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What is RS232 protocol? | Explained

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In telecommunication, RS 232 kept a great value and was mostly used for the great quality for transmitting data in serial communication. The application of RS-232 was very popular in old days. In this article, we are going to discuss how the RS232 protocol works and various other perspectives of it.

What is RS232 protocol?

RS232 represents a form of serial data transformation, which means it is related to communication. That is why it is commonly known as a serial connection. For years, it was a renowned data transmission method. In the telecommunication field, the RS232 protocol

kept a great value and was mostly used for the great quality of transmitting data in serial communication. The application of RS-232 can be seen in the modem. RS 232 was first invented through EIA (electronic industries Association) in 1960. At the time of invention, its main intention was to provide seamless digital transmissions through serial communication. Once upon a time, it was the one and only communication system that was only used broadly. It relies on an asynchronous and unbalanced serial protocol, which means at a time single bit data is sent from the sender to the receiver. For this reason, handshaking, starting and stopping bits, error recognizing were made previously. It was mostly used because of the lowest cost and simplicity of use.

Electrical Characteristics

Voltage level: RS 232 considered 0 as ground or off and 5 volts as on. So basically, it operates between 0 to 5 volt. The high voltage is varied between 5 volts to 15-volt dc. Whenever the voltage goes below 20 volts, it is also considered as off position.

Voltage level of selected signal: Binary 0 is operated on the received signal up to +3 volt to +13 volt and the binary wall is operated with the voltage value – 3 volts to -13 volt.

Line impedance: the impedance of wires of RS 232 varies from 3 ohms to 7 ohms, and the wire length is 15 m.

Operating voltage: Maximum operating voltage is 250v.

Rating of Current: maximum current rating is 3amp.

Slew Rate: How much the signal is changed, according to their input level, is known as slew that and the slew rate of RS 232 is 30 V/microseconds.

Bitrate: The maximum bitrate is 20 kbps for RS 232.

Some other specifications of RS232 protocol includes:

- It follows single ended motor for operation.
- One driver or one receiver can be sent on one line.
- Their receiver input sensitivity is from – 3 volt to + 3 volt.

How does RS232 protocol work?

RS 232 protocol is used in the communication sector to define how much data is transmitted from sender to receiver through a wire, for example – a 1-bit stream. The sequence of each bit is known as a protocol. It basically delivers serial information that also explains the protocols. RS 232 follows a two-way communication process for transforming data, as two devices are connected to each other. One is data transmission equipment and another is data communication equipment. The data is sent from DTE as this is the source and received by DCE, which is the receiver. Before sending in information, a request is generated through the RTS pin. This follows two-way communication, so the data is transferred from DCE to DTE.

