Establishing a Gateway: The CAN Conditioner

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Objective

• Design a low cost solution to protect the CAN bus from inadvertent bus overloads, or malicious software from 3rd party devices connected at the diagnostic port
• Develop a CAN bus gateway for the J1939 protocol
• Filter messages sent to the device in one direction, allow all bus messages to pass through on the other direction
• Develop Open-Source software for communication with J1939

Hardware

• Teensy 3.2 Arduino Compatible Microcontroller
• Custom designed expansion board giving a Teensy two CAN channels (FlexCAN and MCP2515).
• 9-pin connectors used to offer compatibility with factory diagnostic connection.

Testing

• Testbed results show proof of concept.
• Successfully defended against Denial of Service attacks while allowing normal messages to be passed.