

EITF45 - Computer Communication

Lab 1 - Tasks

Point to Point Communication

Manual Version 4.1.2

Electrical and Information Technology

November 20, 2019



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Tasks

The primary practical objectives of this lab is to:

- Implement the necessary functionality in the *Development Node* so that it is able to communicate with the static and predictable *Master Node*.
- Convey an action from the *Development Node*, the remote control, to the *Master Node*. The *Master Node* shall then actuate the action.

These two objectives have been broken down into tasks which you should complete during this lab. To your help a sketch skeleton and a library of variables and methods are prepared for you. The skeleton is built around a state machine, which is implemented as a `switch` statement and associated `case` clauses, see the file `Skeleton5.ino`. The states and the state transitions described in the following, refers to this state machine implementation. The lab setup is described in the *Preparation document*. The state machine in the mandatory preparatory exercises is what you will implement in this lab. You have completed the lab when the *Development Node* can traverse the entire state diagram from the preparatory assignments.

1. Using the dip switches on the Arduino shields, set and note the address on the *Development Node* and the *Master Node*.
2. From the `L7_APP_PRODUCE` state, call the `Shield::select_led` method, and print the selected LED number on the *Serial Monitor*. This is a mere hands on exercise.
3. Using the functions from the preparatory exercises, implement `L1_PHY_TRANSMIT` state that sends the bits in the prepared test send buffer `test_frame[]` to the *Master Node*. One of the *Master Node*'s Light Emitting Diodes (LEDs) should light up.
4. In the `L7_APP_PRODUCE` state, select a LED (see task 1 above). Then, in state `L2_LINK_FRAME_COMPOSE` state create a frame and send that to the *Master Node*. Of course the selected LED should be lit on the *Master Node*.
5. In the `L1_PHY_RECEIVE` state, implement for the reception of the frame that the *Master Node* sends as a response to the frame sent to it.
6. Implement the functionality of the `L2_LINK_FRAME_DECOMPOSE` state where you shall print the content of the received frame.

When you are done, inform a TA. You are then expected to walk the TA through your implementation, and you are expected to be able to answer questions about your implementation.