

TTK4155

Industrial and Embedded Computer Systems Design



NTNU – Trondheim
Norwegian University of
Science and Technology

Lab lecture 6

- CAN bus & transceiver
- Node 2

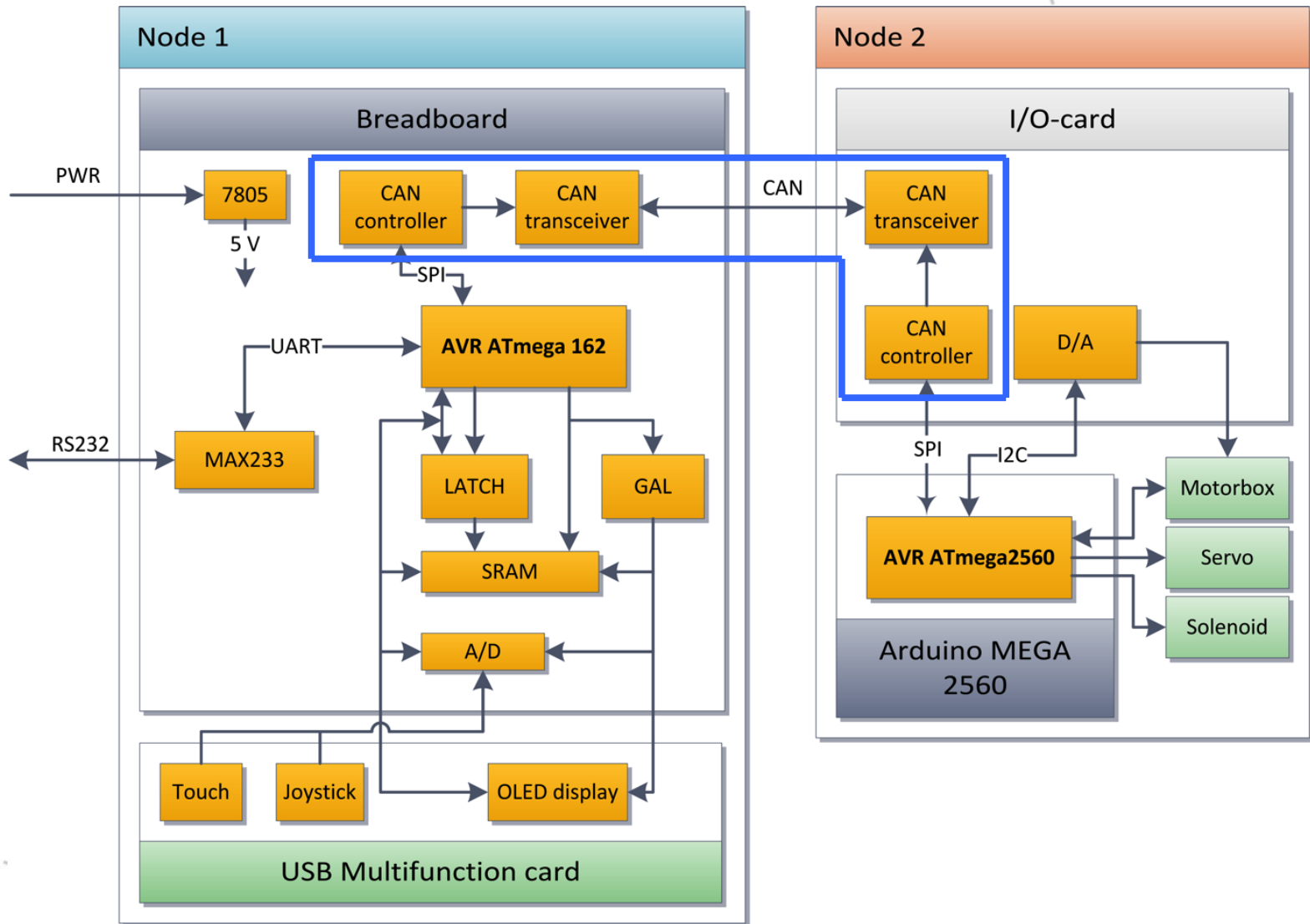


Exercise 6: CAN bus and communication between nodes

- In this exercise, you will
 - Create a CAN communication driver
 - Connect CAN transceiver to controller on node 1
 - Program and test communication with node 2 and I/O card



