

## **WxS Ext-051**

Rainfall sensor

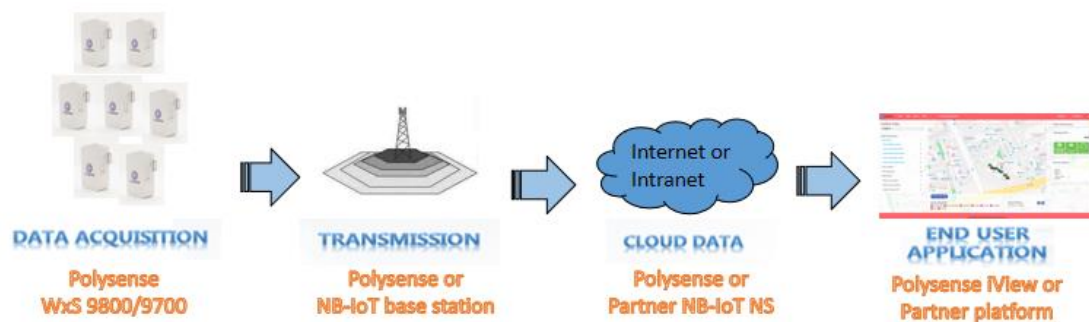
### **Product Highlights**

- ✓ Rainfall sensor
- ✓ High quality ABS material
- ✓ Diameter of rain bearing:  $\phi$  200mm
- ✓ Measurement accuracy: 0.2mm
- ✓ Permissible current: 20mA
- ✓ Working environment temperature: -40 °C ~ 70 °C
- ✓ Built-in level, double reed tube
- ✓ Small size, easy to install; High precision and good stability
- ✓ Good linearity, long transmission distance and strong anti-interference ability
- ✓ A mesh is designed at the funnel to prevent debris, such as leaves, from blocking rainfall
- ✓ Anti - insect, anti - sand, anti - blocking water, can be corresponding to all kinds of bad weather
- ✓ Strong corrosion resistance, long service life, can adapt to a variety of environments
- ✓ ABS economic benefits, cost-effective
- ✓ Edge calculation and cloud data processing and analysis
- ✓ Deployed in a cellular topology, Support service providers, the municipal governments and the enterprises to deploy public and private IOT networks
- ✓ The sensitivity of NB-IoT module is 129 dBm $\pm$ 1 dB, excellent penetration, the network coverage is 20dB stronger than GSM, LTE and other networks.
- ✓ Support the communication protocol frequency band published by the international organization agreement 3GPP.
- ✓ Support two kinds of configuration for data transmission. Single-tone transmission, 15kHz/3.75kHz Subcarrier interval: 25.2kbps(Downlink) , 15.625kbps(Uplink); Multi-tone transmission, 15kHz Subcarrier interval: 25.2kbps(Downlink), 54kbps(Uplink)
- ✓ Switch freely between Active/Idle/PSM modes, and ensure that the un-received data is retransmitted.

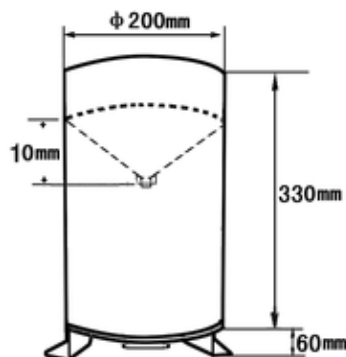


- ✓ Support IPv4/IPv6/UDP/CoAP/LwM2M/Non-IP/DTLS/TCP/MQTT protocol stack.
- ✓ Intelligent terminal provides multi-function interface (MPI), it can be connected with external analog and digital quantity sensors. (RS232/RS485 interface is optional.)
- ✓ Integrated internal antenna or optional external SMA/IPEX antenna.
- ✓ OTA (Over The Air) firmware upgrade, including to upgrade loader and application images
- ✓ Support wide voltage 5~12V DC input, 5 – 10 years of battery operational life with 2 x AA Li-SOCI2 Battery.
- ✓ IP67 enclosure rating.

