

CS-428/9AT PRO

RS232 to RS422/485 Converter



User's Manual Version 2.1

English



16F Daerung Post Tower-1, 212-8, Guro-dong,
Seoul, Korea Tel.82-2-855-0501 Fax.82-2-855-0580
www.sysbas.com / marketing@sysbas.com

User's Manual

CS-428/9AT PRO

1. Introduction

We appreciate to purchase our products. This product is manufactured under strict quality control, and comes with a manufacturer's 5 year limited warranty. The warranty comes in effect from the date of purchase. If there are any difficulties or questions during the use, please contact our Technical Support Department [Tel.82-2-855-0501(Ext. 113), tech@sysbas.com]

2. Function

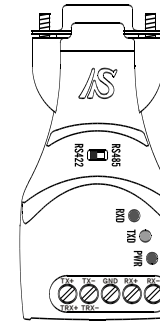
- This is a serial communication interface converter which converts RS232 signals to RS422 or RS485 signals and extends the distance up to maximum 1.2Km. It also allows to be connected to maximum 32 devices by Multi-drop mode as well as Point to Point mode.
- It is designed to be operated without any external power supply, when it is connected to PC or to RS232 connector of various system. But a connector for the external power (not included in the product package) is also equipped for the case that an external power supply should be used.
- It includes highly-effective Surge Protector to protect itself from the transient voltage(Max. 15,000 volt) coming along the communication line.
- Especially, CS-428/9AT PRO includes an automatic RTS opening and closing function (RTS auto-toggling) for the output data so that the opening and closing consent work in the Multi-Drop mode is automatically made by the hardware, which makes you apply easily under any installing environment without any software operation.

3

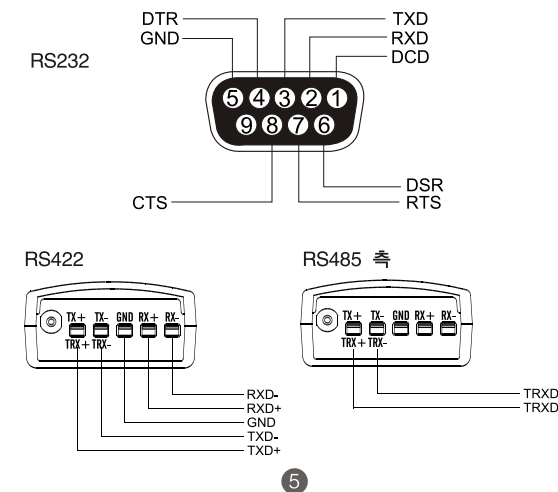
User's Manual

CS-428/9AT PRO

4. Structure



5. Connector



5

User's Manual

CS-428/9AT PRO

8. Installing Method

A user can select an operating mode in order to be applied for the various installing environments. Please set the Slide Switch on the converter surface to meet the purpose.

- The 422/485 slide switch selects the signal interface type
 - If set to 422, it converts RS232 to RS422
 - If set to 485, it converts RS232 to RS485

If the slide switch is set according to its intended use, insert RS422 circuit(4 lines), or RS485(2 lines) into the hole of RS422/485 circuit board of converter and tighten with a screw driver. Then connect the DB9 connector side to PC or RS232 port of the equipment. It may not be necessary to connect the GND pin depending on the installation environment.

7

5-Year Warranty



SystemBase Co., Ltd. warrants that the Product(s) shall be free from manufacturing defects in materials and workmanship for a period of five (5) years from the date of delivery provided that the Product was properly installed and used. Defects, malfunctions or failures of the warranted Product caused by damage resulting from acts of God (such as floods, fire, etc.), environmental and atmospheric disturbances, other external forces such as powerline disturbances, host computer malfunction, plugging the board in under power, or incorrect cabling and damage caused by misuse, abuse and unauthorized alteration or repair are not warranted.

The warranty is limited to the repair and/or replacement, at SystemBase's option, of the defective Product during its warranty period. Customer must obtain a Return Material Authorization (RMA) number prior to returning the defective Product to SystemBase for service. Customer agrees to insure the Product or assume the risk of loss or damage in transit, to prepay shipping charges and to use the original shipping container or equivalent. Contact SystemBase Customer Support at tech@sysbas.com for further information. Product repaired or replaced shall be warranted for a period of ninety (90) days or the duration of the initial Product warranty period, whichever is longer.

