

Project Proposal

Encrypted Wireless Communicator

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Project Abstract

The Encrypted Wireless Communicator is a device that takes input from a keyboard, encrypts and sends the data out over a wireless link. The proof of concept version will consist of two devices. One will take the input from a PS2 keyboard, encrypt the data and send it over a wireless RF link. The second device will read the data on the RF link, decrypt and display the message on an LCD screen.

Strategy

Platform: The Zilog Z8 development kit will be used as a base for both devices.

Capabilities: It has plenty of general purpose IO ports for the PS2 interface, wireless link and LCD display. It also has strong interrupt abilities, and headers for easily connecting to external devices. The DUART may also be used as a means to communicate over the RF link or to the LCD display.

External Devices: A PS2 port connector, LCD display, and RF link will need to be added to the development board.

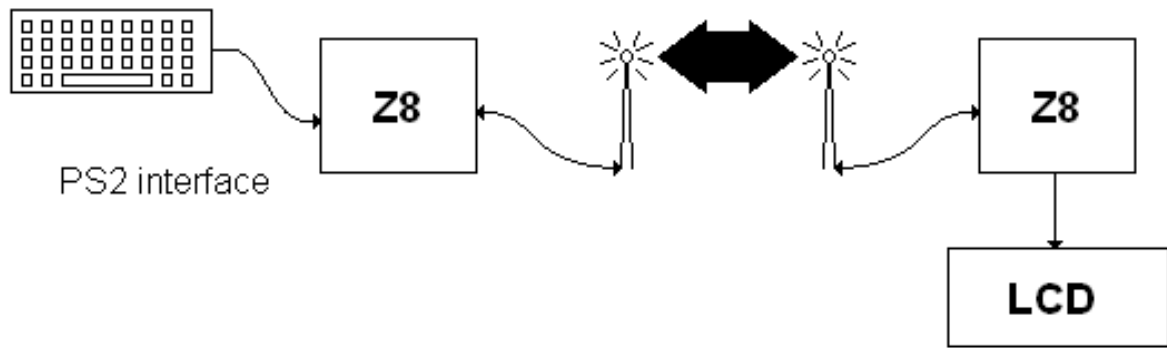
Evaluations: PS2 keyboard connection and LCD display have already been done as labs in previous classes. The RF link was also suggested by the professor so this should also be achievable on the Z8 platform.

Main Software Modules: Keyboard input, LCD display, RF send, RF receive, Encrypt, Decrypt, Packet Encapsulator, Packet Verification

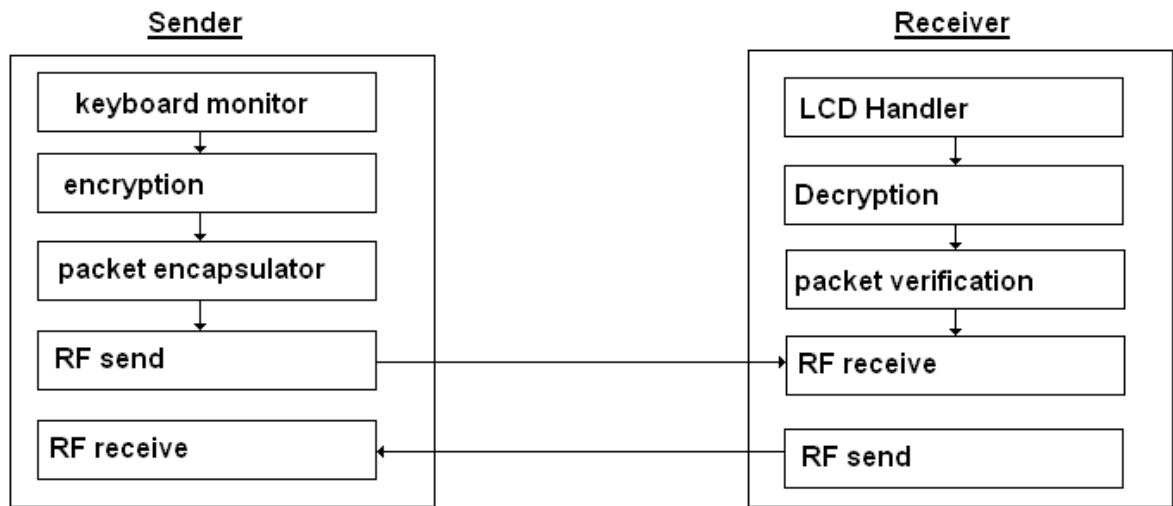
Main Control Loop: Since there are two devices, there will be two main control loops.
Sender: Monitor keyboard inputs. When a complete message is formulated, encrypt, send and verify receipt.

Receiver: Monitor RF link. When a message is received, verify integrity, decrypt, display and then send acknowledgement

Bi-Directional Encrypted Link



Preliminary Hardware Diagram



Preliminary Software Design

Unknowns

RF Link – I don't know what the interface to the RF hardware module will be. I don't know if it can interface with UART or i2c, what voltage levels it will need, or if I can control it using the GPIO.

LCD – This is the same situation as the RF link. Also, will the LCD require an external power source, or can it run off the power from the board?

Implementation Plan

Acquire a second Z8, display module, PS2 connector, and RF link pair.

Write a test module to demonstrate PS2 connection, RF link, and display.

Implement encryption/decryption algorithm, use LCD display for verifying long strings.

Design communication protocol stack.

Implement the protocol stack

Write final PS2, communication link, and display modules.

Resources

Second Z8 board (from professor)

RF Link (from professor)

PS2 connector (from professor)

LCD Display (from professor)

Second Computer (currently in possession)