## Application Architecture



## Specifications



Parameter	Value
<b>Sensor</b>	
Texture	High quality ABS



## Polysense Technologies

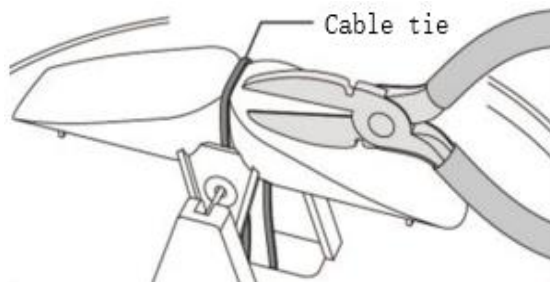
Bearing the rain diameter	Φ 200mm	
Measurement accuracy	0.2mm	
Current license	20mA	
Output signal	Double reed tube on and off (built-in filter circuit, level meter)	
Working environment temperature	-40℃～70℃	
Storage temperature range	-40℃~70℃	
Operating Mode	Active	The terminal is active, all functions are available and data can be sent and received. In this mode, the terminal can switch to Idle mode or PSM mode.
	Idle	The terminal is in the state of light sleep and the network is connected. Paging messages are accepted and the terminal can switch to Active mode or PSM mode in this mode.
	PSM	Only the RTC is working, the network is disconnected, and paging messages are not acceptable. When DTE (Data Terminal Equipment) actively sends Data or the timer T3412 (associated with periodic updates) times out, the terminal is awakened.
MPI	Analog input 0 - 3/5/10V;4-20mA;Digital interface:RS232/RS485/UART	
Upgrade	The serial port or DFOTA	
Data report	For any of the above sensor types, support for cross-threshold data reporting and periodic data reporting every 2 hours (both threshold and periodic reporting cycles can be configured by the user)	
Wireless		
Sensitivity	- 129dBm±1dB	
Frequency band	B1 @H-FDD: 2100MHz B3 @H-FDD: 1800MHz B8 @H-FDD: 900MHz B5 @H-FDD: 850MHz B20 @H-FDD: 800MHz B28 @H-FDD: 700MHz	
Protocol	IPv4 / IPv6 IP/UDP/CoAP/LwM2M/Non-IP/ DTLS/TCP/MQTT	
Distance	NLOS (Non-line-of-sight) 2km;	
Antenna	Integrated internal antenna or external IPEX antenna (SMA)	
Mechanical		
Dimension	114mm x 80mm x38mm The overall height increases with the increase of sensors.	
Shell IP rating	IP67	
Operating Temperature	-40℃ to +85℃	

Storage Temperature	-40℃ to +90℃
Total Weight	150g
<b>Electrical</b>	
Supply Voltage	Low power consumption, 3.1V~3.66V; 1or2 Li-SOCl <sub>2</sub> Battery; 5VDC optional.

## Installation Guide

The figure below shows the installation mode and installation precautions of the rainfall sensor:

Install on the ground

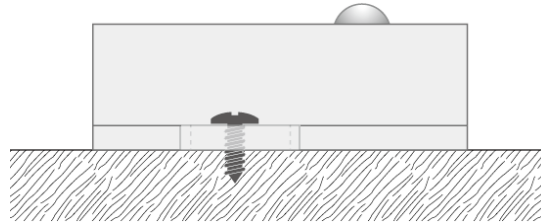
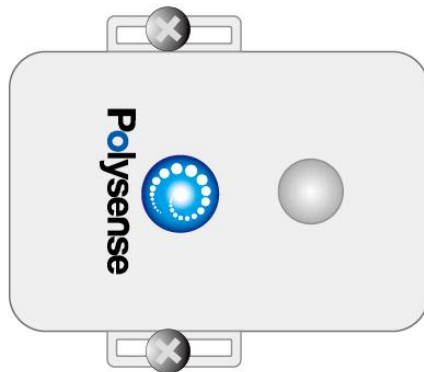


Rack mounting

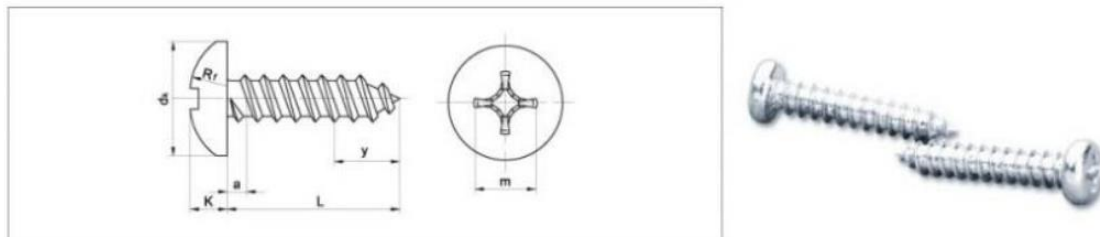


Installation note: during the initial installation, cut off the binding wire and tape tied to the tilting bucket to make it swing freely before use.

