

Wireless ECU Monitoring System

Team WEMS



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Introduction

- **ECU (Electronic Control Unit)** – responsible for monitoring and controlling engine parameters (fuel injection ratio, RPMs, etc).
- ECU keeps track of vital engine performance statistics that can be used for diagnosing of malfunctions.
- Notifies of problem through “Check Engine” light.
- Provides OBD-II (OnBoard Diagnostics) connector to retrieve information.

ECU and OBD-II

OBD-II



ECU



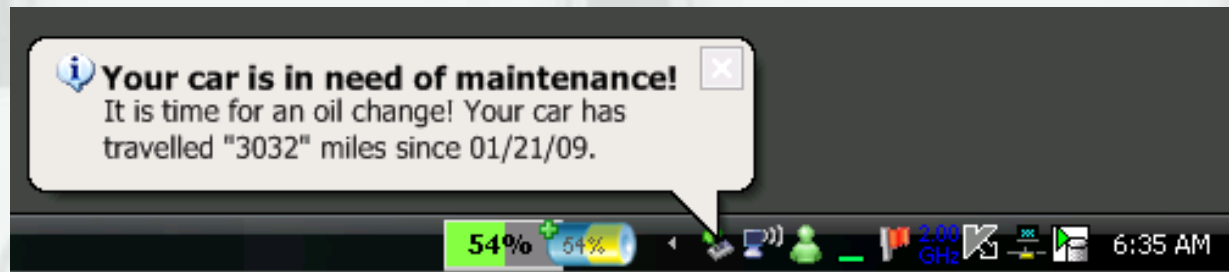
<http://www.ashspecz.com/ashspec/ECU/16-bit%20images/16-bitECU-1.jpg>

WEMS

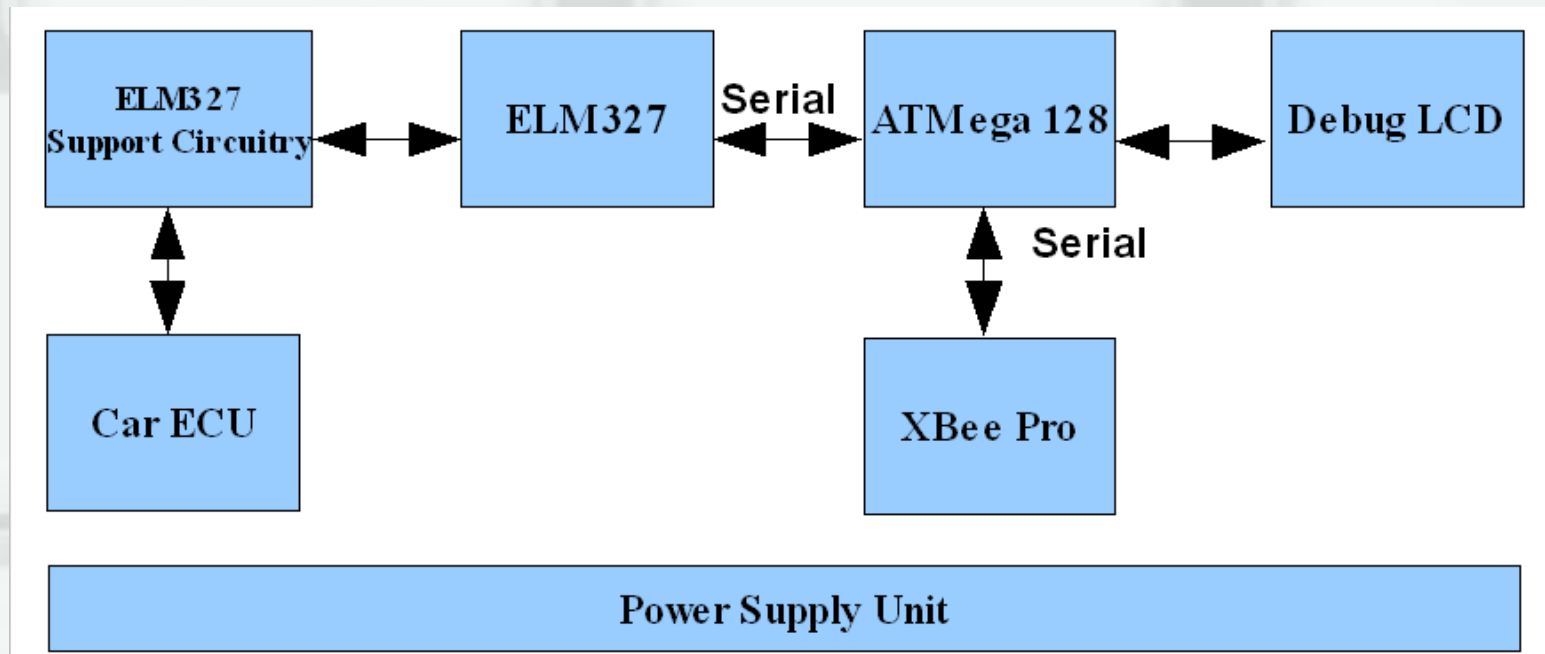
- **WEMS** - Wireless ECU Monitoring System.
- WEMS is a system for wirelessly monitoring ECU parameters via a personal computer.
- These parameters can be used to diagnose current engine malfunctions or help to predict future malfunctions.
- Most OBD-II scanners are intended for in-shop diagnostics. WEMS will provide logging during vehicle operation.

