TWIN485
Converter & Bridge Box
Owner's Manual

TWIN485-001

CONTENTS

-----Chapter 1-----
Introduction

1-1. Introduction:

TWIN485 converter box is one device to support two sets ground isolated RS232 to RS422/RS485 interface converter and RS422/RS485 to RS422/RS485 repeater.

When user needs to send data over long distance, we may use RS422 interface for full-duplex data transmission or RS485 interface for half-duplex data transmission. TWIN485 converter box can set the target RS422 or RS485 interface type by DIP SWITCH.

Traditionally RS232 to RS422/RS485 converter box just support one set circuitry. When we find the function is not properly, it is not easy for us to find the problem and recover the network to work properly. For TWIN485 converter box we have two sets RS232 to RS422/RS485 converter circuitry. So we can use the redundacy circuitry to backup the damaged one. Because we have two sets RS232 to RS422/RS485 converter in TWIN485, so we can have one converter for working one and the other converter for monitor one. Then it is very easy for us to check the working one is running properly or not. When we find the working one is not running properly, we can use the other monitor converter to replace the working one. Because we have two converters working simultaneously, so we can confirm the monitor one can backup the working one. Tranditionally, we may have one converter working and the spare one keep in stock for service purpose. But it is not easy to confirm the spare one working properly in backup condition. TWIN485 converter can offer you on-line converter for monitor and backup purpose.

Traditionally we need one dedicated RS422/RS485 repeater or bridge to extend the number of node in RS485 segment or extend the possible connection distance in RS422/RS485 equipment. TWIN485 converter box can use one DIP SWITCH to set in BRIDGE mode. It means that you can use one DIP SWITCH to set TWIN485 converter box working in NORMAL mode or BRIDGE mode. In NORMAL mode TWIN485 converter box support two set RS232 to RS422/RS485 interface converter. In BRIDGE mode TWIN485 converter box work as BRIDGE or REPEATER between both RS422/RS485 interface. So it is very easy for you to have TWIN485 converter box only in your application environment. Traditionally you need to have spare RS232 to RS422/RS485 converter and dedicated RS422/RS485 repeater in stock for maintenance purpose. Right now you just need to have one type TWIN485 converter box in stock. When you need one extra BRIDGE, you can change one TWIN485 converter box from NORMAL converter function to new BRIDGE function. In traditonal condition you must have enough converter and repeater in hand for maintenance purpose. You can not use converter as repeater usage. You can not use repeater as converter usage. And you are always short of important one. To use TWIN485 converter box you never have such redundancy problem.

-----Chapter 2-----
System Setup

2-1. Introduction

We have two DIP SWITCH to setup the interface type for RS422/RS485. We have one DIP SWITCH to setup TWIN485 in NORMAL mode or BRIDGE mode.
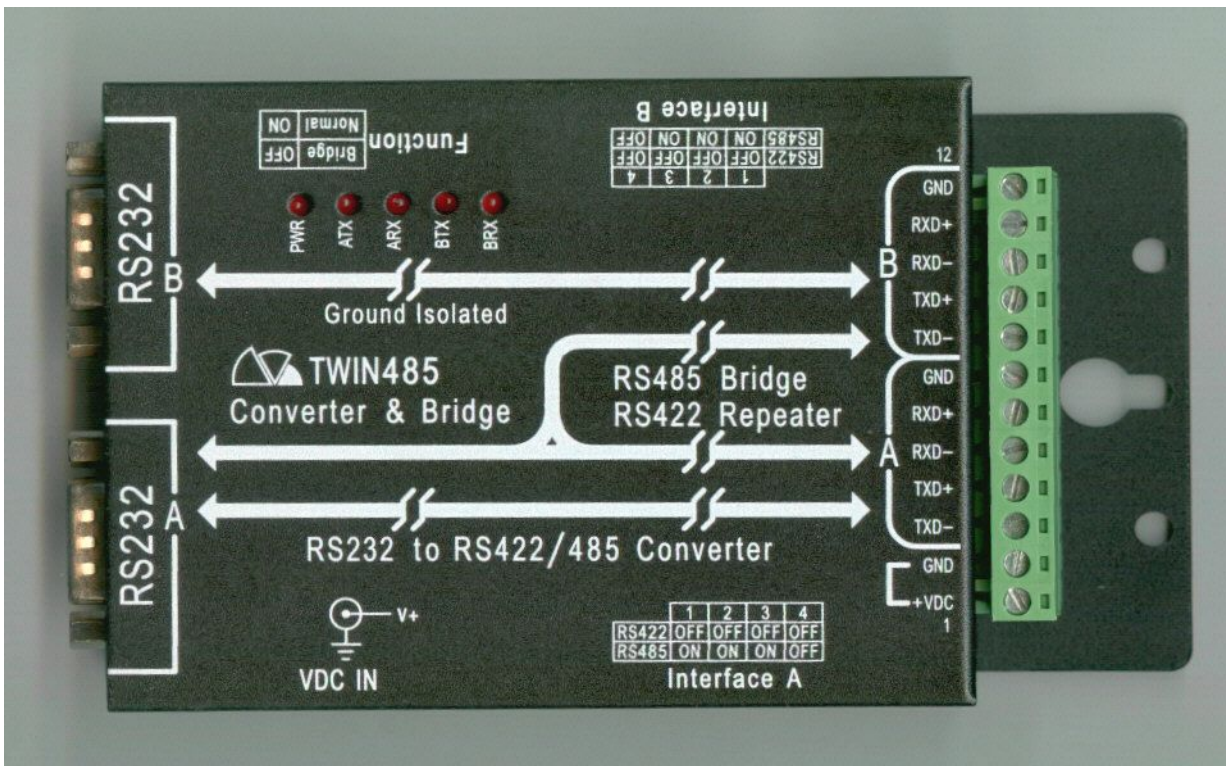
2-2. RS422/RS485 interface setting

Each port we have one 4bit DIP SWITCH to set the interface type and terminator resistor insert or not.

When we need to set in RS422 interface type, we need to set bit1,2,3 of DIP SWITCH in OFF location.

When we need to set in RS485 interface type, we need to set bit1,2,3 of DIP SWITCH in ON location.

When we need to insert 120 ohm terminator resistor in RS422/485 interface,   we need to set bit4 of DIP SWITCH in ON location.

When we don't need to insert 120 ohm terminator resistor in RS422/485 interface, we need to set bit4 of DIP SWITCH in OFF location.

***NOTE: Because RS485 network can only insert terminator resistor in both end of device. So we do not insert terminator resistor in TWIN485 box normally.

2-3. Function mode setting

We can have one DIP SWITCH to set TWIN485 box working in normal converter mode or BRIDGE/REPEATER mode.

When we need to use as NORMAL two RS232 to RS422/RS485 converters in TWIN485 box, we need to set bit1 of DIP SWITCH in ON location. The other bit is no use.

When we need to use as RS422/RS485 to RS422/RS485 BRIDGE/REPEATER in TWIN485 box, we need to set bit1 of DIP SWITCH in OFF location. The other bit is no use.

2-4. Installation procedure

Please use following procedure to install TWIN485 in your system.

STEP 1: set the Function DIP switch for NORMAL converter mode or SPECIAL Bridge mode.

