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Industrial IOT

USR-DR124 2.4GHZ LoRa

USR-DR124 Product Introduction

USR-DR124 is a new - generation 2.4G frequency band LoRa DTU developed based on the Sx128x chip. It has a lipstick - sized, rail - mounted design, is powered by DC, and boasts an ultra - small size, high stability, and strong anti - interference capability. This product adheres to industrial - grade standards, supports a wide temperature and voltage range, and is equipped with the function of converting RS485 serial ports to 2.4G LoRa wireless communication. It also features built - in mechanisms such as dual hardware and software watchdogs and fault self - recovery. It can adapt to different industry scenarios and still operate stably and reliably in harsh and severe environments. The product comes with a rail - mounted installation method and allows parameter configuration via upper computer software, making it convenient for users to install and use. It is widely used in fields such as smart factories, smart meter reading, valve control, energy monitoring, environmental protection monitoring, smart agriculture, smart fire protection, and smart cities.

Product Features

Hardware reliability

- Ultra-small size, made of V0 grade flame-retardant material and PC+ABS;
- Operating temperature range: -40℃ to 85℃, suitable for a wide range of environments;
- Wide voltage design with DC 8-24V input and power reverse protection;
- Built-in hardware watchdog for 24-hour stable operation without downtime;
- Rail-mounted, easy to install and wire, with small space occupation;

Powerful

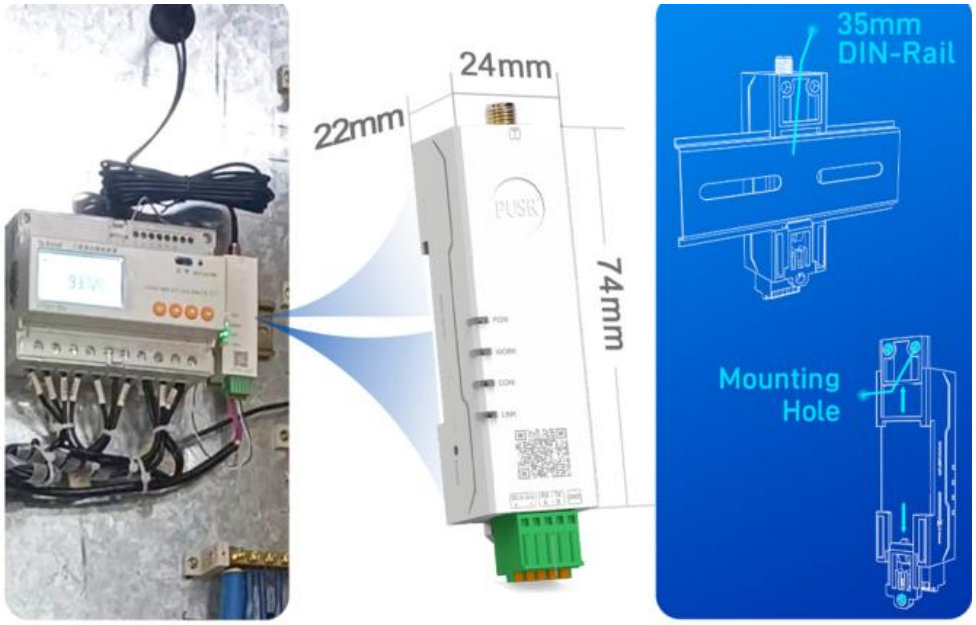
- Transparent transmission for broadcasting, fixed-point, and master-slave transmission, applicable to various transmission scenarios;
- Relay networking, enabling multi - device relay transmission for ultra - long - distance wireless data transmission;
- FLRC/LoRa modulation, supporting high - speed, low - speed, and medium - to - long - distance transmission;
- High - power transmission, with 12/27dBm optional, and a maximum range of up to 5 - 8 kilometers;
- 2.4GHz unlicensed frequency band, supporting the frequency range of 2.4GHz - 2.5GHz;
- Modbus transparent transmission, featuring transparent communication and simple operation;

Stable data transmission

- Remote parameter configuration: supports wireless configuration of remote devices via upper computer or commands, facilitating operation and maintenance;
- Additional data transmission: data transmission can carry and add node ID and signal data;
- LBT anti-interference: reduces interference and packet loss, improving communication success rate;
- Signal light indication: signal quality can be observed at any time, facilitating network deployment and maintenance;
- Data Retransmission: uses an acknowledgment mechanism to determine whether data transmission is successful, and retransmits if unsuccessful;
- Restart when there is no data timeout, improving wireless network reliability;

