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 transducer, HMI and sensors 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 CO_2 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、400MHz, 450MHz, 470MHz
Power Output	1W(3000m)
Protocol support	Standard Modbus 、PPI
Power supply	9-36V DC usually use 24V DC or 12V DC
Interface	RS-485(default）or RS232 or USB
Channel No.	8 channel, use DIP to change
Antenna	Free sucker antenna with 1.5m cable(buy 5.5dBi sucker antenna)
Temperature	-35℃~+75℃ (industrial)
Dimension	175×115×32(mm) exclude antenna
Fix method	Screw

4. LS-R324 Application examples:

4.1
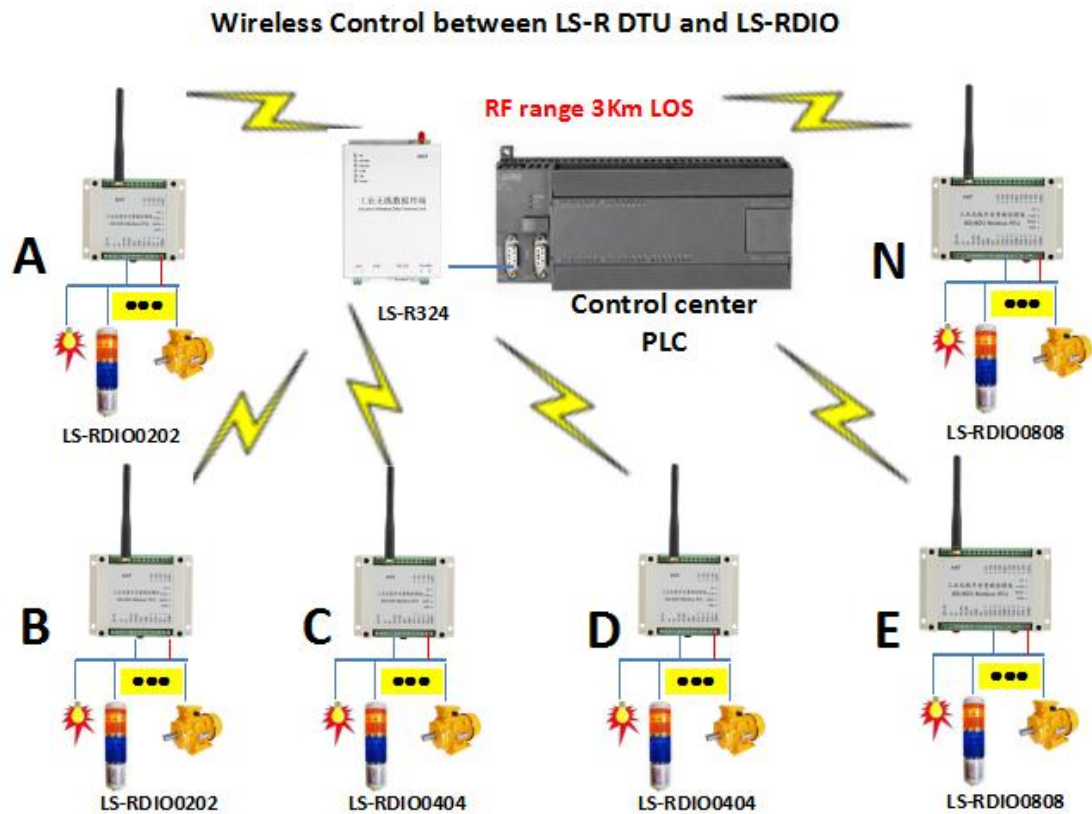

LS-R324 DTU point to point control

2km LOS

A   B

rs485   rs485

LS-R324   PLC   LS-R324   PLC
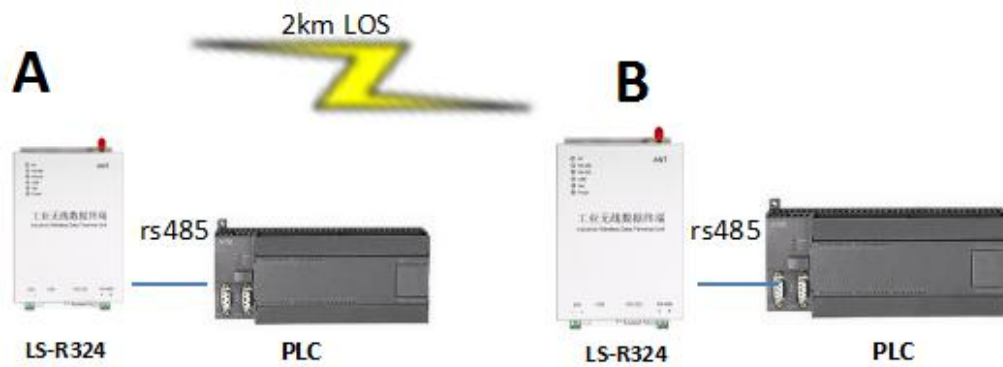
Support Modbus DTU, PPI protocol