STEP 2: set the Interface DIP switch for Port A and Port B as target RS422 or RS485 interface type.

STEP 3: wire the terminal block for RS422 or RS485 interface.

STEP 4: insert the power adapter or wire the power input in terminal block. Please keep in mind that we can only have one for power input.

STEP 5: connect RS232 device to RS232 interface connector.

STEP 6: You can test TWIN485 function now.

-----Chapter 3-----
Connector Pin Definition

3-1. RS232 connector pin definition.

Each RS232 interface is DB9 male connector with following pin definition.

Pin 1: short to Pin 4 and Pin 6 internally.

Pin 2: RXD (input) signal input from external RS232 device.

Pin 3: TXD (output) signal output to external RS232 device.

Pin 4: short to Pin 1 and Pin 6 internally.

Pin 5: GND (common signal ground of DC power input)

Pin 6: short to Pin 4 and Pin 1 internally.

Pin 7: short to Pin 8 internally.

Pin 8: short to Pin 7 internally.

Pin 9: no connection. (user may ask PORT A pin 9 as DC power input).

3-2. DC Power input.

We can have two method to offer DC POWER input. One is 9VDC or 12VDC power adapter input from POWER JACK. The inner side is +9VDC and the outer side is ground.

The other is +9VDC -- 32VDC input from TERMINAL BLOCK. Pin 1 is +VDC input and Pin 2 is ground. It is suitable for industrial +24VDC or +12VDC power.

The power ground is common ground signal for RS232 interface.

For OEM based user we can also use pin 9 of RS232 PORT A DB9 male connector as +VDC power input. The VDC range will be +9VDC -- +32VDC. (This is not in standard product).

3-3. RS422/RS485 connector pin definition.

Each RS422/RS485 interface has 5 signal pin in TERMINAL BLOCK.

Each RS422/RS485 interface has isolated ground signal with other circuitry. So you have three isolated ground signal for RS232 and two RS422/RS485 interface.

PORT A is in pin3 -- pin7 of TERMINAL BLOCK.
Pin 3 = 422TXD- (Output) signal.
Pin 4 = 422TXD+ (Output) signal.
Pin 5 = 422RXD- (input) or 485DATA- signal.
Pin 6 = 422RXD+ (input) or 485DATA+ signal.
Pin 7 = isolated GND (the signal ground of PORT A only)

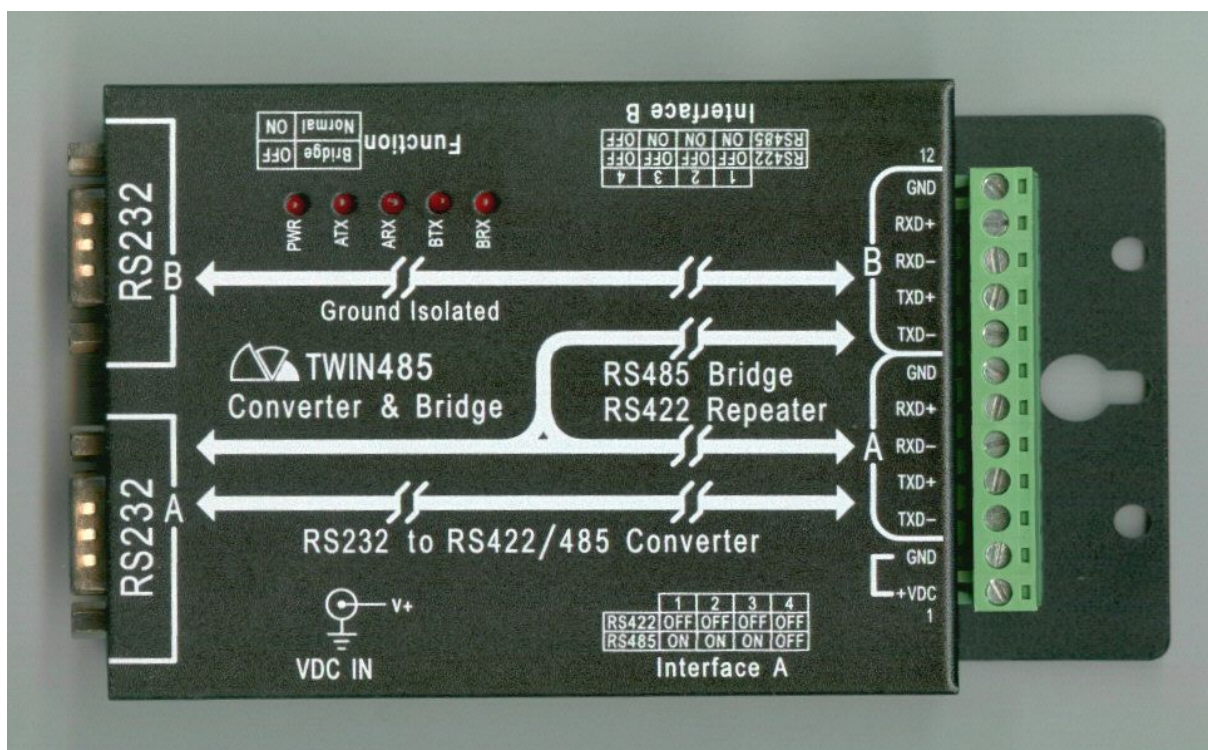PORT B is in pin8 -- pin12 of TERMINAL BLOCK.
Pin 8 = 422TXD- (Output) signal.
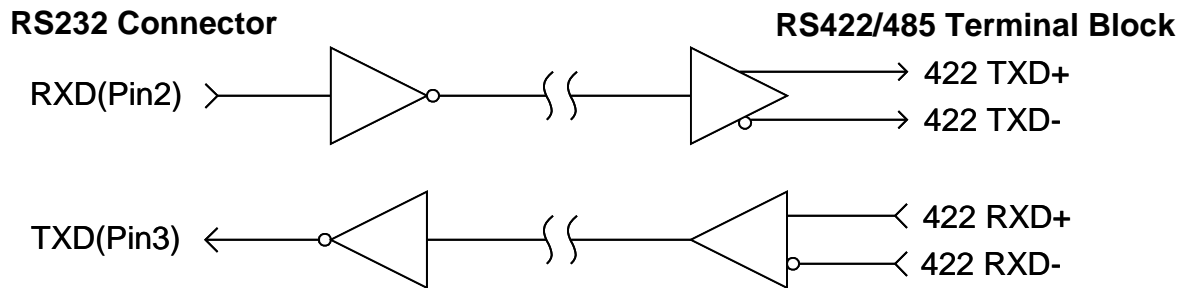Pin 9 = 422TXD+ (Output) signal.
Pin 10 = 422RXD- (input) or 485DATA- signal.
Pin 11 = 422RXD+ (input) or 485DATA+ signal.
Pin 12 = isolated GND (the signal ground of PORT B only)

3-4. The signal relationship in TWIN485.

