



DT-9003

Commercial grade interface converter  
Manual

I. Overview

The Converter is compatible with the RS-232, RS-485 standard. RS-232 signal is converted to RS485 or RS422 balanced differential signal; no need of external power supply, it adopts the unique "RS-232 charge pump" to drive the whole circuit inside; there is zero delay automatic transceiver conversion device in the circuit, and I/O circuit prevents collision to automatically control data flow direction, thereby it ensures that the program written on RS232 mode is no need to be changed and safely be operated in RS485 or RS422 mode, fully ensure it's compatible with for existing software and hardware interface.

II. Performance parameter

- 1. Interface characteristics: compatible with EIA/TIA RS-232C, RS-485/RS-422 standard
- 2. Electrical interface: DB9 female connector at RS-232 end, DB9 male connector at RS485/RS422 end, with 6 position terminal

board

- 3. Working mode: Asynchronous Full Duplex, half duplex automatic selection of differential transmission, without jumper settings
- 4. Transmission medium: twisted pair wire or shielded wire
- 5. Transmission rate: 300BPS-115.2KBPS
- 6. Size: 64mmX33mmX17mm
- 7. Use of the environment: -20 degrees to 70 degrees, relative humidity of 5% to 95%
- 8. Transmission distance: 1200 meters (RS-485 end), 5 meters (RS-232 end)

III. Connector and Signal

RS-232C pin-out

DB9 Female (Pin)	RS-232C Interface signal
1	Protective Grounding
2	Receive data SIN (RXD)
3	Send data SOUT (TXD)
4	Data terminal ready (DTR)
5	Ground signal (GND)
6	Data setting ready (DSR)
7	Request send (RTS)
8	Clear send (CTS)

9	Ring indication RI
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RS-485 /RS-422 output signal and pin-out of terminal board

DB9 Male	Single output	RS-422 Full duplex	RS-485 Half duplex
1	T/R+	Send(A+)	RS-485 (A+)
2	T/R-	Send (B-)	RS-485 (B-)
3	RXD+	Receive(A+)	N/C
4	RXD-	Receive (B-)	N/C
5	GND	Ground wire	Ground wire
6	VCC	Power	Power

IV. Hardware installation and application

The product is designed with universal adapter plug DB9 M / DB9 F. Its output interface comes with a terminal block, which is connected with twisted pair or shielded cable, making it quite convenient for either connection or dis-assembly. T/R+, T/R- stands for receiving / sending A+ B-, GND stands for Ground. VCC stands for Positive Supply voltage.

In RS-485 half duplex connection mode, connecting T/R+ (send / receive +) to opposite side's A+ and T/R- (send / receive -) to opposite side's B-; In RS-422 half duplex connection mode, connecting T/R+ (transfer+) to opposite side's RXD+ (receive+),

T/R- (transfer-) to opposite side's RXD- (receive-),  
 RXD+(receive+) to opposite side's TXD+(transfer+), RXD-  
 (receive-) to opposite side's (transfer-).

### Communication mode supported:

- ① Point to point / Four line full duplex
- ② Point to multi-point / four line full duplex
- ③ Point to point / two line half duplex
- ④ Point to multi-point / two line half duplex

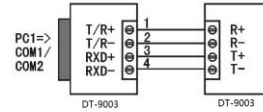
Note: to avoid signal reflections and interference, a matched termination resistor ( $120\Omega$ ,  $1/4W$ ) is required to be wired at the terminal of the line according to particular situation

Please be noted: this converter is port-powered, so normally external power supply is not required. If you need it as your case may be, the pin of VCC allows you to connect a 9V external power supply to it.

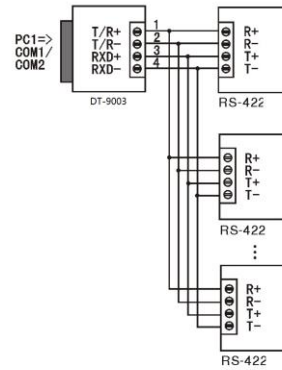
## V. Communication Wiring Diagrams

### RS-232 TO RS-422 Conversion

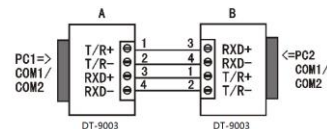
1 · RS422 Point to point / four line full duplex communication



2 · RS422 Point to multi point / four line full duplex communication

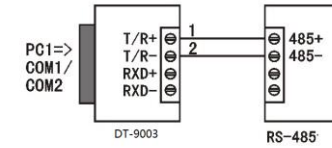


3 · Full duplex communication connection between the interface converter

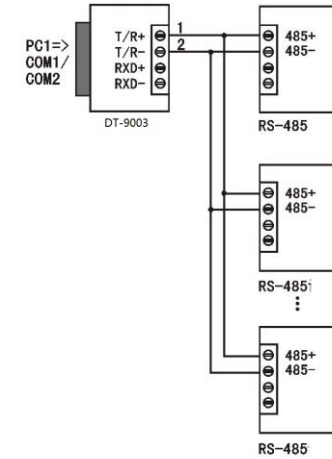


### RS232 TO RS485 CONVERT

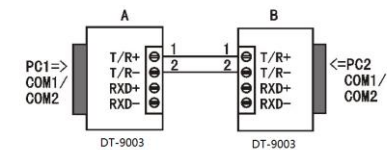
1 · RS485 Point to point / two line full duplex



2 · RS485 Point to multi point / line two full duplex communication



3 · Half duplex communication connection between the interface converter



## VI. Troubleshooting

### 1. communication failure

- A. Check to see if RS-232 interface connection is correct
- B. Check to see if RS-485 output interface wiring is correct
- C. check to see if the wired terminal board is connected well

## **2. data loss or error**

Check to see if data rate and format at both ends of the communication equipment are consistent

## **3. Unstable Signal**

Wired a matched termination resistor at RS485 end or replace it with an active RS232 to RS485 converter