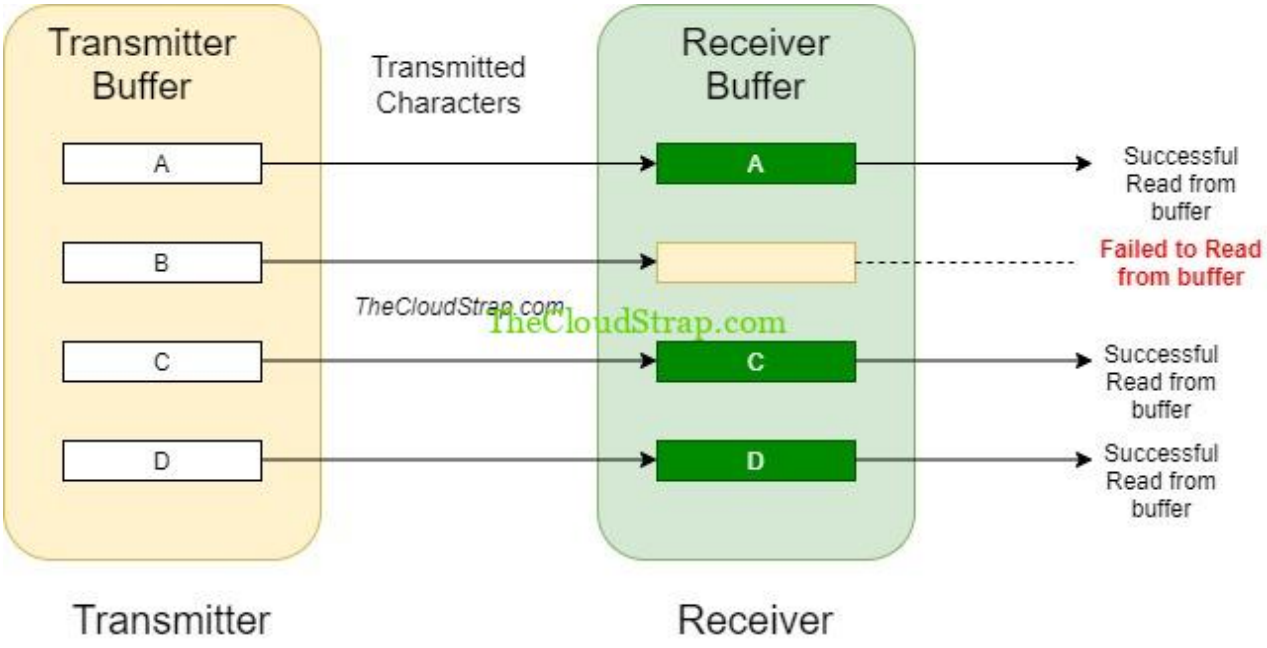
Is RS232 protocol serial or parallel?

RS 232 completely follows the serial communication strategy, and here one data bit is transmitted with one single data line at a time. But if we consider the operation of parallel communication, we can see that multiple data is transmitted through it along with multiple data lines.

Handshaking

Handshaking defines a process when the data is transferred from one end to another end. Basically, the data is transferred in the form of a signal, which makes a relationship between

transmitter and receiver. Come only two kinds of handshaking is used, such as hardware handshaking and software handshaking. Handshaking is generally used for transmission because it sends data without any loss, and for this reason, the buffer is used here. Buffer is nothing but offers a temporary memory location, which stores data between transmitting from sender to receiver.



RS232 handshaking

Handshaking is used in the RS232 protocol to ensure that the data will not be transmitted when the receiver is not ready. However, it is not mandatory to use handshaking in the RS232 protocol. The flow of data of the transmitter and receiver is controlled by hardware handshaking. When ASCII characters are used to inform the start and stop of communication, the working of software handshaking includes controlling the flow.

RS 232 Frame Format

While transferring a byte, the start bit is sent by UART, which is considered as zero, and the stop bit is considered as 1. If the parity bit is used then in RS 232 maximum of 8 bit is transmitted, and if the parity bit is not used, then a maximum of 9 can be transmitted.

Application of RS 232

Serial communication is mainly used between computers or PCs and some similar peripherals for generating connections, and the application of RS 232 is regarding that.

Is RS 232 a full-duplex?

RS 232 completely polos the operations of full-duplex. Because here, the controller and receiver can transmit data at a time without any interference. It requires 3 kind of wires for making the connection, dayar transmit data, receive data and signal ground.

Advantages of RS 232:

- RS 232 can be used in different kinds of legacy devices for or it's a simple approach. The application of RS 232 can be seen broadly on point to point connection, connected through DTE and DCE devices.
- It can be used for sending the data for a long distance, that is up to 50 feet.
- It has good capability to find out the error.
- The maintenance cost of RS232 protocol is comparatively lowest, that is why it was used widely before for communication purposes.
- The converters or adaptors which are used for RS 232 are available at an affordable price in the market.
- They are renowned for generating low noise.

Limitations of RS 232

- Its processing is slow because the transmission speed becomes slower as the distance increases due to capacitance.
- At a time, only a single device can be operated through RS232 protocol.

- Nowadays, a USB port is generally used rather than a serial port.

Admin

This post was published by Admin.

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