

Experiment 7

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Question

USART Connection between two microcontroller

Admin Microcontroller:

- Login user
- Show Details on LCD
 - ID
 - Date & Time
 - Temperature
 - Admin
- Add/Remove User
- Setup speed of stepper motor
- Change Date & Time

Operation Microcontroller:

- Send Temperature to admin micro
- Receive number of rotation of stepper motor and rotating it

For usart(uart) connection we have 3 function in code:

- `uart_transmit` -> This function send a integer data to another micro
- `ISR(USART_RXC_vect)` -> This function is interrupt for get data
- `uart_init()` -> For initial buand rate & enable transmitter & receiver and size of the data we send or receive.

Note: we need to have the same uart configuration.

Admin micro have some extra functionality like:

- login() -> to login by username and password
- home_page() -> to show a details like temperature, date and time
- admin() -> to configure some system setting like:
 - set_time() -> setup timer
 - set_date() -> setup date
 - Set_stepper_motor -> to send number of rotation to operation micro
- notification() -> to turn light red when username or password incorrect and otherwise green

And Operation micro have bottom functionality:

- adc_read() -> to read temperature of environment
- main() -> that rotate stepper motor by steps -> data get from admin micro

have some common functionality like:

- show_on_lcd() -> for display on lcd
- go_to_line_lcd() -> to go line 1-4 of lcd
- get_key_pressed() -> for read from keypad
- get_number() -> for get a sequence of keypad press until user click "*" "

At the end the video of result of project attached in folder results that contain videos:

- Authentication
- Setup Date
- Setup Stepper Motor
- Setup Time
- Temperature

References:

- [Serial Communication - Introduction » maxEmbedded](#)
- [The USART of the AVR » maxEmbedded](#)
- [Interfacing matrix keyboard with AVR](#)
- [LM044L LCD. Datasheet pdf. Equivalent](#)