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EBYTE E34-DTU-2G4D20

EBYTE E34-DTU-2G4D20 2.4GHz Wireless Transceiver User Manual

Model: E34-DTU-2G4D20 | Brand: EBYTE

1. INTRODUCTION

The EBYTE E34-DTU-2G4D20 is a robust 100mW wireless data transceiver operating in the 2.4GHz to 2.518GHz frequency band. It facilitates data transmission and reception via RS232 and RS485 serial ports, simplifying wireless application integration. This module is engineered for high-speed, full-duplex communication, supporting simultaneous bidirectional data flow and file transfers. It features data encryption and compression to enhance security and transmission efficiency. Designed for industrial environments, the E34-DTU-2G4D20 operates within a wide voltage range of 8V to 28V and adheres to international design specifications including FCC, CE, and CCC.

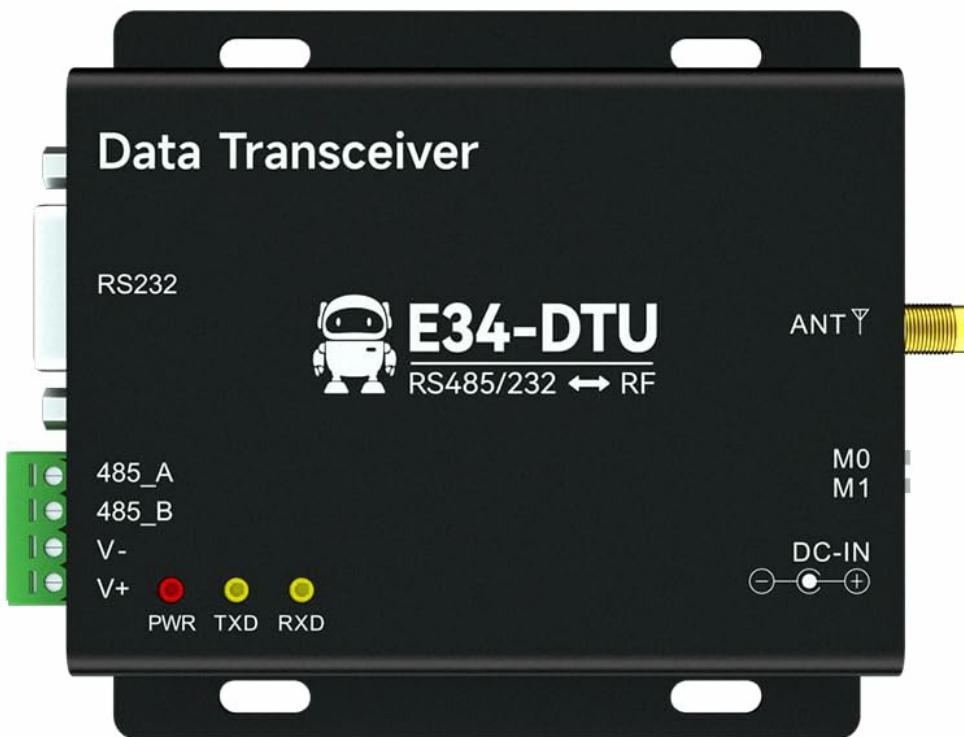


Figure 1: Front view of the EBYTE E34-DTU-2G4D20 wireless data transceiver, showing RS232, RS485, DC-IN, and antenna ports.

2. KEY FEATURES

- **Reliable nRF24L01P+ Chip:** Utilizes original nRF24L01P+ chips for enhanced reliability and performance.
- **High Performance:** Features 100mW (20dBm) transmit power, meeting European industrial standards.
- **Industrial Grade Durability:** Equipped with temperature compensators for frequency stability ($\pm 1.5\text{PPM}$) and an operating temperature range of -40°C to $+85^\circ\text{C}$.
- **Robust Design:** Housed in an aluminum alloy case for excellent heat dissipation, shielding, electromagnetic compatibility, and strong anti-interference capabilities.
- **Protection Features:** Includes power reverse, overload protection, and antenna surge protection to improve system reliability.
- **Configurable Parameters:** Allows programming of parameters such as transmit power, frequency, air data rate, and address.
- **Full-Duplex Communication:** Supports simultaneous bidirectional data transmission at high baud rates.
- **Data Security:** Incorporates data encryption and compression for secure and efficient data transfer.



Figure 2: Angled view of the E34-DTU-2G4D20, highlighting its compact design and robust casing.