Below diagram shows the general installation guide for WxS9800, it can be installed on any flat and solid surface, the lid is contacted with the surface and fixed via 2 self-tapping screws:



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						

## The Sample Application

### ● Weather station

Monitoring stations are set up in a relatively uniform area to monitor rainfall in real time, and the rainfall data measured by rain gauges are transmitted through the network to the servers of the meteorological bureau. Setting rainfall standards by rainfall:

- [light rain] : 24h rainfall is less than 10mm;
- [moderate rain]: 10-25mm of rainfall in 24h;
- [heavy rain] : 24h rainfall of 25~50mm;
- [rainstorm] : rainfall of 50~100mm within 24 hours;
- [heavy rain] : 24h rainfall of 100~250mm;
- [heavy rain] : rainfall of more than 250mm in 24h.





## ● Hydrometric station

Remote measurement of precipitation, precipitation intensity and precipitation starting and ending time in rivers, lakes and other places; Rain sensor with water level detection, when the rainfall is rising, the edge, it can be independently adjust the water level of sampling period, a warning from the usual time sampling period of 3 ~ 6 hours, 30 minutes to 1 hour, and even 10 minutes per time, automatically generate rainfall records, reservoir for flood control, water supply dispatching, power stations and other hydrological telemetry data.



## ● Agriculture and forestry

The use of rainfall sensors in agriculture and forestry combined with the collected information of temperature, humidity, light, and other sensors, users can timely grasp the growth situation according to the rainfall preferences of crops, and take emergency preventive measures according to the limited factors for rapid response.





# Polysense Technologies

## About Polysense

Polysense Technologies Inc., Located in Santa Clara, California, with offices in St. Paul, Brazil, Beijing, Luo Yang ,Shanghai and Guangzhou, China, develops Universal Sensing and communicating Solutions with Distributed Data Analytic for IoT.

Polysense focuses on fiber and wireless IoT products, solutions, and engineering services for service providers, enterprises, government agencies, and consumers, including 3G/4G LTE based WxS 6x00, Wi-Fi/BLE based WxS 7x00, LoRa based WxS 8x00, and NB-IoT/eMTC based WxS 9x00, enabling a rich array of applications such as Smart City, Industrial Internet of Things, Smart Retail and SMB, Precision Agriculture, Water Treatment, Environmental Protection, Energy and Power. Polysense currently supports over 100 sensing parameter, iEdge edge computing turnkey software,iView data visualization cloud PaaS platform, and iServer scalable Network Server, with a goal to offer the industry's broadest portfolio of sensors over 140 sensing parameters, including temperature, humidity, light, pressure, acoustic, accelerometer, tilt, vibration, displacement, environmental and industrial gases, water quality, PIR/IR motion, ultrasonic, soil sensors, thermal imaging, and 18 types gases with flammable, explosive, poisonous, or bad odor attributes.

## Contact Polysense

### Silicon Valley Office

Address : 3000 Scott Blvd, Suite 108  
Santa Clara, CA 95054  
Telephone : +1 408 980 9466  
Mailbox : info@polysense.net



### Sao Paulo, Brazil Office

Address : Rua Bela Cintra 746 3rd Floor  
01415-002 Sao Paulo Brazil  
Telephone : + 54 9113644-385  
Mailbox : Latam\_Rep@Polysense.net  
mauricioj@artimar.com.br

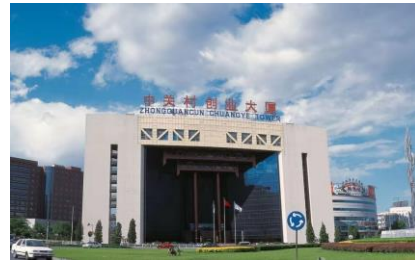




## Polysense Technologies

### Beijing Office

Address : 26 Shangdi Xinxu Road. Room 0820  
Haidian Dist. Beijing China 100085  
Telephone : +8610 6060 7008  
Mailbox : info@polysense.net



### Shanghai Office

Address : 88 Shengrong Road, Building 1,  
Room 416, Pudong Dist, Shanghai,  
China 200120  
Mailbox : info@polysense.net



### Guangzhou Office

Address : No. 100, keyun north road, tianhe  
district, Guangzhou ChuangJin  
entrepreneurial industrial park h7-101  
Mailbox : info@polysense.net



### Luoyang Office

Address : 2 Chongqing Road, 6/F CITIC Marketing  
Building, Jianxi Dist. Luoyang, Henan  
Province, China 471039  
Telephone : +86379 6222 0518  
Mailbox : info@polysense.net

