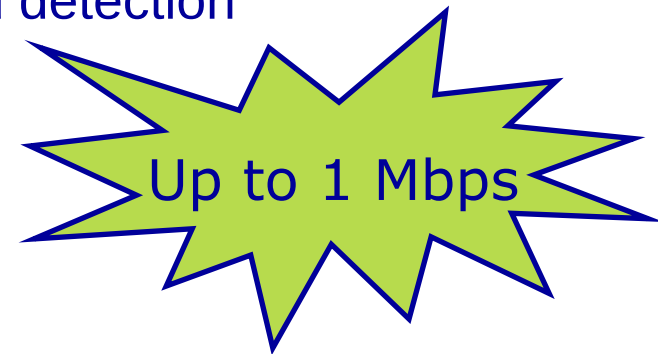


Universal asynchronous receiver transmitter USART

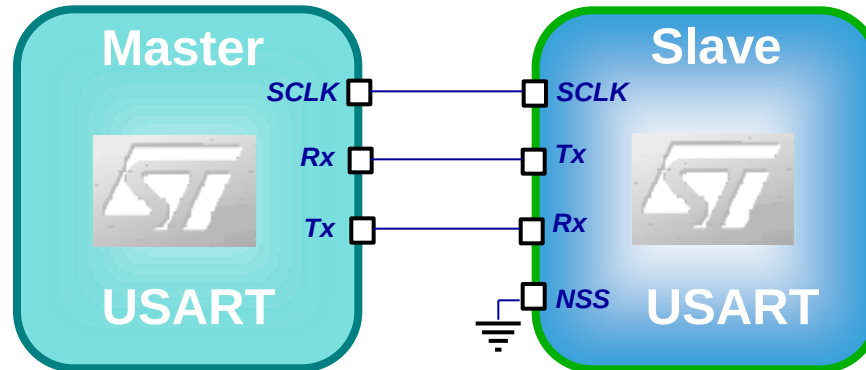
- USART 101x devices, USART1 15x devices
- Fully-programmable serial interface characteristics:
 - Data can be 8 or 9 bits
 - Even, odd or no-parity bit generation and detection
 - 1, 1.5 or 2 stop bit generation
 - Programmable baud rate generator
 - Integer part (12 bits)
 - Fractional part (4 bits)
- Dedicated transmission and reception flags (TxNE and RxNE) with interrupt capability
- Support for DMA (USART1)
 - Receive DMA request
 - Transmit DMA request



- 5 or 8 (USART/USART1) interrupt sources to ease software implementation
- Synchronous Mode: Master mode only
- USART1
 - IrDA SIR Encoder Decoder
 - Smartcard Capability
- Single wire Half Duplex Communication
- Multi-Processor communication
 - USART can enter Mute mode
 - Mute mode: disable receive interrupts until next header detected
 - Wake up from mute mode (by idle line detection or address mark detection)

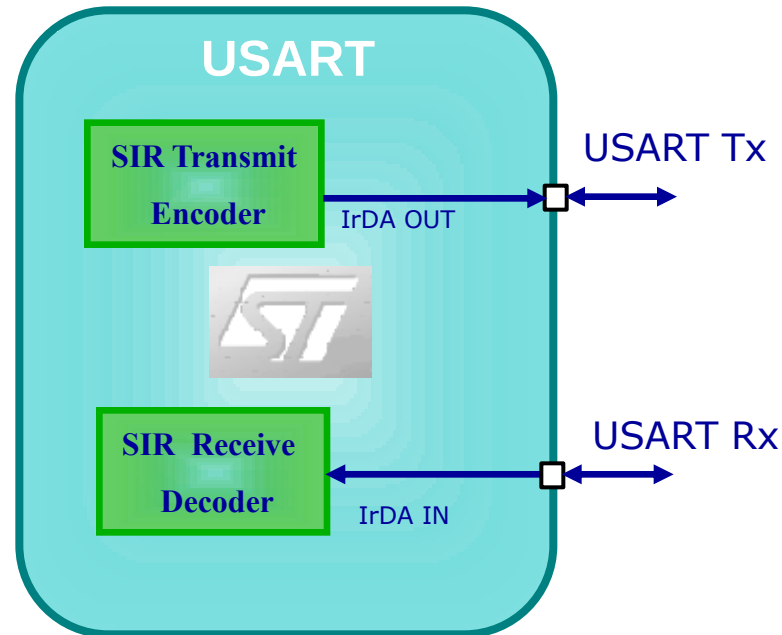
- The USART1 has a DMA Tx and Rx requests
- The USART1 requests is mapped on a different DMA channel: possibility to use DMA for both USART1 transfer direction in the same time