RS232 Connector   **RS422/485 Terminal Block**

RXD(Pin2) ———▷○———)(———▷ → 422 TXD+
                              → 422 TXD-

TXD(Pin3) ←——○◁———)(———◁ < 422 RXD+
                              < 422 RXD-

In Config. 1 is the signal relationship for RS232 interface and RS422/RS485 interface. Because RS422/RS485 interface is differetial signal with plus signal name and minus signal name. And different company may have different meaning for such signal name. So user need to confirm the signal for TWIN485 box and other RS422/RS485 device.

In Config. 1 we can find the signal from RS232 interface connector will be inverted by RS232 interface chip and send to RS422/RS485 interface chip with same phase in plus signal and invert phase in minus signal.

When we have MARK state (-12V) in RS232 interface, we will have larger voltage level in plus signal than minus signal.
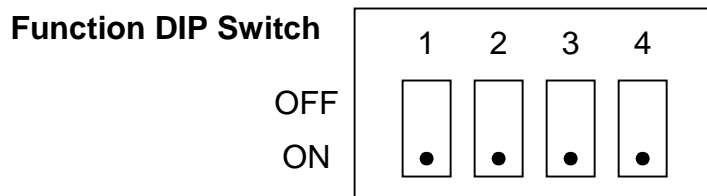
When we have SPACE state (+12V) in RS232 interface, we will have less voltage level in plus signal than minus signal.

-----Chapter 4-----
System function and setting

4-1. double RS232 to RS422 converter usage

Interface DIP Switch

	1	2	3	4
OFF	●	●	●	
ON				●
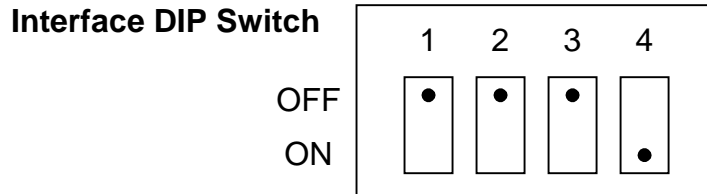
We need to set interface DIP SWITCH bit1,2,3 in OFF location and function DIP SWITCH bit1 in ON location.

Function DIP Switch

	1	2	3	4
OFF				
ON	●	●	●	●

In this mode you can have two sets RS232 to RS422 converter to connect with RS422 devices.

```
RS232 ←——→   TWIN485    A  ←——→ RS422
             ------------------
RS232 ←——→              B  ←——→ RS422
```

4-2. double RS232 to RS485 converter usage
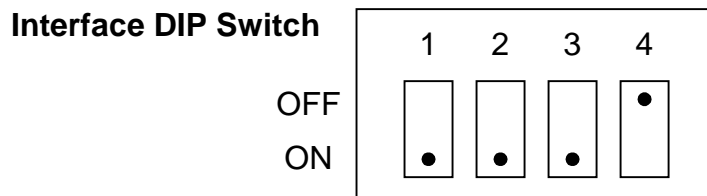
Interface DIP Switch

	1	2	3	4
OFF				●
ON	●	●	●	

We need to set interface DIP SWITCH bit1,2,3 in ON location and function DIP SWITCH bit1 in ON location.

Function DIP Switch

	1	2	3	4
OFF				
ON	●	●	●	●
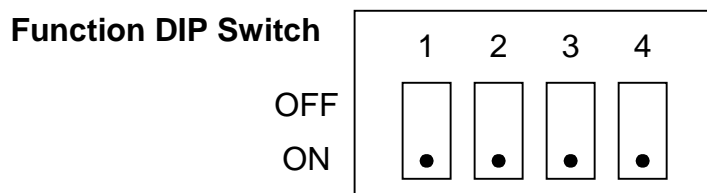
In this mode you can have two sets RS232 to RS485 converter to connect with RS485 network.

```
RS232 ⟷──────→  TWIN485      A  ⟵────→ RS485
                 ─ ─ ─ ─ ─ ─ ─ ─
RS232 ⟷──────→               B  ⟵────→ RS485
```
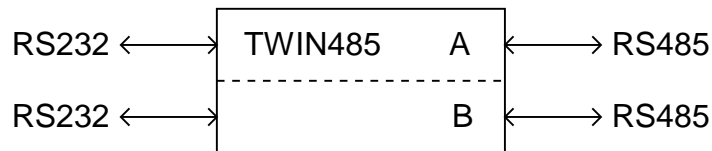
4-3. special RS485 bridge application

Interface DIP Switch

```
        1    2    3    4
OFF                    •
ON      •    •    •
```
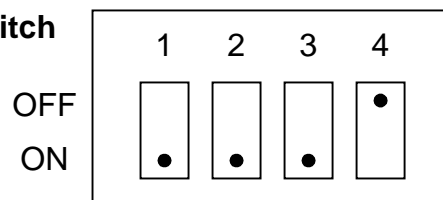
We need to set interface DIP SWITCH bit1,2,3 in ON location and function DIP SWITCH bit1 in OFF location.

Function DIP Switch

```
        1    2    3    4
OFF     •    •    •    •
ON
```
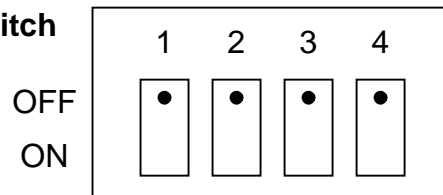
In this mode you can have two RS485 segment bridge in TWIN485.

```
RS232 ⟷──────→  TWIN485  ┌→A  ⟵────→ RS485
                 ─ ─ ─ ─ ─│─ ─
                         └→B  ⟵────→ RS485
```
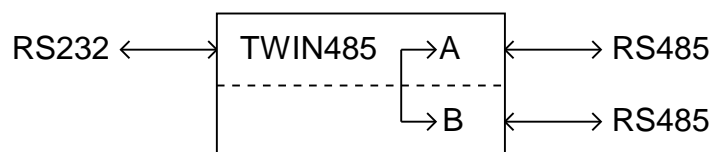
In this mode you can also set one interface to be RS422 type. So you can have one full duplex RS422 to half-duplex RS485 converter function.

In this mode RS232 interface PORT A will send data to whole RS485 network and receive data from RS485 network.

-----Chapter 5-----
System application structure

5-1. RS232 to RS422 converter. (TWIN485 set in NORMAL mode)

We can have one RS232 to RS422 converter circuitry as working unit. The other RS232 to RS422 converter circuitry as backup unit.

When we find the working unit with problem, we can use backup unit to recover such condition. Anytime you can have two units for you to find and solve your problem.

5-2. RS232 to RS485 converter. (TWIN485 set in NORMAL mode)

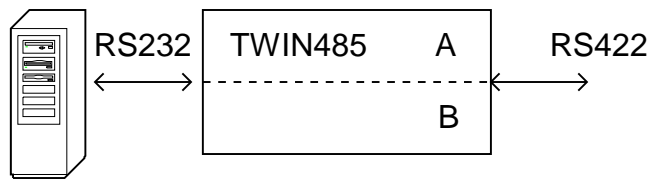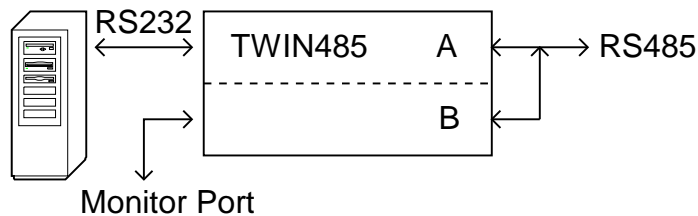We can have one RS232 to RS485 converter circuitry as working unit. The other RS232 to RS485 converter circuitry as monitor and backup unit.

