DT-9003

Industrial Converter
RS232 to RS485/RS422
Manual

I. Overview

The converter is compatible with RS-232, RS-485 standard. It converts the RS-232 signal to RS-485/RS422 differential signal. DT-9003 with surge protection converter. When the electric circuit or communication line suddenly produces the peak current or voltage due to the external interference, the surge protector can conduct the shunt in a very short time, so as to avoid the damage of the surge to other equipment in the circuit.

DT-9003 with internal charge pump circuit, without external power supply. It can directly from the serial port power, provide for the use of the whole circuit. Converter built-in automatic transceiver and anti-collision automatic control circuit, to ensure that data flow fast switching. These ensure the program written in RS-232 mode can be safely running in RS-485/RS422 mode without having to change, it fit for the existing software and hardware interface.

II. Performance parameter

1. Standard: compatible with EIA/TIA RS-232C, RS485
2. RS485/RS422: 5-wire DB9M + 6 screw terminal board
   RS-232: DB9F connector
3. Working mode: asynchronous half-duplex differential communication
4. Transmission medium: twisted pair cable or shielded cable
5. Speed: Up to 115.2 Kbps+
6. Size: 64mm X 33mmX17mm
   Weight:192g
7. Operating temperature : -20℃ to 70℃,
   Ambient Relative humidity 5% to 95%
8. Distance: RS485/RS422 up to 1250 meters and RS232 within 15m
   meters
9. Protection: 600W surge protection each line for RS-485 /RS422 interface .
10. Power: Source of input power.

Note: this converter is port-powered, 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. type power is under 0.2W.

III. Connector and Signal

RS-232C PIN DEFINITION RS-485/RS422 PIN DEFINITION

DB9F	RS232
1	DCD
2	TXD
3	RXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

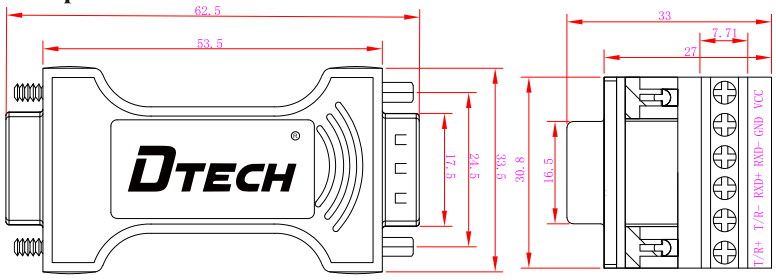
DB9 Male	Screw Terminal Board	RS-485 Halfduplex	RS-422 Full-duplex
1	T/R+	TXD(+)/A	TXD(+)/A
2	T/R-	TXD(-)/B	TXD(-)/B
3	RXD+		RXD(+)/Y
4	RXD-		RXD(-)/Z
5	GND	GND	GND
6	VCC	DC 6V to 9V	DC 6V to 9V
7	NONE	NONE	
8	NONE	NONE	
9	NONE	NONE	

IV. Hardware installation

Model: DT - 9003 is a plug-and-play product, do not need to set any parameters and jump needle, without external power supply. Automatic conversion from RS232 to RS485 signal, baud rate adaptive communication interface. In general, DT - 9003 RS232 port is directly connected to the computer serial port, or use a pass-through DB9F - DB9M data cable connection between converter and computer.RS485 port use a pair of twisted pair connection to another terminal of RS485 port, using direct connection. Specific how to connect, please refer to the above RS485 definition table.

DT - 9003 is internal power supply from outside RS232 port, so a power stable and sufficient RS232 interface elements is the key to guarantee the normal work of the converter. How to judge the RS232 port whether there is enough power keep converter work, through the voltage measurement method: first, the RS232 port of converter connected to the serial port of A computer, run computer serial program, then measure the converter RS458 port no-load voltage between A and B, its value at around 5 V, no less than 4 V, no higher than 6.2 V. Second, direct measurement external DB9M between pin3(TXD) and pin5(GND) voltage value, if the value between - 6.5 V ---11V, then power meet the driver. Above two methods of measurement, need to meet one. When external conditions don't have, can be add a power supply(DC9V), connect between terminals VCC and GND.

