- Structure Health Monitoring)
- o   PSS-333051   0-3.3V   PIR Sensor (3-4 Meters)
- o   PSS-333052   0-3.3V   PIR Sensor (up to 20 Meters)
- o   PSS-334061   0-3.3V   UV Sensor (Range:0-15 grade, outdoor)
- o   PSS-355051   Switch   Uni-Call Button & Controller
- o   PSS-362011   Uart   Sound/Noise Sensor (30~130dB range, Indoor)
- o   All Gas Sensors with Product No. PSS-21xxxx

❖   Support 1-8 enclosure externally connected sensors

- o   All enclosure external PSS sensors w/o separate power supply

❖   RTU OD & PWR(PWM) output control inerfaces

- o   OD output control interface for controlling external devices such as electric relay,AC contactor, beeper, draught fan, lamps and lantern etc.
- o   PWR*2 output, one default for external devices/sensors power supply voltage output, one with 3.3V voltage; or customization usage,such as for PWM port
- o   PWR port signal can be used as PWM output to control stepper moter or lamp
- o   Sensor(s) data or OTA Command triggered OD/PWR controlling signal & interfaces

❖   Power supply options:

- o   PSB-BT01   WxS Terminal Battery Power (3.6VDC Output) (3.6V Li-SOCl2 ER34615H/M)
- o   PSB-BT02   WxS Terminal Battery Power Board (3/5/9/12VDC Output) (3.6V Li-SOCl2 ER34615H/M)
- o   PSB-DC01   WxS Terminal DC Power Board (Inc. PSP-DC012V)
- o   PSB-BD01   WxS Terminal Battery (3.6V Li-SOCl2 ER34615H/M) & DC Power Board(Inc. PSP-DC012V)
- o   Battery capacity ER34615H: 19000mAh/ER34615M: 13500mAh

❖ iEdge 4.0 terminal enclosure options

   o ENC-102001 WxS Series 4.0 Enclosure(φ145x90x55mm, IP67)
   o ENC-102002 WxS Series 4.0 Poromeric Enclosure(φ145x90x59mm)
   o ENC-102003 WxS Series 4.0 High Poromeric Enclosure(φ145x90x70mm)

❖ Terminal and sensor parameters configurable with Configuration Tool running on PC

   o LoRaWAN ISM Global Bands Supported and SW Configurable
   o LoRaWAN Uplink Transmission Cycle Configurable
   o Sensor Parameters Configurable
   o Sensor Data Report Cycle Configurable

❖ FOTA (Over The Air) firmware upgrade, including to upgrade loader and application images
❖ OTA (Over The Air) terminal running parameters supported including output signal
❖ Low power consumption, years of battery operational life with 3.6V Li-SOCl2 ER34615H/M Battery with various scenarios
❖ Integrated internal antenna, or optional external SMA/IPEX antenna
❖ The transmission reaches 5km in NLoS (non-line of sight) and 18km in LoS (line of sight) environment
❖ LoRaWAN Compliance

Specifications

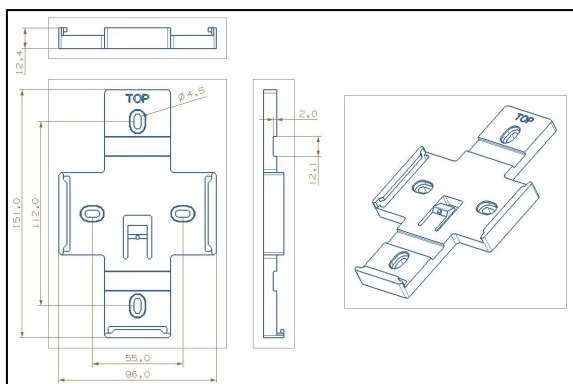| Parameters	Value
Smart Terminal	
Interfaces	MPI Interfaces-Any Mixture of Following: MPI:(AIN(0-20mA) *2, PT100 *1, VIN(0-10V/0-3.3V) *2, Switch *1 ,Unibus*1, IIC *1，SPI*1, Uart(3.3V TTL)*2), RS485*1 Output Control: OD*2 & PWR*2
Data Report	Cross-threshold report, plus periodic report (the threshold and the periodic report cycle are both user-configurable)
Intensive data sampling and averaging	Support intensive data sampling and averaging to improve data accuracy
Wireless	
ISM Regional Parameters	AS923 (AS923-1, AS923-2, AS923-3, AS923-4) AU915 CN470 CN779 EU433 EU868 IN865 KR920 RU864 US915
Maximum Link Budget	168dB
Distance	Up to 5km in NLOS; up to 18km in LOS
Antenna	Integrated internal antenna or external 1/2 wavelength whip antenna (SMA)