THE PROVISIONS OF THE WARRANTY ARE IN LIEU OF ANY OTHER WARRANTY, WHETHER EXPRESSED OR IMPLIED, WRITTEN OR ORAL, AND SYSTEMBASE'S LIABILITY ARISING OUT OF THE MANUFACTURE, SALE OR SUPPLYING OF THE PRODUCT AND ITS USE, WHETHER BASED ON WARRANTY, CONTRACT, NEGLIGENCE, PRODUCT LIABILITY OR OTHERWISE, SHALL NOT EXCEED THE ORIGINAL COST OF THE PRODUCT. IN NO EVENT SHALL SYSTEMBASE BE LIABLE FOR UNINTENDED OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR USE DAMAGES ARISING OUT OF THE MANUFACTURE, SALE OR SUPPLYING OF THE PRODUCT.

Help Hotline : Technical supports are available to all our customers for assistance in installation and operation.
[+82-2-855-0501 (EXT. 113)]
e-mail: tech@sysbas.com



2009. 6. 22

3. Specifications

Model	CS-428/9AT PRO : DB9 Connector, Automatic opening-closing function terminal resistor
Communication type	Asynchronous serial communication
Transmission speed	Max. 115.2Kbps
Distance	Maximum 1.2Km (Refer to chart-transmission distance per transmission speed)
Connector	RS232 side : DB9 Female RS422/RS485 side : Terminal Block
Slide switch	422/485 : RS422/RS485 selection
Power	w/o Power Adapter : RS232 TXD, RTS, DTR signal w/ Power Adapter : Voltage - DC 7~12V Polarity - Independent Caution: Power Adapters in earlier versions (2.0 or below) are dependent on polarity. Inside is (-) and Outside is (+).
Terminal resistor	RS422/485 common jumper : JP2 jumper connects or disconnects terminal resistor.
Circuit protection	15,000 volt-surge protector included.
LEDs	TXD, RXD, PWR

* DCD, DSR, CTS pins are selectively connected to GND.

4

6. Power Supply

It is operated with the power of TXD, RTS or DTR signal generated from the PC or the RS232 port of the equipment when no external power is supplied from outside. In case of application program, or when it is not possible to keep the TXD, RTS or DTR signal connected to Jumper at "ON" status then power should be supplied from outside by using the power source adapter. You can recognize whether the power is being supplied or not, by checking the power LED on the converter. The power source part of the converter has a high volumed condenser to supply stable power to the converter circuit by using TXD, RTS or DTR signal. Therefore it may not work for a very short period of time(within 0.1 second) until the condenser is filled with enough power. So wait for a second before start to use converter after turning on the TXD, RTS or DTR signal when TXD, RTS or DTR signal is controlled directly in the application program. The LED display is turned on and steady when power is supplied to converter. Apply an external power supply when you have no power LED turned on.

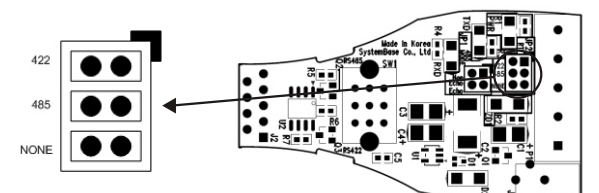
7. Terminal Resistor

When a communication error occurs due to noises on the lines, install the terminal resistor(s) to solve the problem.

- Terminal resistor installation
 - Open the case, connect the jumper inside and then install the terminal resistors.
 - Please Refer to '8. Installing method for details.

6

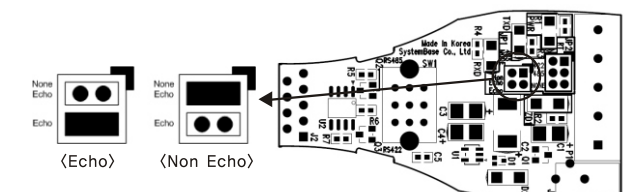
■ Setting Terminal Resistor-JP2, RT



422 : Install RS422 Terminal Resistor.
485 : Install RS485 Terminal Resistor.
NONE : Not Install any Terminal Resistor.

