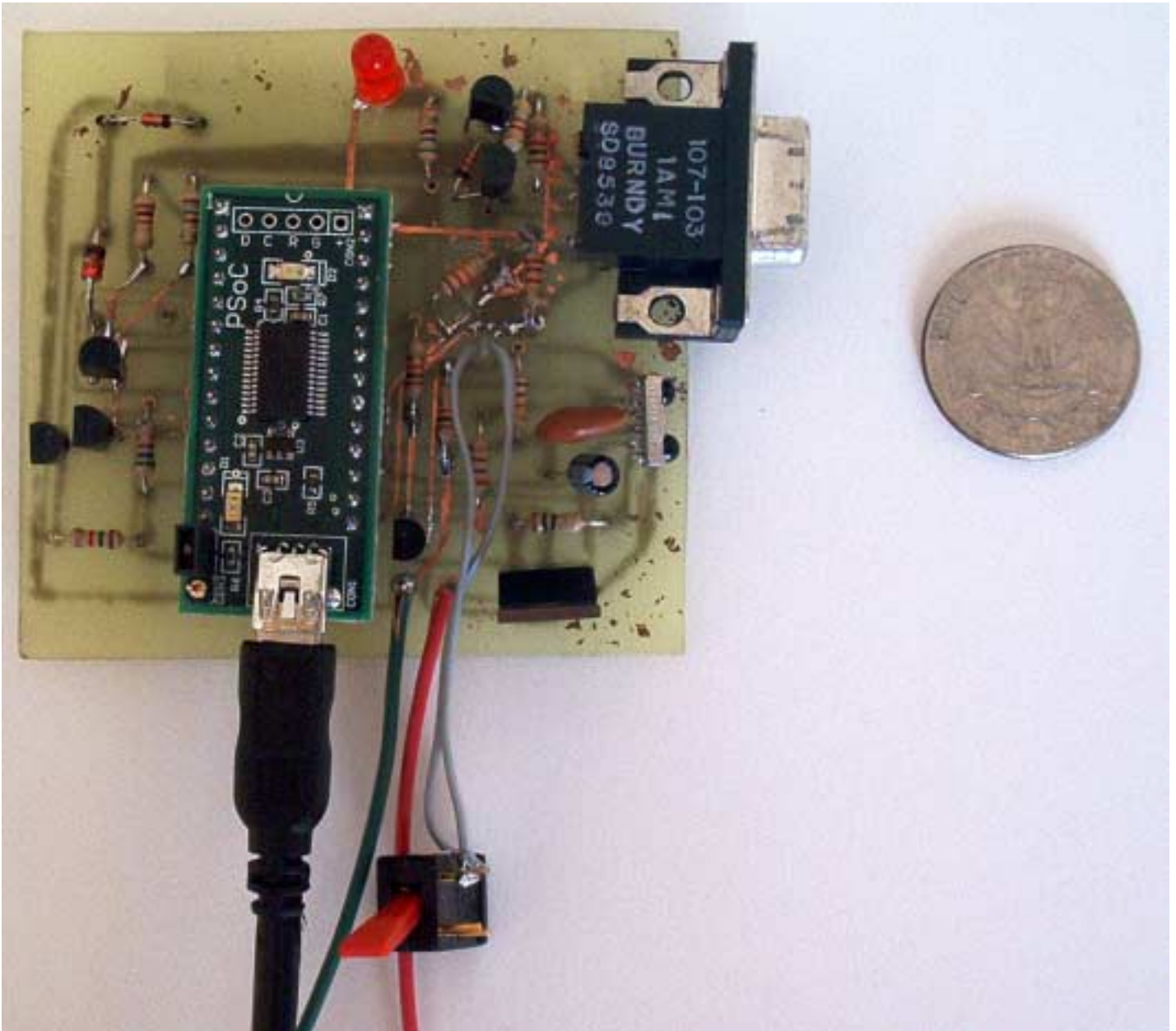


PSoC Based OBD Scanner



The project implements an OBD II diagnostic scanner for cars that use the J1850 VPW OBD II protocol. (All GM cars use the VPW protocol)