3. TECHNICAL SPECIFICATIONS

Parameter	Value
Frequency Range	2.4 GHz to 2.505 GHz
Transmit Power	20 dBm (100 mW)
Transmission Distance	Up to 2.0 km (line of sight)
Interface	RS232 / RS485
Supply Voltage	8V to 28V DC
Operating Temperature	-40°C to +85°C

Parameter	Value
Frequency Stability	±1.5 PPM
Manufacturer	EBYTE
Model	E34-DTU-2G4D20

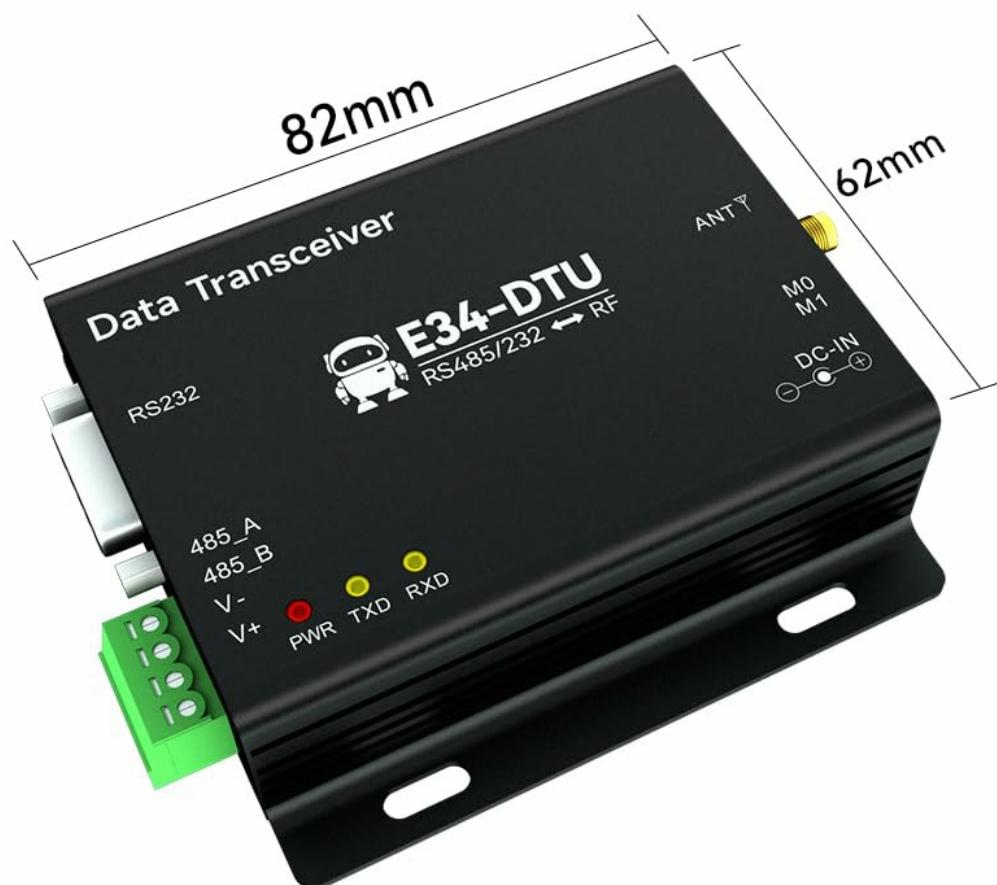


Figure 3: Physical dimensions of the E34-DTU-2G4D20 module.

4. SETUP AND INSTALLATION

Follow these steps to set up your E34-DTU-2G4D20 wireless transceiver:

- 1. Connect Data Interface:** Connect the E34-DTU-2G4D20 to your PC, PLC, or RTU using either the RS232 or RS485 interface. Ensure proper wiring for the selected serial communication standard.
- 2. Attach Antenna:** Connect a 50Ω antenna or a dummy load to the ANT port on the transceiver. A suitable antenna is crucial for optimal wireless performance.

3. **Power Supply:** Provide power to the module via the DC-IN port. The module accepts a voltage range of 10V to 28V DC. You can use a regulated power supply or a compatible power adapter.
4. **Driver Installation (if required):** If connecting to a PC, download and install the necessary drivers from the EBYTE official website to ensure proper recognition of the serial port.
5. **Initial Testing (Optional):** For quick verification of functionality, use a serial port debugging assistant software.
 - Download and install a serial port debugging assistant.
 - Connect the radio, antenna, and power supply to your computer.
 - Open the debugging assistant, select the corresponding serial port number, and configure it to send and receive test data.