V. Specifications

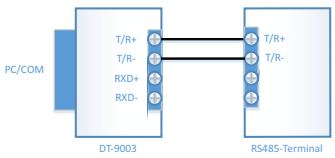


Front

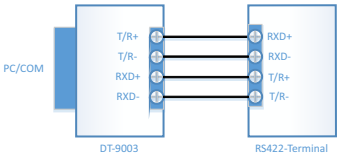
Unit: mm

VI. Communication Wiring Diagrams

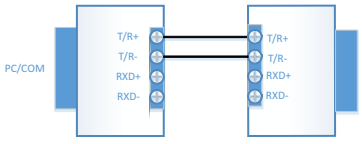
1、RS485 Point to Point two line in half-duplex



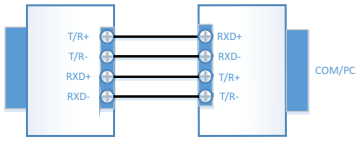
2、RS422 Point to Point four line in full-duplex



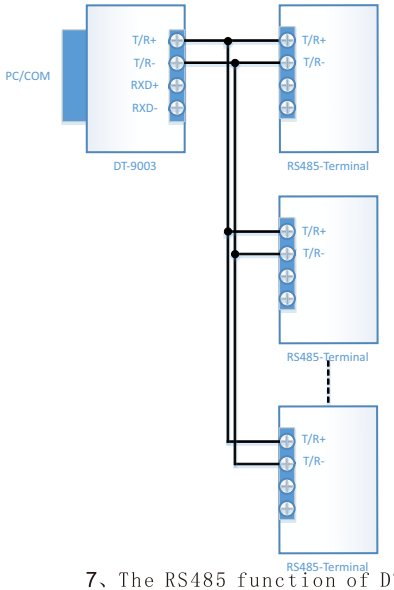
3、Half-duplex Communication between the converter



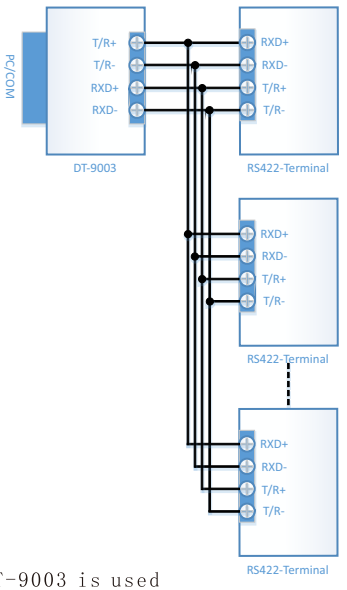
4、Full-duplex Communication between the converter



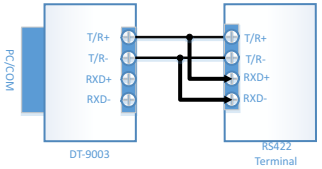
5、RS485 Point to MultiPoint two line in half-duplex



6、RS422 Point to MultiPoint four line in full-duplex



7、The RS485 function of DT-9003 is used to connect the RS422 terminal in half-duplex



VII. 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

VIII Accessories list

Index	Name	Unit	Num.
1	DT-9003	pic	1
2	6 screw terminal board	pic	1
3	Manual	pic	1
4	Certificate	pic	1

RoHS 600W TVS 15 KV ESD

DT-9003

工业转换器

RS232 to RS485/RS422

说明书

一、产品概述

型号DT-9003转换器符合EIA-232-A,TIA/EIA-422和TIA/EIA-485标准. 它的功能是把RS232信号转换成差分平行的RS-485/RS422信号. DT-9003具备浪涌保护功能。当电子电路或在通信线中，因为外界干扰突然产生尖峰电流或者电压，浪涌保护器能在极短时间内导通分流，从而避免浪涌对回路中其它设备造成损坏。

DT-9003内置电荷泵功能电路，不需要外部额外的电源供给。即采用端口窃电的方式，从而能为整个转换器提供足够的电功率。转换内置信号收发自动防碰撞电路，从而确保转换器两端数据流能正常实时地转换。同时确保在RS232模式下编写的程序，不需要做任何改变都能在RS485/RS422方式下正常运行。

