INTERFACE CONVERTER

RS-232 < — > RS-422/485
RS-232 < — > CURRENT LOOP
USER'S MANUAL

1. GENERAL DESCRIPTION

RS-232 interface is a standard communication port in PC, PLC, POS and other industrial control system. And it is very popular communication interface in industrial control system, building automation system, office automation system, barcode system, POS system... etc... But its specification has many limitations in transmition speed and distance, so it can not flexibly use in high speed and long distance control system. Now we support RS-422/485 and CURRENT LOOP interface converter for RS-232 communication system. You don't change any specifications of your system and save your time and cost. They are your best choice in your system and we can give you the best service and support when you have any problems of RS-232, RS-422/485 and CURRENT LOOP communication system.
"You don't need to pay a modem or a LAN's price, but they can extend your system communication capabilities as a short haul modem or a low priced LAN." they are our goals and they are your system's solution in the future.
Following are your best choice models of RS-422/485 and CURRENT LOOP interface converter:

485-I : Intelligent RS-232 < - > RS-422/485 converter
485-II : Full duplex RS-232 < - > RS-422 converter
485-III
485-IIIA : Smart RS-232 < - > RS-422 converter

CL-I : Intelligent RS-232< - > CURRENT LOOP converter
CL-I : Smar RS-232 < - > CURRENT LOOP converter

2. SPECIFICATIONS

485-I RS-232 < – > RS-422/485 INTELLIGENT INTERFACE CONVERTER

* MONITOR/SIMULATION selectable
* DTE/DCE device setting selectable
* FULL/HALF duplex mode selectable
* Implements low priced LAN
* Supports up to 32 users
* Programmable control Tx or Rx by RTS/CTS
* RS-422/485 up to 100K bps under 4000 feet (AWG 24,22,18... individually shield multiple pair cable)

485-II RS-232 < – > RS-422 FULL DUPLEX INTERFACE CONVERTER

* DTE/DCE device setting selectable
* Full deplex
* RS-422/485 up to 100K bps under 4000 feet (AWG 24,22,18... individually shield multiple pair cable)

485-III , 485-IIIA RS-232 < – > RS-422 SMART INTERFACE CONVERTER

* Default DCE device
* H/W Handshaking signal selectable by DIP switch
* Full duplex
* RS-422/485 up to 100K bps under 4000 feet (AWG 24,22,18... individually shield mutliple pair cable)
* RTS, CTS (DSR, DCD and DTR) control signal indicators (easy for debug)
* RS-232 interface connector: D-SUB 25 pins (female) connector , D-SUB 9 pin (female) connector for 485-IIIA
* RS-422/485 interface connector: D-SUB 9 pins (male and female) connector , D-SUB 25 pin (male and female) connector for 485-IIIA

CL-I RS-232 < – > CURRENT LOOP INTELLIGENT INTERFACE CONVERTER

* MONITOR/SIMULATION selectable
* DTE/DCE device setting selectable
* Up to 19.2K bps under 1000 meters (AWG 24,22,18... individually shield multiple pair cable)

CL-II RS-232 < – > CURRENT LOOP SMART INTERFACE CONVERTER

* DTE/DCE device setting selectable
* Tx, Rx active/passive selectable
* 60, 20 mA selectable
* Up to 19.2K bps under 1000 meters (AWG 24,22,18... individually shield multiple pair cable)

GENERAL SPECIFICATIONS

* RS-232 high data rate up to 120K baud under load
* Bidirectional converter
* TD/RD transmssion indicator (easy for user debug)
* Power indicator (easy for user debug)
* RS-232 interface connector: D-SUB 25 pins (male/female) connector
* RS-422/485 interface connector: 4 screw terminal
* Dimension 69mm*53mm*22mm
* Environmental 0 to 50 degree C, 0 to 90% RH
* Power source from 9V or 12V/200mA DC adapter or through RS-232 interface pin #9 (+)

3. INPUT/OUTPUT TERMINAL AND SWITCHS DESCRIPTIONS

(1) RS-232 D-SUB 25 pins configuration:

