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RS-232/RS-422/RS-485

ATC-107 光隔离型接口转换器 说明书

一、概述:

ATC-107 光隔离型接口转换器, 兼容 RS-232C, RS-422, RS-485 标准, 能够将单端的 RS-232 信号转换为平衡差分的 RS-422 或 RS-485 信号, 内置的光电隔离器, 能够提供 3500V 的隔离电压, 快速的瞬态电压抑制器 (TVS) 可以有效地抑制闪电 (Lightning) 和 ESD, 可以有效的防止雷击和共地干扰。RS-232 接口端通过一个 DB25 母头的连接器与 PC、IPC、或手提电脑相连, RS-422、RS-485 端通过方便的四位接线端子连接, 由于 RS-485 支持两线半双工, 也就是说 RS-485 仅有的两条线路即要发送数据也要接收数据, 握手信号 (如 RTS, Request To Send) 通常去控制数据发送的方向, ATC-107 光隔离型接口转换器内部电路能够自动感知数据流方向, 并且自动的切换使能控制, 可以方便的组成一个 RS-485 网络而不需任何握手信号, 这种 RS-485 使能控制是完全透明的, 不需要对以前的基于 RS-232 的工作方式作任何软件的修改。

ATC-107 光隔离型接口转换器可以为点对点、点到多点的通信提供可靠的连接, 点到多点可允许连接 32 个 RS-422 或 RS-485 接口设备, 数据通讯速率从 0-115.2KBPS, 双色数据流量指示灯可指示故障情况, 支持的通讯方式有 RS-232C 到 RS-422, RS-232 到 RS-485 转换。

二、性能参数

- 接口特性: 接口兼容 EIA/TIA 的 RS-232C, RS-485/RS-422 标准
- 电气接口: RS-232C 接口 DB25 孔型连接器
RS-422/RS-485 接口四位接线端子
或 RJ-11 电话插座
- 传输介质: 双绞线或屏蔽线
- 工作方式: 异步半双工或异步全双工
- 信号指示: 两个双色信号指示灯 TXD, RXD
- 隔离度: 隔离电压 3500VRMS 500VDC 连续
- 传输速率: 115.2K BPS 到 300M

38.4K BPS 到 2.4KM

9600 BPS 到 5KM

- 保护等级: RS-232 接口 $\pm 15KV$ ESD 保护,
RS-422, RS-485 接口每线 600W 的雷击

浪涌保护

- 传输距离: 0-5 公里 (115200-9600BPS)
- 尺寸: 125mmx54mmx25mm
- 使用环境: $-25^{\circ}C$ 到 $70^{\circ}C$, 相对湿度为 5% 到 95%

三、连接器和信号

RS-232 接口在 DB25 孔型连接器的引脚定义

DB25 孔	RS-232 定义
PIN2	RXD
PIN3	TXD
PIN7	GND

RS-422/485 引脚定义: (四位接线端子)

Terminal No(台起)	1	2	3	4
RS-422	T+	T-	R-	R+
RS-485	485+	485-	-	-

四、安装设置及应用:

安装 ATC-107 光隔离接口转换器前请先仔细阅读产品说明书, 将产品所配的电源变压器接入 +9V 插口, 一端按四位接线端子引脚定义说明连接 RS-422 或 RS-485 设备。

ATC-107 接口转换器可以支持以下四种通信方式:

- 点对点/四线全双工
- 点到多点/四线全双工
- 点到点/两线半双工
- 点到多点/两线半双工

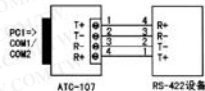
RS-232 至 RS-422 转换: 设置 ATC-107 接口转换器开关至 RS-422 位置。

RS-232 至 RS-485 转换: 设置 ATC-107 接口转换器开关至 RS-485 位置。

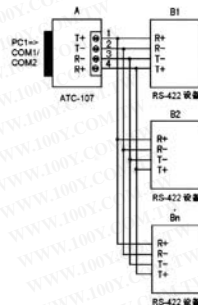
五、通信连接示意图

RS-232 至 RS-422 转换

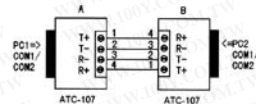
1、RS-422 点到点/四线全双工通信



2、RS-422 点到多点/四线全双工

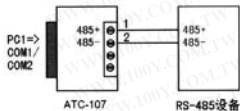


3、ATC-107 接口转换器之间全双工通信连接

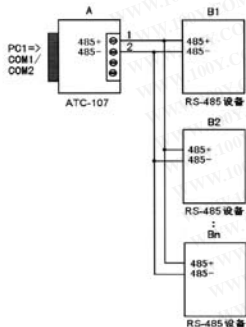


RS-232 至 RS-485 转换

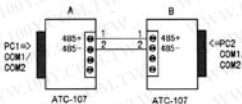
1. RS-485 点到点/两线半双工



2. RS-485 点对多点/二线半双工



3. ATC-107 接口转换器之间半双工通信连接



六、故障及排除

1. 数据通信失败:

- 检查 RS-232 接口连接是否正确
- 检查 RS-422 接口连接是否正确
- 检查 RS-485 接口连接是否正确
- 检查供电是否正常
- 检查开关设置是否在正确的转换模式上

2. 数据丢失或错误:

- 检查数据通信设备两端数据速率、格式是否一致

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RS-232 to RS-422/485 Isolated Interface Converter
User's Manual



1.0 General Description

The ATC-107 is a series of a bi-directional interface converters, Models ATC-107 optically isolate and convert unbalanced, full or half-duplex RS-232 signals to optically isolated, balanced, full or halfduplex RS-422 or RS-485 signals at baud rates up to 115.2 kbps. These units also surge suppress the RS-422/485 lines. They feature Send Data Control circuitry so no software control of handshake lines is required in RS-485 mode. ATC -107 has built-in isolators for high voltage (2500V) protection. it provides Point-to-Point, Multidrop and Simplex Operations. The ATC-107 can be powered from the DC 9V, 200mA power adapter, One slide switches are used to configure its operation mode.

2.0 Specifications

2.1 Interface

Conforms to EIA /RS-232 and RS-422/485 standards.

2.2 Connectors and signals

The ATC-107 has a DB-25 female connector on the RS-232 side and a terminal block connector on the RS-422/485 side

RS-232 Side:

Connector: DB-25 Female.

Signals: ATC-107 will be connected into a DTE interface.

Use Pins 3 (TXD)、2 (RXD) and 7 (Near side ground) .

Use Pin 2、4、20 to power from ATC-107 RS-232 side.

RS-422/485 Side:

RS-422 Connector: 4 position terminal block : (1)T+, (2)T-, (3)R-, (4)R+.

RS-485 Connector: 4 position terminal block: (1)485+, (2)485-.

Signals: Dual-duplex or Half-duplex two-wire/four-wire operation only.

2.3 Data Rate :

300 to 115.2 KBPS, up to 1.2km at 38.4 KBPS.

2.4 Sending Control

The ATC-107 can use handshake lines to power the converter, no handshaking is required to control the RS-422/RS-485 driver. the RS-485 driver is automatically enabled during each spacing state on the RS-232 side. During the marking or idle state, the RS-485 driver is disabled and the data lines are held in the marking state by the 4.7K Ohm pull-up and pull-down resistors.

2.5 Operating Distance

Data Rate (KBPS): 38.4 19.2 9.6 4.8

Maximum Distance (km): 1.2 2.0 2.5 3.5

(using 24 AWG wire)

2.6 Power

At the RS-422/485 side, ATC-107 is powered by an external power supply (+9VDC to +12VDC@200mA) by a AC/DC adapter. At the RS-232 side It powered by RS-232 signals TXD,RTS or DTR ,We only need one of these signals, the ground signals in two sides are different.

2.7 Switches:

RS-422/RS-485 switch selectable for RS-422/485 operation mode.If you set ATC-107 to RS-422 mode, ATC-107 can convert the TD and RD signals of RS-232 into balanced Dual -duplex RS-422 signals.If you set ATC-107 to RS-485 mode, ATC-107 can convert the TD and RD signals of RS-232 into balanced Half -duplex RS-485 signals.

2.8 LED light

One LED indicates sending data to (RED) or receiving data from (GREEN) RS-422/485 bus.

2.9 Isolation :

Optical Isolation is rated at 2500V.

2.10 Dimensions :

8mm × 75mm × 20mm

2.11 Environment :

0* to 50* C, 5% to 95% relative humidity.

3.0 Installation

3.1 RS-232 and RS-485 Interface

In the RS-232 side:

The RS-232 interface is a DB-25 female connector, It can be plug into a DTE interface.

In the RS-422/485 side:

Screw Terminals-The ATC-107 is supplied with 4 screw terminals marked 1(T+)/(485+)、2(T-)/(485-)、3(R-)、4(R+)、.

3.2 Connection Diagram

3.21 ATC-107 connecting RS-422 Device

RS-422 mode

ATC-107	RS-422 Device
(1) T+ -----	R+
(2) T- -----	R-
(3) R- -----	T-
(4) R+ -----	T+

3.22 ATC-107 connecting RS-485 Device

RS-485 mode

ATC-107	RS-485 Device
(1) 485+ -----	485+
(2) 485- -----	485-

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