RS-232 to RS-485/RS-422 interfaced converter Manual

1. summary

STM422 is a multifunctional interfaced converter, changing RS-232 to RS-485/RS-422 interface.It has protecting circuit for controlling voltage which is the function of surge-protection.It can be used as RS232 to RS485 converter,also can be RS232 to RS422 converter,it will be changed as RS485 or RS422 automatically,instead of special jumper to change.Besides,you can provide extra outside power for the converter,then when RS232 interface without power,the converter also can work.This product is compatible with the standard of RS-232,RS-485,RS-422.It can change the single-ended signal of RS-232 to the balanced signal of RS-485 or the difference signal of RS-422.RS-232 interface is connected to the serial port of computer by a DB9 socket.RS-485/RS-422 plug is connected to the hexad connection pins on the terminal board through DB9 pinhead,.Owing to RS-485's ability of supporting dual-lined semiduplex, (that is to say , RS-485 has only one pair of difference circuitry sending and receiving data),users often make the proper communication protocols to control sending/receiving directions through controlling RTS signals from serial port modem. The inside circuitry of STM-422 interfaced converter can apperceive the direction of the data stream, and convert the control of sending/receiving automatically . So it can be made into a convenient RS-485 network, and there is no need for software to compile complicated, ever-changing RTS signals to control the direction of sending/receiving. This control is transparent. The former softwares, which are based on RS-232 connection fashion, needn't to be changed in any way. The external power supply of this product has the features of small size, distant transmission, high velocity, stable performance, etc. The adopted RS-232,RS-485/RS-422 interfaces are self-adapted interfaces, so there isn't any need to set up softwares or hardwares. For this feature, they are widely used in work-attendance checking machines, IC card charging systems, industrial automation control systems, card-passing door systems,parking lot systems, automating banking systems, public automobile charging systems, dining hall meal selling systems, high way toll station system,etc.

Standard fittings：

①A manual

②A hexad terminal connector board

2. capability parameters

1.interface features: compatible with RS-232C, RS-485/RS-422 standard of EIA/TIA

2.electric interface:RS-232 interface is the interface of DB9 mode (socket). RS-485/RS-422 interface is the interface of DB9 mode(plug),DB9 plug can be connected to terminal connection board,can be wired conveniently through the hexad connection pins on the board.

3.transmission medium:RS-485 is with a twisted-pair (can be with screen, advised impedance of the twisted-paire should be 120Ω）.RS-422 is with 2 twisted-pairs (can be with screen, advised impedance of the twisted-pair should be 120Ω）

4.working: RS-422 is asynchronous full-duplex. RS-485 is asynchronous half-duplex.

5.transmission rate: 300~115200bps。

6.transmission distance : 0~800 metres

7.size : 95mm×33mm×17mm。

8.Working environment 0℃~70℃, relative humidity 5%~95%.

9.connecting capability:16~32 equipments

10. biggest difference of voltage from two sides devices:+-5.7V,if over,then the converter will be in protection state and prohibid correspondence.(pls refer to"6. power supply and grounding surge protection")

3. interface definition

1.RS-232 interface definition

DB9 socket	1	2	3	4	5	6	7	8
RS-232(DTE)	DCD	RXD	TXD	DTR	GND	DSR	RTS	CTS
RS-232(DCE)	DCD	TXD	RXD	DTR	GND	DSR	RTS	CTS

Pls notice that the definition of RS-232(DTE) and RS-232(DTE), there are difference for Pin 2 and Pin 3.Pls use RS232 convert pins cable if neccessory.

2、 RS-485/RS-422 interface definition (the numbers of the connection pins on the connection platelet are the same as DB9 plug):

DB9 plug	1	2	3	4	5	6
422 definition	send minT-	send posT+	receive posR+	receive minR-	GND	5-12v
485 definition	485 min D-/B	485 pos D+/A	——	——	GND	5-12v

4. usage:

Please read the manual carefully before using. First, install the product firmly, connect DB9 socket to the RS-232 port of the controlling host computer. RS-485/RS-422 port must be connected to 6 hole connection port on terminal board and then, connect RS-485/RS-422 equipments according to the corresponding interface definition. Lastly, if power supply from RS232 port is not enough,pls plug 5-12V DC power with the connector which marked "5-12V" on terminal board.

The product support the following communication modes:

A .point to point/4 line whole duplex (RS-422 mode)

B . point to multi-point/4 line whole duplex (RS-422 mode)

C. point to point/2 line semiduplex (RS-485mode)

D. point to multipoint/2 line semiduplex (RS-485mode)

The product is of the state of self-adaptation. When users make the connection according to RS-485,the product is in the state of RS-485 semiduplex. When users make the connection according to RS-422,the product is in the state of RS-422 whole duplex.
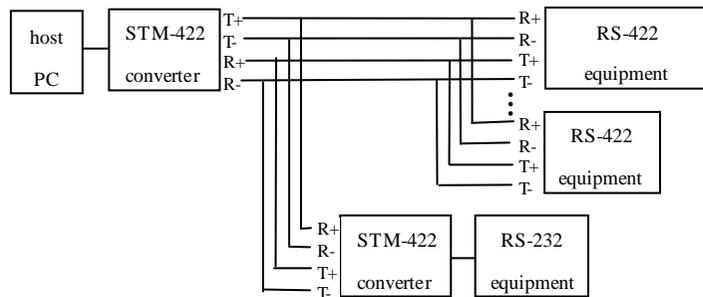
5. Illustrate

