

USER'S MANUAL



PH232T485Y11

RS-232/TTL UART to RS-485/422 ISOLATED CONVERTER

IPEX

(IP Electronix)

16 January 2022

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1. INTRODUCTION

IPEX PH232T485Y11 is a Bi-Directional RS-232/TTL UART to RS-485 and RS-422 Converter that converts RxD & TxD signals of RS-232 standard to differential (Data+ & Data-) signals of RS-485 standard and (RX+, RX- & TX+, TX-) signals of RS-422 standard at a same time. It works with Baud-Rate from 300bps to 230400bps

Since RS-485 is a Half-Duplex standard, switching between Transmit and Receive is done automatically and further signals (such as RTS) are not required. **PH232T485Y11** supports Point-to-Point and Point-to-Multi Point Party Line network topologies.

There are 3kV Optical and Electrical insulations have between RS-232/TTL UART and RS-485/422 sides, thus using this device in the RS-485/RS-422 line, can be very effective in eliminating electrically and electromagnetically noises.

Protection against Surge, ESD and EMI is considered in its design, so, **PH232T485Y11** is good for industrial usage and is useful for Industrial Automation, Telecommunications, SCADA Systems, DCS Systems and ...

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2. SPECIFICATIONS

- **RS-232/TTL UART to RS-485/422** Bi-Directional Isolated Converter;
- **Number of Ports:** #1 RS-232 to #1 RS-485/422 Bi-Directional Repeater;
- **Serial Standard:** Meets or Exceeds the Requirements of TIA/EIA-232-F and ITU v.28 Standards;
- **RS-232 Signal (Full Flow Control Support):** TxD, RxD, DTR, RTS, DSR, CTS, GND;
- **RS-232 Parity:** Even, Odd, None, Mark and Space;
- **Standard TTL** TxD and RxD Signals, suitable for directly connect to a Microcontroller
- **Serial Standard:** Meets or Exceeds the Requirements of RS-485/422 Standards;
- **RS-485 Signal:** Data+, Data-, GND;
- **RS-422 Signal:** TX+, TX-, RX+, RX-, GND;
- **RS-485/422 Parity:** Even, Odd, None, Mark and Space;
- **Maximum Communication Distance:** 2400m (1200m each side);
- **Loading:** RS-485 and RS-422 Side up to 32 Nodes are supported;
- **Fully Plug & Play;**
- **Wide Range Power Supply:** +8V to +48V DC;
- **Serial Transmission Speed** up to 230.4 kbps;
- **Power (Green)** LED Indicator;
- **Transmit (Blue)** and **Receive (Yellow)** LED Indicator;
- **Isolation Protection:** 3kV Instantaneous, 500V DC Continuous;
- **Surge Protection:** Embedded 1500W Surge Protection;
- **Magnetic Isolation:** 1.5 kV Built-in;
- **ESD Protection:** Exceeds ± 15 kV Using Human-Body Model (HBM);
- **Dimensions:** 26mm x 71.6mm x 122 mm (1.03in x 2.8in x 4.82in);
- **Operating Temperature:** -10°C to +70°C (+14°F to +158°F);
- **1 Year Guarantee and 5 Years Support.**

3. PACKAGE CHECKLIST

Before installing the PH232T485Y11, verify that the package contains the following items:



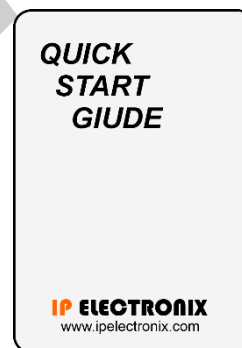
1) #1 PH232T485Y11



2) #1 RS-232 Male to Female Cable



3) #1 Document and Driver CD-ROM



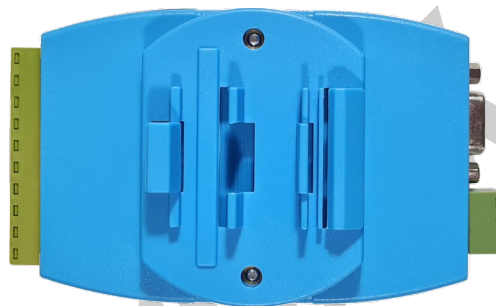
4) #1 Quick Start Guide

NOTE: Notify your sales representative if any of the above items is missing or damaged.

