1. What are the data types used in the modbus?

It is a classification that a varible can store specific value and what type of operations can be performed on that data types .

Different types used in modbus are :

* Signed integer that ranges from -32768 to 32768.
* Unsigned Integers are from 0 to 65535
* Boolean values that are true or false or 0 or 1.
* Bitmap16 - Is an array of 16 Boolean values (bits). Values are indexed from 0 to 15. The number read from or written to the register is the sum of all bits with the value 1 multiplied by 2 to the power of its index.
* Bit 0: 20 = 1 To Bit 15 : 215 =32768.
* BITMAP32 - Is an array of 32 Boolean values (bits). Please check Bitmap for the calculation details.

1. what kinds of physical layers used in for Modbus protocol

🡪The Modbus protocol supports multiple physical layers, including

There are different types of physical layer network like

RS 485, RS 232 , USB ,Ethernet.

All Modbus devices on network should have the ability to connect to each other .

1. what is data frame format in modbus

There are two types of format 1) Modbus RTU frame Format 2) ASCII fram Format.

RTU format is used on asunchronous serial data lines like RS 484 .

The Modbus RTU Application Data Unit (ADU) consists of the shown elements:

* Address: We set the slave address for the device to which we want to send the message.
* Function Code: The number of the function code. You can see the table of the function codes in the "Modbus function codes" section.
* Data: The message itself. This can vary depending on the function code.
* CRC: The number of the cyclic redundancy check. It must be calculated.
* Of these, The Function Code and Data constitute the Protocol Data Unit (PDU)
* Modbus protocol also supports an ASCII format, which is a human-readable format that can be useful for debugging

The ASCII frame format in Modbus consists of the following components:

1. Colon: The frame starts with a colon (:), which is used to indicate the beginning of the frame.
2. Address: This is the Modbus address of the device that is being addressed. It is represented as two ASCII characters that correspond to the hexadecimal representation of the address.
3. Function Code: This is the code that identifies the type of Modbus function that is being requested. It is represented as two ASCII characters that correspond to the hexadecimal representation of the function code.
4. Data: This is the data that is being sent as part of the Modbus message. Each byte of data is represented as two ASCII characters that correspond to the hexadecimal representation of the byte.
5. LRC: The LRC (Longitudinal Redundancy Check) is a one-byte field that contains the two's complement of the sum of all the bytes in the message, excluding the colon at the beginning and the LRC itself. It is represented as two ASCII characters that correspond to the hexadecimal representation of the LRC.

Carriage Return and Line Feed: The frame ends with a carriage return and line feed (CR LF) sequence

01 03 00 06 00 01 C4 0B CR LF

In this example, the address is 01, the function code is 03, the data is 00 06 00 01 C4 0B, and the LRC is CR.