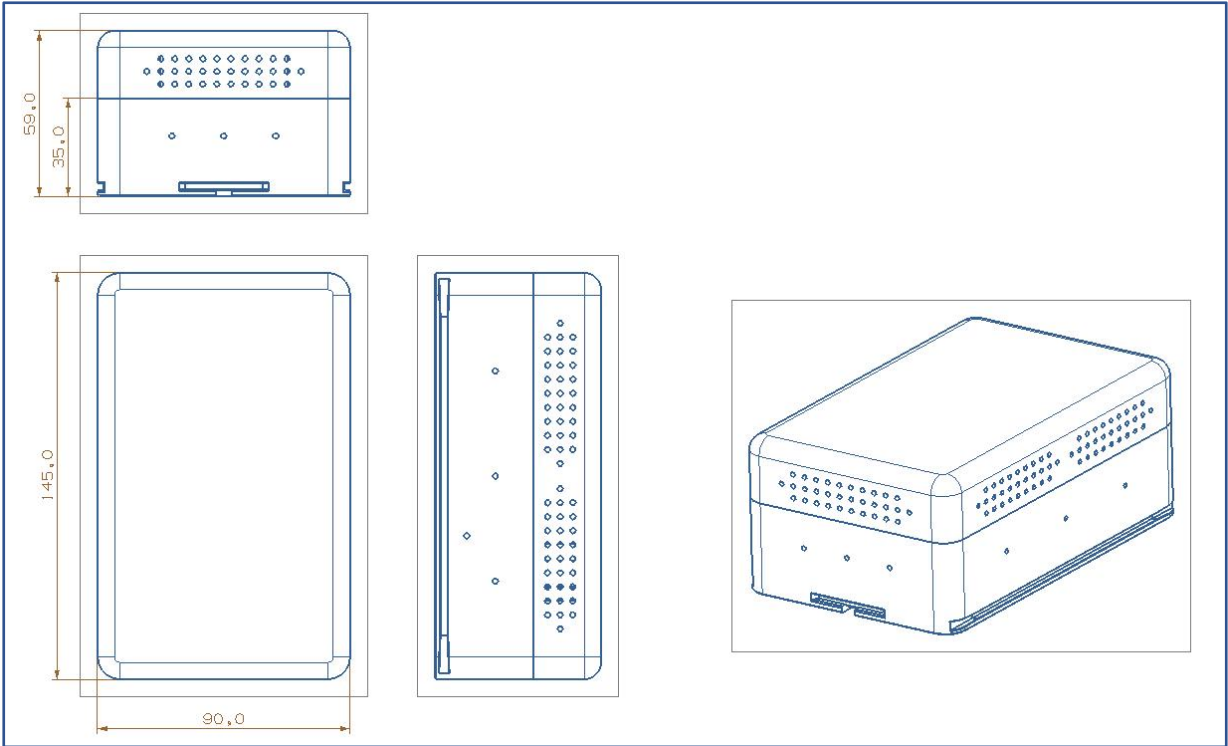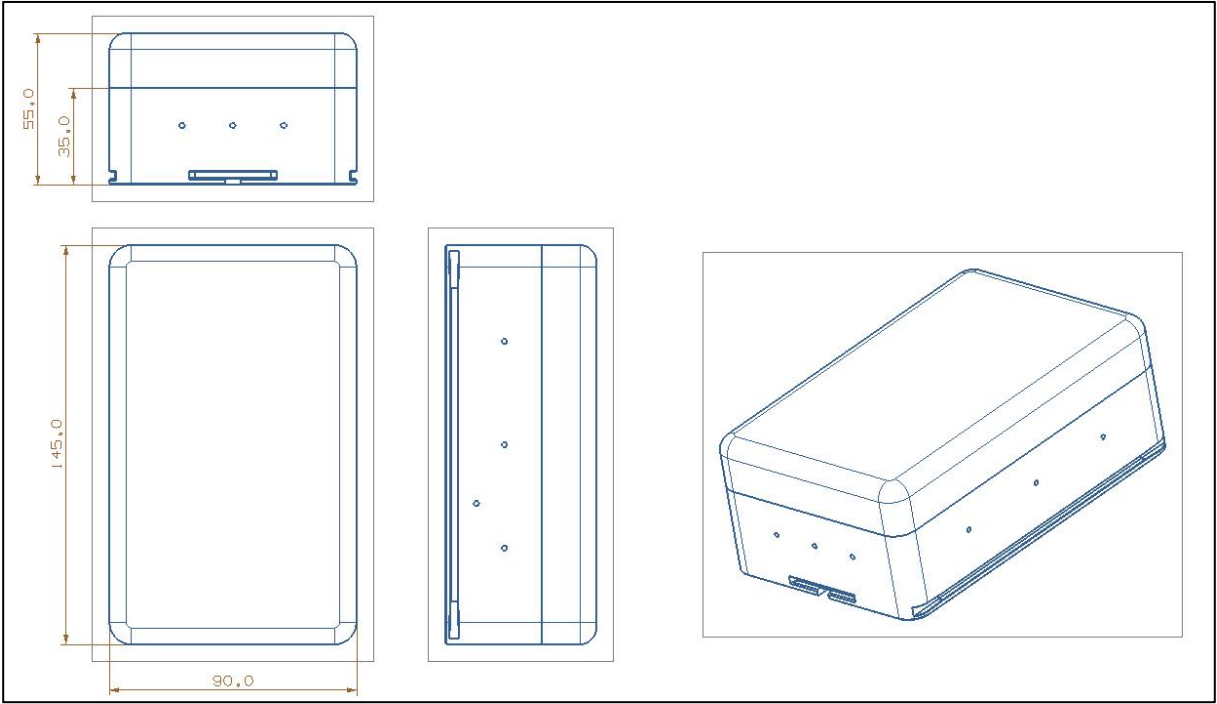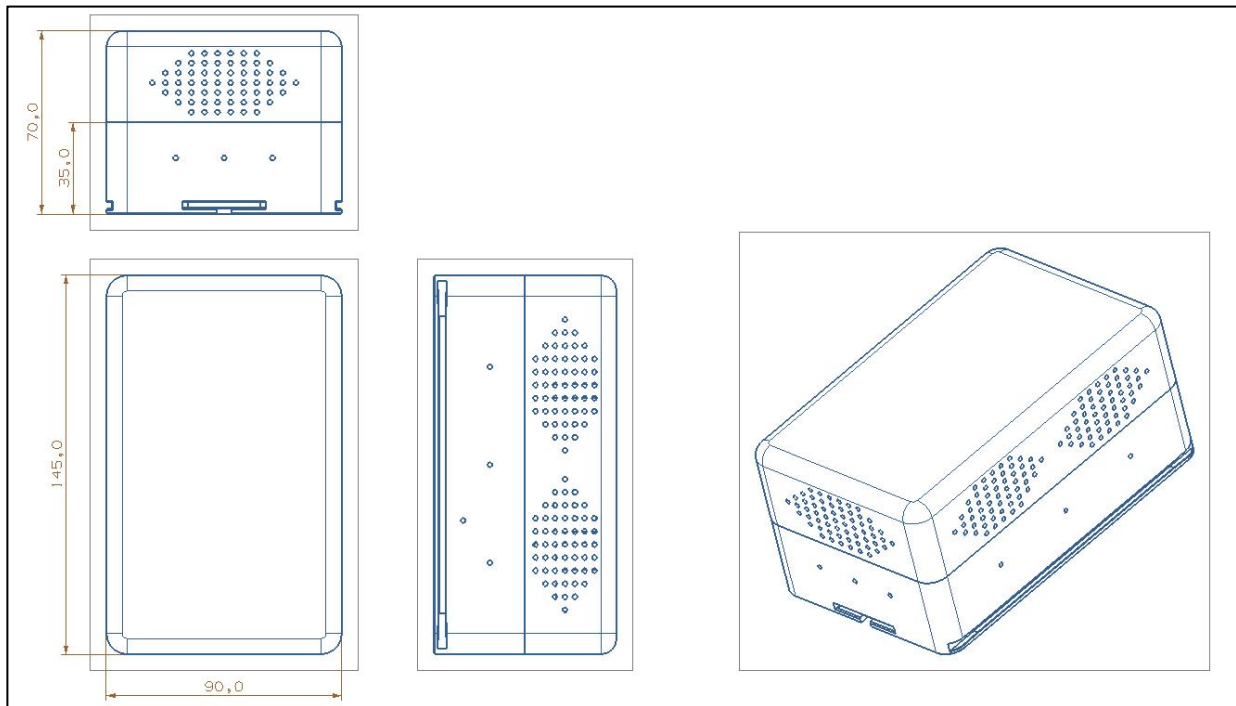| Mechanical	
Dimension	3 Enclosure options with different size WxS Series 4.0 Enclosure(φ145x90x55mm, IP67) WxS Series 4.0 Poromeric Enclosure(φ145x90x59mm) WxS Series 4.0 High Poromeric Enclosure(φ145x90x70mm)
IP rating	IP65 & IP67
Operating Temperature	-40C to +85C
Total Weight	150 g
Electrical	
Supply Voltage	3.6VDC
Power Type	Replaceable 1 ER34615H/M 3.6V Li-SOCl2 Battery (H/M); DC 4.5V – 12V optional
Compliance/Certification	
LoRa Alliance	LoRaWAN 1.0.2
FC IC CE RoHS	FCC(America): 2AO7W-WXS8000, IC(Canada): 23701-WXS8000 CE(European Union)：B1810246 ROHS(European Union): R2BJ180927F0664E