4. TOP VIEW



5. BOTTOM VIEW



6. FRONT VIEW



7. BACK VIEW



8. PORT SETTINGS

- RS-422

To use PH232T485Y11 as a RS-232 to RS-422 converter, it is not required to set a Baud-Rate and DIP-Switch condition (on the Top Panel), is not important.




- RS-485

Before using PH485iX as a RS-232 to RS-485 converter, it is necessary to set the DIP-Switch (on the top Panel) to appropriate state according to the desired Parity and Baud-Rate. PH232T485Y11 supports a wide range Baud-Rates from 1200 bps to 921600 bps.

Set the DIP-Switch state according to the following table to set the suitable Baud-Rate.

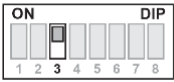

- Parity

Set the Parity type by the DIP-Switch keys number 1 and number 2 on the device. "None", "Even" and "Odd" Parity type are supported by PH485iX. The Parity setting are shown in the following table.

<p>Parity None</p> 	
<p>Parity Even</p> 	<p>Parity Odd</p> 



- Stop Bit

1 and 2 bits are selectable for Stop Bit according to the following figure:

<p>1 Stop bit</p> 	<p>2 Stop bits</p> 
--	--

















- Data-Length

7-Bits and 8-Bits Data-Length are supported by PH485iX. Set Data-Length by key number 4.


<p>7 Bits</p> 	<p>8 Bits</p> 
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- Baud-Rate

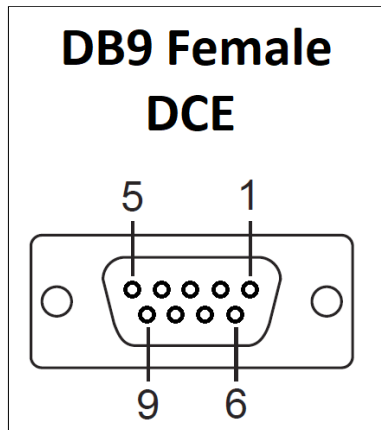
Four keys from number 5 to number 8 are used to set Baud-Rate as the following table.

600 bps 	28800 bps 
1200 bps 	38400 bps 
2400 bps 	57600 bps 
4800 bps 	115200 bps 
7200 bps 	153600 bps 
9600 bps 	230400 bps 
14400 bps 	460800 bps 
19200 bps 	921600 bps 

Example: Setting Baud-Rate = 9600bps, Data-Length = 8bits, Stop Bit = 1bit and Parity = None, are done as in the table below.

<p>Baud Rate = 9600 bps Data Length = 8 Parity = None Stop bits = 2</p>	
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9. RS-232 SERIAL PORT PIN CONFIGURATION



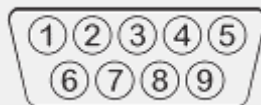
PIN	NAME	TYPE
1	DCD	OUTPUT
2	RxD	OUTPUT
3	TxD	INPUT
4	DTR	INPUT
5	GND	GROUND
6	DSR	OUTPUT
7	RTS	INPUT
8	CTS	OUTPUT
9	RI	OUTPUT

Data Communication Equipment (DCE)

10. RS-485/RS-422 SERIAL PORT PIN CONFIGURATION

Port	Pin #	Name	Task	Type
RS-422	1	TX+	Transmit +	Output
	2	TX-	Transmit -	Output
	3	RX+	Receive +	Input
	4	RX-	Receive -	Input
	5	GND	Ground	GND
RS-485	6	NC	No Connection	-----
	7	DATA-	Data -	Bi-Directional
	8	DATA+	Data +	Bi-Directional
	9	GND	Ground	GND