* When communication error occurs due to high speed or distance, please install both Terminal Resistors to solve the problem

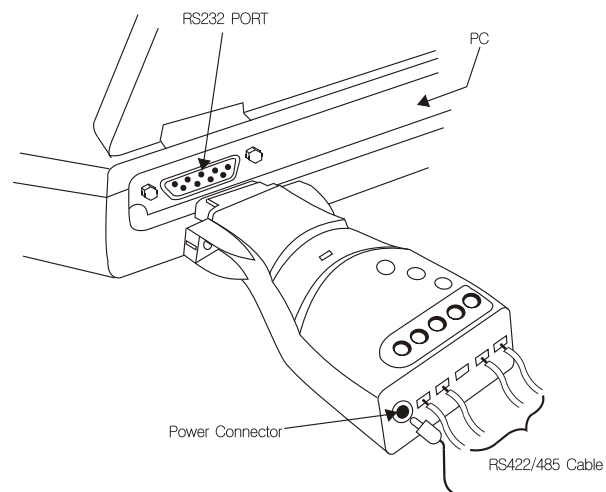
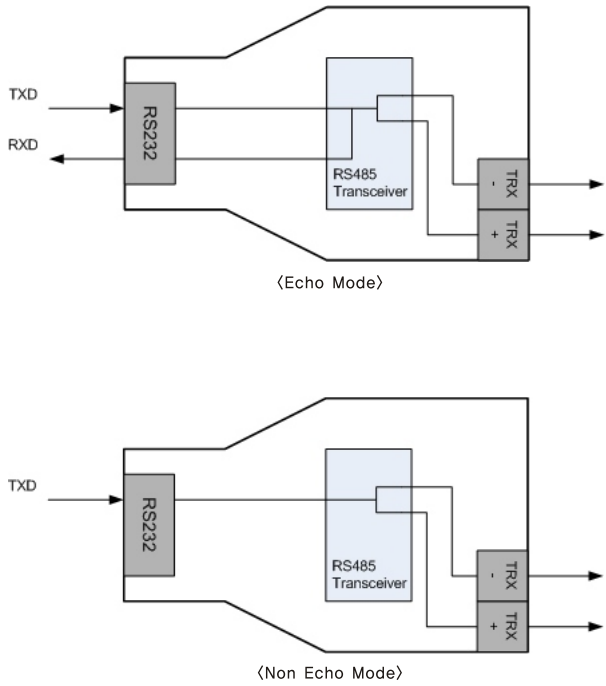
■ Setting RS485 Comm. Mode-JP1, 485_MODE



Echo : Select RS485 Echo mode. Data from TXD of RS232 port are transmitted to the other device through TRX+/TRX- of RS 485 port, and go back to RXD of RS232 port at the same time. So the data transmitted can be checked in the TX side.

Non Echo : Select RS485 Non Echo mode. Data are transmitted to the other device only.

8



〈 RS422-Interface Installation Example 〉

9. The Wire Connection for RS422

This wire connection is used when using 1:1(Point to Point) and 1:N (Multi-Drop) full-duplex communication(Max. 10 units).

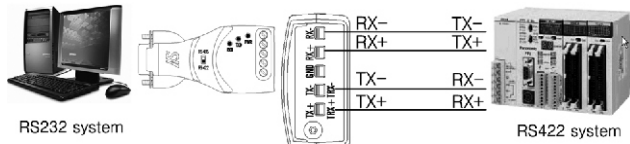
■ Slide Switch of Host & Terminal Side

RS422 ☐ RS485 ☒

- * As the RS422 interface type, CS-428/9AT PRO automatically supports both Point to Point mode and Multi-Drop mode.
- * In RS422 Multi-Drop mode, the CS-428/9AT PRO of host side need not open or close the output signal line because it may always transfer communication data to terminal side; however, that of terminal side must open or close the output signal line when it sends or receives communication data. But in this product, all operation is controlled by hardware circuit, therefore no operation is required by application program.