Normally we can use monitor port to check the RS485 network condition. Anytime we find problem in RS485 network, we can use monitor port as backup port to recover such problem.

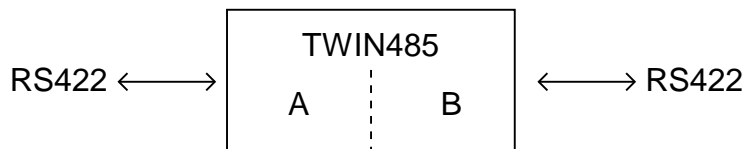## 5-3. double RS232 to RS485 converter. (TWIN485 set in NORMAL mode)
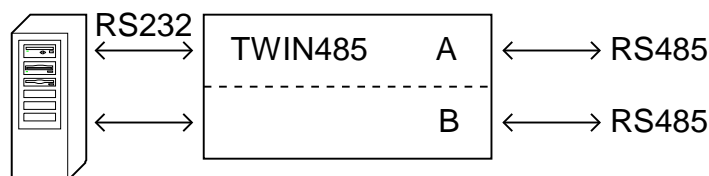
When we need to extend the cover range of RS485 network. We can have two RS485 segments. Each RS485 segment will cover 4000 feet range. So we can have two RS485 segments to cover 8000 feet range. In this application we will have two RS232 ports. Each RS232 port will use one RS232 to RS485 converter to handle one RS485 network.

When we have two types RS485 equipment. One equipment may need high speed transmission baud rate for buck data packet to send. The other equipment may not have enough processing power to handle such data transmission speed. And the data packet is small. So such equipment may need lower speed transmission baud rate to send. In this condition we need two RS485 networks to handle. One is high speed equipment group and the other is low speed equipment group. So we need double RS232 to RS485 converters to handle two RS485 networks.

In this condition TWIN485 box works as two traditional RS232 to RS485 converters.

5-4. RS422 to RS422 repeater (TWIN485 set in BRIDGE mode)

```
                  ┌──────────────────┐
                  │     TWIN485      │
RS422 ←────→      │                  │      ←────→ RS422
                  │   A  ┆  B        │
                  └──────────────────┘
```

Normally RS422 can transmit upto 4000 feet. When you need to transmit over 4000 feet, you need RS422 repeater.

We can use TWIN485 to work as RS422 repeater. In this condition you can also use RS232 PORT A as monitor port. All the data to be sent and received in TWIN485 repeater will be received in RS232 PORT A.

5-5. RS485 to RS485 bridge (TWIN485 set in BRIDGE mode)

```
                 ┌──────────────────┐
                 │     TWIN485      │
RS485 ←────→     │                  │   ←────→ RS485
                 │   A  ┆  B        │
                 └──────────────────┘
```
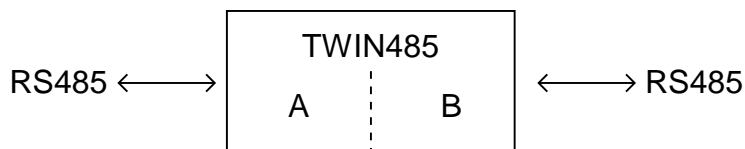
Normally RS485 network can cover 4000 feet range. When you need to cover over 4000 feet range, you need RS485 bridge.

Because one RS485 segment can only handle upto 32 nodes. When you need to handle more nodes in your RS485 network, you need extra RS485 segment to handle another 32 nodes. In this condition you need RS485 bridge between different RS485 segment.

We can use TWIN485 to work as RS485 bridge. In this condition you can also use RS232 PORT A as monitor port. All the data in RS485 network will be received in RS232 PORT A to monitor.

5-6. **RS422 to RS485 converter** (TWIN485 set in BRIDGE mode)

```
                    ┌──────────────┐
                    │   TWIN485    │
RS422 <─────>       │           │  │    <─────> RS485
                    │   A       │ B│
                    └──────────────┘
```
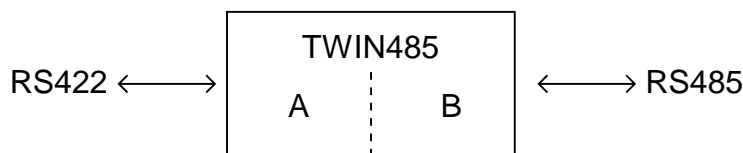
Normally RS422 is used in full-duplex point to point application. When you need to use such equipment in multi-drop environment, you need to change RS422 interface to half-duplex RS485 interface.

TWIN485 can work as RS422 to RS485 converter. In this condition you can also use RS232 PORT A as monitor port. All the data in RS422 connection and RS485 connection will be received in RS232 PORT A to monitor.

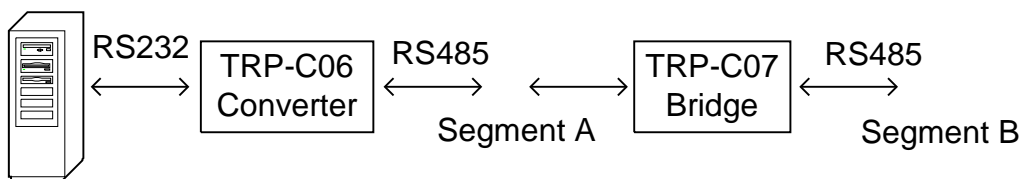# -----Chapter 6-----
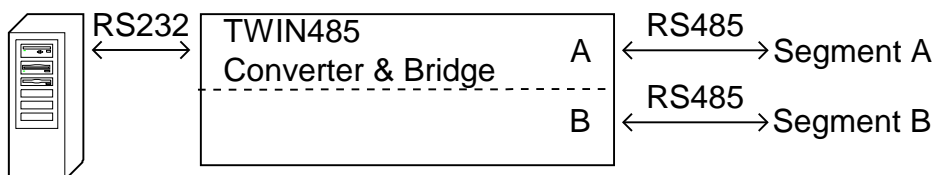# The feature for TWIN485 BRIDGE mode

When we set TWIN485 box in BRIDGE mode. TWIN485 can be used as bridge of two RS485 segment. The RS232 PORT A can also have function for RS232 to RS485 converter in this RS485 network.

```
                     ┌──────────────────┐
RS232 ←──────→       │  TWIN485    A    │  ←──────→ RS485
                     │ - - - - - - - - -│
                     │             B    │  ←──────→ RS485
                     └──────────────────┘
```

Traditionally, one dedicated RS485 bridge can only have function as bridge of RS485 network segment A and B. But TWIN485 box can also have function for RS232 to RS485 converter. In Config.2 we can find traditional RS485 network structure. We need TRP-C07 bridge for RS485 segment A and segment B. We need TRP-C06 RS232 to RS485 converter to let one PC COM port working in this RS485 network. From maintenance consideration you need to prepare TRP-C06 and TRP-C07 in stock. When we are short of TRP-C06 converter, you can not use TRP-C07 to replace. When we are short of TRP-C07 bridge, you can not use TRP-C06 to replace.

```
          RS232    ┌──────────┐  RS485              ┌──────────┐  RS485
   ┌──┐  ←──────→  │ TRP-C06  │ ←──────→  ←──────→  │ TRP-C07  │ ←──────→
   │  │            │ Converter│                      │  Bridge  │
   └──┘            └──────────┘   Segment A          └──────────┘   Segment B
```