#2	TD
#3	RD
#4	short with #5 -- to control signal (485-I only)
#5	short with #4
#6	short with #20
#7	signal ground
#9	9V/12V DC 200mA power input
#20	short with #6

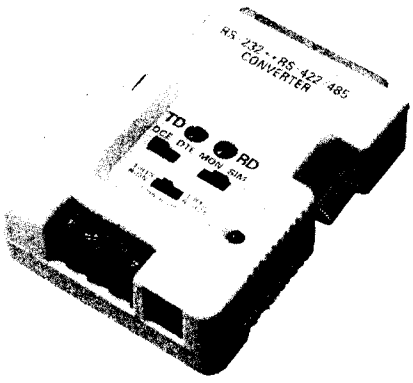
(for model 485-I, 485-II, CL-I and CL-II)

(2) Switchs setting, RS-232 and RS-422/485 connector's relationship

485-I

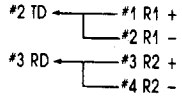
RS-232 D-SUB 25 pins connector < – > RS-422/485 4-screw terminal

RS-232 D-SUB 25 pins connector < – > RS-422/485 4-screw terminal



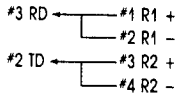
DCE (Left switch set to DCE position)

RS-232 D-SUB 25 pins connector < – > RS-422/485 4-screw terminal



DTE (Left switch set to DTE position)

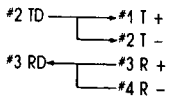
RS-232 D-SUB 25 pins connector < – > RS-422/485 4-screw terminal



485-II

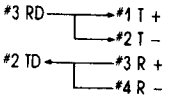
DCE (Switch set to DCE position)

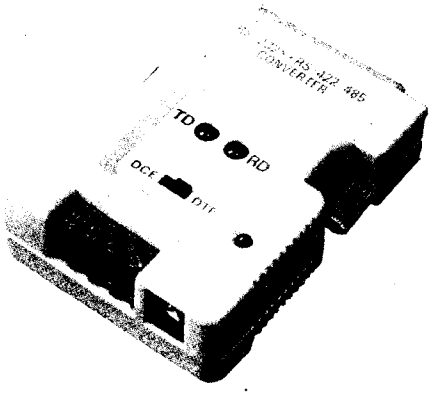
RS-232 D-SUB 25 pins connector <–> RS-422/485 4-screw terminal



DTE (Switch set to DTE position)

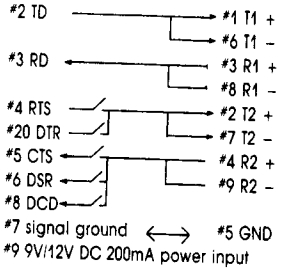
RS-232 D-SUB 25 pins connector <–> RS-422/485 4-screw terminal