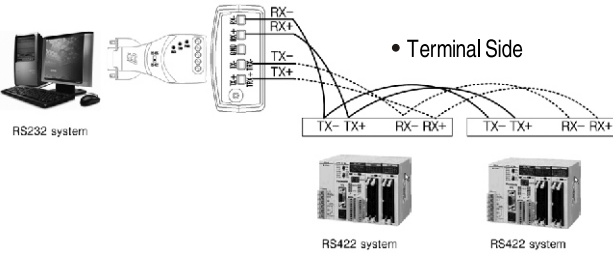
■ The Wire Connection of CS-428/9AT PRO

〈Point to Point〉



〈Multi-Drop〉

• Host Side



- * DCD, DSR, CTS pins are selectively connected to GND inside of converter.
- * Check and confirm if the power LED is turned on during the operation

10. The Wire Connection for RS485

This wire connection is used when trying N:N half-duplex communication(Max. 32 units).

■ Slide Switch of Terminal Side

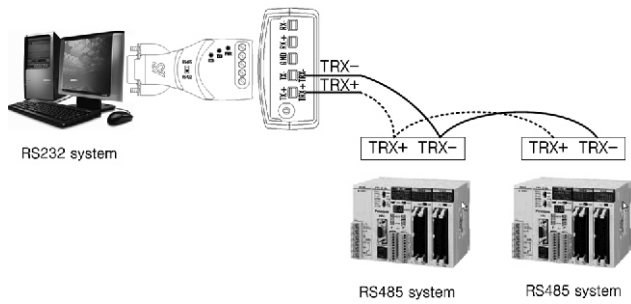
RS422 ☒ RS485 ☐

- * Basically, as the RS485 interface type, both the host

side and the terminal side are regarded as just terminals, it is required to open or close the output signal line to send or receive communication data. But in this product, all operation is controlled by hardware circuit, therefore no operation is required by application program.

- * In case of RS485 setting, both Echo and Non-Echo mode are Supported.

■ The Wire Connection of CS-428/9AT PRO



- * DCD, DSR, CTS pins are selectively connected to GND inside of conberter.
- * Check and confirm if the power LED is turned on during the operation

〈Annex〉

■ Transmission Distance per Transmission Speed

RS422, Without External Power Adapter

speed (baud rate)	distance (m)	200	300	500	800	1000	1200
9600		○	○	○	○	○	○
19200		○	○	○	○	○	○
38400		○	○	○	○	○	○
57600		○	○	○	○	○	○
115200		○	○	○	○	○	×

RS422, Without External Power Adapter

speed (baud rate)	distance (m)	200	300	500	800	1000	1200
9600		○	○	○	○	○	○
19200		○	○	○	○	○	○
38400		○	○	○	○	○	○
57600		○	○	○	○	○	○
115200		○	○	×	×	×	×

RS485, Non-Echo Mode, Without External Power Adapter

speed (baud rate)	distance (m)	200	300	500	800	1000	1200
9600		○	○	○	○	○	○
19200		○	○	○	○	○	○
38400		○	○	○	○	○	○
57600		○	○	○	○	○	○
115200		○	○	○	○	○	○

RS485, Non-Echo Mode, Without External Power Adapter

speed (baud rate)	distance (m)	200	300	500	800	1000	1200
9600		○	○	○	○	○	○
19200		○	○	○	○	○	○
38400		○	○	○	○	○	○
57600		○	○	○	○	○	○
115200		○	○	○	×	×	×

RS485, Echo Mode, Without External Power Adapter

speed (baud rate)	distance (m)	200	300	500	800	1000	1200
9600		○	○	○	○	○	○
19200		○	○	○	○	○	○
38400		○	○	○	○	○	○
57600		○	○	○	×	×	×
115200		○	○	○	×	×	×

RS485, Echo Mode, Without External Power Adapter

speed (baud rate)	distance (m)	200	300	500	800	1000	1200
9600		○	○	○	○	○	○
19200		○	○	○	○	○	○
38400		○	○	○	×	×	×
57600		○	○	○	×	×	×
115200		○	○	×	×	×	×

- * Above chart is the test result in the laboratory of SystemBase Co., Ltd. This result can be changed according to communication line quality and communication circumstances.