BF-850
USB/RS-485/RS-422 Converter
User's Manual

1.0 General introduction

In a fast developing PC industry, the USB interface is replacing many old PC serial interfaces one step at a time. However, many types of important equipment still use RS-422/RS-485 interfaces in order to transfer data. This is why there is need for the USB/RS-422/485 converter.

The BF-850 is a commonly used type of converter. It is powered from the USB interface of a PC and does not need any external power source. It also conforms to the USB, RS-422 and RS-485 standards. There is no delay and the signal is converted automatically inside the device. The unique I/O auto-controls the direction of data transfer, and needs no handshake signals (like RTS or DTR) to transfer with full duplex (RS-422) and half duplex (RS-485).

The BF-850 can provide a reliable connection with point to point and point to multi-point data transfer. In point to multi-point, each converter can connect up to 32 units of RS-422 or RS-485 interface. The speed of data transfer is between 300 and 921600 bps and the communication types are USB to RS-422 or USB to RS-485.

2.0 Performance parameter

1. Standard：
   Conform to the standards of USB V1.1, EIA RS-485, and RS-422.

2. USB signal：
   VCC, DATA+, DATA-, GND, FG

3. RS-485 signal：
   T+, T-, GND

4. RS-422 signal：
   T+, T-, R+, R-, GND

5. Communication type：
   Asynchronous communication, point to point or point to multi-point, 2 lines of halt-duplex, and 4 lines of full-duplex.

6. Communication control：
   Uses auto-control technology to transfer data and automatically determines and controls the direction of data transfer.

7. Baud Rate：
   300~921600 bps, automatic detect the serial port speed.

8. Load ability：
   In point to multi-points each converter can connects 32 units of RS-422 or RS-485 interface equipment.

9. Communication distance：
   RS-422/RS-485 5000 meter (9600 bps), USB less than 5 meter

10. Type of communication line：
    Double twist line or cover line.

11. Communication speed：
    921600 bps 300 M 38400 bps 2.4 KM 9600 bps 5 KM

12. Dimension：
    55mm × 36mm × 18mm

13. Operation environment：
    -25 ~ 70℃℃, humidity 5% ~ 95%

14. Operating Systems
    Windows95/98/2000/XP/Vista/7

3.0 Connector and signal

RS-422/RS-485 export signal

DB9 PINS	Output	RS-422 Duplex	RS-485 Half Duplex
1	T/R+	Transfer(A+)	RS-485(A+)
2	T/R-	Transfer(B-)	RS-485(B-)
3	RXD+	Receive(A+)	Empty
4	RXD-	Receive(B-)	Empty
5	GND	Ground	Ground
6	N/A		
7	N/A		
8	N/A		
9	N/A		

4.0 Installation setup and application

The BF-850 uses a USB/DB-9 connector and needs no crossover cable. T/R+ and T/R- represent transfer and RXD+/RXD- represent receive. GND represents the public ground line.

The BF-850 provides 4 types of communication as below：

1. Point to point/4 lines full-duplex
2. Point to multi-point/4 lines full-duplex
3. Point to point/2 lines half-duplex
4. Point to multi-point/2 lines full-duplex

Half-duplex (RS-485)
   Connect the 2 lines to T/R+ and T/R-
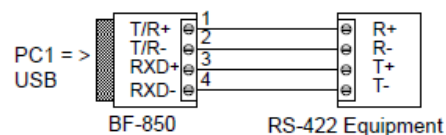
Full-duplex (RS-422)
   Connect the 4 lines to T/R+, T/R-, RXD+ and RXD-

When connecting full-duplex or half-duplex, in order to prevent reflection or interference of the signal, you need to connect a resistance at the end of line (120Ω 1/4W).
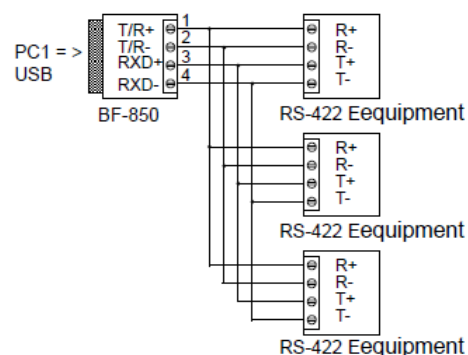
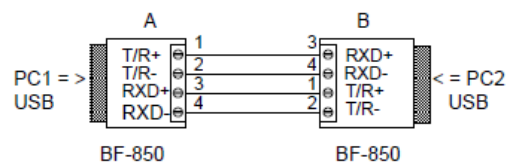# 5.0 Sketch map for communication connection

USB/RS-422 transfer

5.1 RS-422 point to point 4 lines full-duplex communication

5.2. RS-422 point to multi-point/4 wire full duplex

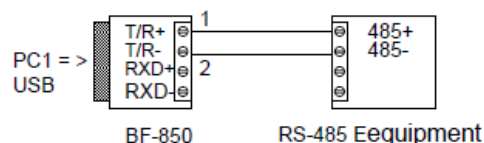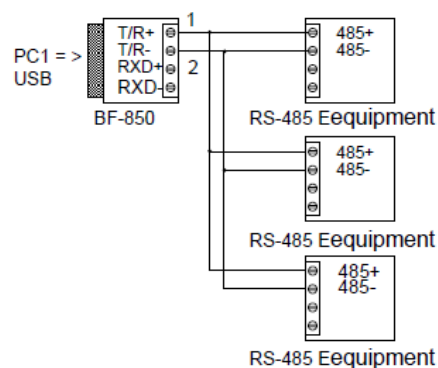**5.3. Full duplex communication connection between GC-BF-850 interface converters**
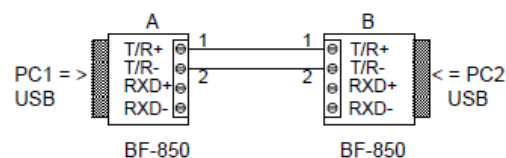

USB/RS-485 transfer

5.4 RS-485 point to point/ dual-line half duplex

5.5 RS-485 point to multi- point /dual-line half duplex

5.6 Half duplex communication connection between GC-ATC-107N interface converters

6.0 Trouble shooting

7.1 Data transmission failure

A. Check to make sure the USB interface is correctly connected

B. Check to make sure the RS-422/RS-485 interface is correctly connected

C. Check to make sure the terminal connections are correct

7.2 Data loss or error

A. Check the consistency of the data speeds and formats at the both ends of the data communication device.