United States legislation requires all cars and light trucks model year (MY) 1996 and newer to be OBD-II compliant, which means that the car is equipped with a standard 16pin connector that allows

a “Scan tool” such as this PSoC OBD II reader to read diagnostic data from the engine computer. More information is available on the [EPA's website](#). Most car manufacturers use an SAE standard J1850 to communicate the diagnostic information to external readers (Example: [Actron OBD Scanner](#)). The SAE J1850 Standard supports two main alternatives, a 41.6 Kb/s PWM approach and a 10.4 Kb/s VPW approach. This project implements the J1850 VPW protocol. All GM cars from 1996 onwards use the VPW protocol (GM calls it their class 2 network).

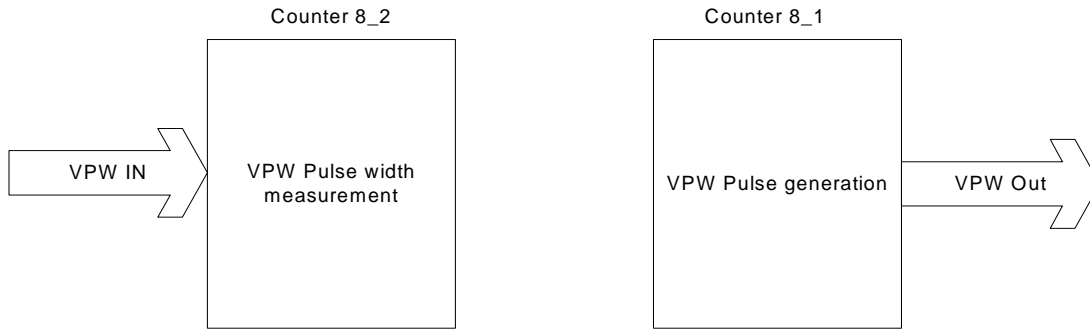
A google search reveals that there are a number of scan tools available to receive OBD II diagnostic data, but most of them are either very expensive or only implement a subset of the functionality presented here.

A PSoC with the huge variety of digital user modules is an ideal platform to implement an OBD scanner; this implementation has a few neat features not found in commercial scanners.

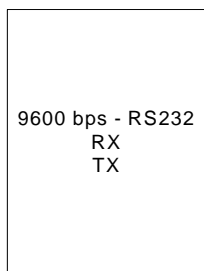
1. Ability to listen in on any messages going over the J1850 bus.
This device can be configured to listen to only the OBD messages or to listen for any messages broadcast over the bus and monitor them. In addition to the diagnostic messages the class II network is also used as a low speed bus to communicate status and state of various subsystems within the car. For example a door unlock signal is sent over this bus to unlock the door, also when you hit seek up / seek down on the steering wheel remote radio controls the event is broadcast over the class II network. My implementation allows one to listen in on these messages. These messages are defined in the SAE 2178 Part B.
2. Ability to switch between IR and RS232 communications
I believe this to be a very unique feature of the scanner. Basically by leveraging the dynamic configurability of the PSoC the scanner can be setup to talk IRDA with a Palm OS powered PDA or talk RS232 over a serial port. A prior circuit cellar contest talks about IR communications using a PSoC but there has been no bi-directional implementation that works in a robust fashion. (Basically most implementations used raw IR). I have managed to show a pseudo IRDA implementation that is robust enough to communicate bidirectionally with a Palm based device and the PSoC.

