Developing Communication between the Leg and the Body of EduBot

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Motivation and Goal

**Motivation:**
- Add flexibility and efficiency to EduBot

**Goal**
- Enable Edubot to change the stiffness of its leg while on the move
The Approach

- Develop communication between the robot and the leg for data acquisition and relaying commands.

- Control the movement of the slider, which controls the stiffness of the leg.
Communication Schematic

Body
- Microcontroller
- Encoder/Decoder
- IrDA

Leg
- IrDA
- Encoder/Decoder
- Microcontroller
Microcontroller (PIC18F2680)

- Controls what kind of data is sent and how fast
- Can be programmed in C Language
- Generates a Pulse Width Modulation (PWM) to control the speed of the motor
Infrared Data Association (IrDA)

- A form of wireless communication
- Built in receiver and transmitter
- Small Dimensions (1.6mm H, 7mm W, 2.8mm D)
Two Communication Protocols

- The body of the EduBot initiates the communication

First Protocol:
- The body asks the leg for data
  - Slider Position (1 Byte)
  - Stress on the Leg (1 Byte)
  - The time the leg touches the ground (1 Byte)
  - The time the leg leaves the ground (1 Byte)
- The body gets 4 bytes of information back from the leg
Second Protocol

- The body commands the leg to change the slider position
- The leg in return positions the slider as specified by the body
Slider Control Schematic

- Microcontroller
- Encoder/Decoder
- IrDA

Logic Hi or Low

Pulse Width Modulation

Motor

H-Bridge

Slider

Leg
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