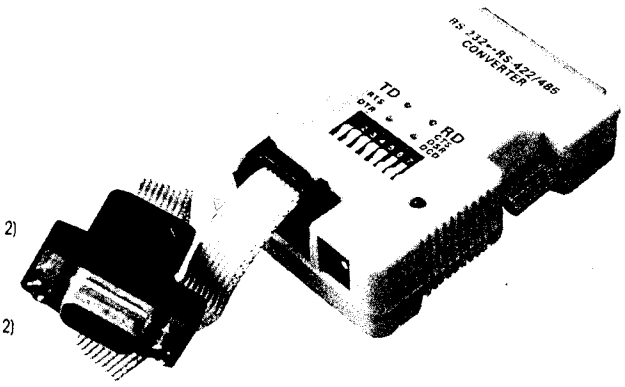
485-III

RS-232 D-SUB 25 pins connector < – > RS-422/485 D-SUB 9 pins connector



#7 signal ground ⟷ #5 GND

#9 9V/12V DC 200mA power input



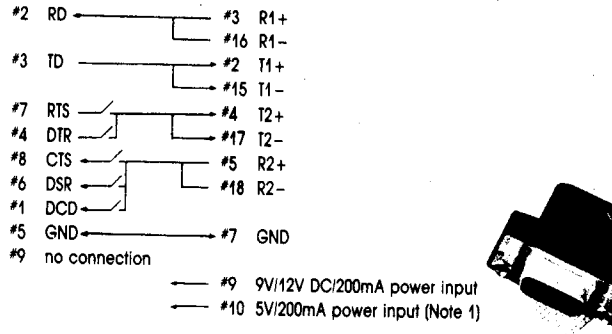
DIP switch definition

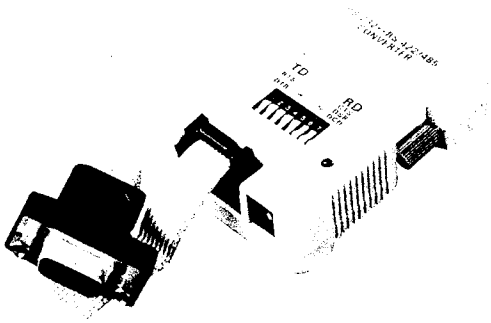
No.	on	off	
1	RTS enable	RTS disable	(Note 2)
2	CTS enale	CTS disable	
3	DSR enable	DSR disable	
4	DCD enable	DCD disable	
5	DTR enable	DTR disable	(Note 2)
6	RTS,CTS short	RTS,CTS open	
7	DTR,DSR short	DTR,DSR open	
8	DSR,DCD short	DSR, DCD open	

(Note 2: RTS and DTR can not set "on" simultaneously, because they are output signals from personal computer.)

485-III (A)

RS-232 interface D-SUB 9 pin connector < – > RS-422 interface D-SUB 25 pin connector





Note 1: If use the 5V power source should need to cut off J1 pin 2 and pin 3 , and connect J1 pin 2 and pin 1. J1 is inside the case.

DIP switch definition:

DIP NO.	RS-232 signal	ON	OFF	DIP NO.	RS-232 signal	ON	OFF
1	RTS #7	ENABLE (**)	DISABLE	5	DTR #4	ENABLE (**)	DISABLE
2	CTS #8	ENABLE	DISABLE	6	RTS #7 & CTS #8	SHORTED	OPEN
3	DSR #6	ENABLE	DISABLE	7	DSR #6 & DTR #4	SHORTED	OPEN
4	DCD #1	ENABLE	DISABLE	8	CDC #1 & DTR #4	SHORTED	OPEN

** RTS and DTR can not be set "ON" simultanuously, because they are output signals from personal computer.

CL-I

SIMULATION MODE (Down switch set to SIM position)

DCE (Up switch set to DCE position)

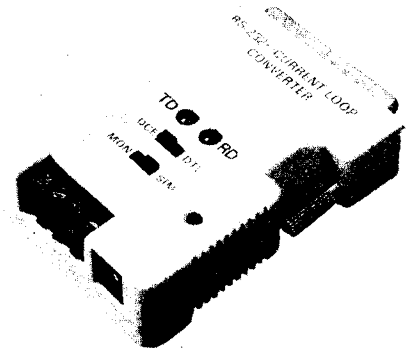
RS-232 D-SUB 25 pins connector < – > CURRENT LOOP 4-screw terminal

```
#2 TD ──────┬──→ #1 T I out (active)
            └──→ #2 T I in
#3 RD ←─────┬─── #3 R I in (passive)
            └─── #4 R I out
```

DTE (Up switch set to DTE position)

RS-232 D-SUB 25 pins connector < – > CURRENT LOOP 4-screw terminal

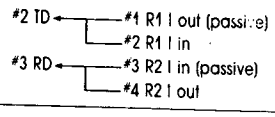
```
#3 RD ──────┬──→ #1 T I out (active)
            └──→ #2 T I in
#2 TD ←─────┬─── #3 R I in (passive)
            └─── #4 R I out
```



MONITOR MODE dDown switch set to MON position

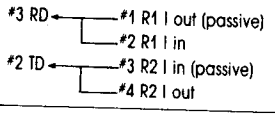
DCE dip switch set to DCE position

RS-232 D-SUB 25 pins connector < – > CURRENT LOOP 4-screw terminal



DTE dip switch set to DTE position

RS-232 D-SUB 25 pins connector < – > CURRENT LOOP 4-screw terminal



CL-II

Up/Left switch set to 20 for 20mA loop, set 60 for 60mA loop

DCE (Up/Right switch set to DCE position)