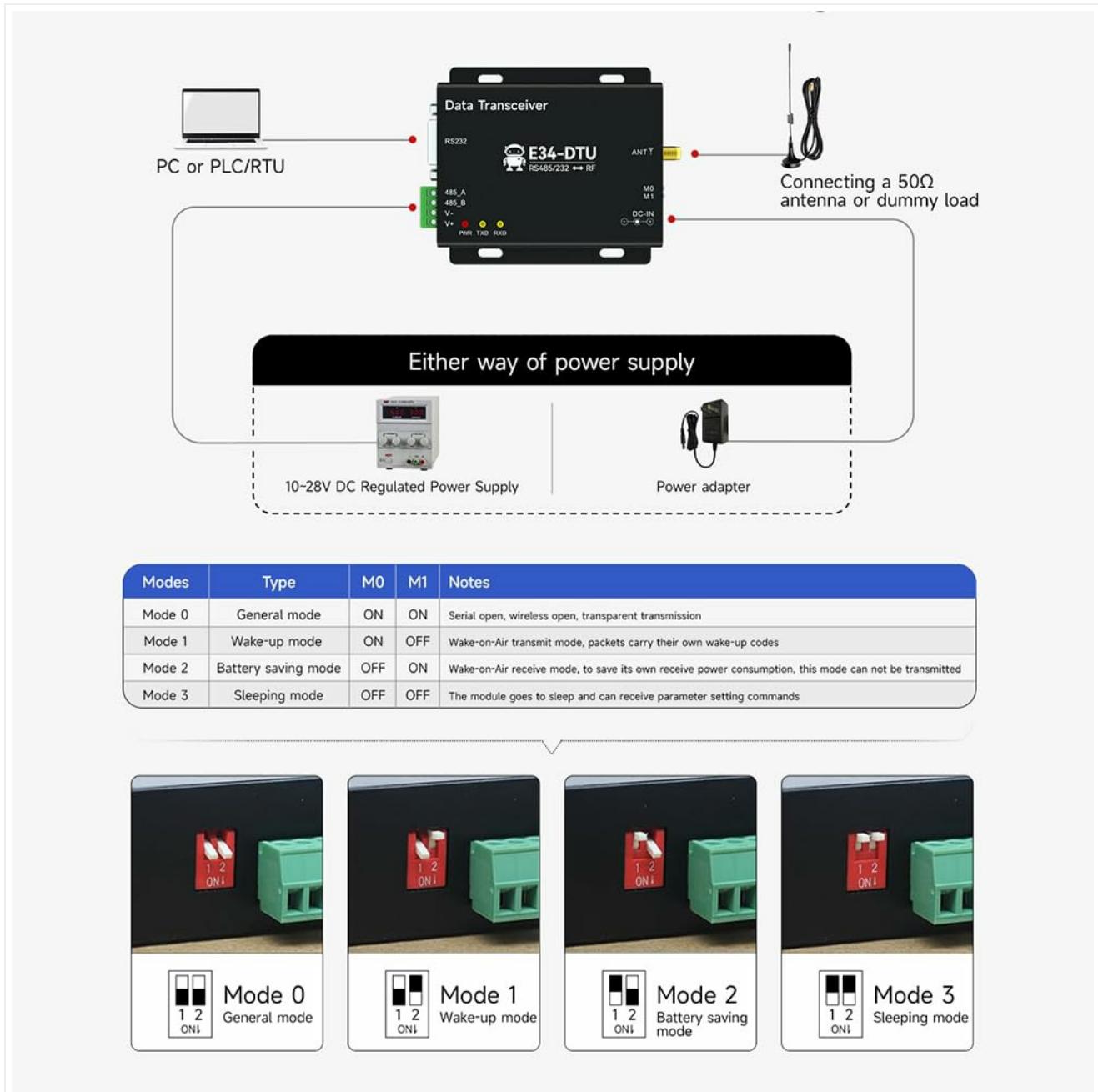
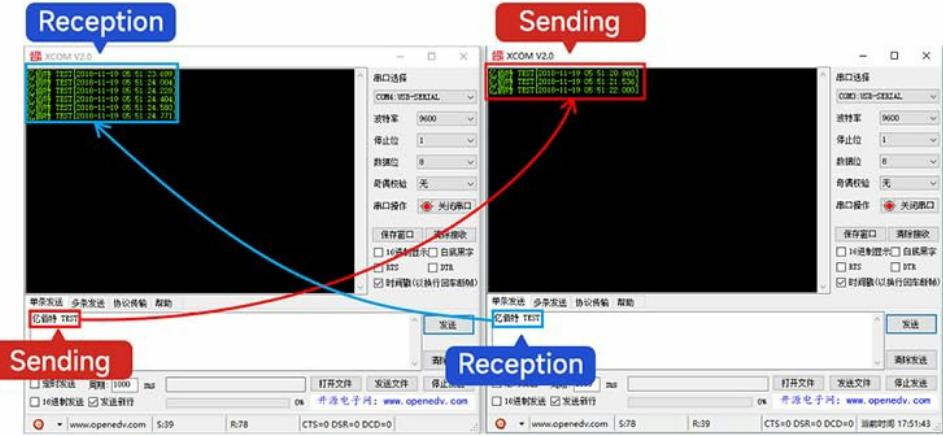