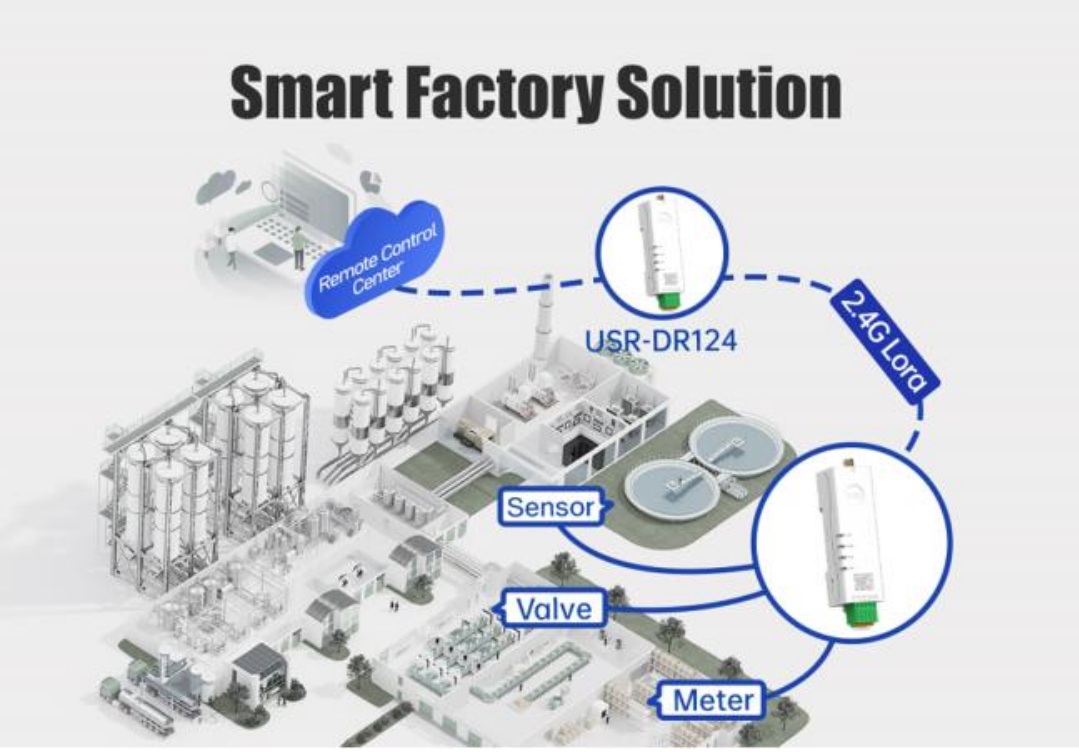
Product details

The shell is made of V0 grade flame-retardant material, specifically PC+ABS.



Application scenarios

Application schematic diagram



Widely used in wireless network networking, long-distance wireless data collection, control, and operation and maintenance scenarios, such as: smart meter reading, valve control, smart factory, energy monitoring, environmental protection monitoring, smart agriculture, smart fire protection, smart city, etc.

Hardware specifications

Category	Specification Parameters	Parameter Range
Wireless Parameters	Wireless Solution	Sx128x
	Modulation Mode	LoRa/FLRC
	Operating Frequency Band	2.4GHz-2.5GHz
	Transmission Power	USR-DR124-27：27±1dBm USR-DR124-12：12±1dBm
	Receiver Sensitivity	-140dBm @0.268Kbps
	Operating Mode	Point-to-point, point-to-multipoint transmission
	Transmission Distance	Sunny, open environment, antenna gain 3dBi, height > 2m 27dBm maximum distance: 8000m @rate 1 12dBm maximum distance: 5000m @rate 1
Hardware Parameters	Serial Port	RS485：1200bps - 921600bps
	Operating Voltage	8V ~ 24V ，12V recommended
	Operating Current	Transmitting current: 45mA @12V; Receiving current: 11mA @12V
	Weight	34g
	Operating Temperature	-40℃ ~ +85℃
	Operating Humidity	10~90%RH(no condensation)
	Antenna Option	SMA antenna connector (external thread, internal hole) with rod antenna
	Watchdog	Built-in hardware watchdog

Hardware Interface

Name	Function Description	Remarks
Antenna Interface	SMA antenna connector (external thread, internal hole)	
Reload	Factory reset button	When the LoRa data transmission terminal is in normal working state (Work light flashes normally), press and hold for 3-15 seconds or more, then release. You can observe the TXD light flash once, which means the setting parameters of the LoRa data transmission terminal are restored to the factory configuration.
Power Interface	Terminal power supply	
RS485	RS485： A (+) \ B (-) \ G (GND)	Connect to 485 serial port devices, A connects to A, B connects to B

Status Indicator

Name	Function Description	instruction
POWER	Power indicator	Illuminates steadily when the power input is correct.
WORK	Working indicator	Blinks with a 2-second cycle during normal operation; stays on after network access.
COM	Serial data indicator	Red and green lights blink alternately when there is serial data communication (red for TX, green for RX) during data transmission.
LINK	Signal quality indicator	Indicator for LORA and FLRC signals: Red: For LORA modulation mode, blinks according to signal quality (judged by SNR and RSSI values) in three states: Steady on for excellent signal; blinks every 1 second for good signal; blinks every 3 seconds for poor signal. Green: For FLRC modulation mode, blinks according to signal quality (judged by SNR and RSSI values) in three states: Steady on for excellent signal; blinks every 1 second for good signal; blinks every 3 seconds for poor signal.

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