Block diagram:

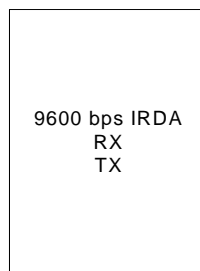
Base Configuration

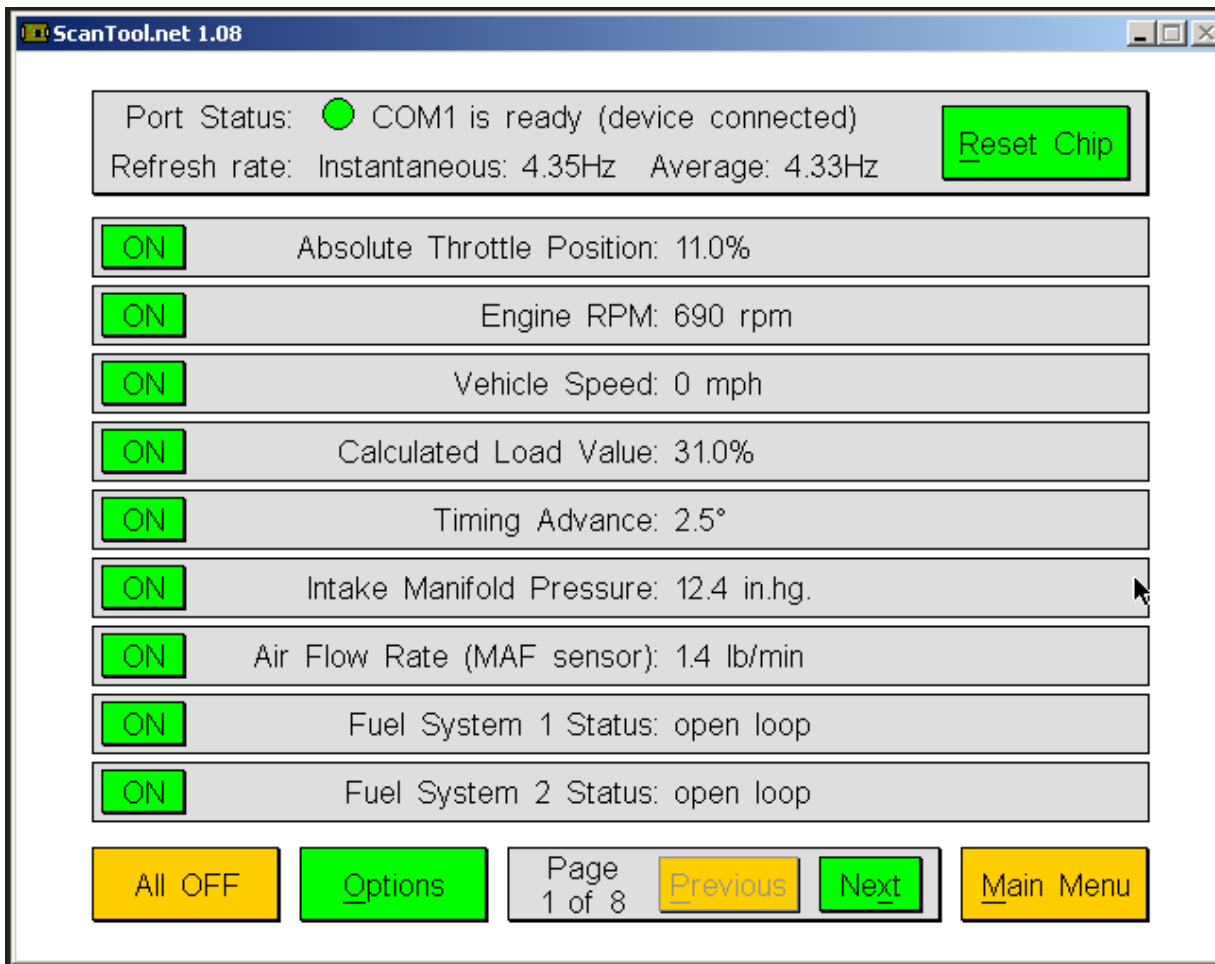


UART User Module



IRDA User Module





Screen Shot of the ScanTool.net software showing sensor readings