Figure 4: Connection diagram illustrating how to connect the E34-DTU-2G4D20 to a PC/PLC/RTU, antenna, and power supply.

Quick Visualization Tests



Visualization testing in three steps

1. Connect the radio, antenna and power supply and plug it into the computer
2. Download the driver from the official website and install it to your computer successfully
3. Open the serial port debugging assistant (downloaded from the official website), select the corresponding serial port number and set it to complete the data sending and receiving test

Figure 5: Screenshot demonstrating quick visualization tests for data reception and sending using serial port software.

5. OPERATING MODES

The E34-DTU-2G4D20 supports various operating modes, configurable via the M0 and M1 pins (typically DIP switches or jumpers). Understanding these modes is crucial for optimal performance in different applications.

Mode	M0	M1	Description
Mode 0: General Mode	ON	ON	Standard operating mode for serial open, wireless open, and transparent data transmission.
Mode 1: Wake-up Mode	ON	OFF	Wake-on-Air transmit mode. Packets include wake-up codes to activate receiving modules.
Mode 2: Battery Saving Mode	OFF	ON	Wake-on-Air receive mode. Designed to save power by only receiving data when woken up. This mode does not support transmission.

Mode	M0	M1	Description
Mode 3: Sleeping Mode	OFF	OFF	The module enters a low-power sleep state. It can still receive parameter setting commands.

Full-Duplex High-Speed Transmission Air Rate Auto Adaptation Baud Rate

Supports full-duplex feature (simultaneous transmitting and receiving in both directions) at the highest baud rate of 115200

