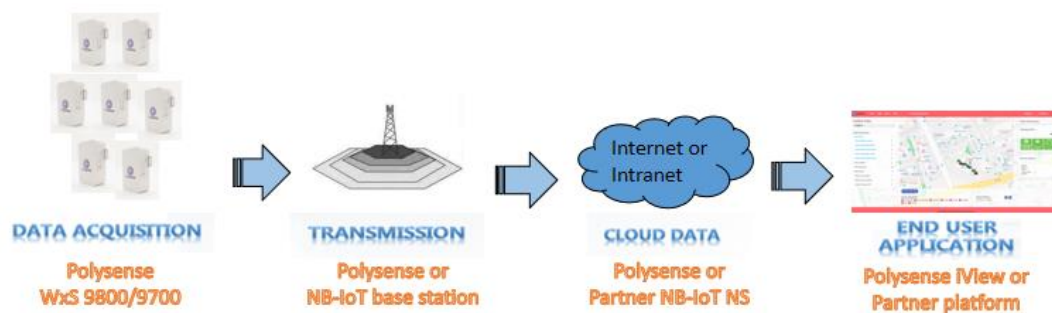# Polysense Technologies

WxS Ext-048

External UV sensor

Product Highlights

- ✓ External ultraviolet sensor

- ✓ Small size, 11 mm * 27 mm

- ✓ Low power consumption, power supply voltage 2.5v ~5V, working current is microampere level

- ✓ Good linearity and high sensitivity

- ✓ The detection wavelength of UV was 200nm~370nm

- ✓ Big Angle, 130 degrees

- ✓ Schottky type of photodiode, suitable for photoelectric mode

- ✓ 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±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.
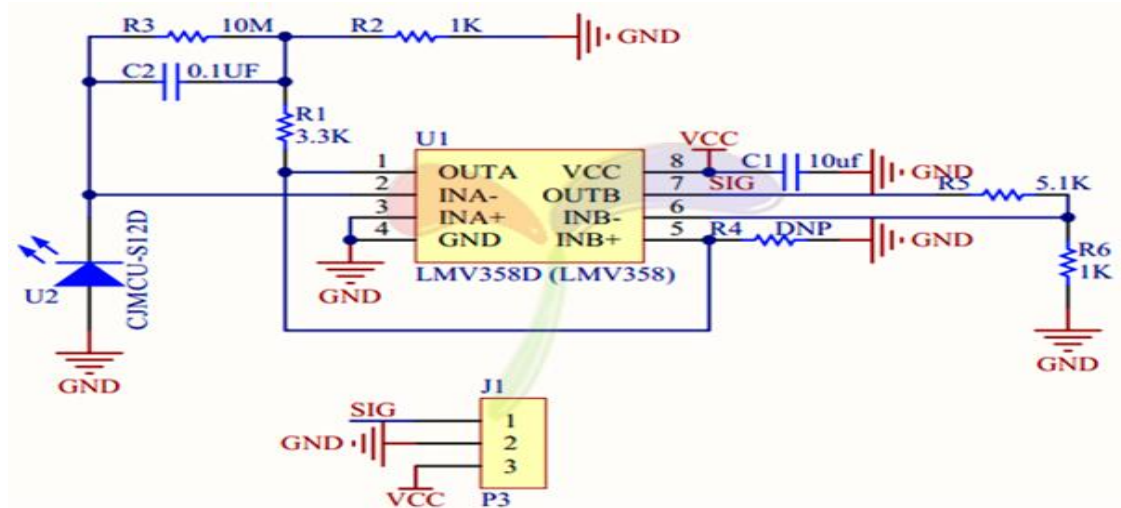
Application Architecture

Specifications

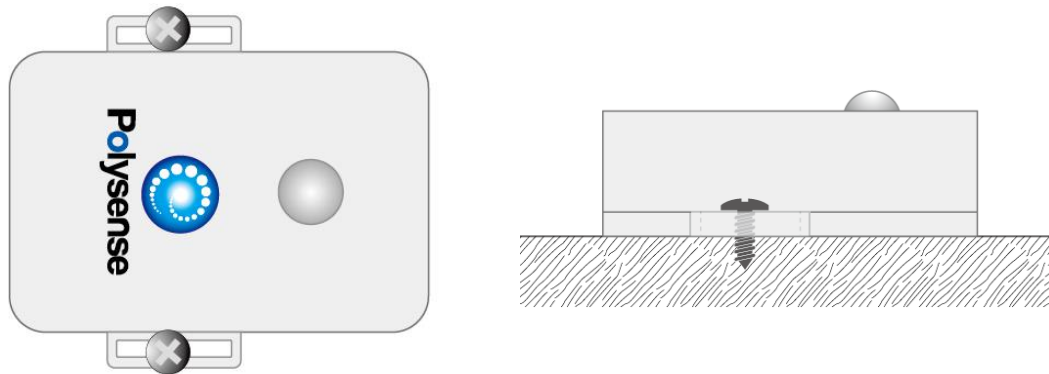| Parameter	Value	
Sensor		
product size	11mm*27mm	
service voltage	2.5V~5V	
working current	Microamps level	
Small temperature drift	0.08%/℃	
Wide detection range	200nm~370nm	
wide-angle	130℃	
Operating Mode	Active	The terminal is active, all functions are available and data can be sent and received. In this mode, the terminal can switch to

