**GLOW 2024**  
Testing the integration of the Ultra Sonic Sensors client with the Raspberry Pi server.

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IntroductionIn this document we will describe the results of testing the integration of the Arduino Uno with the Ultra Sonic sensors which make use of interrupts (the client), and the Raspberry Pi (the server) which receives all the information from the sensors.

## Goal of the test

The goal is to verify if the interrupts on the client prevents or disturbs sending data to the server.

## Testing setup

The setup consists of the following:

* Raspberry Pi (server).
* Arduino Uno with eight ultra sonic sensors (client).
* Network switch, to connect the client and the server.

The server can be started with the following steps:  
**1.** Login with *username: Delta* and with the *password: Delta123*.  
**2.** Go to the following path with: “cd server/cpp”.  
**3.** Start the server with: “make run”.

After that the code used on this [Github-repository](https://github.com/Glow-Delta/Networking/blob/Client/ArduinoToRaspberry/ArduinoToRaspberry.ino) is combined with the code in this [Github-repository](https://github.com/Glow-Delta/Ultra_Sonic_Sensor/blob/main/sketch_oct4a.ino).

## Test results

After combining the code the server could detect values sent by the client based on the sensor information, but after a while the server received nothing and the connection from the client to the server is lost, see Figure 2.

A screenshot of a computer

Description automatically generated

Figure 1 Client-server connection lost.

By removing the loop in Figure 1. The server could receive information for a long time. No exact time measurement has been made yet, but the connection was not lost unexpectedly.

A computer screen shot of code

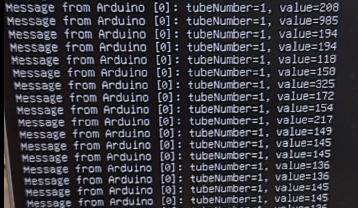
Description automatically generated

Figure 2 Removing the for-loop and the used array.

The problem of losing the connection to the server could also have something to do with the client expecting a response from the server. But we did not found any unexpectedly connection lost anymore.

In figure … the received information has been shown.

{Image of the server monitor}



Currently we send an integer ranging from 100 to 999 based on the individual sensor measurements. Mapped to a distance from 1 to 200 centimeters.

## Risks

It is important to mention that the client still expects to receive a response from the server. This needs to be fixed to prevent bugs in the future. Thereover, currently when the client is disconnected and reconnected the server stops receiving information. For ease of use at GLOW it is important to further test and fix this problem.

## Conclusion

It is possible to receive a continuous stream of information about the ultra-sonic sensor measurements. But currently the server receives data which cannot be transfer to a sound intensity. Therefore, it is important to send the server how many sensors measure something within 2 meters

## Next steps

The next step is to implement the code ([in the current code](https://github.com/Glow-Delta/Ultra_Sonic_Sensor/blob/main/UltraSonicsWithInterruptsAndServerCon.ino)) that the client sends the number of present sensors to the server.