

LS-R324 Industrial Wireless Data Terminal Unit



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1. General Introduction

LS-R324 wireless DTU whose transmission distance reaches 3km LOS, supports wireless communication between Siemens S7-200, S7-300 series PLC, Schneider PLC, Mitsubishi PLC, ABB PLC etc. LS-R324 supports Modbus protocol, including Modbus ASCII and Modbus RTU protocol, PPI protocol.

LS-R324 DTU can also connect with VFD, HMI, PC for wireless communication. It supports point to point, point to multi-points wireless data transmission. Wireless solution has the advantage of keep users from wiring cables in dangerous field, easy to set up, no need program knowledge. It is a reliable and competitive solution.

2. Application Field

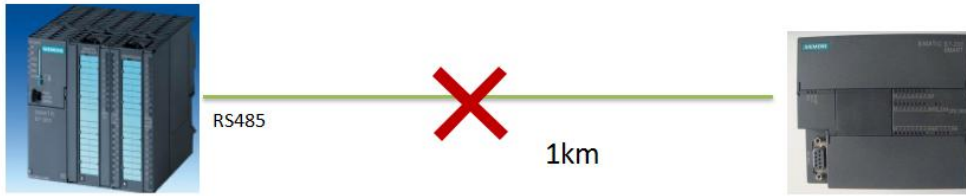
- * Pressure, flow rate, temperature etc data collections, wireless transmission and control in water/waste water treatment field
- * Wind speed, rainfall, humidity etc data collection, wireless transmission and control at whether monitoring station
- * Temperature, humidity, concentrations of CO2 etc data collection, wireless transmission and control in agriculture greenhouse
- * AGV wireless monitoring and control
- * Other kinds of OEM equipment wireless data collection and transmission
- * Wireless communication between PLC and sensors on Chemical machinery and equipment, oil field.

3. Technical specification

| | |
|-------------------------|--|
| Frequency | 433MHz or 450MHz, 470MHz |
| Power Output | 1W(3000m LOS) |
| Protocol support | Standard Modbus RTU protocol or user-defined protocol |
| Power supply | 9-36V DC usually use 24V DC or 12V DC |
| Interface | RS-485(default) or RS232 or USB |
| Channel No. | 15 channel, use DIP to change |
| Antenna | Free sucker antenna with 1.5m cable(buy 5.5dBi sucker antenna) |
| Temperature | -35°C~+75°C (industrial) |
| Dimension | 175×115×32(mm) exclude antenna |
| Fix method | Screw |

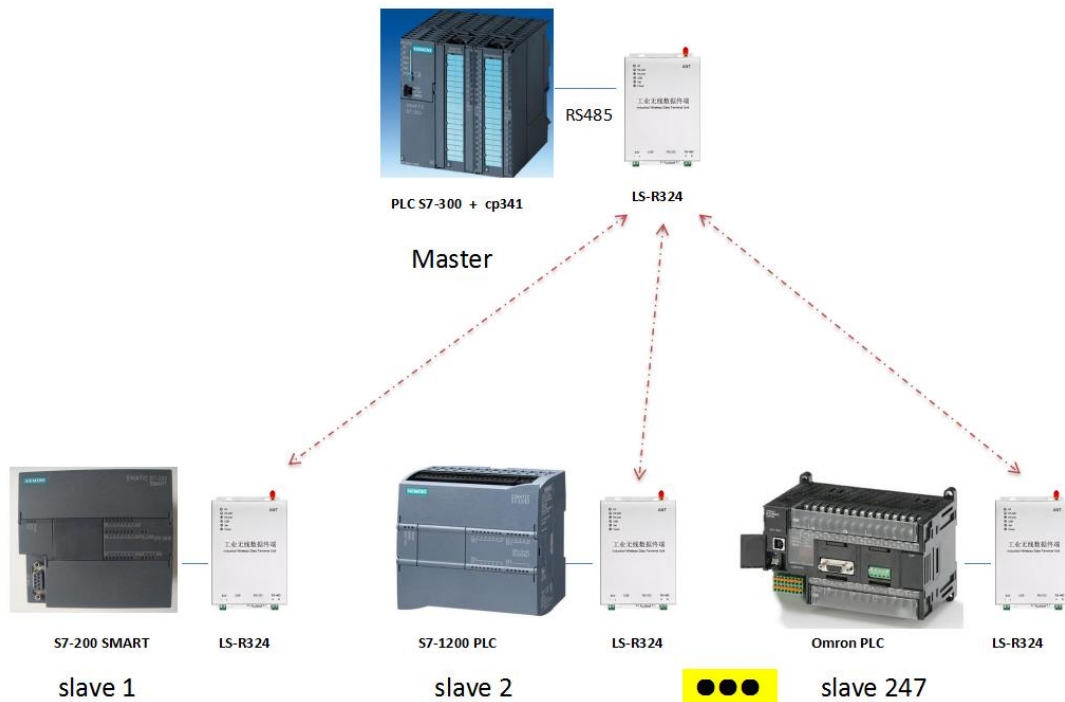
4. LS-R324 Application examples:

4.1

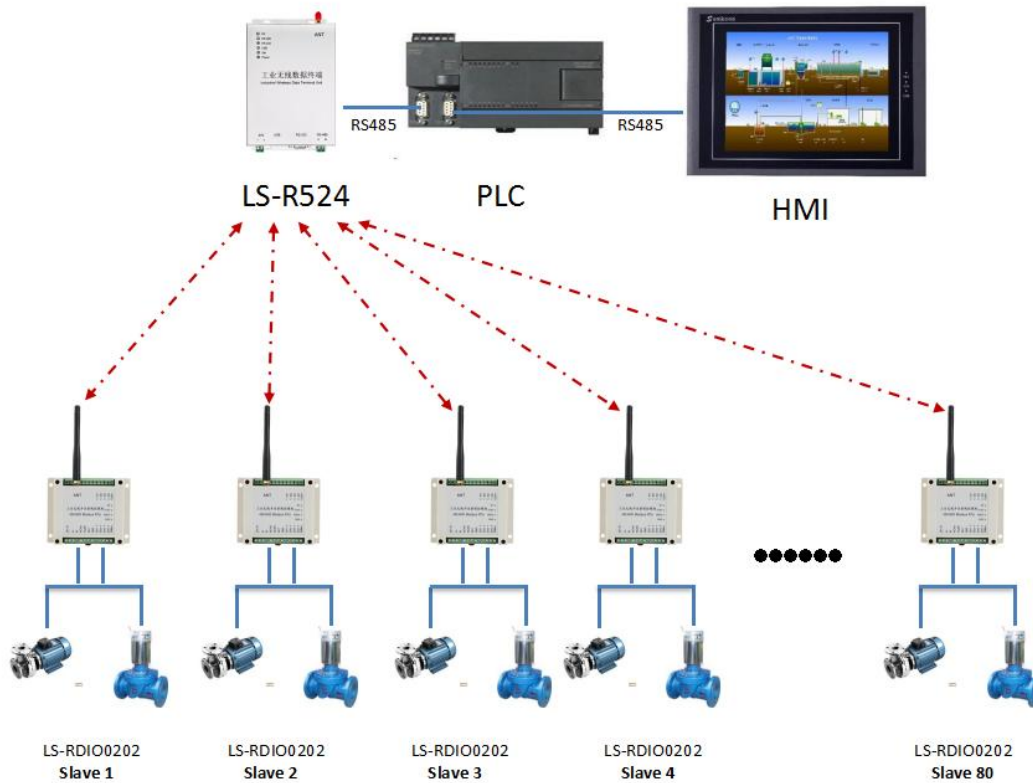


4.2

PLC wireless control system



4.3

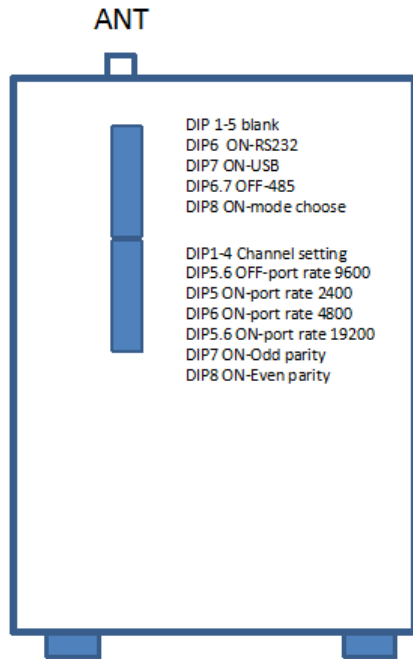


5. LS-R324 DTU networking









LS-R324 DTU adopts half-duplex communication mode. It suits point to multipoints communication. In this way, we should set 1 module as master and others as slaves. Each slave has its own unique ID. Master uses data frame with ID to transmit data or command. All slaves will receive data and compare the received ID with its own ID. If ID is the same, receive it and give corresponding response according the command . If ID is different, just ignore it, give no response. All these should finish by upper protocol. It can promise there is only one radio is in transmitting mode in any time to avoid interference.

LS-R324 RTU can also use for point to point communication. This is more easier. When you program serial port, please note it is half-duplex and there is wireless transmission delay.

6. LS-R324 DTU DIP switch setting



Note: about channel setting

| Channel No. | DIP Setting | Channel No. | DIP Setting | Channel No. | DIP setting | Channel No. | DIP setting |
|-------------|---|-------------|---|-------------|---|-------------|---|
| 1 |  1234 | 2 |  1234 | 3 |  1234 | 4 |  1234 |
| 5 |  1234 | 6 |  1234 | 7 |  1234 | 8 |  1234 |

DIP1 ON means 1

DIP2 ON means 2

DIP3 ON means 4

DIP4 ON means 8

For example, channel 15, you need to set DIP 1, 2, 3 and 4 all ON

7. About the LED indicator

- When module is power on, POWER LED is always ON (red).
- When module enter to set mode (DIP 8 ON), SET LED is always ON (red).
- When module is transmitting,
 - if you use RS232 port, RS232 LED blinks (green) regularly.
 - if you use RS485 port, RS485 LED blinks (green) regularly.

