Ford Elm320 Obd Pwm To Rs323 Interpreter 9658 How To Make Your

Ford ELM320 OBD PWM to RS232 Interpreter 9658: A DIY Guide

The Ford ELM320 OBD-II interface, often paired with a MAX232-based RS232 converter like the 9658, opens up a world of possibilities for diagnosing and modifying your vehicle's systems. This article delves into the complexities of using a Ford ELM320 OBD PWM signal and converting it to a usable RS232 signal using a 9658 chip, guiding you through the process of building your own interface. We will cover the process from understanding the underlying protocols to practical implementation and troubleshooting.

Understanding OBD-II, PWM, and RS232

Before diving into the construction, let's clarify the involved technologies. OBD-II (On-Board Diagnostics) is a standardized diagnostic system used in most vehicles manufactured since 1996. It utilizes a communication protocol to relay vehicle data via a 16-pin connector. The ELM320 chip acts as an interpreter, receiving this data—often in Pulse Width Modulation (PWM)—and converting it into a format computers can understand. PWM, itself, represents data as varying pulse widths within a fixed period. This isn't directly compatible with most computer serial ports, hence the need for an RS232 converter. RS232 is a serial communication standard that transmits data as voltage levels, creating a compatible interface for your computer. The 9658 chip, a popular

MAX232 replacement, performs this crucial voltage level conversion. Understanding these three components – **OBD-II protocol**, **PWM signal interpretation**, and **RS232 conversion** – is essential for success.

Benefits of Building Your Own OBD-II Interface

Building your own OBD-II interface using the Ford ELM320 and a 9658 offers several advantages over purchasing a pre-built solution:

- **Cost Savings:** Components are significantly cheaper than pre-assembled interfaces.
- **Customization:** You have complete control over the design and features.
- **Learning Experience:** It provides valuable hands-on experience with electronics, microcontrollers, and communication protocols.
- **Troubleshooting Skills:** Building your interface hones your troubleshooting skills, essential for understanding OBD-II systems.
- **Improved Understanding:** The process deepens your understanding of the OBD-II protocol and its interactions with your vehicle's computer.

Building Your Ford ELM320 OBD to RS232 Interface

This section details the process of creating the interface. Remember, working with electronics requires caution. Always double-check your wiring before applying power.

Materials Required:

- Ford ELM320 OBD-II interface chip
- 9658 RS232 level converter chip
- 16-pin OBD-II connector (male)
- DB9 serial connector (female)
- Resistors (values will depend on the specific 9658 chip

datasheet)
- Capacitors (values will depend on the specific 9658 chip datasheet)
- Breadboard or PCB
- Jumper wires
- Power supply (5V DC)

Step-by-Step Instructions:

1. **Consult the Datasheets:** Thoroughly review the datasheets for both the ELM320 and the 9658. These provide pinouts, voltage requirements, and other crucial information.

2. **Wiring the ELM320:** Connect the ELM320 to the OBD-II connector according to its datasheet.

3. **Wiring the 9658:** Connect the 9658 according to its datasheet, paying close attention to the power supply connections and the connections to the ELM320's serial output pins.

4. **Connect to the DB9:** Wire the output pins of the 9658 to the DB9 connector, ensuring correct pin assignments for TXD and RXD.

5. **Test the Connection:** Connect the interface to your vehicle's OBD-II port and to your computer's serial port (or a USB-to-serial adapter).

6. **Software Setup:** Use appropriate OBD-II software (like ScanGauge, for example) to communicate with your vehicle.

Note: The exact wiring will vary depending on the specific versions of the ELM320 and 9658 chips used. Always refer to the respective datasheets for precise pin assignments.

Troubleshooting Your OBD-II Interface

Common problems include incorrect wiring, power supply issues, or software incompatibilities. Methodically check each component and connection. Use a multimeter to verify voltage levels and signal continuity. Ensure your software is compatible with the ELM320 and configured for the correct serial port. If problems persist, consider consulting online forums or OBD-II expert

communities for further assistance. Remember, patience and methodical troubleshooting are key.

Conclusion

Building a custom OBD-II interface using a Ford ELM320 and a 9658 converter offers a rewarding experience, combining electronics, automotive technology, and software development. While the initial setup may seem challenging, the process empowers you with a deeper understanding of vehicle diagnostics and control systems. Through careful planning, precise wiring, and diligent troubleshooting, you can create a functional and cost-effective interface tailored to your needs.

FAQ

Q1: What is the difference between the ELM320 and other OBD-II interfaces?

A1: The ELM320 is a specific OBD-II microcontroller with certain characteristics. Other chips may offer different features or capabilities, impacting compatibility with various vehicles and software.

Q2: Can I use a different RS232 converter chip instead of the 9658?

A2: Yes, other MAX232-compatible chips can work, but ensure they meet the voltage and current requirements of the ELM320. You'll need to adjust the wiring accordingly, based on the alternative chip's datasheet.

Q3: My computer doesn't have a serial port. What should I do?

A3: You'll need a USB-to-serial adapter. These are readily available and provide a connection between your computer's USB port and the DB9 connector of your interface.

