WxS8800-318521

LoRaWAN Multi-target High-oprecision Positioning and Speed Measurement Radar & RTU Smart Terminal

Product Highlights

❖ LoRaWAN Multi-target High-oprecision Positioning and Speed Measurement Radar & RTU Smart Terminal
❖ 2-in-1 smart sensor(s) and RTU terminal product
❖ Optional DC 12V power supply
❖ Optional Battery power supply (ER34615H 19,000mAh/ER34615M 13,500mAh)
❖ It can monitor multi lane traffic flow speed, lane occupancy, etc
❖ 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-102001 WxS Series 4.0 Enclosure(Φ145x90x55mm, IP67)
❖ PSS-318521 Multi-target High-oprecision Positioning and Speed Measurement Radar

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 Enclosure(Φ145x90x55mm, IP67) , as shown in the figure below
❖ The sensor is externally connected. See the following document PSS-318521 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:

- 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
- 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:

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

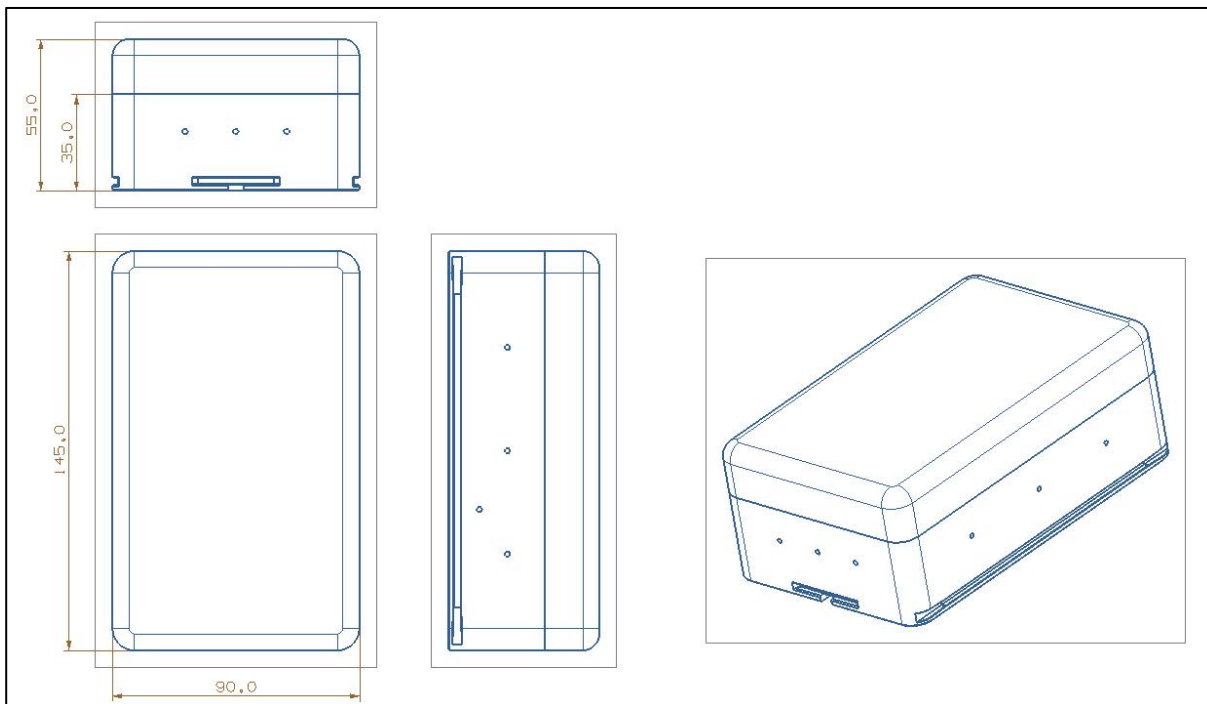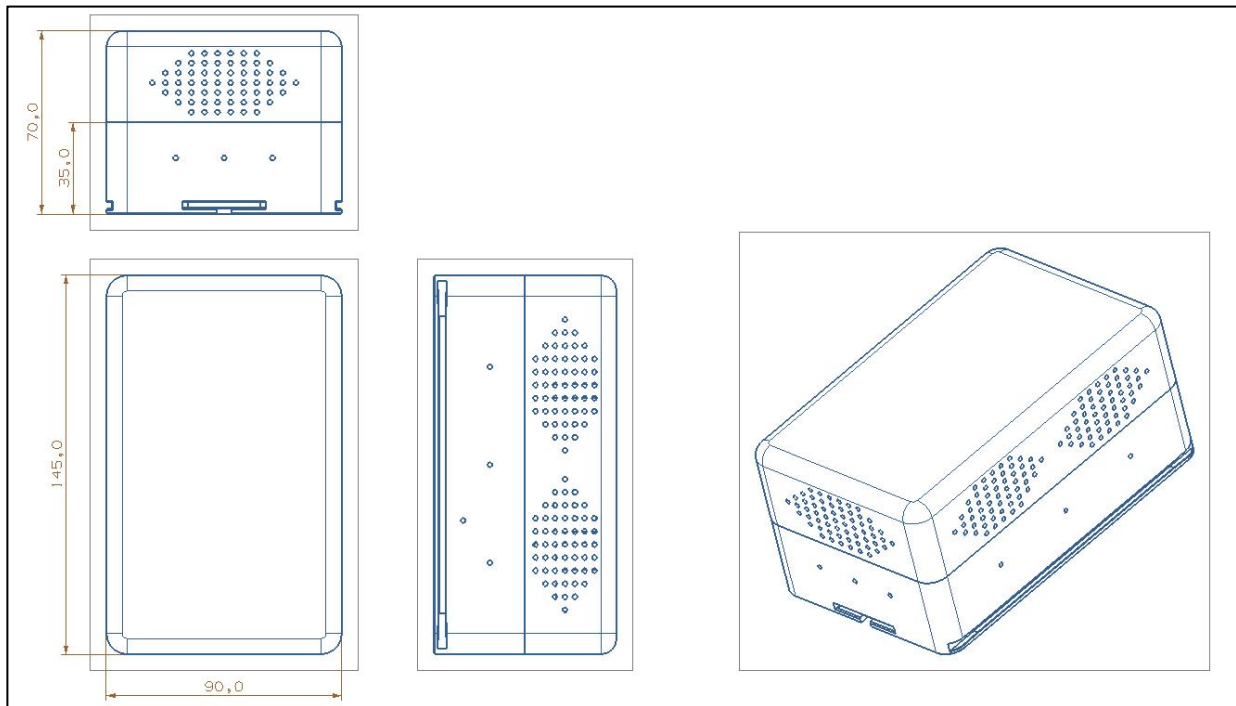| Mechanical	
Dimension	3 Enclosure options with different size WxS Series 4.0 Enclosure(φ145x90x55mm, IP67) WxS Series 4.0 Poromeric Enclosure(φ145x90x59mm) WxS Series 4.0 High Poromeric Enclosure(φ145x90x70mm)
IP rating	IP65 & IP67
Operating Temperature	-40C to +85C
Total Weight	150 g
Electrical	
Supply Voltage	3.6VDC
Power Type	Replaceable 1 ER34615H/M 3.6V Li-SOCI2 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