Configuration Tool

❖ iEdge4.0 WxS IoT Terminal products can be configured with PolySuite software-visual based Configuration Tool or CLI interface command or OTA via IoT platform, such as PolySuite PaaS platform iView.

❖ Download link http://ota.polysense.online/wincc/ConfigurationTool.rar

Installation Guide

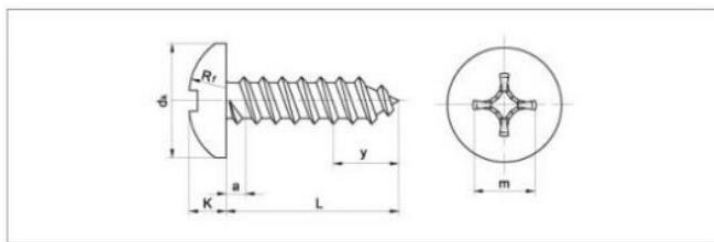❖ Below diagram shows the general installation guide for WxS8800, it can be installed on any flat and solid surface:

❖ Below is the recommendation of the self-tapping screw and its sizes:

螺纹规格		ST2.2	ST2.9	ST3.5	ST4.2	ST4.8	ST5.5	ST6.3
dk	min	3.7	5.3	6.64	7.64	9.14	10.57	11.57
K	min	1.4	2.15	2.35	2.8	3.4	3.7	4.3
m		1.9	3	3.9	4.4	4.9	6.4	6.9
L		4.5mm–100mm						

Product Images

❖ WxS Series 4.0 Enclosure(φ145x90x55mm, IP67)

❖ WxS Series 4.0 Poromeric Enclosure(φ145x90x59mm)

❖ WxS Series 4.0 High Poromeric Enclosure(φ145x90x70mm)

PSS-21E0J7

CO2 Gas Sensor

Related Products

Product No.	Interf.	Descriptions
PSS-21E0J7	Uart	CO2 Gas Sensor (Range:0-2,000PPM, Resolution:1PPM),LP 3.3V
PSS-21E0J8	Uart	CO2 Gas Sensor (Range:0-5,000PPM, Resolution:1PPM),LP 3.3V
PSS-21E0J9	Uart	CO2 Gas Sensor (Range:0-10,000PPM, Resolution:1PPM),LP 3.3V

Product introduction

The PSS-21E0J7 CO2 sensor is a high-precision CO2 sensor with ultra-low power consumption (3.5MW), which is very suitable for battery powered portable instruments. Based on infrared LED, detector technology and patented optical detection cavity.