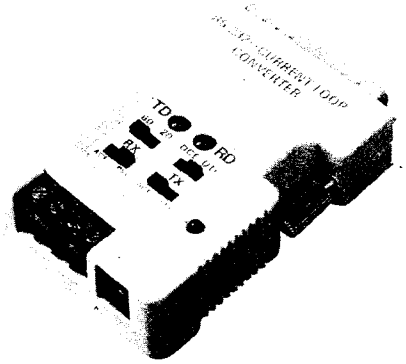
RS-232 D-SUB 25 pins connector < – > CURRENT LOOP 4-screw terminal

#2 TD	→ #1 T I out	(Active or Passive depends on Down/Right
	→ #2 T I in	switch setting on ACT or PSV)
#3 RD	← #3 R I in	(Active or Passive depends on Down/Left
	← #4 R I out	switch setting on ACT or PSV)

DTE (Up/Right switch set to DTE position)

RS-232 D-SUB 25 pins connector < – > CURRENT LOOP 4-screw terminal

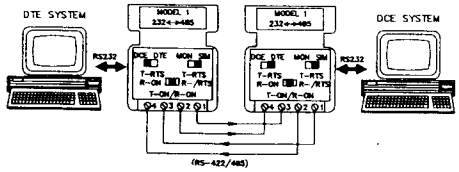
#3 RD	→ #1 T I out	(Active or Passive depends on Down/Right
	→ #2 T I in	switch setting on ACT or PSV)
#2 TD	← #3 R I in	(Active or Passive depends on Down/Left
	← #4 R I out	switch setting on ACT or PSV)



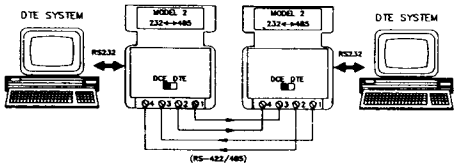
INTERFACE CONVERSION

POINT TO POINT 4 WIRES FULL DUPLEX

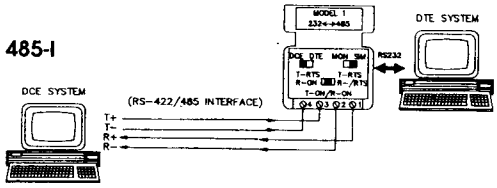
485-I



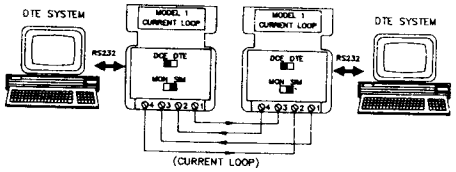
485-II



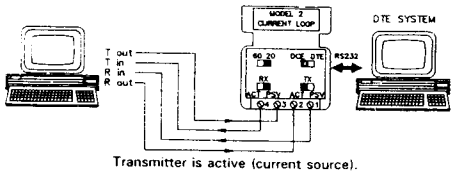
485-I



CL-I

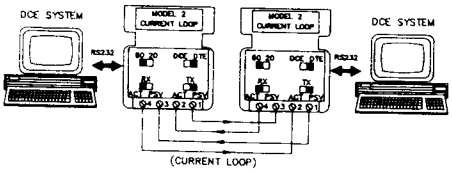


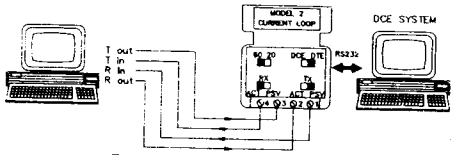
CL-II



Transmitter is active (current source).
Receiver is passive (current loop).

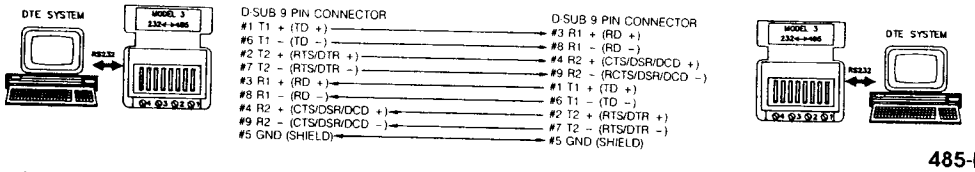
CL-II





Transmitter is active (current source).
Receiver is passive (current source).