Now, you just need one TWIN485 box to support bridge function between RS485 segment A and segment B. And one PC COM port connect to TWIN485 box working in this RS485 network. In cost consideration you just need one TWIN485 box to replace TRP-C06 and TRP-C07 cost. From maintenance consideration you just need to have TWIN485 in stock.

```
          RS232   ┌──────────────────────┐  RS485
   ┌──┐  ←──────→ │ TWIN485          A   │ ←──────→ Segment A
   │  │           │ Converter & Bridge   │  RS485
   └──┘           │ - - - - - - - - - B  │ ←──────→ Segment B
                  └──────────────────────┘
```

When we have one PC COM port to handle RS485 network. TWIN485 box set in BRIDGE mode is easy to use. But you need to have just one COM port to handle whole RS485 network, you may have some performance limitation. Because RS485 network is half-duplex structure. So one COM port need to poll each device and wait response.

If we had two COM ports in PC to handle RS485 network, then we can have each COM port to hanlde one RS485 segment. So one COM port just need to poll half number of equipment. Then the performance of such structure will have double performance of previous structure. In this condition we will set TWIN485 in NORMAL mode to offer two RS232 to RS485 converter function.

When we just have RS422 interface in equipment. And we just have one COM port in PC. We need to handle multiple equipments in PC. Then we need to use TWIN485 box as RS422 to RS485 converter. All the RS485 interface will be connected together. And one of the RS232 PORT A of TWIN485 box will connect to PC COM port. Then you can have one PC COM port to handle multiple RS422 equipments.

When TWIN485 box work in BRIDGE mode, RS232 PORT B can not be used for dedicated application. Please keep this port blank.
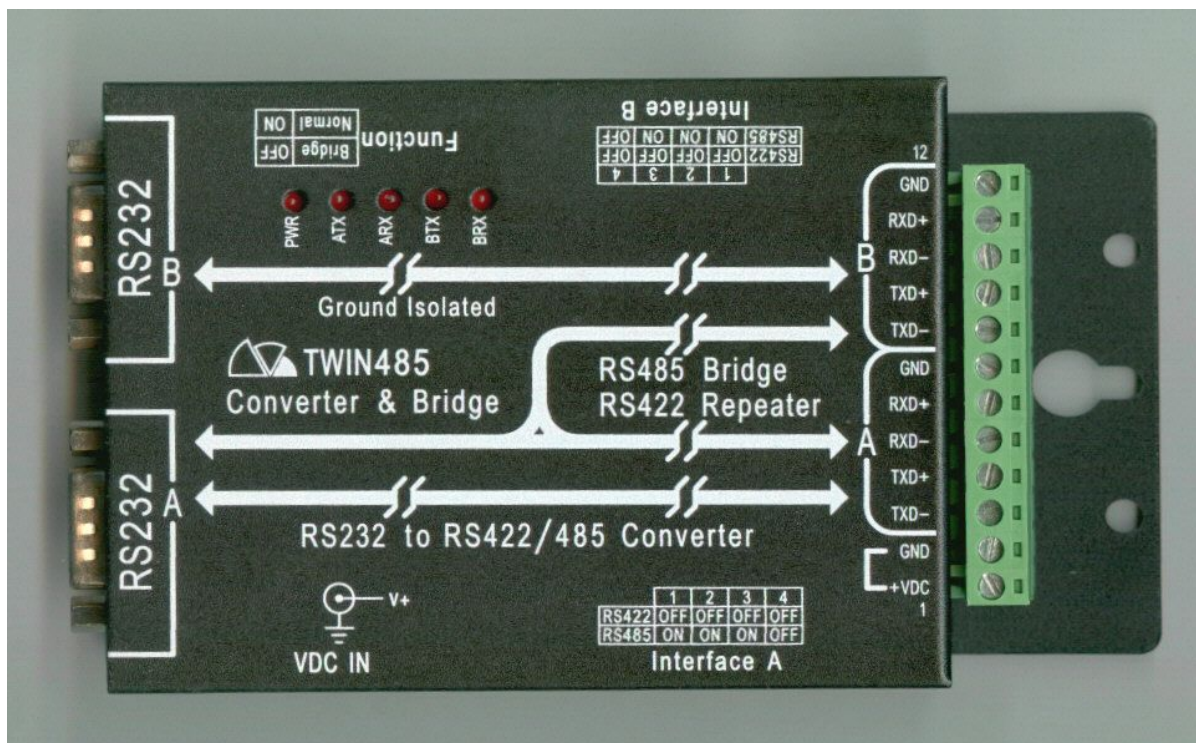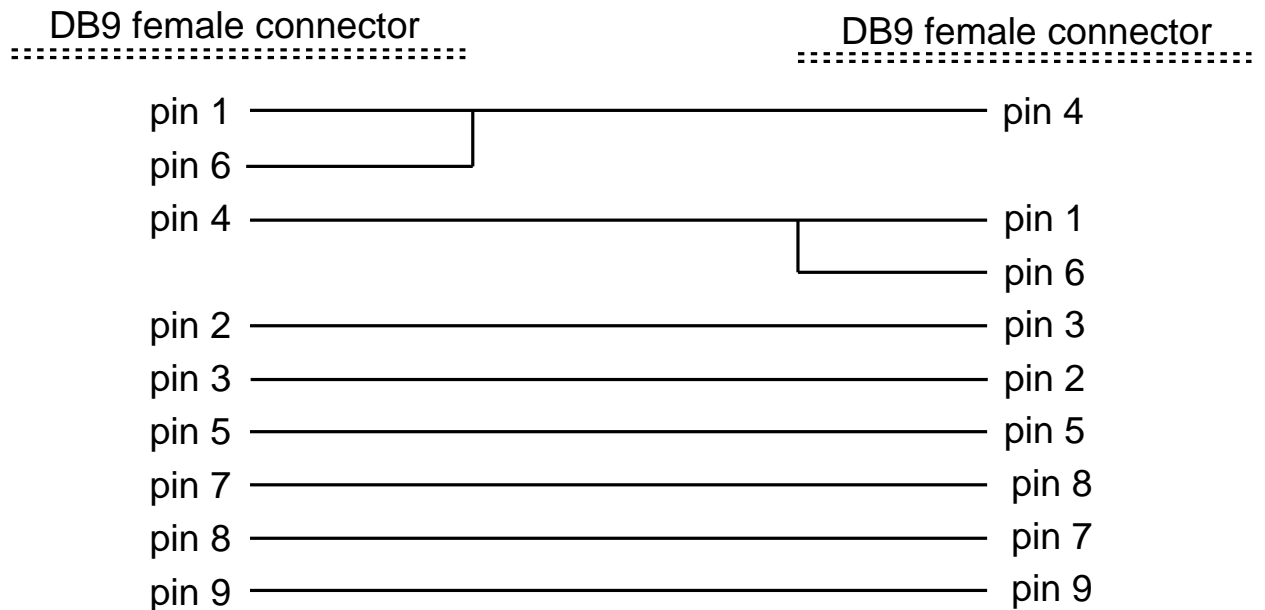
-----Appendix A-----
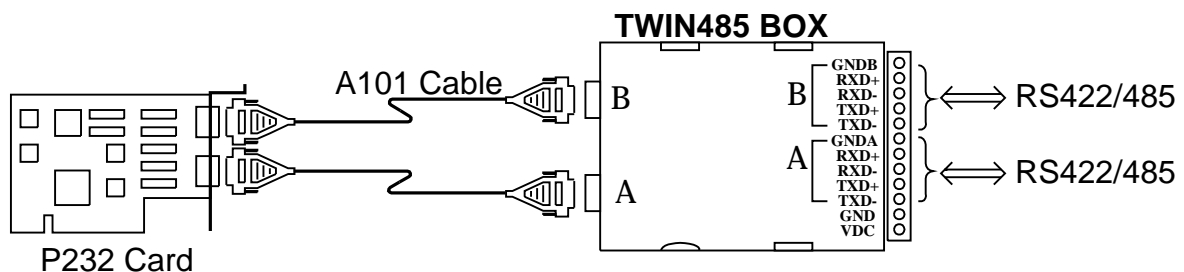# Accessories for TWIN485 Box