Features

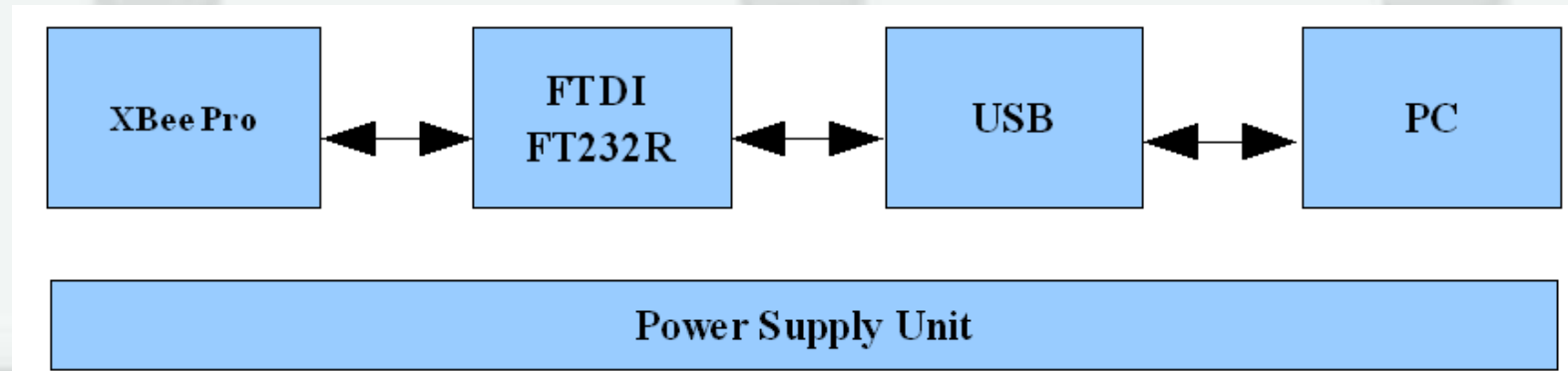
- Provide logged and real time ECU data to the user through a wireless interface.
- Notify the user when statistics reach specified thresholds.
- Display and clear ECU error codes (through LCD and buttons or wireless interface).



