RS485 link on TDM

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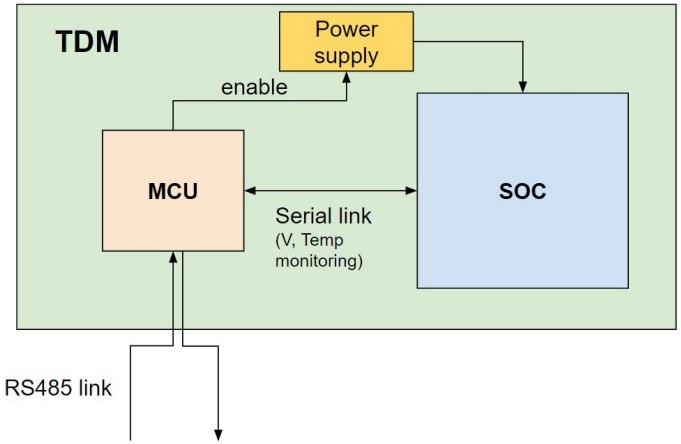
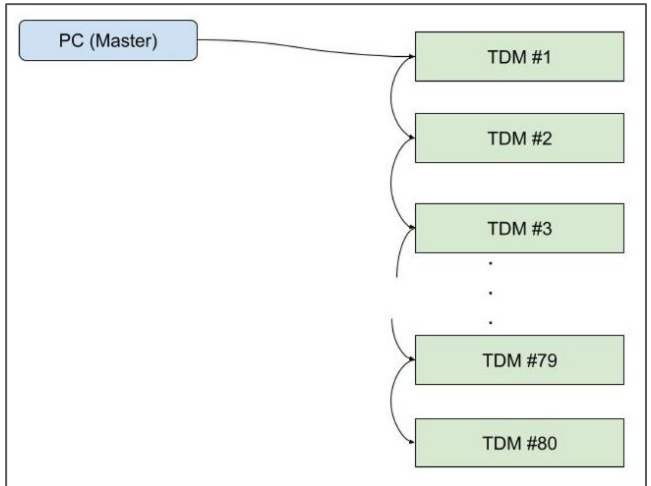
RS485 link on TDM

Goal: switch on/off the SOC remotely

Hardware implemented:
- RS485 link on RJ45 connectors
- connected to microcontroller I/O
- RS485: one line for all the slaves

1. TDM board identification
2. Switch on/off implementation
3. Test of the link with several boards



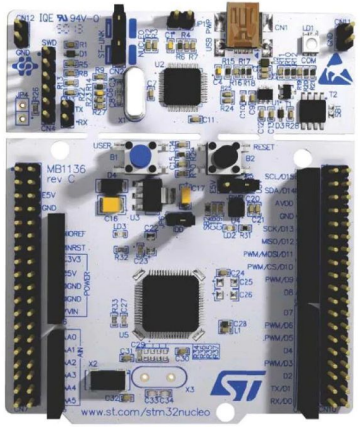


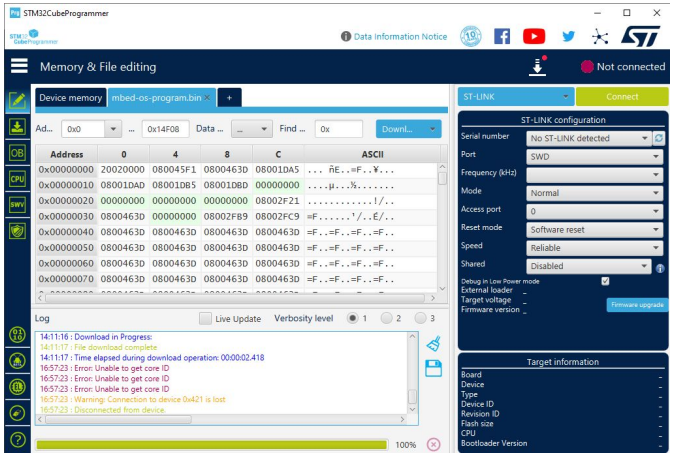
Microcontroller environment

Evaluation board: STM32 NUCLEO-F446RE: same MCU on the TDM

Development plateform: MBED Os (Arm based MCU operating system, API and libraries available. C++ code to program the MCU)

Programmer: STM32CubeProgrammer with the ST link.