Q4: The software doesn't recognize the interface. What are the common reasons?

A4: This is often caused by incorrect wiring, a faulty connection, incorrect serial port selection in the software, or driver issues. Check all wiring and connections, ensure the correct COM port is selected, and verify that your operating system has the necessary drivers for the USB-to-serial adapter (if used).

Q5: What kind of software can I use with this interface?

A5: Various OBD-II software packages are available, both free and commercial. Some popular choices include ScanGauge, Torque Pro (for Android), and others. Choose software compatible with the ELM320 chip.

Q6: Is it safe to connect this interface to my vehicle's OBD-II port?

A6: Provided the wiring is correct and you follow safety precautions, it's generally safe. However, improper use or modifications could potentially damage your vehicle's electronic systems. Always double-check your work.

Q7: Can I use this setup to modify my vehicle's parameters?

A7: Potentially, depending on the vehicle and the software used. Modifying vehicle parameters improperly can cause serious damage or create safety hazards. Only attempt such modifications if you have the necessary knowledge and expertise, understanding the potential risks.

Q8: Where can I find the datasheets for the ELM320 and 9658 chips?

A8: Datasheets are usually available from the manufacturers' websites or through online electronics component distributors. Searching online using the chip's name and "datasheet" will usually yield the desired results. Ensure you are using the correct version number when searching.

Decoding the Ford ELM320: Building

Your OBD PWM to RS232 Interpreter (9658)

This tutorial delves into the challenging world of automotive diagnostics, specifically focusing on the creation of a custom OBD-II interface using a Ford ELM320 chip and a MAX9658 RS232 transceiver. We'll investigate the practical aspects of this endeavor, providing a comprehensive approach for enthusiasts looking to achieve a deeper knowledge of their vehicle's systems.

The Ford ELM320 is a popular selection for OBD-II communication due to its affordability and extensive support. However, the ELM320 generates data using Pulse Width Modulation (PWM), which isn't directly usable with most computers. This is where the MAX9658 comes into play. This integrated circuit transforms the PWM signal from the ELM320 into a standard RS232 serial data stream that your computer can seamlessly understand. This allows you to obtain a wealth of diagnostic data about your vehicle's functionality.

Understanding the Components:

- **Ford ELM320:** This chip acts as the core of the OBD-II interface. It interprets data from the vehicle's OBD-II connector and processes it according to the commands sent by your computer.
- **MAX9658:** This is a crucial component for data translation. It converts the PWM signal from the ELM320 into a serial RS232 signal, bridging the gap between the OBD-II system and your computer.
- **Supporting Components:** You'll also need a prototype board, capacitors, wires, and a voltage regulator to energize the circuit.

Building the Interface: A Step-by-Step Guide:

1. **Circuit Design:** Create a schematic diagram depicting the wiring between the ELM320, MAX9658, and other parts. Pay close attention to the pinouts of each chip and follow the supplier's datasheets carefully.

2. **Component Sourcing:** Gather all the required components. Reputable online retailers are your best options.

3. **Circuit Assembly:** Carefully build the circuit on your chosen platform. Verify all connections to avoid errors.

4. **Software Configuration:** You'll need appropriate software on your computer to interact with the RS232 port. Many open-source applications are available for this purpose. Configure the software to match the baud rate and other settings of the MAX9658.

5. **Testing and Calibration:** After assembly, assess the interface by connecting it to your vehicle's OBD-II port and attempting to retrieve data using your chosen software. Troubleshooting any issues may require careful examination of the circuit and software configurations.

Advanced Considerations:

This undertaking can be further enhanced by incorporating features like a power indicator LED, a robust power supply, and a housing for the circuit. Advanced users might explore programming custom data analysis routines to access specific data points from the vehicle's systems.

Conclusion:

Constructing a custom OBD-II interface using a Ford ELM320 and a MAX9658 RS232 converter is a fulfilling experience that grants a deeper insight of automotive electronics and diagnostic systems. While the process requires dedication and a basic knowledge of electronics, the rewards – access to a wealth of vehicle data – are certainly valuable.

Frequently Asked Questions (FAQ):

1. **Q: What software is recommended for communicating with the ELM320?**

A: Several options exist, including free and open-source software like ScanTool.net, and commercial options like Torque Pro (for mobile devices). The choice depends on your needs and operating system.

2. **Q: Can I use other RS232 converters instead of the MAX9658?**

A: Yes, other RS232 transceivers can be used, but ensure they are compatible with the ELM320's PWM output and your computer's RS232 (or USB-to-RS232) interface. Check datasheets carefully.

3. **Q: What happens if I wire the components incorrectly?**

A: Incorrect wiring can damage the components, your computer, or even your vehicle's onboard systems. Always double-check your wiring and refer to the datasheets before connecting anything.

4. **Q: Is this project suitable for beginners?**

A: While feasible for beginners with some basic electronics knowledge, it's recommended to start with simpler projects first to build confidence and understanding. Careful attention to detail is crucial.

5. **Q: Where can I find detailed datasheets for the ELM320 and MAX9658?**

A: Datasheets for these chips and other electronic components are usually available on the manufacturers' websites or from reputable electronic component distributors.

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