POINT TO POINT 8 WIRES FULL DUPLEX HARDWARE HANDSHAKING BY RTS/DTR, CTS/DSR/DCD (SELECTABLE)

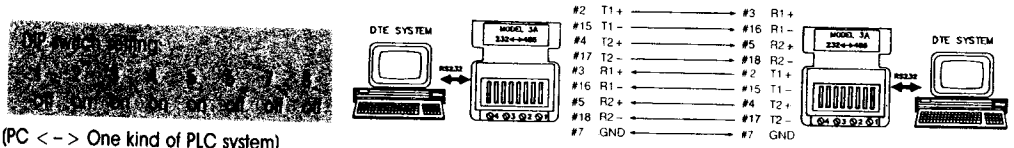


485-III

485-IIIA Applications:

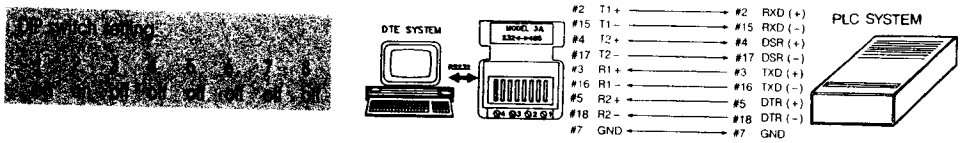
Point to point 8 wires full duplex hardware handshaking by RTS/DTR, CTS/DSR/DCD (selectable) (PC-WANG < - > PC-WANG)

For WANG computer system, the H/W handshaking signal by DTR and CTS/DSR/DCD.



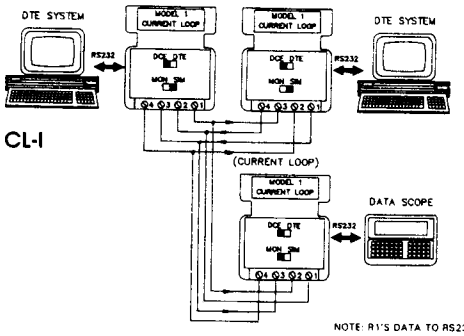
(PC < - > One kind of PLC system)

For PLC system, the H/W handshaking signal by RTS and CTS.



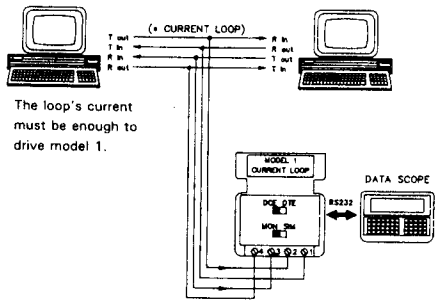
INTERFACE CONVERSION FOR MONITORING DEVICE

CL-I



NOTE: R1'S DATA TO RS232C PIN #2(TD)
R2'S DATA TO RS232C PIN #3(RD)

CL-I



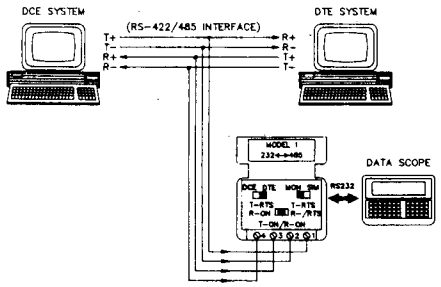
The loop's current must be enough to drive model 1.