A-1. A101 cable for PC COM port and TWIN485 box.

PC COM port is DB9 male connector. The RS232 port in TWIN485 box is DB9 male connector. So we need DB9 female null MODEM cable for PC COM port and TWIN485 RS232 port. A101 cable is the cable for PC COM port to connect with TWIN485 box.

The pin definition for A101 cable as following:

DB9 female connector   DB9 female connector

```
pin 1 ─────────────┐                           pin 4
pin 6 ─────────────┘
pin 4 ──────────────────────────────┐     pin 1
                                     └──── pin 6
pin 2 ─────────────────────────────────── pin 3
pin 3 ─────────────────────────────────── pin 2
pin 5 ─────────────────────────────────── pin 5
pin 7 ─────────────────────────────────── pin 8
pin 8 ─────────────────────────────────── pin 7
pin 9 ─────────────────────────────────── pin 9
```
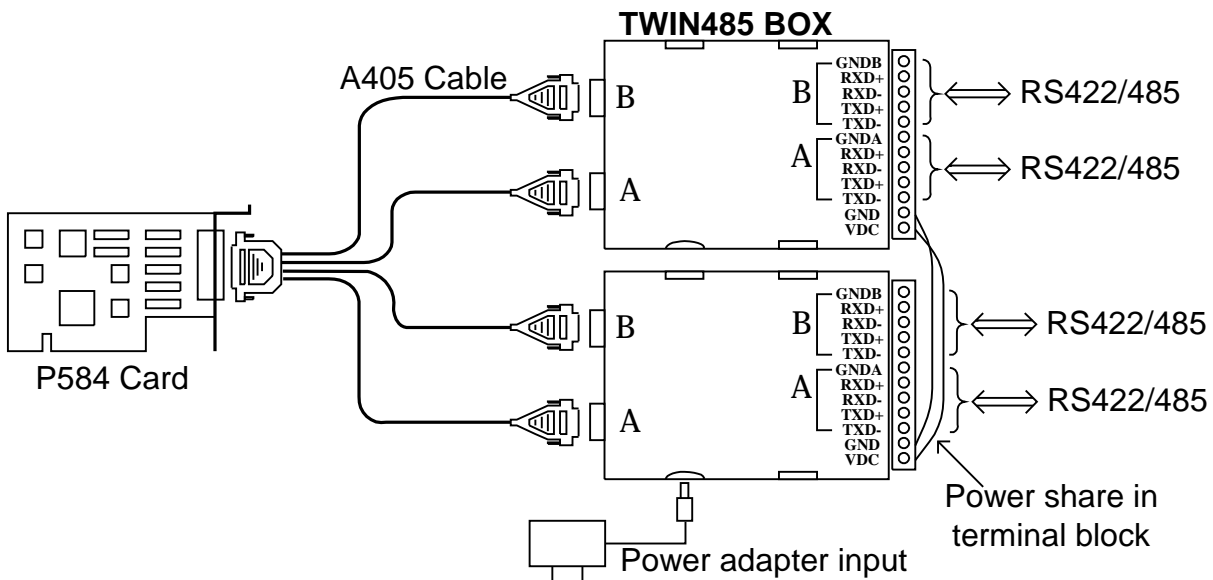
When you have our P232 card in your system, you can use two A101 cables to connect between P232 card and TWIN485 box. Then you can have two ground isolated RS422/RS485 port available.

TWIN485 BOX

A101 Cable

B   B ⟨ GNDB / RXD+ / RXD- / TXD+ / TXD- ⟩ ⟺ RS422/485

A   A ⟨ GNDA / RXD+ / RXD- / TXD+ / TXD- / GND / VDC ⟩ ⟺ RS422/485
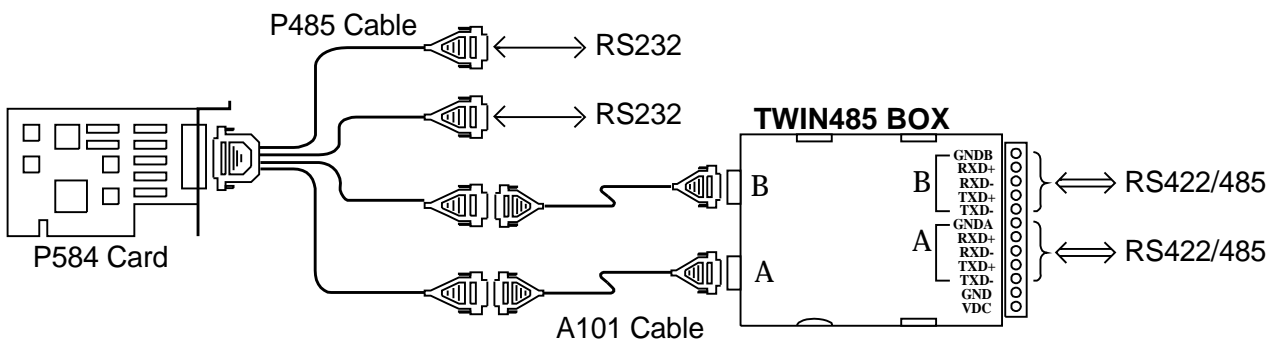
P232 Card

A-2. A405 cable for P584 card and TWIN485 box.