Detection principle

Non dispersive infrared (NDIR). Detection principle is a method based on gas absorption theory. When the infrared light passes through the CO2 gas to be measured, these gas molecules will absorb infrared light of a specific wavelength. By measuring the intensity of infrared light, the concentration of CO2 gas can be analyzed quickly and accurately.

Product features

❖ Detection item of intelligent sensor: CO2 gas

❖ Ultra low power 3.5MW

❖ Measurement range: 0 ～ 2,000PPM

❖ Low noise measurement (<10PPM)

❖ 3.3V power supply

❖ Peak current only 33 mA

❖ Temperature and humidity output optional

Product parameters

Parameters	
Monitoring gas	CO2 gas
Detection principle	Non dispersive infrared (NDIR)
Sampling method	Natural diffusion
Detection range	0~2,000ppm
Accuracy	$\pm$ (50ppm+3% of reading)
Calibration	Auto Calibration
Non linear	<1% of full scale
Pressure influence	$\pm$ 0.13% difference per mm Hg under standard atmospheric conditions
Operating pressure range	950 mbar to 1050 mbar
Preheating time	<10S (the first reading is 1.2 seconds)
Response time	30 seconds to 3 minutes (through filtering and application configuration) Readings are refreshed twice per second
Input power	3.25V ～ 5.5V (3.3V recommended)

	Peak current 33 mA Average current<1.5mA
Power dissipation	3.5mW
Interface	
Output signal	Default Uart, analog output (to be customized)
Upgrade	
Upgrade	Main serial port or DFOTA
Warranty	
Warranty period	3 months (the gas sensor is a consumable, and its service life is related to the tested environmental concentration)
Design life	15 years(Related to the ambient concentration tested)
Machinery	
Size	43mm*24mm
Operating temperature	0 ℃~50 ℃ (standard) -25 ℃～ 55 ℃ (wide range)
Operating humidity	0～95%RH (no condensation)
Power	
Power	3.25V ～ 5.5V (3.3V recommended)

Application

Suitable for building control, gardening and other occasions.

Ordering Guide

❖   PSS-21E0J7 sensor is a sensor only, it needs to use with WxS terminals to combine to different product series; On the basis of the combination, multiple PSS sensors can be loaded through the Multiple Purpose Interface (MPI) of the intelligent IoT terminal.

❖   According to the specific scenario of use case, the enclosure and antenna of intelligent IoT terminal will be replaced to ensure the product quality and performance.

❖   PSS sensors can be integrated with the WxS terminal via the MPI interface to form different product series.

❖   Example of products are as follows:

   o   WxS7800-21E0J7 WiFi Series CO2(0-2,000PPM) Gas Smart Sensor & RTU 2-in-1 Terminal
   o   WxS8800-21E0J7 LoRaWAN Series CO2(0-2,000PPM) Gas Smart Sensor & RTU 2-in-1 Terminal
   o   WxS9800-21E0J7 NB-IoT (China) Series CO2(0-2,000PPM) Gas Smart Sensor & RTU 2-in-1 Terminal
   o   WxS9900-21E0J7 NB-IoT (Global) Series CO2(0-2,000PPM) Gas Smart Sensor & RTU 2-in-1 Terminal
   o   WxSC800-21E0J7 LTE Cat1 Series CO2(0-2,000PPM) Gas Smart Sensor & RTU 2-in-1 Terminal
   o   WxSC900-21E0J7 LTE Cat1 w/GPS Series CO2(0-2,000PPM) Gas Smart Sensor & RTU 2-in-1 Terminal
   o   WxSD800-21E0J7 LTE Cat4 Series CO2(0-2,000PPM) Gas Smart Sensor & RTU 2-in-1 Terminal
   o   CxS1800-21E0J7 Ethernet (RJ45) Series CO2(0-2,000PPM) Gas Smart Sensor & RTU 2-in-1 Terminal