

STM485-C and STM485-I  
RS-232 to RS-485 passive converter

# User's Guide

## I. Summary

In order to communicate between various standard series ports of computers, external equipments, or intelligent instruments, we must convert these signals first. This converter is compatible with RS-232C and RS-485 standard. It is able to convert RS-232 signal to RS-485 balanced differential signal and extend the communication distance to 1.2km. It is passive and doesn't require external power. It uses a particular pump to gain power from RS-232 signals (RTS, DTR, TXD) without initializing the RS-232 series interface. An internal transceiver and particular circuit automatically controls the data stream direction instead of handshake signals (such as RTS, DTR, etc.). When works in RS-232 half-duplex mode, the software keeps the same function under RS-485 without any change. The transmission rate of 300-115200bps is capable of applying between host computers, host computer and its external equipments and forms point to point, point to multi-points network. It is widely used in industrial automation, door safe, all-in-one-card, car parking, ATM, bus charge, eatery sell out, staff attendance management, and highway toll gate etc.

This guide is suitable for two models:  
 STM485-S (Standard)  
 STM485-C (Commercial version)  
 STM485-I (Industrial version)

## II. Features

1. Interface: Compatible with EIA/TIA RS-232C standard and RS-485 standard.
2. Electronic interface: At the side of RS-232 is a DB9 female (hole-type) connector. At the side of RS-485 is a DB9 male (needle-type) connector, with connection board.

3. Working mode: Asynchronous, half-duplex, differential transmission.
4. Transmission media: Twisted pair or shielded twisted pair (STP).
5. Transmission rate: 300-115200bps.
6. Mechanical dimension: 95mm\*33mm\*17mm
7. Working environments:  
 0~70°C (STM485-C), -20~85°C (STM485-I).  
 relative humidity 5% to 95%.
8. Transmission distance: 1200m(RS-485), 5m (RS-232).

## III. Connector and signal definition

### 1. RS-232C connector definition:

DB9 female	RS-232C signal
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

### 2. RS-485 connector definition:

PIN number	DB9 Male	RS-485 connection board
1	D-/B	D+/A
2	D+/A	D-/B
3	---	GND
4	---	+5V~+12V
5	GND	
6	+5V~+12V	
7	---	
8	---	
9	---	

#### IV. Hardware installation and application

This converter use traditional DB9/Female and DB9/Male connectors. Output connection board has four poles. You can use twisted pair(TP) or shielded twisted pair(STP) and easily to assemble or disassemble. D+/A is positive signal, D-/B is negative signal, +5V/+6V is external power input if need, GND is public ground wire. Communication needs at least 2 connections (D+/A, D-/B). Connecting the same polarity signals together. If you use STP, the GND signal must connect too.

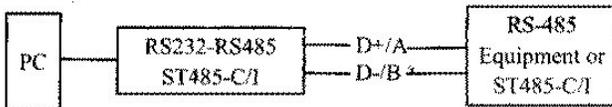
This converter supports 2 communication modes as below:

1. Point to point, 2 wires, half-duplex.
2. Point to multi-points, 2 wires, half-duplex.

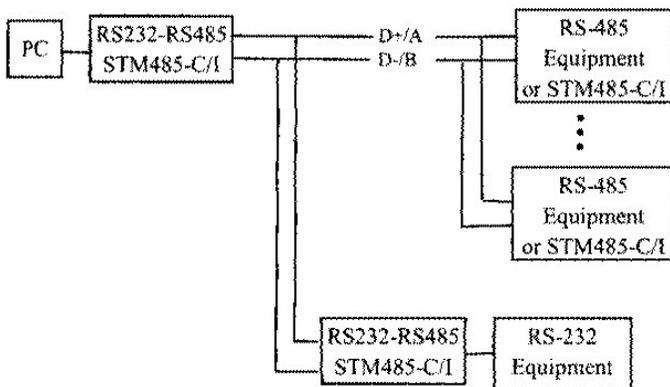
When this converter works at the end of the network, it needs to install a terminal resistance (normally 120  $\Omega$ , 1/4 W), for preventing signal reflection and interference.

#### V. Network illustration

1. Point to point, 2 wires, half-duplex



2. Point to multi-points, 2 wires, half-duplex



#### VI. Frequently asked question (FAQ)

1. Data communication failure
  - a. Check if RS-232 interface connection is correct;
  - b. Check if RS-232 output signal is correct;
  - c. Check if connection poles are well connected.
2. Data loss or mistake
  - a. Check if data rate and format is consistent on both communication equipments.

#### Standard accessory:

- ① User's guide on a paper 1pc
- ② 4 poles connection board 1pc