

Lab 6: USB Serial Communication

CSE 2100-001

Ellen Ripley

October 12, 2016

Date Performed: September 14, 2016
Partners: Ellen Ripley
John Connor

1 Objective

Program the Teensy 3.2 microcontroller with the packetized serial communication program on the class GitHub repository (`serial_communication_variable.ino`). Verify working bidirectional communication using the CuteCom terminal program on your Raspberry Pi.

Once you have your communications working correctly, modify the firmware (`serial_communication_variable.ino`) to extend the checksum from 8-bits to 16-bits (2 byte fields instead of 1). When generating the checksum, use the same cumulative XOR method, but perform using two bytes for each operand. For example, in the packet...

0xAA 0x07 0x01 0x02 0x03 [checksum]

the 16 bit checksum would be...

0xAA07 XOR 0x0102 XOR 0x0300 = A805

For payloads with odd numbers of bytes (such as above), use the last payload byte as the first (leftmost) byte and 0x00 as the second when performing the final XOR.

Demonstrate your modified packeting protocol with CuteCom using the test cases provided by the lab instructors.

1.1 Definitions

serial port Replace this text with a brief description of the term (1-2 sentences).

serial emulation Replace this text with a brief description of the term (1-2 sentences).

HID Replace this text with a brief description of the term (1-2 sentences).

bulk transfer Replace this text with a brief description of the term (1-2 sentences).

isochronous Replace this text with a brief description of the term (1-2 sentences).

2 Question 1

Name 3 different standards for serial communication

Replace this text with your response.

3 Question 2

Suppose we transmit a packet and the final byte (the checksum) of the unmodified packeting strategy is lost by the receiver. Immediately after the transmission, another packet is sent and the receiver interprets the start byte of the 2nd packet as the checksum of the previous one. What are the odds that the receiver would incorrectly interpret the first packet as valid? What would be the odds for the modified (16-bit) protocol?

Replace this text with your response.