

FT232RL Breakout Module

FTDI FT232RL USB to TTL 6-Pin 5V Module User Manual

Model: FT232RL Breakout Module | Brand: Generic

1. PRODUCT OVERVIEW

The FTDI FT232RL USB to TTL 6-Pin 5V Module is a compact breakout board designed to provide a USB to serial TTL interface. It is commonly used for programming microcontrollers, debugging serial communication, and uploading code to devices that require a 3.3V or 5V TTL serial connection. The module features the FT232RL chip, which handles the USB to serial conversion, offering reliable and stable communication.

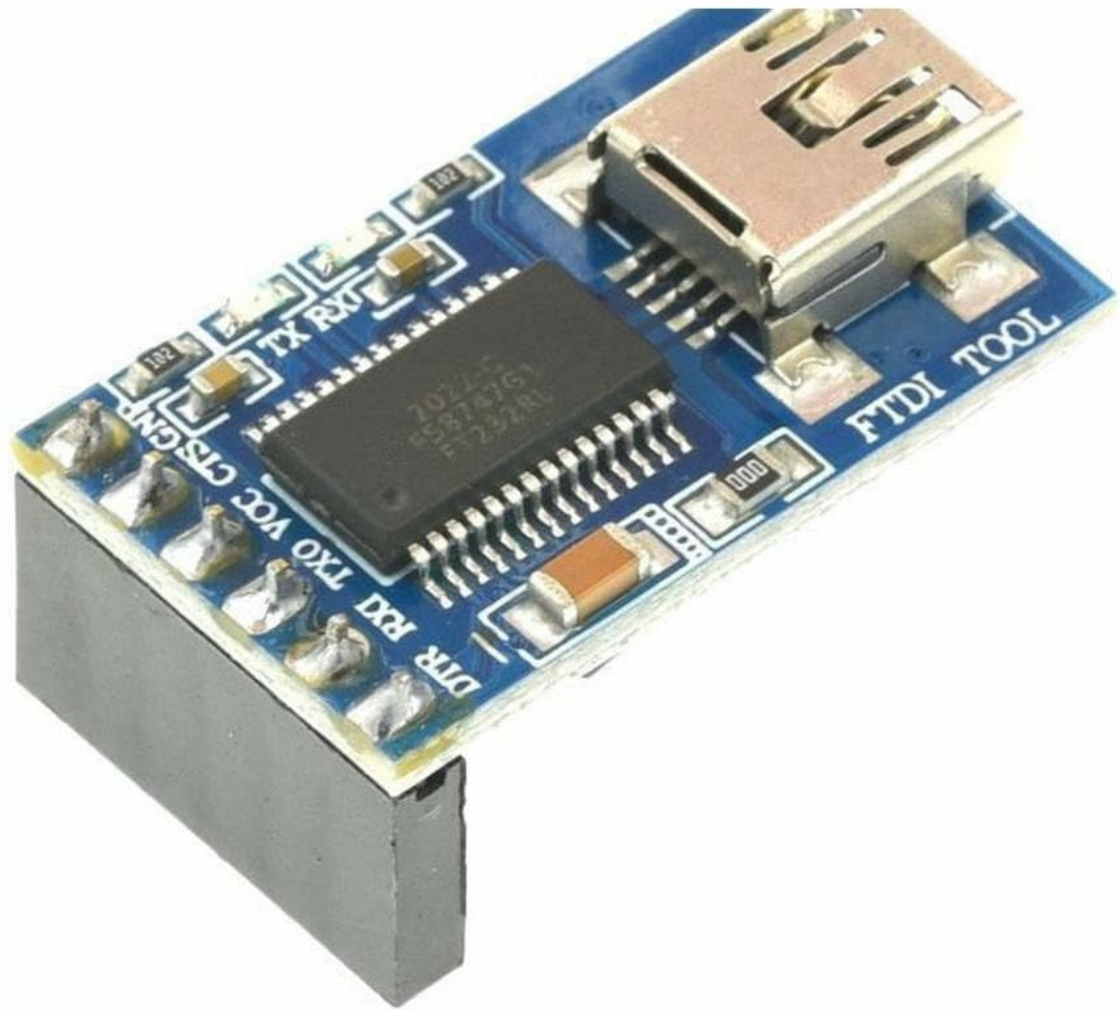


Figure 1: Top view of the FTDI FT232RL USB to TTL 6-Pin 5V Module, showing the USB connector and the FT232RL chip.

2. SAFETY INFORMATION

- Always handle the module with care to avoid physical damage.
- Observe proper electrostatic discharge (ESD) precautions when handling the module to prevent damage to sensitive electronic components.
- Ensure correct voltage (5V) and pin connections before powering on to prevent damage to the module or connected devices.
- Do not expose the module to moisture, extreme temperatures, or corrosive environments.
- Disconnect power before making or changing connections.

3. SETUP

3.1 Driver Installation

The FTDI FT232RL module requires specific drivers to function correctly on your computer. These drivers are typically available from the official FTDI website. Follow these steps:

1. Visit the official FTDI website (www.ftdichip.com/Drivers/VCP.htm) to download the latest Virtual COM Port (VCP) drivers for your operating system (Windows, macOS, Linux).
2. Follow the installation instructions provided by FTDI for your specific OS. For most systems, running the installer executable will suffice.
3. After installation, connect the FTDI module to your computer's USB port. The system should automatically detect the device and assign a COM port.
4. Verify the installation by checking Device Manager (Windows) or equivalent system tools to confirm the FTDI device is recognized and assigned a COM port.

3.2 Hardware Connection

Connecting the FTDI module to your target device requires careful attention to the pinout. The module provides 6 pins for serial communication and power. Ensure that the voltage level (3.3V or 5V) is correctly selected on the module if applicable, to match your target device's requirements.

