RS232 to 3.3V/5V TTL Isolated Serial Converter

Please read the product manual carefully before using the product.

I. Product Description

This industrial-grade RS232 to TTL isolated serial module delivers bidirectional, transparent data conversion between RS232 and 3.3V/5V TTL serial interfaces. Utilizing a charge-pump power-stealing design, it operates reliably without the need for an external power supply. The module features wide-ranging baud rate adaptation, multi-stage protection circuits, high compatibility, and robust anti-interference capabilities, effectively resolving signal adaptation issues between devices with different voltage levels. Engineered for seamless deployment in industrial control, smart metering, MCU development, and automation equipment, this wiring-free and easy-to-install solution ensures stable and dependable serial communication.

II. Specifications

1. Serial Communication Parameters

(1) Baud Rate: 300 bps to 256,000 bps, adaptable to both high-speed and low-speed serial communication scenarios.

(2) Data Bits: Supports 7-bit and 8-bit configurations.

(3) Parity: Full coverage of five modes: Even, Odd, None, Mark, and Space.

(4) Stop Bits: Supports 1 or 2 stop bits.

(5) TTL Level: Standard TTL logic levels, compatible with mainstream TTL serial devices.

2. Power Supply Parameters

(1) Operating Mode: Serial bus power-stealing; eliminates the need for an external DC power supply (supports auxiliary DC power input in case of insufficient bus power).

(2) Reverse Polarity Protection: Built-in reverse-polarity and miswiring protection circuits on signal terminals to prevent module damage from wiring errors.

3. Protection Performance

(1) ESD Protection (IEC 61000-4-2): ± 15 kV Contact Discharge, ± 20 kV Air-Gap Discharge, defending against various electrostatic shocks.

(2) Surge Protection: TTL ports support up to 600W surge protection to suppress instantaneous high-voltage pulse interference.

(3) Isolation Rating: 2500 Vrms impulse or 500 VDC continuous isolation.

III. Pin Definitions and Wiring Instructions

RS232 Interface (DB9 Female Connector)

Pin	Pinout	Description
1	DCD	NC
2	TXD	Transmit Data
3	RXD	Receive Data
4	DTR	NC
5	GND	RS232 Signal Ground
6	DSR	NC
7	RTS	Request to Send
8	CTS	Clear to Send
9	RI	NC

TTL Interface (DB9 Male Connector)

Pin	Pinout	Description
1	TXD	Isolated TTL Data Transmit Output
2	RXD	Isolated TTL Data Receive Input
3	NC	/
4	NC	/
5	GND	Power Supply Ground
6	I_GND	Isolated TTL Signal Ground Input
7	NC	/
8	NC	/
9	5-24 VDC Power Supply	Power Supply Input

Terminal Block Definitions

No.	Pinout	Description
1	TXD	Isolated TTL Data Transmit Output
2	RXD	Isolated TTL Data Receive Input
3	I_GND	Isolated TTL Signal Ground Input
4	VCC	Power Supply Input
5	GND	Power Supply Ground

1. Serial Parameter Configuration

Users can configure the corresponding serial parameters through a host computer or serial debugging tools based on the specifications of the connected device. The core configuration rules are as follows:

(1) Baud Rate: Selectable from 300 to 256,000 bps; 9600 bps and 115,200 bps are commonly used.

(2) Data Bits: 7-bit or 8-bit (8-bit is the industrial default).

(3) Parity: "None" is standard for general use; Even or Odd parity can be selected for high-precision communication; Mark or Space parity is available for specialized scenarios.

(4) Stop Bits: 1 stop bit is standard for general use; 2 stop bits can be selected for long-distance, low-speed communication.

2. Operating Steps

(1) Wiring under Power-Off Condition: Power off all equipment before wiring, and verify that all connections are correct.

(2) Powering Up and Communication: No external power supply is required under standard conditions. Once wiring is complete, simply power up the host system to begin communication (if the module fails to operate normally due to insufficient bus power, an external power supply must be connected).

(3) Parameter Matching: Configure the serial parameters of the devices on both ends to ensure they match exactly.

(4) Initiating Communication: Start the communication sequence; the module will automatically execute bidirectional, transparent signal conversion.

V. Troubleshooting

Symptom	Possible Cause	Remedy
No response upon power-up	Loose connection, miswiring, or insufficient signal amplitude.	Check the wiring; ensure normal signal output from the equipment's serial port; re-tighten all connections.
No data communication	Mismatched serial parameters, reversed TX/RX connections, or devices not sharing a common ground.	Unify serial parameters (such as baud rate); swap the transmit (TX) and receive (RX) lines; connect a common ground line.
Garbled data / Packet loss	Incorrect parameter settings, electromagnetic interference (EMI), or poor physical contact in wiring.	Recalibrate/verify parameters; keep the device away from interference sources.
Failure to operate under bus power	Insufficient power-stealing from the RS232 charge pump, causing the module to function abnormally.	An external DC power supply ranging from 5–24V must be connected to the product's power interface.

VI. Applications

This module is ideal for applications requiring bidirectional transparent level conversion between RS232 and TTL, utilizing serial bus power-stealing to eliminate the need for external power (while supporting auxiliary external power if necessary). Featuring a simple 3-wire deployment (TX/RX/GND) for plug-and-play operation, it seamlessly interfaces legacy sensors, smart meters, PLCs, and access control systems with mainstream MCU development boards such as STM32 and ESP32. It effectively supports data acquisition, firmware flashing/debugging, and wireless module integration. Designed with a wide operating temperature range and robust ESD protection, its compact form factor is perfectly suited for dense installations inside industrial control cabinets and outdoor monitoring sites.

VII. Precautions

(1) Bus Power Limitation: This module features a bus-powered (power-stealing) design. If it fails to operate normally, an external power supply must be connected.

(2) Power-Off Operation Required: All wiring, plugging, and unplugging operations must be performed under power-off conditions. Live-line operation is strictly prohibited.

(3) Voltage Level Compatibility: The TTL port is compatible only with 3.3V or 5V logic level devices (depending on the specific model purchased). Connecting to devices with other voltage levels is prohibited.

(4) Hazardous Environments Prohibited: Use of this device is strictly prohibited in harsh environments, including those with condensation, corrosive gases, flammable or explosive substances, dust, or high humidity.

(5) Storage Guidelines: If the device is left idle for an extended period, it must be powered off and stored in a dry, well-ventilated environment.

(6) No Unauthorized Disassembly: Unauthorized disassembly of the module is strictly forbidden. Tampering with or breaking the enclosure will void the warranty.

Product Warranty Card

Customer Information

Model:	
Date of purchase:	
User telephone:	
User address:	
Distributor:	
Agency address:	
User telephone:	Dealer stamp valid

Intenance Records

Repair times	Date	Fault	Treatment measures	Repair with NO.

Electronic products are guaranteed for one year, and other products are guaranteed for two years. Damage caused by human factors or product burnout caused by improper operation is not included in the scope of warranty.