P584 card is four RS232 port with DB37 female connector in bracket. The RS232 port in TWIN485 box is DB9 male connector. So we need one DB37 male connector to four DB9 female connector to connect between P584 card and TWIN485 RS232 port. A405 cable is the cable for P584 card to connect with TWIN485 box.
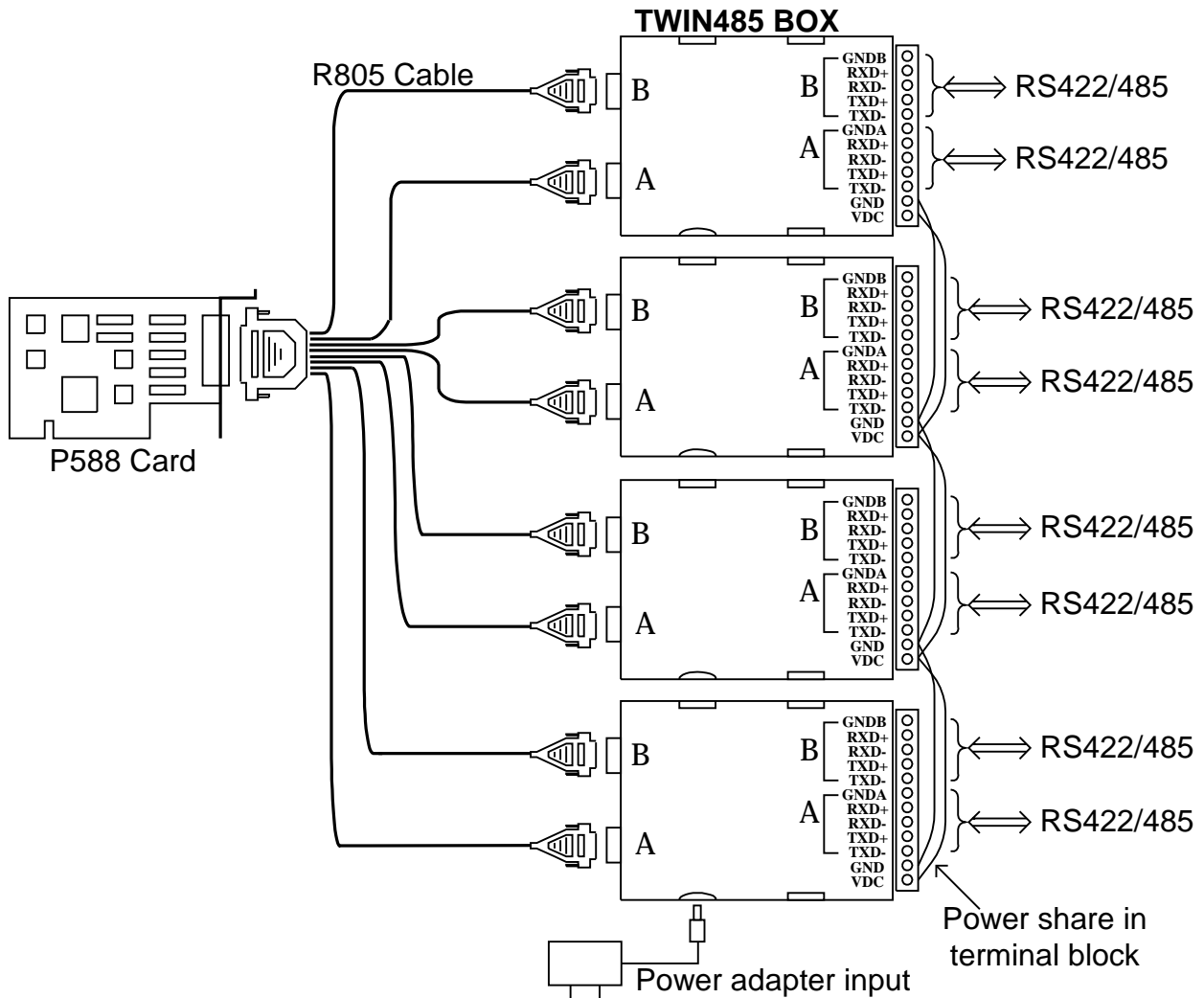

When you have our P584 card in your system, you can use one A405 cable to connect between P584 card and two TWIN485 boxes. Then you can have four ground isolated RS422/RS485 port available.

Of course you can use P485 cable for P584 card. Then you can have four DB9 male connector for RS232 port. When you need to have ground isolated RS422/485 port, you just need to connect A101 cable between such RS232 port and TWIN485 box.

A-3. R805 cable for P588 card and TWIN485 box.

P588 card is eight RS232 port with DB62 female connector in bracket. The RS232 port in TWIN485 box is DB9 male connector. So we need one DB62 male connector to eight DB9 female connector to connect between P588 card and TWIN485 RS232 port. R805 cable is the cable for P588 card to connect with TWIN485 box.

When you have our P588 card in your system, you can use one R805 cable to connect between P588 card and four TWIN485 boxes. Then you can have eight ground isolated RS422/RS485 port available.

Of course you can use R804 cable for P588 card. Then you can have eight DB9 male connector for RS232 port. When you need to have ground isolated RS422/485 port, you just need to connect A101 cable between such RS232 port and TWIN485 box.
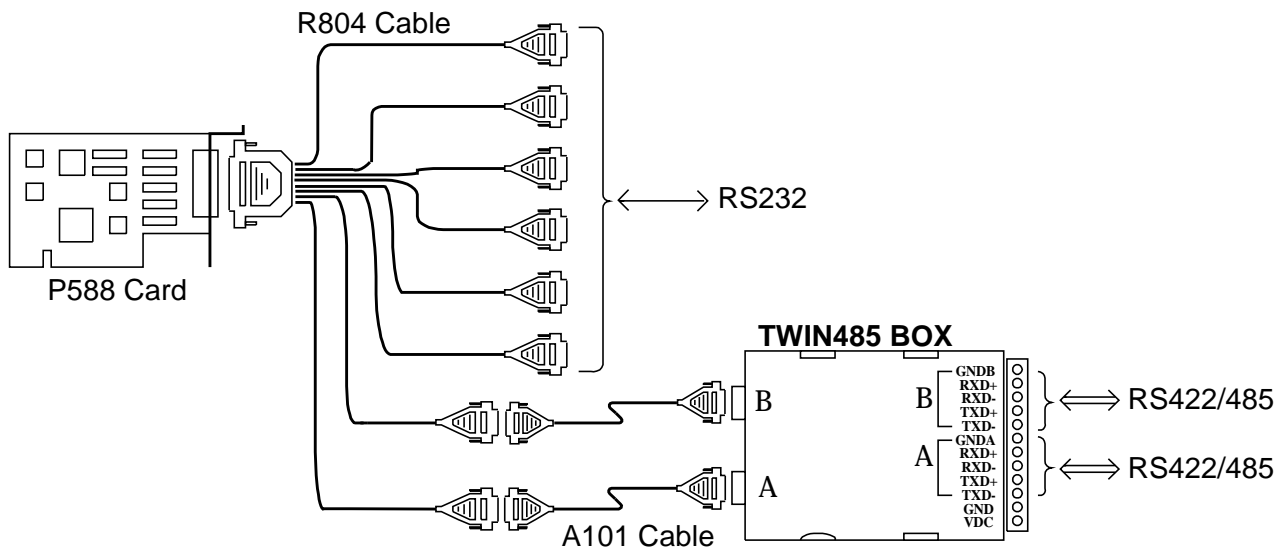
A-4. Power adapter for multiple TWIN485 box

When we need to use one power adapter to support multiple TWIN485 box, we need to check the power capacity in power adapter.