Communication bus



CAN Physical Layer

- Two wires, denoted CANH and CANL
- Two states
 - Logical 1: Recessive state – $CANH = CANL = V_{cc}/2$
 - Logical 0: Dominant state – $CANH \approx V_{cc}$ and $CANL \approx Gnd$

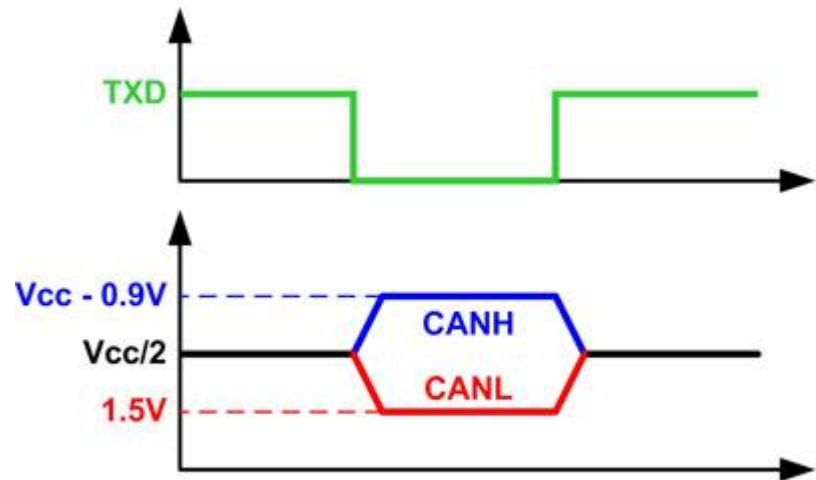
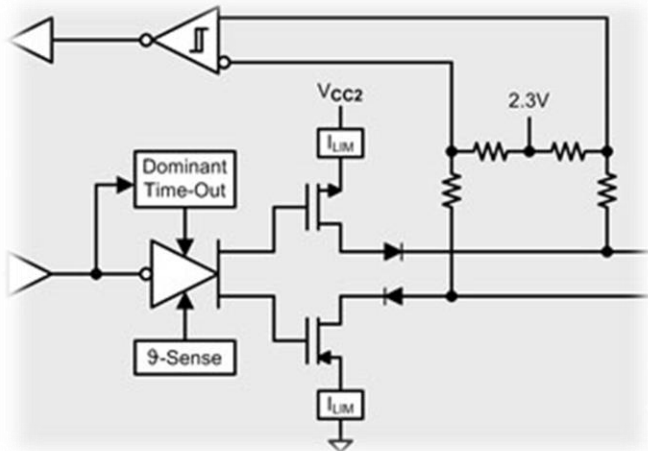
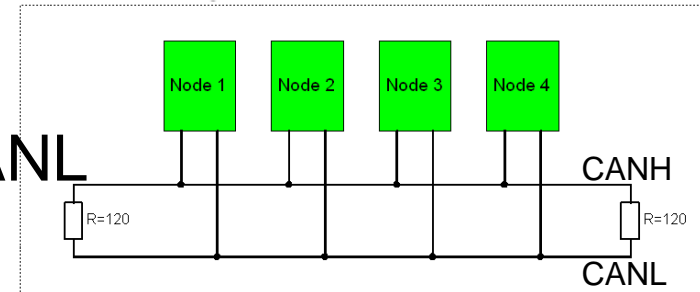
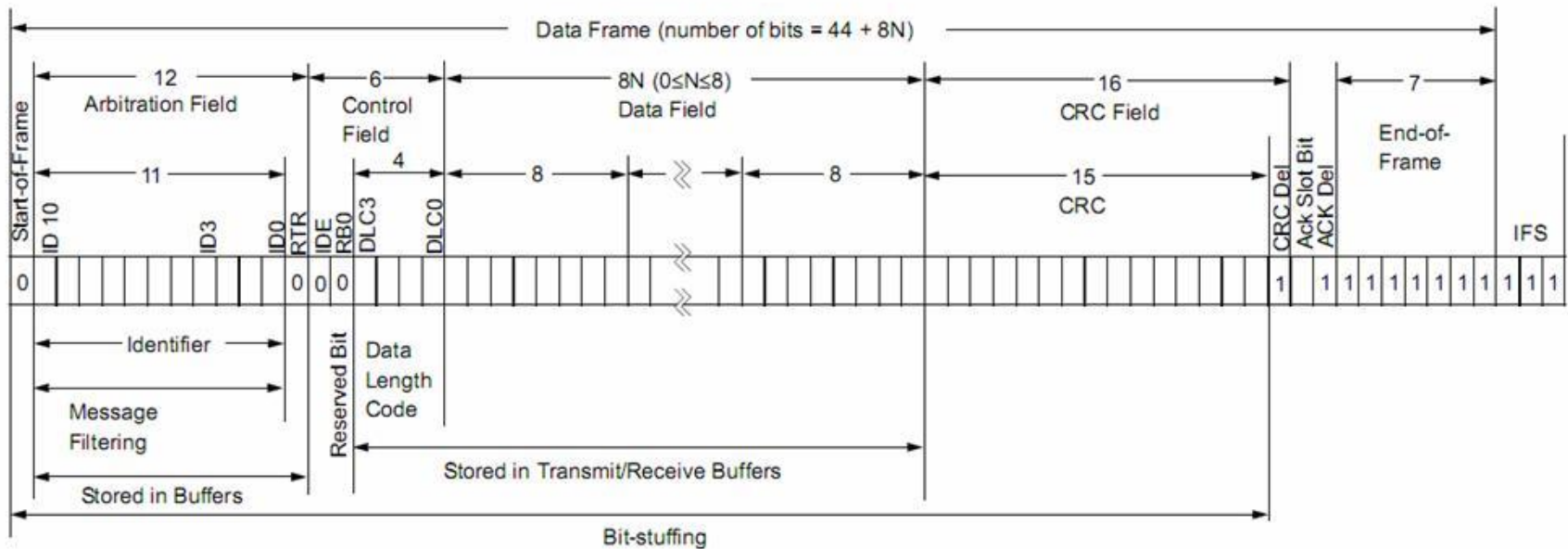