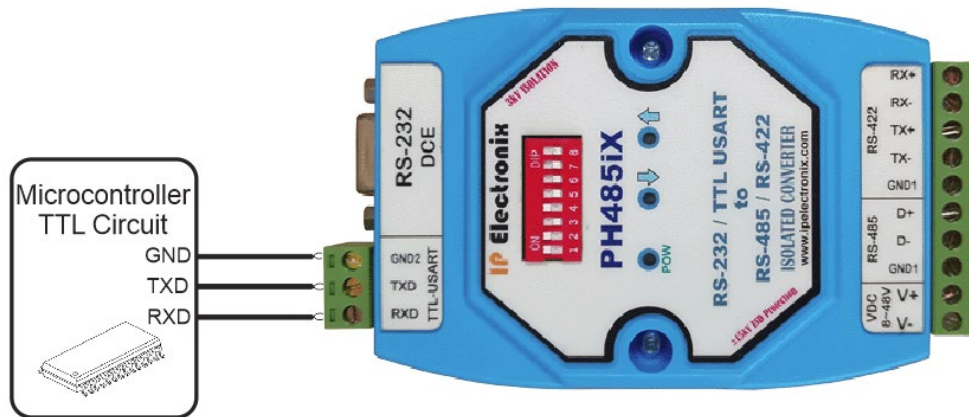
Connector Type: DB9 Male



11. TTL USART Signals

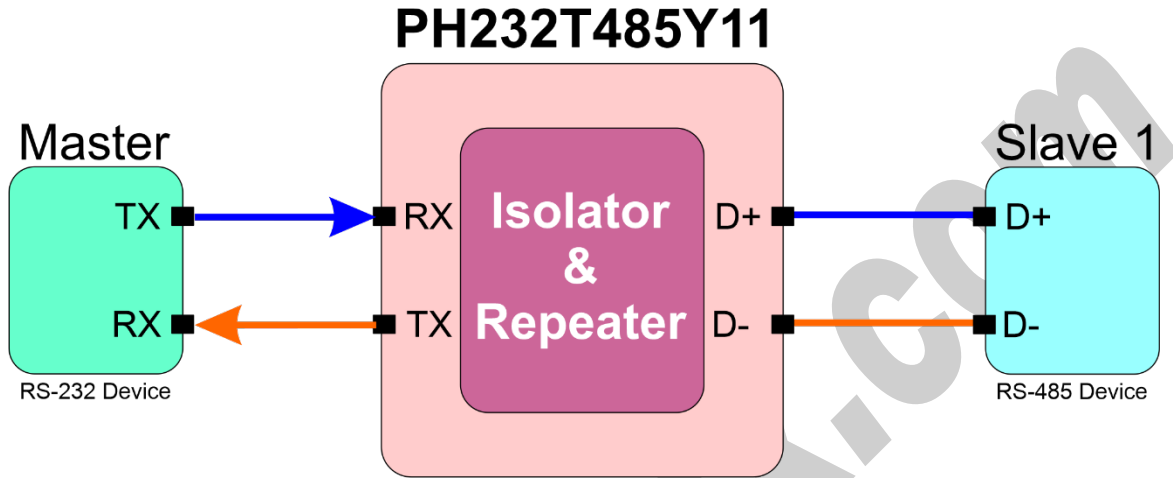
DTE Microcontroller	DCE (PH232T485Y11)	
GND	GND	Necessary
TXD	TXD	Necessary
RXD	RXD	Necessary

Connecting Method: Connect GND to Microcontroller Board's GND, Connect TXD directly to TXD of Microcontroller and RXD directly to RXD of Microcontroller if your Microcontroller has TTL Logic.

