PV198 – One-chip Controllers

UART

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What is UART
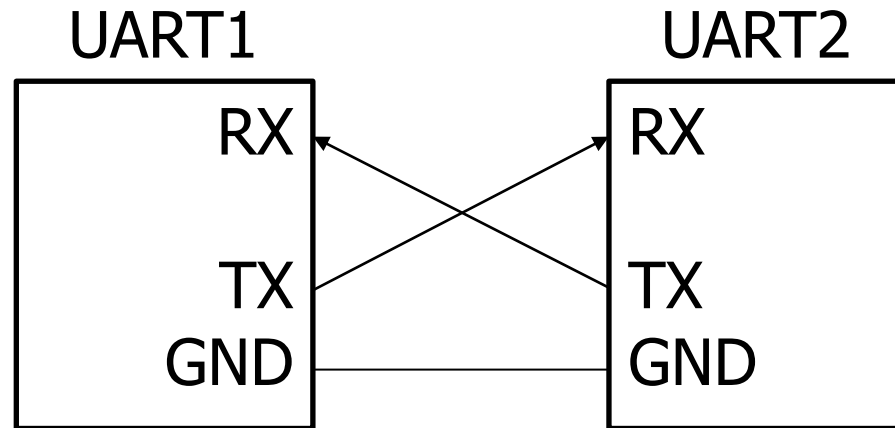
- UART – **U**niversal **A**synchronous **R**eceiver-**T**ransmitter

- Serial communication

What is it used for

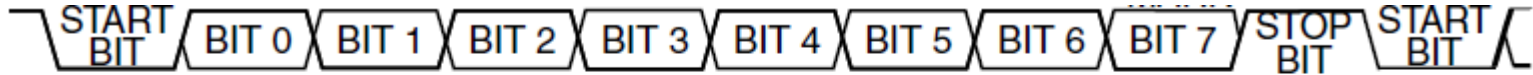- Intra-board communication

- Sensors
- GPS
- Bluetooth
- Modems

How does it work – Scheme

How does it work

- 2 wires (Receive – RX, Transmit – TX)
- 1 to 1 communication
- Works without clock signal
- Requires same settings for devices (baud rate, parity, etc.)
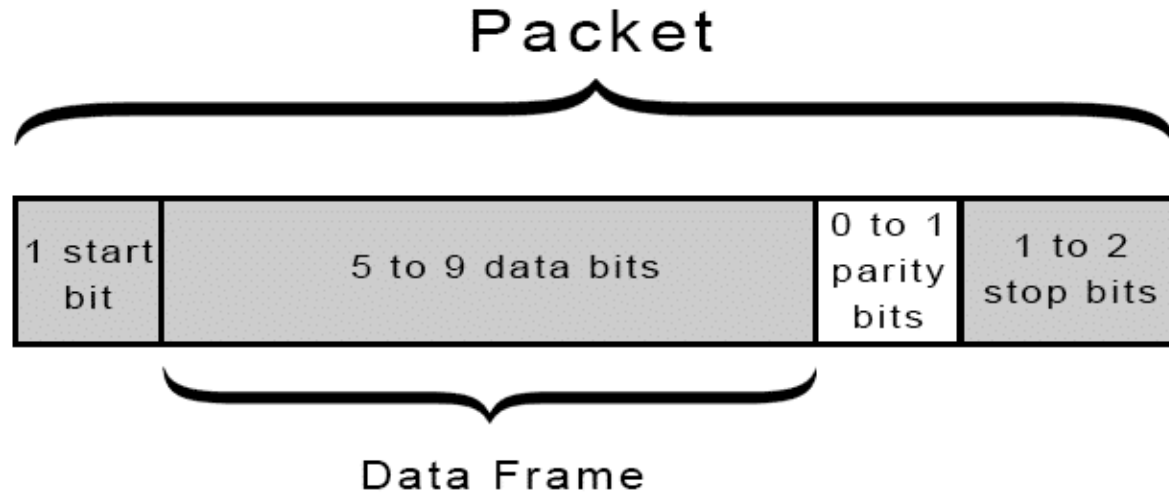- Asynchronous
- Full-duplex

How does it work – Message

Figure 59-14. Eight bits of data with LSB first

K66 Sub-Family Reference Manual

How does it work – Message

http://www.circuitbasics.com/basics-uart-communication/

How does it work – Settings

- Baud rate (typical 9600 – 115200)
- Number of data bits (8 – 9)
- Number of stop bits (1 – 2)
- Parity bit (disabled / odd / even)

FRDM-K66F UART

- 5 UART modules
- RS-485 support
- Hardware flow control (RTS/CTS)
- 9-bit UART support
- Interrupts
- DMA support
- TX/RX FIFO