- USART supports Full duplex synchronous communication mode
 - Full-duplex, three-wire synchronous transfer
 - USART Master mode only
 - Programmable clock polarity (CPOL) and phase (CPHA)
 - Programmable Last Bit Clock generation
 - Transmitter Clock output (SCLK)

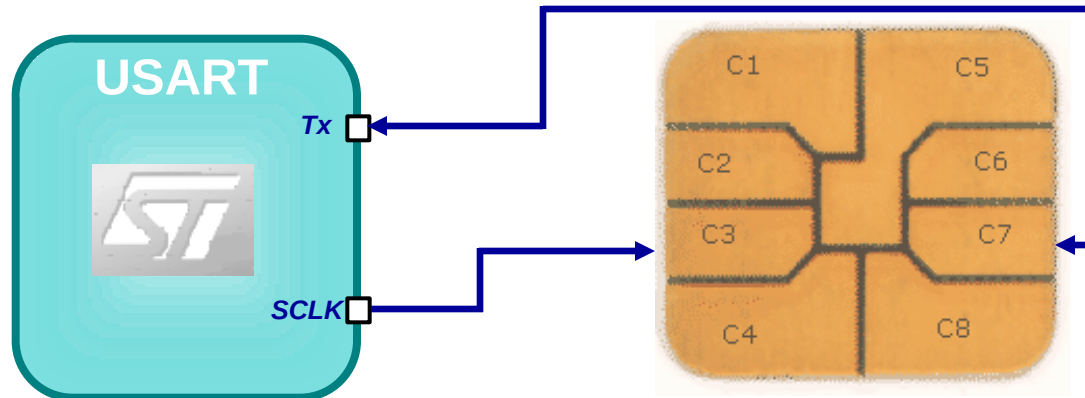


Full Duplex

- USART1 supports the IrDA Specifications
 - Half-duplex, NRZ modulation,
 - Max bit rate 115200 bps
 - 3/16 bit duration for normal mode
 - Low power mode: $1.42\text{MHz} < \text{USART1 Prescaler} < 2.12\text{MHz}$



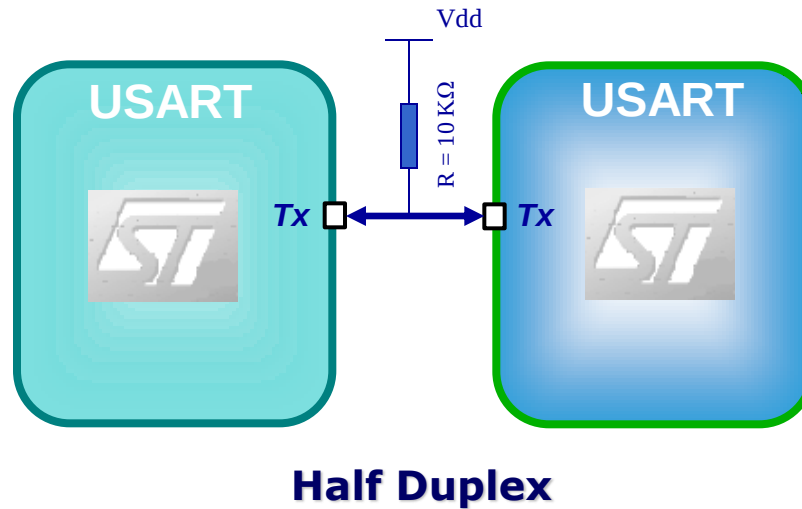
- USART1 supports Smart Card Emulation ISO 7816-3
 - Half-Duplex, Clock Output (SCLK)
 - 9Bits data, 1.5 Stop Bit in receive/ transmit
 - Parity Error Generation with NACK transmission
 - Programmable Guard Time
 - Programmable Clock Prescaler to guarantee a wide range clock input



Single Wire Half Duplex mode



- USART supports Half duplex synchronous communication mode
 - Only Tx pin is used (Rx is no longer used)
- Used to follow a single wire Half duplex protocol.



- Which communication modes the USART support?

- What is the maximum USART BaudRate?

- How many modes does the USART have?

- What are the different USART DMA requests ?

- In which mode the USART should be configured to send and receive data on the same pin?

- In synchronous mode, can we transmit and receive in the same time?

- How many stop bits you should have to set for Smartcard interface and how you can indicate parity error?

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