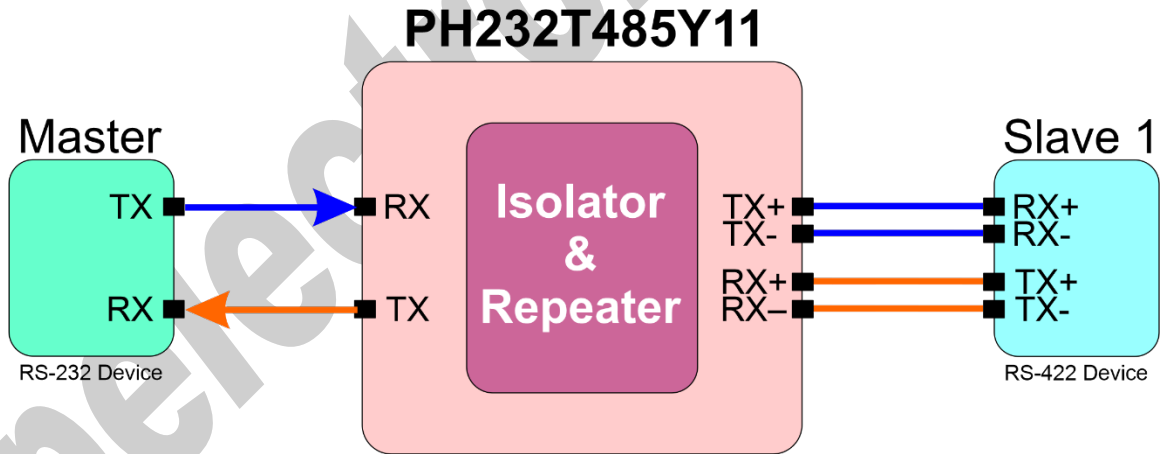


12. PH232T485Y11 CONNECTION DIAGRAM

- PH232T485Y11 in RS-485 Mode



- PH232T485Y11 in RS-422 Mode



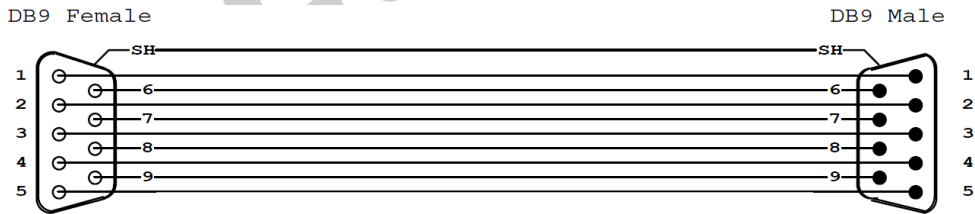
- PH232T485Y11 in Mixed Mode

It is possible to use PH232T485Y11 in mixed mode, this means you can use each port as RS-485 or RS-232 separately.

13. RS-232 CONNECTING METHODS

- Modem Connection (to a Modem, any DCE devices)

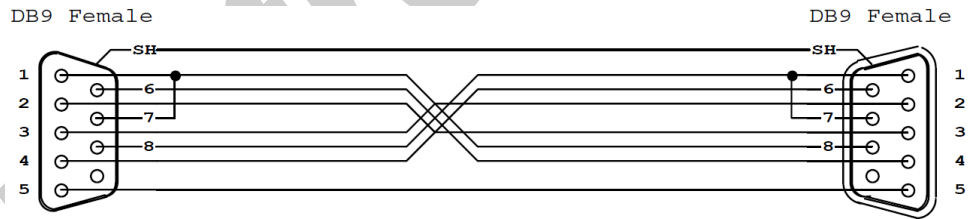
DTE DB9-Male Pin Number		Modem or other DCE devices DB9-Female Pin Number	
Pin 1: DCD	(Input)	Pin 1: DCD	(Output)
Pin 2: RxD	(Input)	Pin 2: RxD	(Output)
Pin 3: TxD	(Output)	Pin 3: TxD	(Input)
Pin 4: DTR	(Output)	Pin 4: DTR	(Input)
Pin 5: GND	(Ground)	Pin 5: GND	(Ground)
Pin 6: DSR	(Input)	Pin 6: DSR	(Output)
Pin 7: RTS	(Output)	Pin 7: RTS	(Input)
Pin 8: CTS	(Input)	Pin 8: CTS	(Output)
Pin 9: RI	(Input)	Pin 9: RI	(Output)



(Modem Cable)

- **Null Modem Connection (to PC, PLC, RTU or any other DTE devices)**

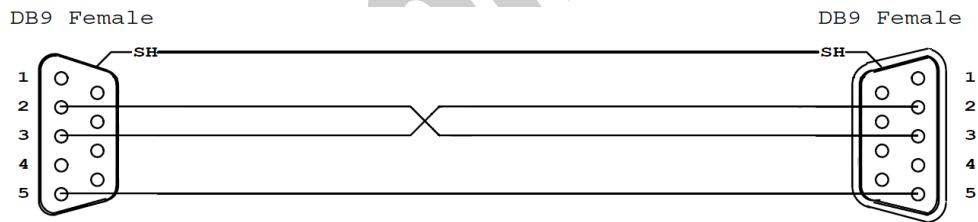
DTE DB9-Male Pin Number		PC, PLC or other DTE devices DB9-Male Pin Number	
Pin 1: DCD	(Input)	Pin 7: RTS	(Output)
Pin 2: RxD	(Input)	Pin 3: TxD	(Output)
Pin 3: TxD	(Output)	Pin 2: RxD	(Input)
Pin 4: DTR	(Output)	Pin 6: DSR	(Input)
Pin 5: GND	(Ground)	Pin 5: GND	(Ground)
Pin 6: DSR	(Input)	Pin 4: DTR	(Output)
Pin 7: RTS	(Output)	Pin 8: CTS	(Input)
Pin 8: CTS	(Input)	Pin 7: RTS	(Output)
Pin 7: RTS	(Output)	Pin 1: DCD	(Input)