USB to UART Bridge

- Silicon Labs – link
- Might be needed to install driver

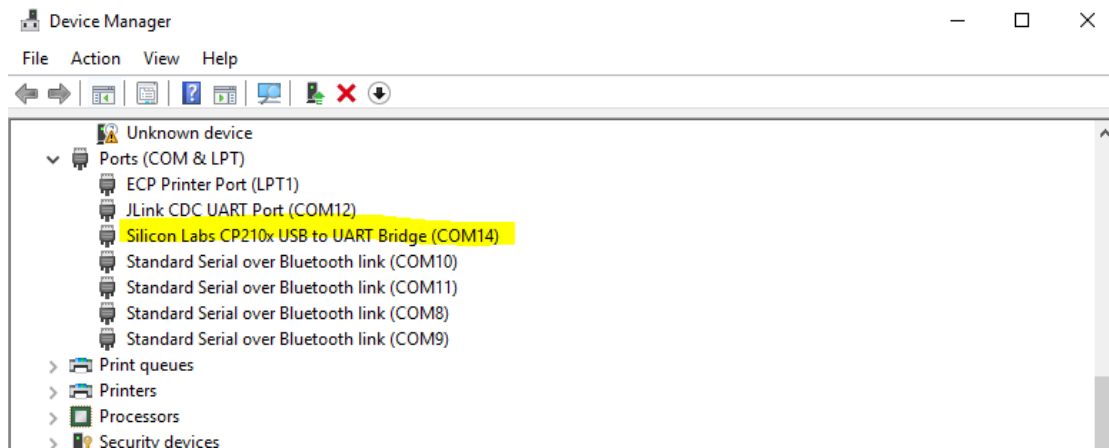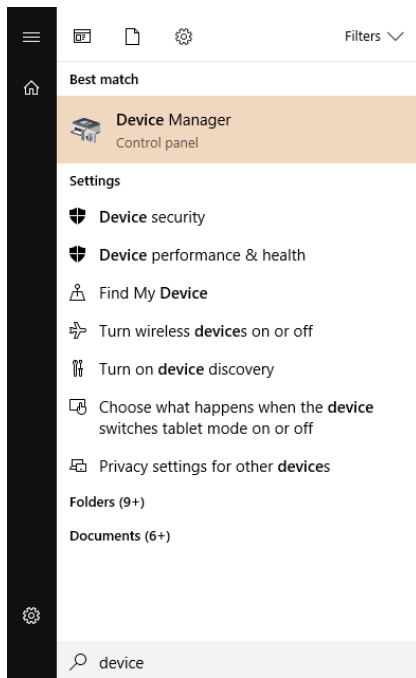# Application

- Create an application that reads data from UART and sends the data back to PC
- Update your code to rotate received character +2

Application – Step-by-step guide

1. Setup pin routing (done in template)
2. Setup UART peripheral (done in template)
3. Connect "USB to UART bridge" to a board (based on pin routing)
4. When "USB to UART bridge" is connected to a PC, it appears in Device Manage in "Ports (COM & LPT)" as "COM" port.
5. Open terminal application (or Terminal view in MCUXpresso IDE) and connect to correct COM port with your UART settings

Application – Step-by-step guide

Application – Step-by-step guide
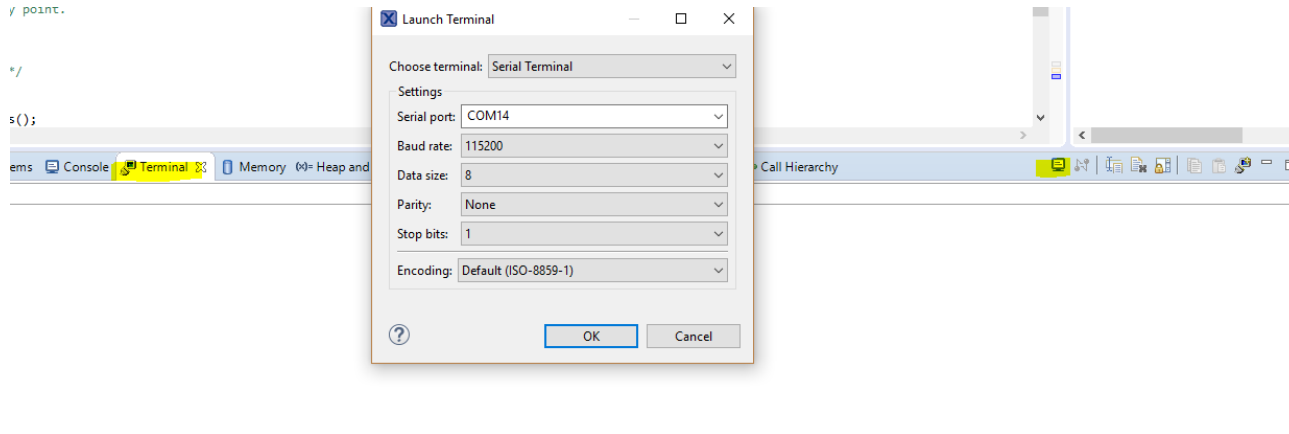
Application 2

- Open Python3
- Use import Serial
- Using Serial send string to device
- Check if device correctly encrypted string

Homework

- On device side you will receive 3 characters
- These 3 characters represent RGB values in order
- Your goal is to set LED color correctly according to received values