二、性能参数

1. 标准兼容 EIA/TIA RS-232C, RS485,RS422
2. RS485/RS422接口：DB9M+6为带螺丝接线柱板
   RS232接口：DB9F
3. 工作方式：异步半双工和异步全双工通信
4. 传输介质：双绞线或屏蔽双绞线
5. 速率：115.2 Kbps+
6. 产品外形尺寸：64mm X 33mmX17mm
   重量：192g
7. 工作温度：-20℃ to 70℃,
   工作环境温湿度：5% to 95%
8. 传输距离：RS485/RS422<1250米,RS232<15米
9. 保护：RS485/RS422接口600W每线浪涌保护
10. 电源：串口窃电<192mW

注：转换器电路内置电荷泵，从外部连接RS232窃电。正常情况下，窃电的功率是能满足转换器内部使用，无需外部电源供给。但有些外部RS232采用低电压，可能会导致窃电功率不足，就需要外部电源供给。当采用外部电源连接到转换器时，正极接到有VCC标识的接线端子，负极连接到GND标识的接线端子。

三、接口和信号定义

1、RS-232C 针脚定义

DB9F	定义	说明
1	DCD	数据载波检测
2	TXD	信号发送
3	RXD	信号接收
4	DTR	数据终端准备
5	GND	信号地
6	DSR	数据设备准备好
7	RTS	请求发送
8	CTS	清楚发送
9	RI	振铃指示

2、RS-485/RS422 针脚定义

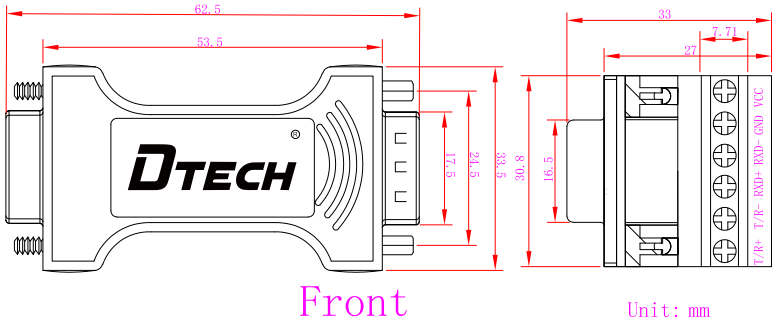
DB9M针	接线端子板	RS-485半双工	RS-422 全双
1	T/R+	TXD(+)/A	TXD(+)/A
2	T/R-	TXD(-)/B	TXD(-)/B
3	RXD+		RXD(+)/Y
4	RXD-		RXD(-)/Z
5	GND	GND	GND
6	VCC	DC 6V to 9V	DC 6V to 9V
7	NONE	NONE	
8	NONE	NONE	
9	NONE	NONE	

四、硬件快速安装说明

型号：DT-9003是一款即插即用型产品，不需要设置任何参数和跳线，不需要外部电源输入。信号从RS232到RS485/RS422是内部自动转换，接口通信速率自适应。一般应用，只需要把DT-9003的RS232口直接插到电脑后部RS232的DB9M接口或通过一根DB9M-DB9F直通数据导线连接。RS485接口使用一对双绞线，也是直通的方式连接到外部的RS485终端，即A接A，B接B 。RS422则需要两对双绞线，A和B是一对，Y和Z是一对。连接时需要跳线，即A接对端的Y，B接对端的Z，反之一样。如果需要更直观的接线方式，请参考后面的图示。