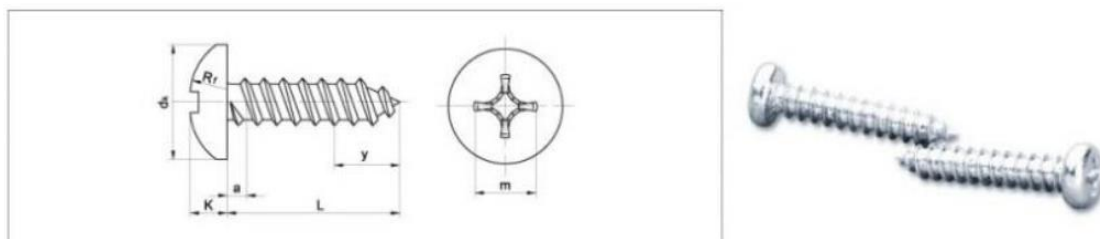|		Idle mode or PSM mode.
	Idle	The terminal is in the state of light sleep and the network is connected. Paging messages are accepted and the terminal can switch to Active mode or PSM mode in this mode.
	PSM	Only the RTC is working, the network is disconnected, and paging messages are not acceptable. 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
Electrical		
Supply Voltage		Low power consumption, 3.1V~3.66V; 1or2 Li-SOCI2 Battery; 5VDC optional.

Circuit diagram description

Installation Guide

The following figure shows the general installation guide for the WxS9800, which can be mounted on any flat and solid surface, with the cover in contact with the surface and fixed by two 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						

UV hazards

UV damage to human body:

Specifically, in the wavelength range of 280nm~3000nm of solar radiation reaching the ground, ultraviolet radiation (UVR) accounts for 6%, which is divided into near-ultraviolet (UVA), far-ultraviolet (UVB) and ultra-short ultraviolet (UVC).

Ultraviolet name	class code	Wavelength region (nm)	Effects on the skin
near ultraviolet	UV-A	400~315	Produce melanin brown spot, make the skin ages, dry and increase wrinkle, still can cause skin cancer
far ultraviolet	UV-B	315~280	Produce erythema and pigmentation, can also lead to skin rashes, burns; Regular exposure to radiation is a risk factor for cancer
Ultrashort ultraviolet	UV-C	280~100	Strong penetration, close to X and Y rays, human impact, can affect white blood cells and cancer. But most of it is absorbed by the ozone layer, carbon dioxide or clouds in the atmosphere, and only a small amount reaches the ground.

Environmental hazards of UV radiation:

1. Enhanced UV radiation will reduce the productivity of Marine plankton, while the decrease of certain important floating organisms will seriously affect the complex food chains and the total production of food in aquatic ecosystems;

2. The abundance of seagrass decreased and redistributed in deep water;

3. Cause a large number of deaths of Marine plankton, shrimp, crab larvae and

shellfish, and even the extinction of certain organisms.

The Sample Application

● **ultraviolet curing**

Curing of paints, inks and adhesives.

● **Disinfect with disinfectant water**

Filtered by an ultraviolet sensor different wavelengths of ultraviolet light disinfect the

water.

● **Currency identification**

Fluorescent imprinting and matte reaction of banknotes were detected by

fluorescent or ultraviolet sensors.

● **Medical ultraviolet light therapy**

The irradiation in the ultraviolet band can cause the photochemical and

photoelectric reactions of the human body, so that the skin produces a variety of

active substances, which are currently used to regulate the higher nervous function,

improve sleep, reduce blood pressure and other aspects.

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.

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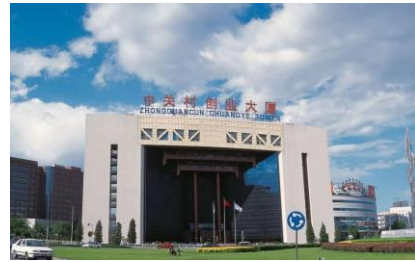   mauricioj@artimar.com.br

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