4.2

LS-R324 DTU Modbus 1 master to 2 slaves control

RF range 2km LOS

A   B

LS-R324   LS-R324

C
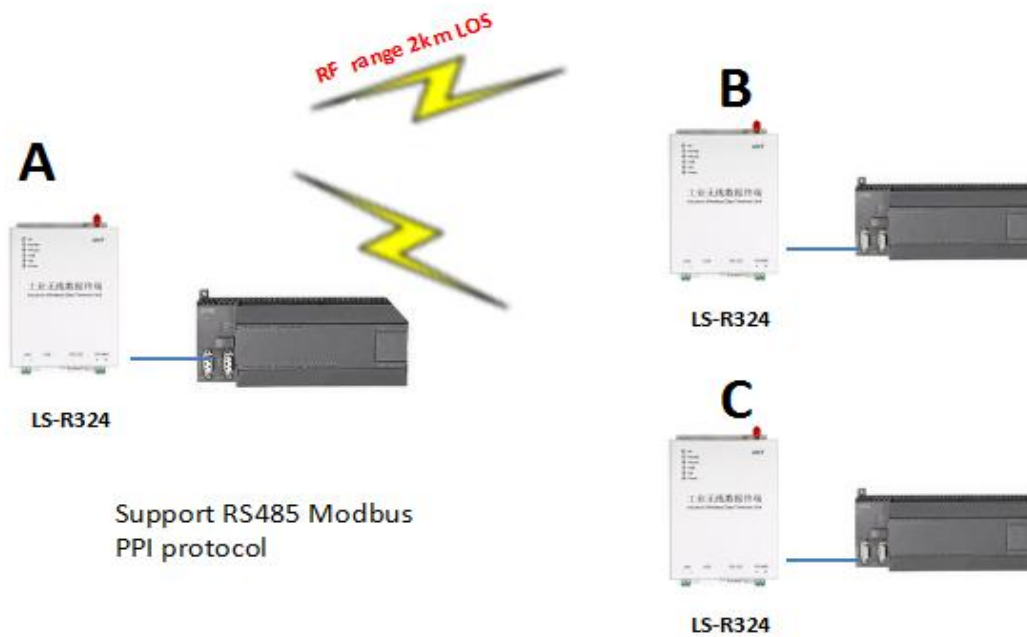
LS-R324

Support RS485 Modbus
PPI protocol

4.3

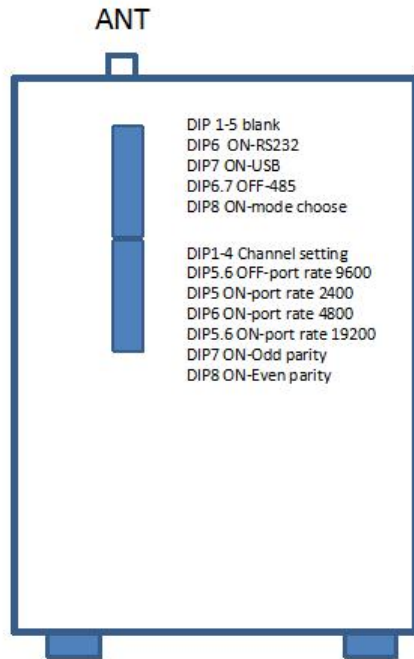Wireless Control between LS-R DTU and LS-RDIO

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

ANT

DIP 1-5 blank
DIP6 ON-RS232
DIP7 ON-USB
DIP6.7 OFF-485
DIP8 ON-mode choose

DIP1-4 Channel setting
DIP5.6 OFF-port rate 9600
DIP5 ON-port rate 2400
DIP6 ON-port rate 4800
DIP5.6 ON-port rate 19200
DIP7 ON-Odd parity
DIP8 ON-Even parity

6. LS-R324 DTU Notice in real application

6.1 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	12
2400	48	19200	6
4800	24		

6.2 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.

6.3 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.