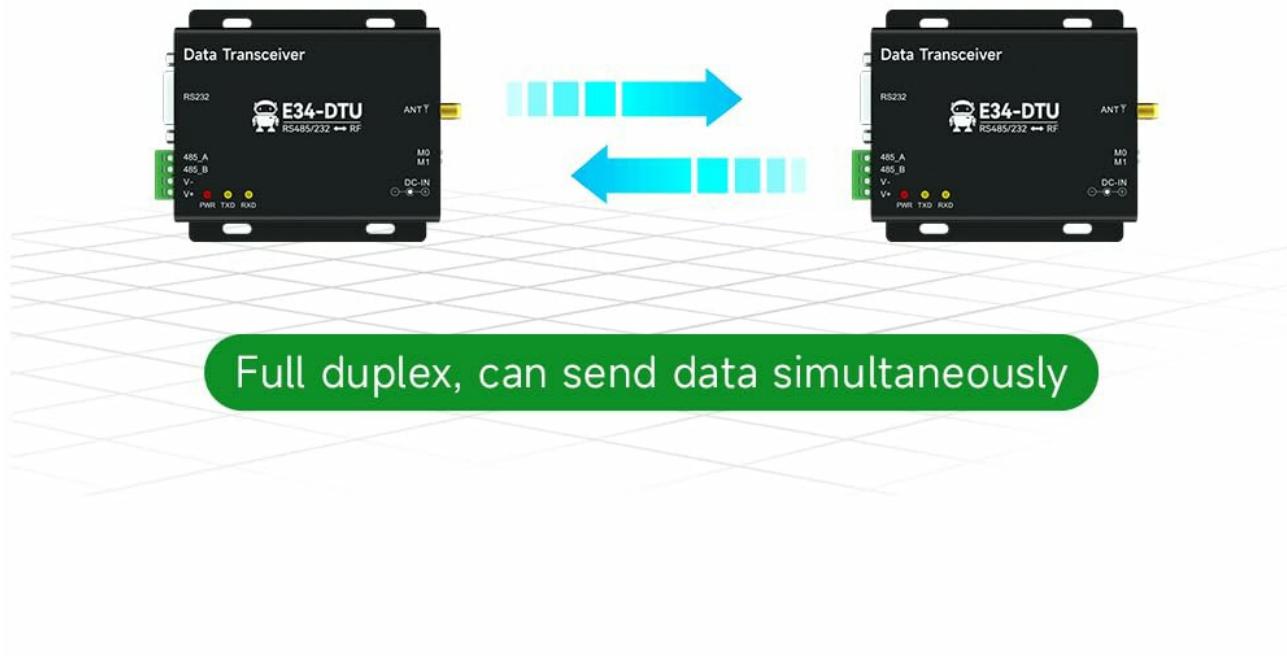


Figure 6: Illustration of full-duplex high-speed transmission, showing simultaneous data flow between two E34-DTU modules.

6. MAINTENANCE

To ensure the longevity and optimal performance of your E34-DTU-2G4D20 transceiver, consider the following maintenance guidelines:

- **Environmental Conditions:** Operate the module within its specified temperature and humidity ranges. Avoid exposure to extreme temperatures, direct sunlight, or high moisture.
- **Cleanliness:** Keep the module free from dust and debris. Use a soft, dry cloth for cleaning. Do not use liquid cleaners or solvents.
- **Connections:** Periodically check all cable connections (RS232/RS485, antenna, power) to ensure they are

secure and free from damage.

- **Antenna Care:** Ensure the antenna is properly installed and not obstructed. Avoid bending or damaging the antenna.
- **Power Supply:** Use only power supplies that meet the specified voltage and current requirements to prevent damage.

7. TROUBLESHOOTING

If you encounter issues with your E34-DTU-2G4D20, refer to the following common troubleshooting steps:

- **No Power:**
 - Verify the power supply is connected correctly and providing the specified voltage (8V-28V DC).
 - Check the power cable for any damage.
 - Ensure the power source is active.
- **No Data Transmission/Reception:**
 - Confirm that the RS232 or RS485 connections are secure and correctly wired.
 - Check the antenna connection and ensure it is a 50Ω antenna.
 - Verify that both transceivers are configured to the same frequency, air data rate, and address.
 - Ensure the operating mode (M0, M1 settings) is appropriate for your application (e.g., not in sleeping mode if expecting to transmit).
 - Check the serial port settings (baud rate, parity, data bits, stop bits) in your software to match the module's configuration.
 - For PC connections, ensure the correct serial port driver is installed and the COM port is selected in your application.
- **Poor Signal Quality or Short Range:**
 - Ensure the antenna is positioned optimally and not obstructed by metal objects or walls.
 - Check for potential sources of interference in the 2.4GHz band.
 - Verify the transmit power setting of the module.
- **Module Overheating:**
 - Ensure adequate ventilation around the module.
 - Verify the ambient temperature is within the specified operating range.
 - Check if the power supply voltage is within the acceptable limits.

8. WARRANTY AND SUPPORT

EBYTE products are designed for reliability and performance. For specific warranty details, please refer to the documentation included with your purchase or visit the official EBYTE website. For technical support, product inquiries, or assistance with troubleshooting beyond this manual, please contact EBYTE customer service through their official channels.

Manufacturer: EBYTE

Official Website: www.ebyte.com

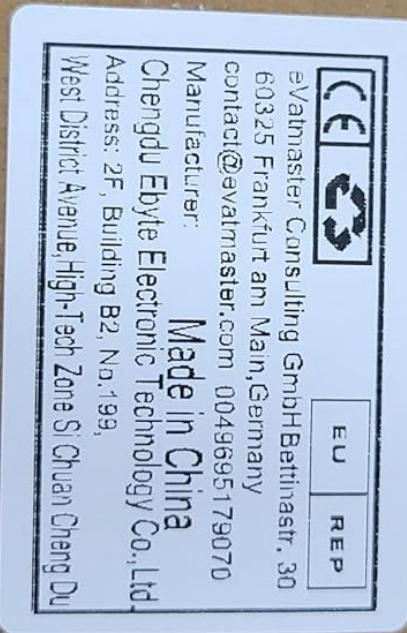


Figure 7: Product box label showing manufacturer information and certifications.