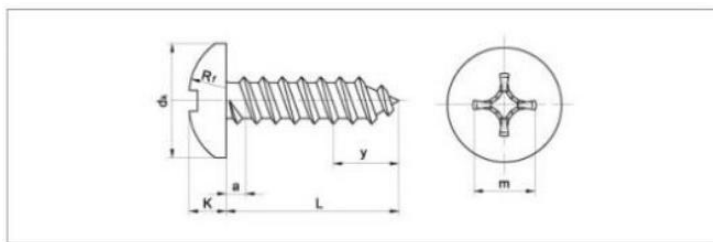❖ Below diagram shows the general installation guide for WxS8800, it can be installed on any flat and solid surface:
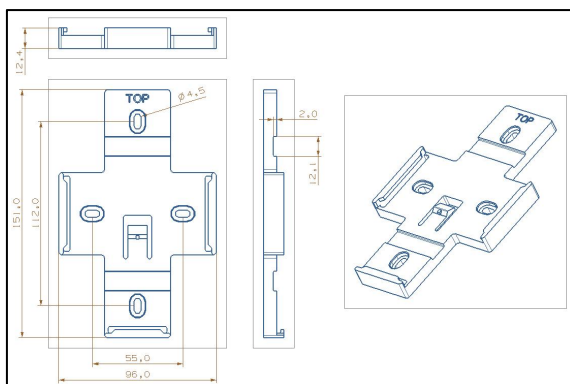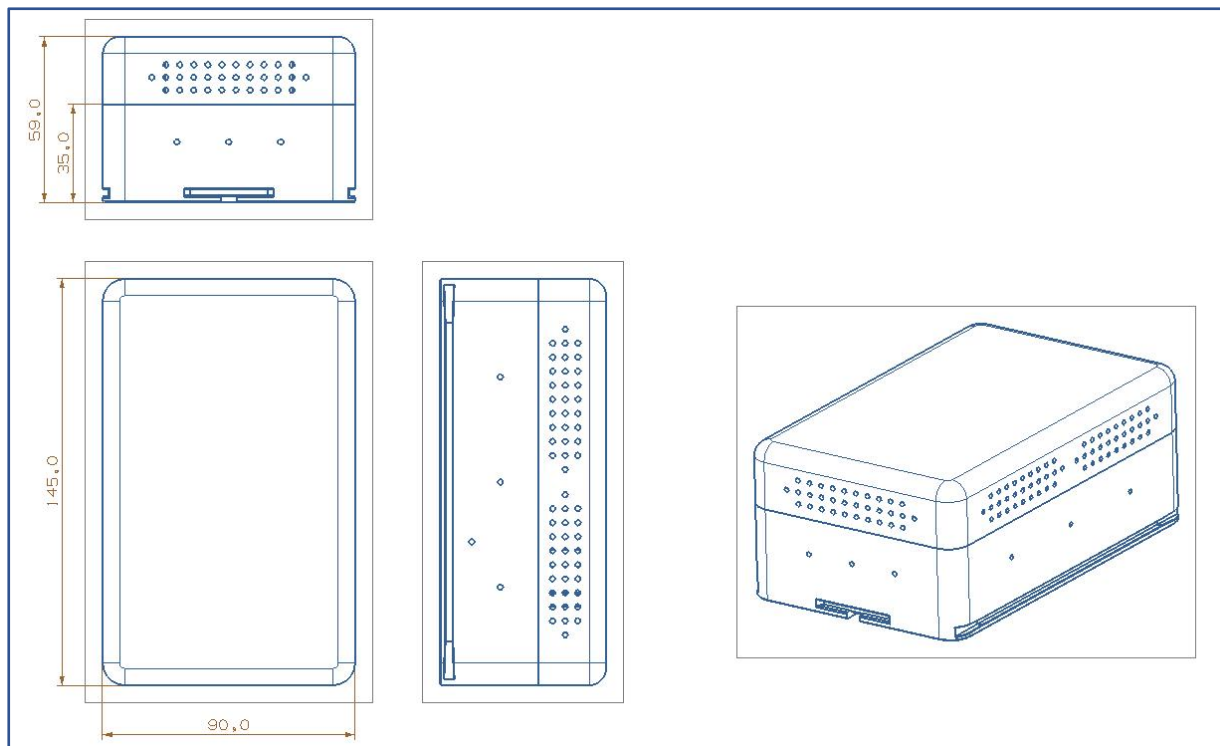
❖ Below is the recommendation of the self-tapping screw and its sizes:

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-318521

Multi-target High-oprecision Positioning and Speed Measurement Radar

Product introduction

PSS-318521The multi-target high-precision positioning and velocity measurement radar adopts the international advanced microwave radar technology, and optimizes the radar system, signal processing and target recognition algorithm. The radar has the ability of multi-target tracking and can monitor 4 lanes at the same time. In the radar radiation area, the speed, distance and lane information of vehicles in each lane can be obtained.

Detection principle

Microwave radar technology: microwave radiates into free space through the transmitting antenna. When electromagnetic waves encounter moving objects, they will scatter on the surface of moving objects. Part of the electromagnetic energy reaches the receiving antenna of the detector through the reflection of the surface of moving objects. The electromagnetic parameters of the reflected waves are detected through signal processing lines to achieve the microwave radar induction function.

Product features

❖ It can monitor the traffic flow information of multiple lanes, and obtain the traffic flow, average speed, lane occupancy, vehicle type distribution of each vehicle and other statistical information
❖ It can adapt to top mounting, side mounting, side top mounting and other installation methods
❖ One button calibration can be realized, error calibration can be carried out during installation, and the operation is simple

Product parameters

Parameters	
Work center frequency	24.15GHz
Antenna beam width	Launch 6 ° × 30 °, receiving 6 ° × 30°
Range resolution	≤1m
Speed range	（5～250）km / h
Velocity resolution	（-4～0）km / h
Reaction time	≤25ms
Interface	
Output signal	Full duplex RS232 or half duplex RS485
Mechanical	
Size	210mm×172mm×50mm
Working temperature	-40℃～+70℃
Working humidity	5％RH～95％RH
Power	
Power	（9～16）VDC

