

Block diagram explanation

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- Data is written to the bus, the CPU or DMA processes the data, and moves it to TDR(Transmit Data Register), the TDR send it to the Transmit shift register, and from there it goes to the Tx pin.
- From the Receive shift register it goes to the Rx pin and collects the data, from there the CPU processes the data.
- The transmit and receive shift registers are connected to other control blocks, Like CR1, CR2 and so on.



How the string / characters are processed:

- Data is written on the bus (say Hello World), starting from the LSB, TDR gets the byte 'd', from there the 8 bit binary value goes to the Transmit Shift Register.
- From the Transmit Shift Register, the signal of 1s and 0s goes to the Tx pin.
- And similarly on the Rx pins.



USART character description :

- Before sending or receiving any actual data, we send a series of character to clear the buffer.
- These characters can either be idle or break characters.
- Idle character : An Idle character is interpreted as an entire frame of “1”s followed by the start bit of the next frame which contains data (The number of “1” ‘s includes the number of stop bits).
- Break character : A Break character is interpreted on receiving “0”s for a frame period. At the end of the break frame the transmitter inserts either 1 or 2 stop bits (logic “1” bit) to acknowledge the start bit.
- We can generate this characters by setting up some of the registers in the configuration .