(Null Modem Cable)

- **Simple Null Modem Connection (to PC, PLC... Without Hardware Flow control)**

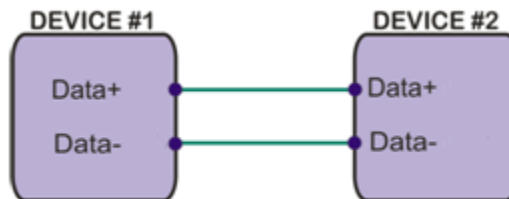
DTE DB9-Male Pin Number		PC, PLC or other DTE devices DB9-Male Pin Number	
Pin 2: RxD	(Input)	Pin 3: TxD	(Output)
Pin 3: TxD	(Output)	Pin 2: RxD	(Input)
Pin 5: GND	(Ground)	Pin 5: GND	(Ground)



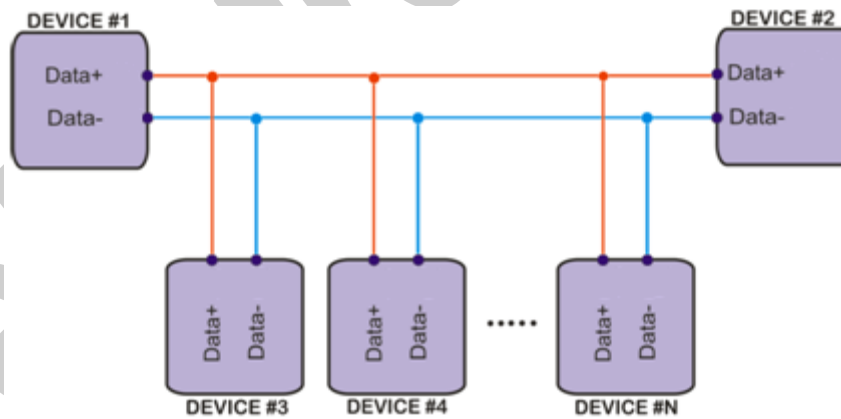
(Simple Null Modem Cable (Without Hardware Handshaking))

14. RS-485 CONNECTING METHODS

- RS-485: Point to Point Connection

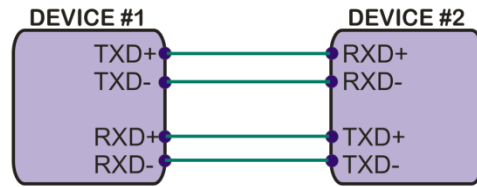


- RS-485: Multipoint Network

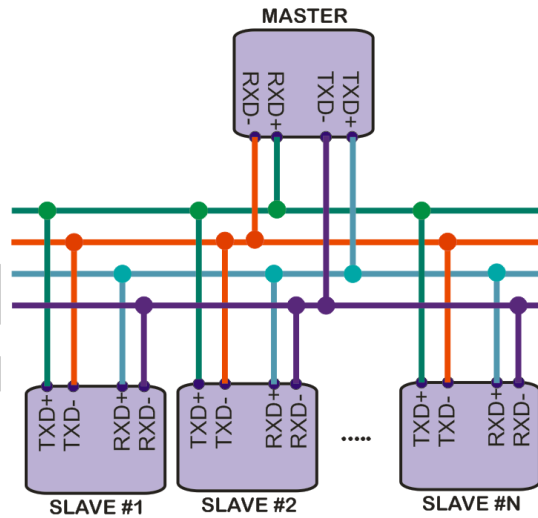


15. RS-422 CONNECTING METHODS

- **RS-422: Point to Point**



- **RS-422: Multi-Drop Network**



16. GUARANTEE

All products manufactured by **IPEX** are under warranty regarding defective materials for a period of one year from the date of delivery to the original purchaser.

17. TECHNICAL SUPPORT

If you have any technical question or need any technical support, please contact us using this Email address: support@ipelectronix.com.

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