System Diagram – Car Module



System Diagram – PC Module



Major Components

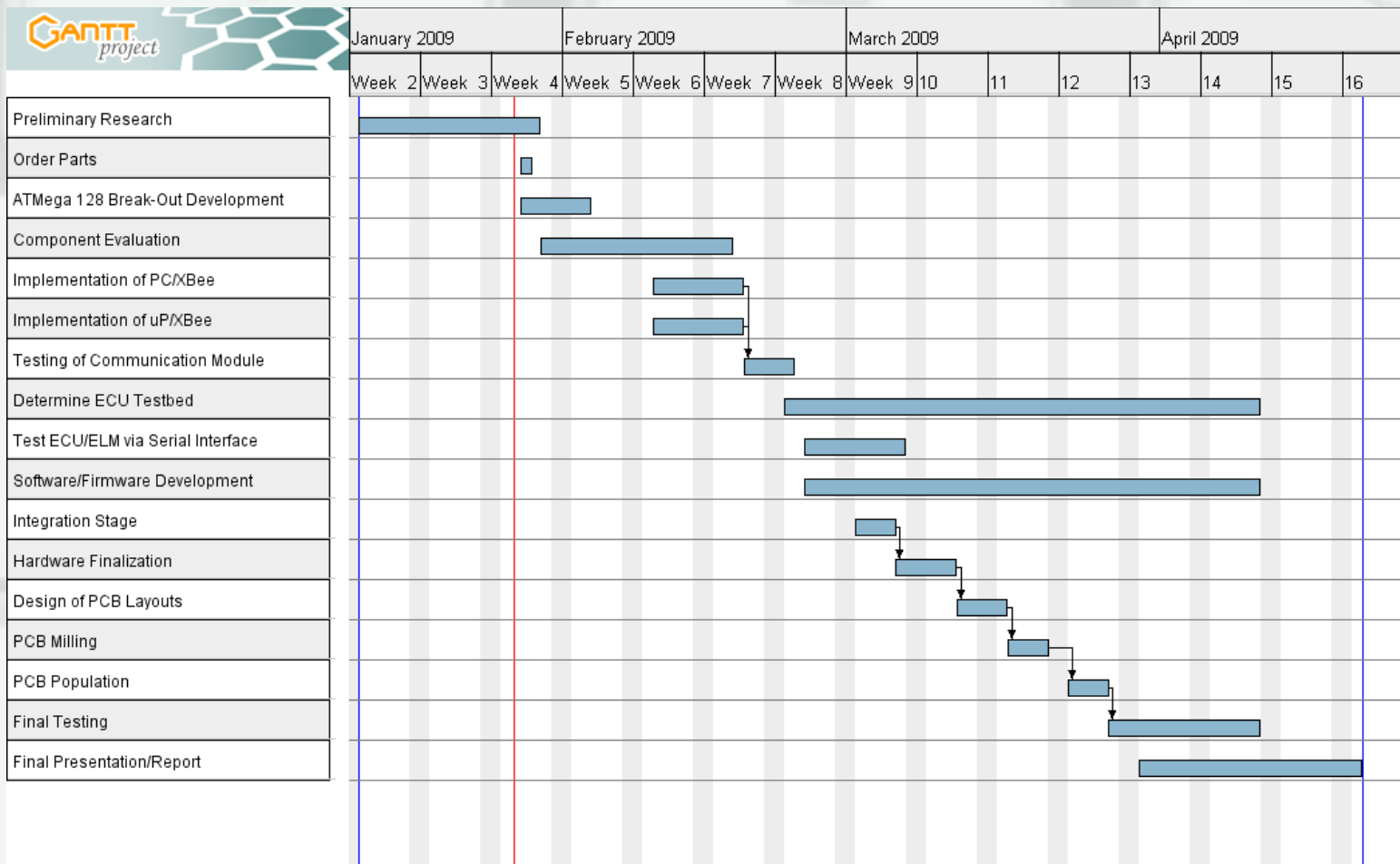
- Wireless transmission/reception – XBee Pro.
- UART to USB – FTDI FT232R.
- Atmel ATmega 128.
- ELM327 OBD-II interface IC.
- Power supply circuitry.

Cost Analysis

ELM327	\$26
J1962M Cable	\$16
2 x XBee Pro	\$32 x 2
ATmega128	\$15.00
1 x UART to USB (FTDI)	\$5
1 x LCD	\$8
Miscellaneous components	Estimated \$10-\$15
Estimated total cost	\$144-149

A similar product, the ElmScan 5 Bluetooth costs \$200. Another product offered by the same company (that provides no wireless connection) costs \$140.

Timeline





Questions?