CIRCUIT DIAGRAM DESCRIPTION
Multiple Sensor CAN Vehicle Dashboard using LPC2129

This section describes the complete hardware interconnection
used to draw the circuit in Proteus or EasyEDA.

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1. CAN NETWORK INTERFACE

Microcontroller : LPC2129 (ARM7)
CAN Controller : CAN2
CAN Transceiver : MCP2551

Connections:

LPC2129 P0.23 (CAN2 TXD) ----------> MCP2551 TXD
LPC2129 P0.24 (CAN2 RXD) <---------- MCP2551 RXD

MCP2551 CANH ---------- Twisted Pair ---------- CANH (Node 2)
MCP2551 CANL ---------- Twisted Pair ---------- CANL (Node 2)

Termination:
120 Ohm resistor connected between CANH and CANL
(at both ends of the CAN bus)

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2. ULTRASONIC SENSOR (FUEL LEVEL MEASUREMENT)

Sensor Used : Ultrasonic Module (HC-SR04 equivalent)

Connections:

Ultrasonic TRIG ----------> LPC2129 P0.2 (GPIO Output)
Ultrasonic ECHO <---------- LPC2129 P0.3 (GPIO Input)
Ultrasonic VCC ----------> +5V Supply
Ultrasonic GND ----------> Ground

Function:
Measures fuel level using time-of-flight principle.
Distance value is transmitted over CAN (ID = 0x02).

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3. LDR BASED HEADLIGHT CONTROL

Components:
- LDR
- Fixed Resistor
- Comparator (LM358 / equivalent)
- LED
- 330 Ohm resistor

Connections:

LDR + Resistor Divider ----------> Comparator Input
Comparator Output ----------> LPC2129 P0.14 (EXTINT0)

Headlight Indicator:

LPC2129 P0.19 ----------> LED ---> 330 Ohm ---> GND

Function:
Automatically toggles headlight based on ambient light
using external interrupt (EINT0).
Status sent over CAN (ID = 0x01).

4. LCD DISPLAY (4-BIT MODE)

Display Used : 16x2 Alphanumeric LCD

Data Lines:

LCD D4	---------->	LPC2129 P0.4
LCD D5	---------->	LPC2129 P0.5
LCD D6	---------->	LPC2129 P0.6
LCD D7	---------->	LPC2129 P0.7

Control Lines:

LCD RS	---------->	LPC2129 P0.8
LCD EN	---------->	LPC2129 P0.9
LCD RW	---------->	Ground

Power:

VCC	---------->	+5V
GND	---------->	Ground

Function:
Displays fuel percentage, speed, and headlight status.

5. PWM SPEED SIMULATION

PWM Channel : PWM4

Connection:

LPC2129 P0.8 (PWM4) ----------> Motor Driver / Speed Indicator

Function:
Simulates vehicle speed using PWM duty cycle.
Speed value sent over CAN (ID = 0x03).

END OF CIRCUIT DESCRIPTION