Test bench

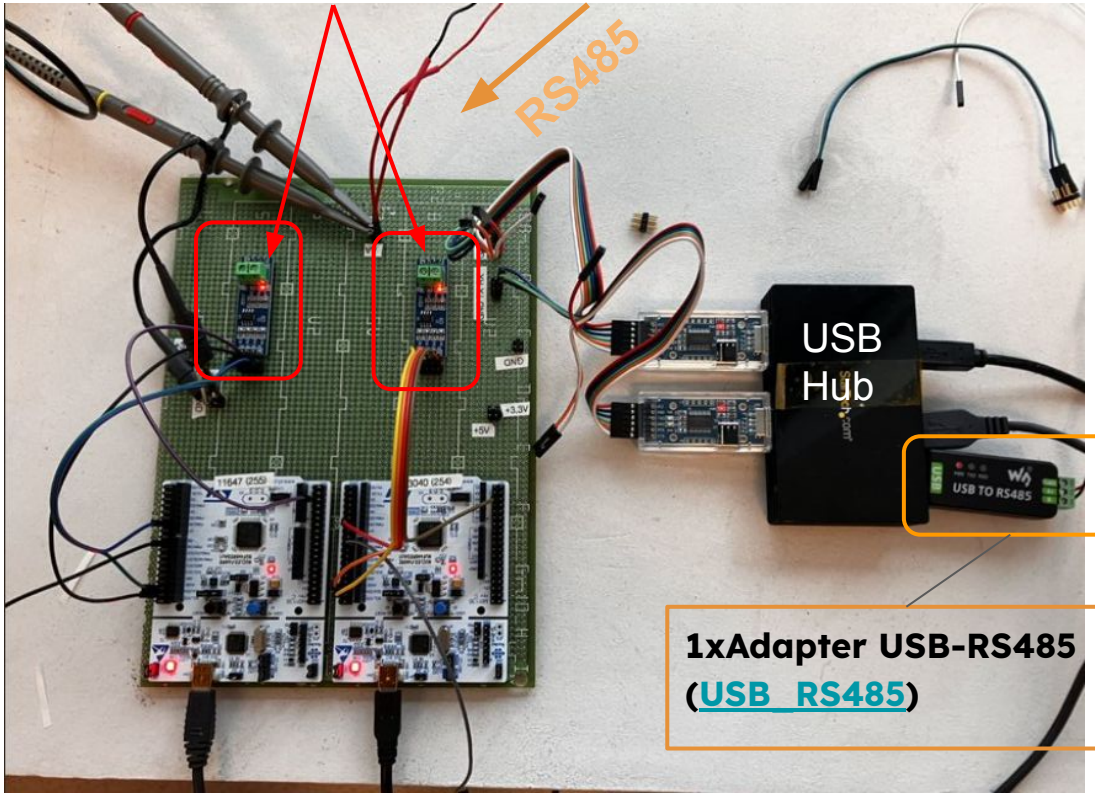
- **RS485-TTL + MCU <=> TDM**
- **Goal:**
  Send a message like:
  “Power BoardID 1” or *“Power BoardID 0”* and raise the power signal on the correct board.

- Open serial session on computer (with microcom or mobaxterm) and send a message

- Message steps:

1. Serial console
2. USB→RS485
3. RS485→ TTL
4. Microcontroller pins

2xAdapter RS485-TTL (MAX485)
(rs485TTL)



2xMCU eval boards

Implementation / Result

Board ID: The board checks that who the message is addressed to.

- MCU has a unique Chip ID (on 96 bits)
- Associate the last 32 bit of the Chip ID to a Board ID (e.g. the eval are 254, 255)
- new serial command to get the Board ID

Set up a new serial link: interpret the message

- reused Fabrizio's code for the other link
- Adapted for RS485 (no error issued)

Commands:

- $ spwr <board_id> 0/1 # : sets the power up or down
- $ gpwr <board_id> # : returns the state of the power signal (0 or 1)

→ **Implemented and tested**

Outlook

- RS485 link is working with this evaluation setup.
  → some adjustments foreseen on TDM (4 wires links) but is should work.

- PC - RS485 connection: Used a USB but not very robust.
  1. Use an old/spare TDM ?
  2. Develop a solution: e.g. Rasperry + RS485 module
  3. Find a complete commercial solution

- Integration to MIDAS ? or not.