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 these models:
STM485-H　　(Compact version)
STM485-S　　(Standard version)
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℃(model H/S/C),-20~85℃(model 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

Note: This definition is in DTE mode, pin 2 and pin 3 must be transposed in DCE mode.

2. RS-485 connector definition:

PIN number	DB9 Male	RS-485 extend 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/+12V" 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.
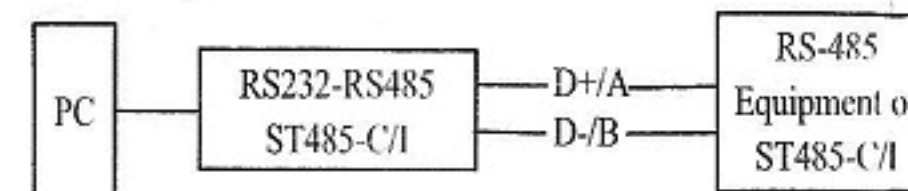
This converter supports 2 communication modes as below:
1. Point to point, 2 wires, half-duplex.
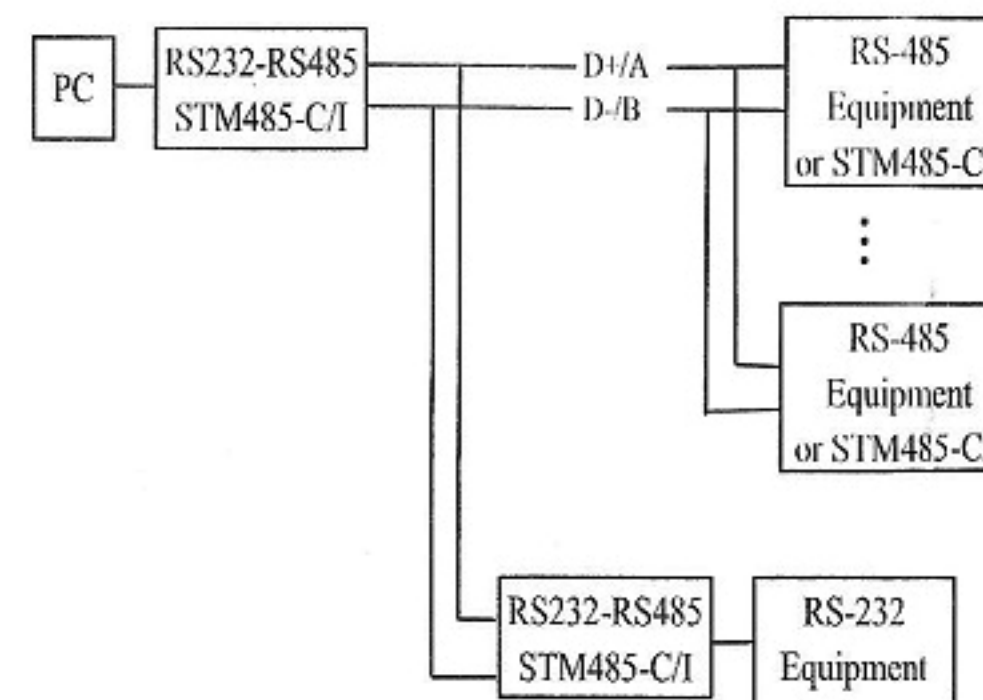2. Point to multi-points, 2 wires, half-duplex.

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

V. Network illustration

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

2. Point to muti-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.

Accessories:

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