DT - 9003转换器内部带窃电功能，从与其连接的外部RS232端口窃电。因此，外部RS232端口是否有足够的驱动功率，这一因素非常重要。如何判断外部RS232端口是否有足够的功率保证转换器获取，采用测量的方式。第一种方法：把DT-9003的RS232端口直接连接到电脑后部的RS232接口，运行电脑串口调试助手，选择好端口等参数，并打开端口。注意，不要发送任何数据。这时用万用表测量空载时RS485接口A和B两脚之间的电压，如果它的电压值在DC5V范围，不低于4V，不高于6.2V。从以上获得数据，基本可以判断外接的RS232端口具备足够的功率驱动。第二种方法：直接用万用表测试外部RS232接口DB9M的PIN3和PIN5之间的电压，如果电压值大于6.5V，则可以提供足够功率给转换器使用。从以上两种测试办法任何一种皆可以，一旦测试参数不符合以上数值时，可以采用外部提供电源方式，使转换器能正常工作。外加电源电压范围：DC6-9V，电流大于200mA。连接时，电源正极接到VCC，负电极连接到GND。

五、产品规格

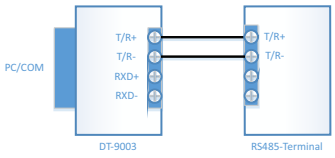


Front

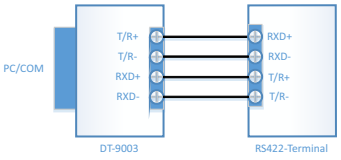
Unit: mm

六、通信方式和接线示意图

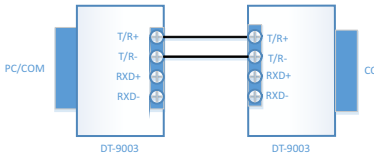
1、RS485 点到点两线半双工



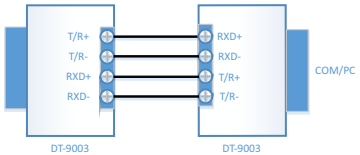
2、RS422 点到点四线半双工



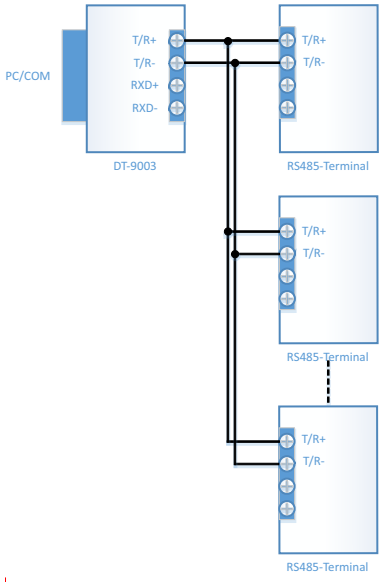
3、转换器之间两线半双工连接



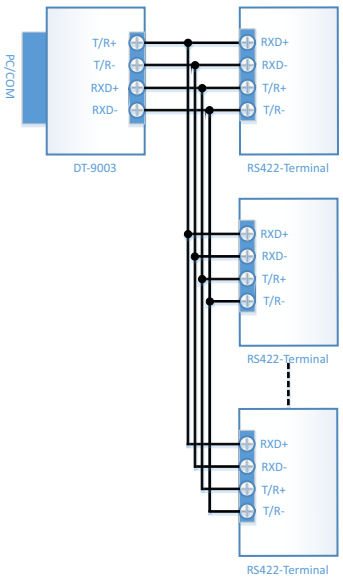
4、转换器之间四线全双工连接



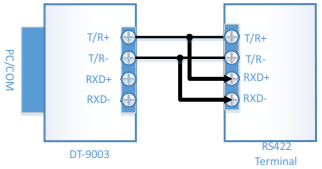
5、RS485点到多点连线半双工



6、RS422点到多点四线全双工



7、DT-9003的RS485两线连接外部四线RS422接口连接方式



七、简单故障说明

1、通信故障
A. 检查RS232接口是否连接正确
B. 检查RS485接口是否连接正确
C. 检查外部接线端子是否连接正确
2. 数据接收丢失或错码
检查设备两端的参数设置是否一致
3. 信号不稳
如果有连接外置终端电阻可以去掉或添加,如果有连接屏蔽线的可以去掉或添加

八、产品配件清单

序号	名称	单位	数量
1	DT-9003	台	1
2	6位带螺丝接线柱	个	1
3	说明书	张	1
4	合格证	张	1

RoHS 600W TVS 15 KV ESD