NOTE: R1'S DATA TO RS232C PIN #2 (TD)
R2'S DATA TO RS232C PIN #3 (RD)

IMPLEMENTS A LOW PRICED LAN

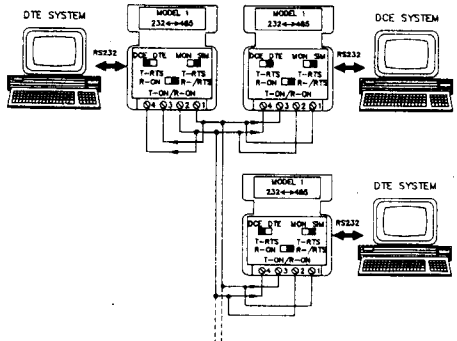
MULTIDROP 2 WIRES HALF DUPLEX PROGRAMMABLE CONTROL TX AND RX BY RTS OR CTS

485-I



NOTE: R1'S DATA TO RS232C PIN #3(RD)
R2'S DATA TO RS232C PIN #2(TD).

485-I

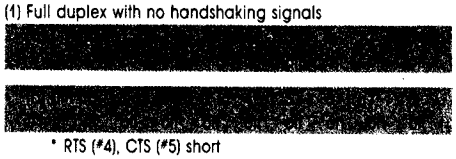


TERMINAL RESISTOR

THE TERMINAL RESISTORS ARE NECESSARY WHEN USE IN MULTIDROP CONNECTION. (100 OHM---1K OHM)

The following DIP switch setting are for 485-III ,485-IIIA only.

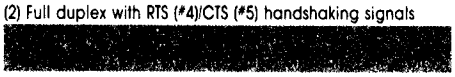
(1) Full duplex with no handshaking signals



* RTS (#4), CTS (#5) short
* DTR (#20), DSR (#6) short

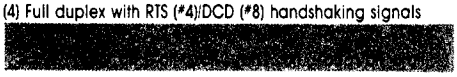
* RTS (#4), CTS (#5) short
* DTR (#20), DSR (#6) and DCD (#8) short

(2) Full duplex with RTS (#4)/CTS (#5) handshaking signals



(3) Full duplex with RTS (#4)/ DSR (#6) handshaking signals

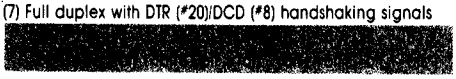
(4) Full duplex with RTS (#4)/DCD (#8) handshaking signals



(5) Full duplex with DTR (#20)/CTS (#5) handshaking signals

(6) Full duplex with DTR (#20)/ DSR (#6) handshaking signals

(7) Full duplex with DTR (#20)/DCD (#8) handshaking signals



(8) Full duplex with RTS (#4)/CTS (#5) handshaking signals (DTR (#20), DSR (#6) and DCD (#8) short)

5. INSTALLATION INSTRUCTIONS

(1) Set the switchs to the desired position.
(2) Connect the cable (4 or 8 wires) to both end.
(3) Plug the DC plug into the DC jack.
(4) Plug the adapter into an AC outlet, the unit is ready for operation.

Caution: Put off the adapter from AC outlet when you want to reinstall the unit.

APPENDIX

DTE SYSTEM: PERSONAL COMPUTER (pin #2 transmits data, #3 receives data)

DCE SYSTEM: MODEM (pin #2 receives data, #3 transits data)

RS-232 25 Pin Assignments

Pin #	Signal Name	DTE	DCE	Abbreviation
1	Protective (Frame) Ground			
2	Transmit Data	–		XMT (TD)
3	Receive Data			RCV (RD)
4	Request To Send	–		RTS
5	Clear To Send			CTS
6	Data Set Ready		–	DSR
7	Signal Ground (Common Return)			GND
8	Carrier Detect		–	CD
9				
10				
11				
12	Secondary Carrier Detect		–	SEC_CD
13	Secondary Clear To Send			SEC_CTS
14	Secondary Transmit Data	–		SEC_XMT
15	Transmit Clock (DCE Source)			XMT_CLK
16	Secondary Receive Data		–	SEC_RCV
17	Receive Clock			RCV_CLK
18				
19	Secondary Request To Send			SEC_RTS
20	Data Terminal Ready	–		DTR
21	Signal Quality Detect			SQD
22	Ring Indicator		–	RI
23	Data Rate Selector			DRS
24	Transmit Clock (DTE Source)	–		XMT_0CLK
25				

INTERFACE CONVERTER

RS-232 < — > RS-422/485
RS-232 < — > CURRENT LOOP
USER'S MANUAL