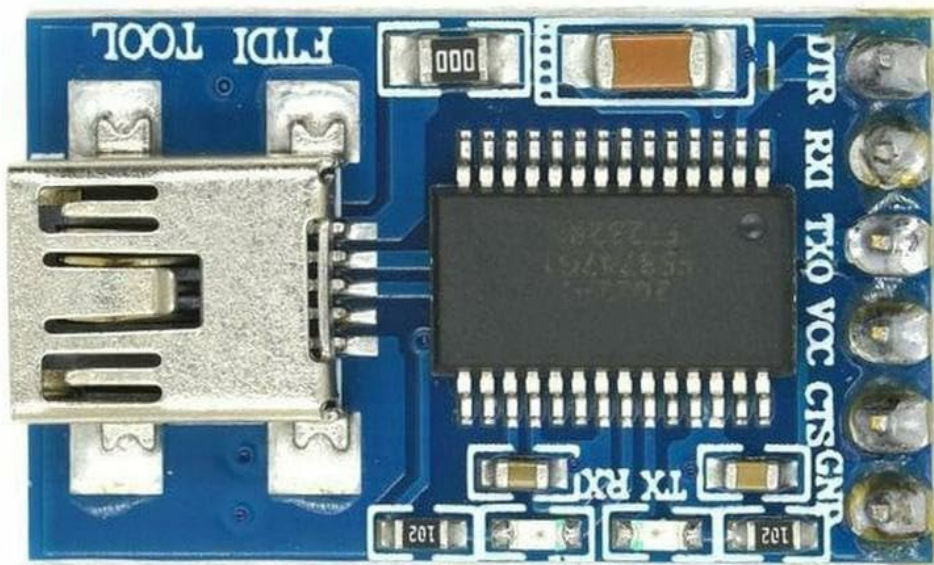


Figure 2: Top view of the FTDI FT232RL module showing the pin labels for connection.

Typical connections are as follows:

- **GND:** Connect to the ground of your target device.
- **VCC:** Provides power to the target device (typically 5V, or 3.3V if selected). Connect to the VCC/power input of your target device.
- **TXO (Transmit Out):** Connect to the RX (Receive) pin of your target device.
- **RXI (Receive In):** Connect to the TX (Transmit) pin of your target device.
- **DTR (Data Terminal Ready):** Often used for automatic reset of microcontrollers like Arduino.
- **CTS (Clear To Send):** Used for hardware flow control.

Important: Always cross-connect TX to RX and RX to TX between the module and the target device. Ensure the voltage level is compatible with your target device to prevent damage.

4. OPERATING INSTRUCTIONS

4.1 Basic Operation

Once the drivers are installed and the module is connected to your computer and target device, you can use any serial terminal program (e.g., PuTTY, Arduino IDE Serial Monitor, Tera Term) to communicate. Configure the serial port settings (baud rate, data bits, parity, stop bits, flow control) to match those of your target device.

For programming microcontrollers, select the appropriate COM port in your IDE or programming software (e.g., Arduino IDE, ESP-IDF) and proceed with the upload process. The DTR pin is often crucial for initiating the bootloader on many microcontrollers.

4.2 Pinout Description

Pin Name	Description
DTR	Data Terminal Ready. Output from the FTDI chip, often used for auto-reset.
RXI	Receive Data Input. Connects to the TX pin of the target device.
TXO	Transmit Data Output. Connects to the RX pin of the target device.
VCC	Voltage Common Collector. Power output (typically 5V or 3.3V selectable).
CTS	Clear To Send. Input to the FTDI chip, used for hardware flow control.
GND	Ground. Common ground connection.

5. MAINTENANCE

- Keep the module clean and free from dust and debris. Use a soft, dry cloth for cleaning.
- Store the module in a dry, cool environment when not in use.
- Avoid bending or stressing the pins or the USB connector.
- Regularly check for driver updates from the FTDI website to ensure optimal performance and compatibility.

6. TROUBLESHOOTING

- **Module Not Recognized by Computer:**

- Ensure FTDI drivers are correctly installed. Try reinstalling them.
- Try a different USB port on your computer.
- Test with a different USB cable.
- Check Device Manager for any error symbols next to the FTDI device.

- **No Serial Communication:**

- Verify that TXO on the module is connected to RX on the target device, and RXI on the module is connected to TX on the target device.
- Ensure the GND pins of both the module and the target device are connected.
- Confirm that the baud rate and other serial settings in your terminal program match those of the target device.
- Check that the VCC voltage supplied by the module (5V or 3.3V) is compatible with your target device.
- If using hardware flow control (CTS/RTS), ensure it is correctly configured or disabled if not needed.

- **Target Device Not Programming/Uploading:**

- Ensure the DTR pin is correctly connected and functioning if your target device requires it for auto-reset during programming.
- Verify the target device is in programming mode or its bootloader is active.
- Check for correct board and port selection in your programming IDE.

7. SPECIFICATIONS

Feature	Detail
Product Name	FTDI FT232RL USB to TTL 6-Pin 5V Module
Chipset	FT232RL
Interface	USB to TTL Serial
Output Voltage	5V (and typically 3.3V selectable via jumper/switch, depending on specific board design)
Pins	DTR, RXI, TXO, VCC, CTS, GND
Hardware Interface	USB
Manufacturer	Generic
ASIN	B0CP781KL2
Date First Available	November 30, 2023

8. WARRANTY AND SUPPORT

This product is provided by a third-party seller. For specific warranty information or technical support, please refer to the seller's policies or contact the seller directly through the platform where the product was purchased. General support for the FTDI chip and drivers can be found on the official FTDI website.