if you use USB port, USB LED blinks (green) regularly.

d. When module is receiving, RF LED blinks (blue) regularly.

8. LS-R324 DTU Notice in real application

8.1 LS-R324 DTU wireless delay time.

Due to LS-R324 adopts FEC (Forward Error Correction) etc technology to process your data before transmitting, there is a delay time between RxD of a LS-R324 transceiver ‘A’ receives your data, transmits it and the other transceiver ‘B’ receive and transmit by its TxD. Different RF baud rate causes different delay time. Please see the specific delay time below:

| RF Date Rate (bps) | Delay Ts(mS) | RF Date Rate (bps) | Delay Ts(mS) |
|--------------------|--------------|--------------------|--------------|
| 1200 | 90 | 9600 | 18 |
| 2400 | 48 | 19200 | 6 |
| 4800 | 24 | | |

8.2 LS-R324 DTU error correction method

To promise your system to be more stable and reliable, we suggest you add check or CRC to re-transmit data if there is error.

8.3 LS-R324 DTU’s transmission method for big data package

In theory, LS-R324 can transmit not limit data package, but we don’t suggest you to transmit too big data package. We suggest each package less than 120B, better 60-100B. Also we suggest your program use ARQ to resend the package with error.

For example, we suppose the real communication BER is 10^{-4} , and user needs to send a 1KB file(10000bit), if you transmit via 1 package, in theory, there will be 1bit error in every receiving time, So this 1KB file can not transmit correctly all the time.

If you can divide the 1KB files into 10 package, each package transmit 100B, in theory, there might be error after you send 10 packages. Module will re-send that package via ARQ. Though, we send 1 more package and the whole efficiency reduce, but this can promise all data can be received correctly.