Installation method

The installation height is required to be 6-10 meters, and the width of the beam coverage is related to the position of the beam center, etc
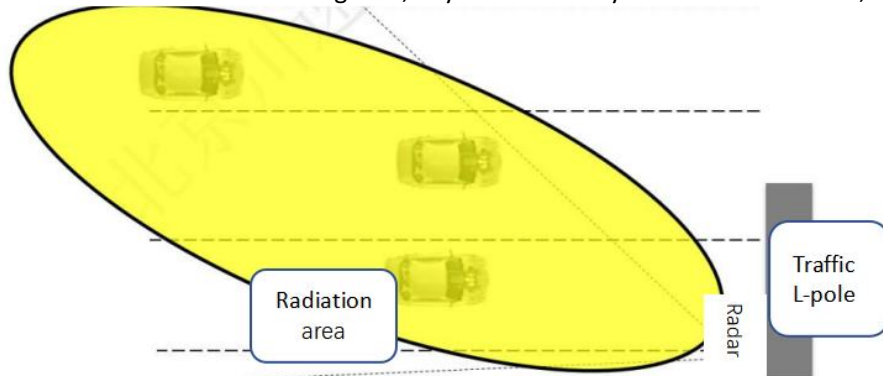
Positive top mounting

Installed in the monitoring lane, right above and in the middle, to adapt to the situation of the gantry
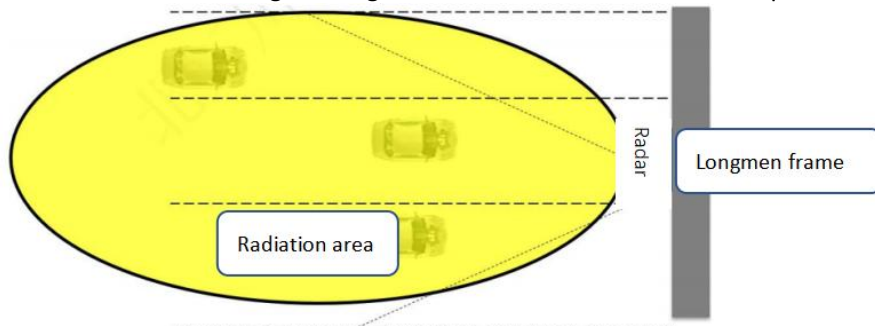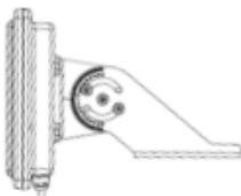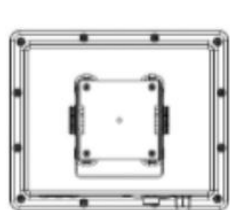

Side top mounting

Installed above the monitoring lane, any distance away from the lane center, suitable for L-pole

Installation diagram

Description of radar installation angle
- ❖ Detection direction: pitch down 2-3 °
- ❖ Direction detection: pitch down 4-5 °
- ❖ Top mounted installation: horizontal angle does not tilt
- ❖ Side top installation:

  - ○ The number of lanes is less than or equal to four lanes, and the horizontal angle is not inclined
  - ○ Five lanes, with a horizontal inclination of 1-2 °
  - ○ Six lanes, with a horizontal inclination of 2-3 °
  - ○ For more than seven lanes, side top mounting is not recommended, and front top mounting is recommended

Application
It is applied to multi lane speed detection.

Ordering Guide
- ❖ PSS-318521 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:

  - ○ WxS7800-318521 WiFi Series Multi-target High-oprecision Positioning and Speed Measurement Radar & RTU Smart Terminal
  - ○ WxS8800-318521 LoRaWAN Series Multi-target High-oprecision Positioning and Speed Measurement Radar & RTU Smart Terminal
  - ○ WxS9800-318521 NB-IoT (China) Series Multi-target High-oprecision Positioning and Speed Measurement Radar & RTU Smart Terminal
  - ○ WxS9900-318521 NB-IoT (Global) Series Multi-target High-oprecision Positioning and Speed Measurement Radar & RTU Smart Terminal
  - ○ WxSC800-318521 LTE Cat1 Series Multi-target High-oprecision Positioning and Speed Measurement Radar & RTU Smart Terminal
  - ○ WxSC900-318521 LTE Cat1 w/GPS Series Multi-target High-oprecision Positioning and Speed Measurement Radar & RTU Smart Terminal
  - ○ WxSD800-318521 LTE Cat4 Series Multi-target High-oprecision Positioning and Speed Measurement Radar & RTU Smart Terminal