（1） RS-232 to RS-422 connection usage, make itRS-422mode

① RS-232/RS-422 point to poin/4 line asynchronous full-duplex communication. This mode is mainly used on host computes of RS-232 port, and the controlled end equipments are of RS-422 port, because of the different electric features, the 2 ends can't be connected directly without an interface adapter.According to the following chart ,when users make the connection:

host PC — STM-422 converter — RS-422 Communication equipment
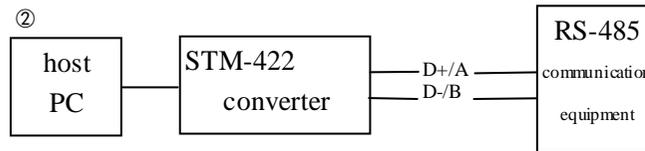(T+ — R+, T- — R-, R+ — T+, R- — T-)
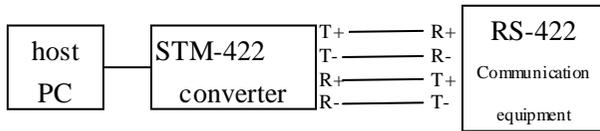
RS-232/RS-422 point to multi-point/4 line 4 line asynchronous full-duplex communication.This mode is mainly used on host computers of RS-232 port, and the controlled end equipments are of RS-422 port, and need to be connected to several RS-422 equipments, (RS-422 from RS-422 SLAVE), from 16 to 32 at most. In order to prevent the reflection and disturbance of signals, users need to install terminal impedance matching resistance at the end of the line(120Ω， 1/4W).

host PC — STM-422 converter (T+, T-, R+, R-) — RS-422 equipment (R+, R-, T+, T-) ... RS-422 equipment (R+, R-, T+, T-) ... STM-422 converter (R+, R-, T+, T-) — RS-232 equipment
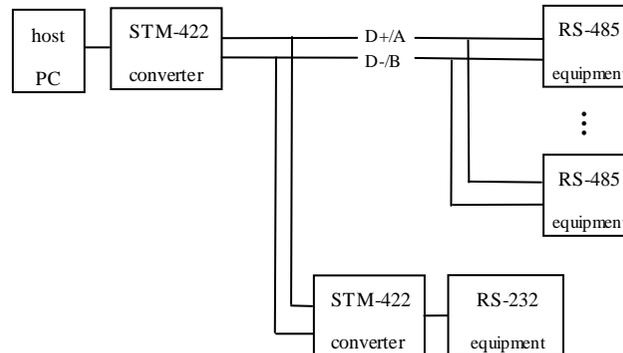
（2） **RS-232 to RS-485connection usage, make itRS-485mode**

① RS-232/RS-485 point to point/2 line half-duplex communication . This mode is mainly used on host computers of RS-232 port， and the controlled end equipments are of RS-485 port. because of the different electric features, the 2 ends can't be connected directly without an interface adapter.According to the following chart ,when users make the connection:

② host PC — STM-422 converter — D+/A, D-/B — RS-485 communication equipment

RS-232/RS-485 point to multi-point/2 line half-duplex communication.This mode is mainly used on host computers of RS-232 port,the controlled end equipments are of RS-485 port, and need to be connected to several RS-485 equipments, (RS-485 from RS-485 SLAVE), from 16 to 32 at most. In order to prevent the reflection and disturbance of signals, users need to install terminal impedance matching resistance at the end of the line(120 Ω， 1/4W).

③

host PC — STM-422 converter — D+/A, D-/B — RS-485 equipment ... RS-485 equipment ; STM-422 converter — RS-232 equipment

6. power supply and grounding surge protection

1.external power supply:STM-422 can be plug extra ouside DC 5-12V directly into the connector marked"5-12V" on terminal board if RS232 port can't get enough power, current: 100mA。

2.grounding surge protection: common interfaced switches are without the protection device of large power. Because of instantaneous high tension of circuitry induction on interfaced data cable, circuitry will try to send power to the ground line through the path of minimum resistance, so the interface parts of an apparatus are easily get damaged. Therefore, in order to have the safe, good communication, users should pay attention to make the good grounding of the hull of the equipment.

7.Frequently asked question(FAQ)

1.Data communication failure

①see if the RS-232 port is correctly linked

②see if the RS-485/RS-422 port is correctly linked

③check RS-232 if the voltage is between -5V~-12V,when the interface signal(TXD、DTR、RTS) is "1",and if the voltage is between +5V~+12V,when signal is "0"

2.Loss of data and unreadable characters

①see if the data velocity of the communication equipments of the 2 ends accord with each other。

②matching resistance could be added (120Ω， 1/4W).

3. poor capability of long distance communication

① see if the twisted-pair are twisted evenly, if the marked transmission impedance is 120 Ω ,add twisted-pair of 120 Ω impedance with screen when necessary

②see if too many equipments are linked to BUS,

and if more terminal impedance matching resistances need to be added to the 2 end equipments on BUS(120Ω， 1/4W).

③check if the communication velocity is too high, users should always use communication of low velocity when making long distant communication.