Figure 3. CAN Bus Signals



CAN Frame

- Standard CAN data frame:



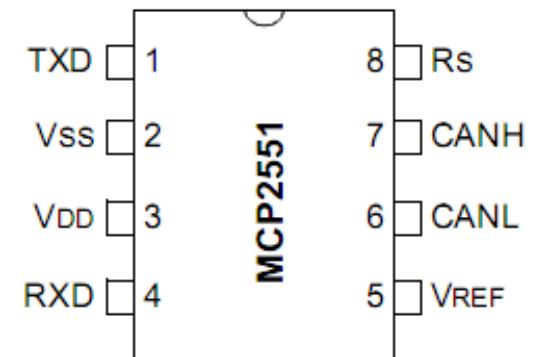
- http://en.wikipedia.org/wiki/Controller_area_network



CAN Transceiver MCP2551

PDIP/SOIC

- Handles the physical layer
- Detects line errors
- Protects against transients
- Controlled by the CAN controller
- End node termination of 120Ω
- Read AN228; A CAN Physical Layer Discussion



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Node 2

- Arduino mega 2560 with expansion card.
- Programming => JTAG interface via expansion card.
- I/O card => provides CAN interface, DAC etc.
- See datasheet/schematics.

Things to do...

- Connect CAN transceiver MCP2551 to node 1.
- Program Node 2 e.g. for CAN reception, sending data on UART etc.
- Test CAN transmission between node 1 & 2.
- Try to send joystick position from Node 1 to Node 2 over CAN bus and display it on UART (Node 2).
- You should be able to reuse most of the drivers (UART, CAN etc.) created previously.



Questions?

Auf wiedersehen



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