Because one TWIN485 need about 2.5W input. For one standard 12VDC @ 500mA power adapter it is no problem to support two TWIN485 boxes and may be three TWIN485 boxes. For one standard 12VDC @ 1000mA power adapter it is no problem to support four TWIN485 boxes and may be five TWIN485.

When you use one power adapter to support multiple TWIN485 box. We will plug power adapter to one TWIN485. Then we will connect every TWIN485 box dasiy chained together in terminal block.

-----Appendix B-----
Troubleshooting Procedure for TWIN485 Box

B-1. Please confirm your system structure firstly.

a) The DIP switch to set the function mode of TWIN485 is correct or not.
   DIP switch bit 1 is in ON location for NORMAL converter mode.
   DIP switch bit 1 is in OFF location for special Bridge mode.

b) The DIP switch to set the interface type of TWIN485 is correct or not.
   DIP switch bit 1 is in ON location for RS485 interface mode.
   In this mode DIP switch bit 2 and 3 must be in ON location.
   Normally DIP switch bit 4 is in OFF location.
   When you set in ON location, you must confirm no more
   terminator resistor in RS485 interface.
   DIP switch bit 1 is in OFF location for RS422 interface mode.
   In this mode DIP switch bit 2 and 3 must be in OFF location.

c) The power input is from power adapter or terminal block. Please
   confirm the inner pin of power adapter is positive voltage input and the
   outer pin of power adapter is ground. Please confirm the pin 1 of
   terminal block is positive voltage input and pin 2 of terminal block is
   ground. Please don't use power adapter input and terminal block input
   simultaneously.

B-2. Troubleshooting procedure

a) When we confirm that we have correct DIP switch setting in TWIN485
   box, we can insert power adapter. In normal condition the POWER
   LED indicator will be ON. If POWER LED were not ON, then we may
   have DC/DC converter in TWIN485 box damaged. Or you may have
   wrong power adapter to use. Please use multimeter to check the
   voltage level in terminal block pin 1 and pin 2 is between 9V and 30V.
   The voltage level under 9V may not have enough power for TWIN485.
   The voltage level over 30V may damage the DC/DC converter in

TWIN485. Please keep in mind that we use DC type power adapter in TWIN485 box. Please don't use AC type power adapter in TWIN485 box.

b) When we send/receive data from RS232 port, there are TXD and RXD LED indicator flash in normal condition. If TXD and RXD LED indicator were not ON, then we may have RS232 interface IC failed in TWIN485. Please confirm that you have correct cable between TWIN485 box's DB9 connector and your RS232 device.

c) When we set RS422 interface mode in TWIN485 box, we can set DIP switch bit 2 and 3 in ON location for loopback test. When we send/receive data in RS232 port. In normal condition we can see the echo data in console. If there were no echo data in console, then we may have RS422 interface IC damaged or DC/DC converter damaged in TWIN485. Please use multimeter to check the voltage level in TXD+ and TXD- signal. If the voltage level for such signal and ground pin were about 0V, then we may have isolated DC/DC converter damaged.

d) When you have some problem to set TWIN485 in special BRIDGE mode. We may have hardware or software problem in TWIN485 box. We can set TWIN485 in NORMAL converter mode. Then we can use above procedure a)--c) to confirm the hardware of TWIN485 box is OK or not. If we could confirm the hardware in TWIN485 box no problem, then you may have software in TWIN485 wrong. Please check with rayon@ms1.hinet.net to specify your environment and problem.

-----Appendix C-----
RMA procedure for TWIN485 Box

C-1. RETURN MATERIAL AUTHORIZATION (RMA or RA)

RAYON requires that you provide the following information :
* Model number
* RAYON serial number
* The reason for returning the products
* Your purchase-order number

You will be given the following information from your RAYON Service Representative:
* Your Return Material Authorization Number (RMA or RA Number)
* Information regarding applicable charges
* The address to which you will return the products

C-2. REPAIR CHARGES

All RAYON products have a one year warranty. Products that are damaged or modified are not covered.

This limited warranty covers defects in materials and workmanship in your RAYON-branded hardware products. This limited warranty does not cover problems that result from:
* external causes such as accident,abuse,misuse,or problems with electrical power.
* Servicing not authorized by us.
* Usage that is not in accordance with product instructions.
* Failure to follow the product instructions or failure to perform preventive maintenance.

Products that are covered under the original warranty and that are found defective by RAYON will be repaired at no cost. A standard handling and testing charge will be assessed for products returned for warranty repair that are found to be operating properly.

Products that are no longer covered under warranty will be repaired, if deemed repairable, for a flat rate charge regardless of the repair work required.

Please contact the nearest RAYON Service Center for current pricing information.

-----Appendix D-----
RCON485 addressable RS232 to RS485 converter

D-1. Introduction

RCON485 is one addressable RS232 to RS485 converter. We can use SETUP procedure to assign one unique address for each RCON485. Due to RS232 interface is full duplex communication and RS485 interface is half duplex communication. So we must have dedicated "Poll & Ack" protocol in RS485 interface. But RS232 device may not have such capability to follow such protocol. Then we can not use one RS232 to RS485 converter for this RS232 device to be used in RS485 network. Or we may always have data collision in RS485 network. In this condition we need RCON485 addressable RS232 to RS485 converter in this application. All the protocol handling in RS485 network will be handled by CPU in RCON485. So any RS232 device can use RCON485 to be used in RS485 network.

D-2. OEM product

Due to different company may have different protocol in their RS485 network. So RCON485 is not standard product. We must write dedicated firmware in RCON485 to meet each protocol in RS485 network. So RCON485 is one standard hardware product. But we will have dedicated firmware to our OEM customer. They may have different product name for their dedicated protocol. So RCON485 is only sold to our OEM customer, we will not sell to end user.

D-3. Function

One side of RCON485 is RS232 interface. Even though we have two DB9 RS232 connector here. We can only use any one of such DB9 connector to work (Generally you may use port A firstly). In the other side of RCON485 is ground isolated RS485 interface. There are two RS485 connector for two RS485 network segment. So RCON485 is

function as bridge of both RS485 segment. Then you can have two RS485 segments to support double number of RS485 device and cover double area length of RS485 network. All the data transmission in RS485 network will be monitored by CPU in RCON485. When CPU in RCON485 find the target address is this RCON485. Then RCON485 will start to handle the communication between RS232 device and RS485 network.

Due to RS485 network may connect upto 4000 feet in one segment. So the ground condition in different device may have big potential difference to damage electric device. So we use ground isolated feature in RS232 device and RS485 network. Both RS485 segment and RS232 device are in ground isolated structure. So we can cover the problem due to ground potential difference in different location. Even though we may have any problem in RS485. We may just damage the RS485 interface IC and protect the RS232 device.

Because we have CPU in RCON485 to handle the data in RS232 interface and RS485 interface. So we can have different baud rate in RS232 interface and RS485 interface. Generally we may use higher speed communication in RS485 interface to have higher throughut for data communication. But we may have some RS232 device can not support such speed. In traditional RS232 to RS485 converter we can not have different baud rate in RS232 and RS485 interface. So we may use lower speed RS232 device and higher speed RS232 device in different RS485 network. In RCON485 we can handle such baud rate different condition. So any RS232 device will be connected to RS485 network via RCON485.