

# Isolated safety barrier

## TD10xW-EX-485-xx Series

Ultra-thin RS485 Input isolated safety barrier  
 TD100W-EX-485-xx(RS485 output \_ half-duplex)  
 TD101W-EX-485-xx(RS232 output)



RoHS



## FEATURES

- Input, output and power supply are mutually isolated from each other
- high isolation voltage (2000VAC/60S)
- High isolation power supply output
- High baud rate up to 56000bps
- 12.5mm ultra-thin case
- Excellent EMC performance
- High reliability (MTBF >500,000 hours)

*TD10xW-EX-485-xx detection side isolated safety barrier, It can supply isolated DC power of the transmitters from the security zone to the danger zone, transform the RS-485 or RS-232 digital signal of danger zone into isolated RS-485 digital signal transmission to the security zone, while increasing the anti-jamming capability of the industrial production process control system, to ensure system stability and reliability. One independent power supply is required. Moreover, within the product power supply, input and output are mutually isolated. This product is connected with the field devices and the area where : With RS-485 communication interface device;zone 0,zone 1,zone 2; IIA,IIB,IIC,T4~T6 hazardous area.*

## Selection Guide

Part No.	hazardous area Signal	safe area Signal	On-site power supply
TD100W-EX-485-00	Half-duplex RS485	Half-duplex RS485	None
TD101W-EX-485-00	Half-duplex RS485	RS232	None
TD100W-EX-485	Half-duplex RS485	Half-duplex RS485	5V Current ≤ 140mA
	Half-duplex RS485	Half-duplex RS485	6V Current ≤ 140mA
	Half-duplex RS485	Half-duplex RS485	8V Current ≤ 140mA
	Half-duplex RS485	Half-duplex RS485	9V Current ≤ 140mA
	Half-duplex RS485	Half-duplex RS485	12V Current ≤ 100mA
TD101W-EX-485	Half-duplex RS485	RS232	5V Current ≤ 140mA
	Half-duplex RS485	RS232	6V Current ≤ 140mA
	Half-duplex RS485	RS232	8V Current ≤ 140mA
	Half-duplex RS485	RS232	9V Current ≤ 140mA
	Half-duplex RS485	RS232	12V Current ≤ 100mA

## Input Specifications

Item	Operating Conditions		Value
Power Supply Input	power supply		18~36VDC (Typical value 24VDC)
	Input power	when the output current is in its max. value	About 3.5W
	Power supply protection		Reverse connection protection, over-current protection
Hazardous Zone	Input signal		RS-485 Half-duplex digital signal
Safe Port	Input signal	TD100W-EX-485-xx	RS-485 Half-duplex digital signal
	Input signal	TD101W-EX-485-xx	RS-232 digital signal

## Output Specifications

Item	Operating Conditions	Value
Hazardous Area Isolation power output	On-site power supply	See List of Selection Guide

### Transmission Specifications

Item	Operating Conditions	Value
RS-485		Signal level rules: Standard RS-485 differential level
		Transmission delay: $\leq 10 \mu s$
		Signal transmission rate: $\leq 56$ kbps
RS-232		Signal level rules: Standard RS-232 differential level
		Transmission delay: $\leq 10 \mu s$
		Signal transmission rate: $\leq 56$ kbps

### General Specifications

Item	Operating Conditions	Value
Electric Isolation	testing for 1minute, leakage current < 5mA, humidity < 70%	intrinsically safe end and non-intrinsically safe end 2000VAC
		between safe area power and signal, between hazardous area with isolated power output and signal: 2000VAC
Insulation Resistance	intrinsically safe end and non-intrinsically safe end	100M $\Omega$ , 500VDC
Signal indicator lamp	Green	Power, lighting at power on
	Yellow	Send Indicator, safety side lights when data is sending
	Red	Receive Indicator, safety side lights when data is receiving
Explosion Protection Certification Mark	Have Isolation power output	(Exib Gb) IIC
	No Isolation power output	(Exia Ga) IIC
Explosion Protection Certification Parameter	Between terminal 5 and terminal 6	Uo=11.2 V, Io=111mA, Um=250V AC/DC Co=1.2 $\mu$ F, Lo=2mH
	Between terminal 3 and terminal 4	Uo=16.1V, Io=185mA, Um=250V AC/DC Co=0.28 $\mu$ F, Lo=0.2mH
Explosion Protection Certification Body		CQFB (Chongqing Electric Exploding Proof Approval Department Ministry of Coal Industry)
Explosion Protection Certificate No.	Have Isolation power output	320160137U
	No Isolation power output	320160138U
Operating Temperature		-25 $^{\circ}$ C to +71 $^{\circ}$ C
Transportation and Storage Temperature		-40 $^{\circ}$ C to +85 $^{\circ}$ C
Storage Humidity		10%~90%RH

### Physical Specifications

Casing Material	Retardant material UL94-V0
Safety Class	IP20 (IEC60529 / EN60529)
Package Dimensions	35mm DIN-rail package: T-rail card package (DIN50022), pluggable connection pin, thickness 12.5mm
Weight	100g(Typ.)

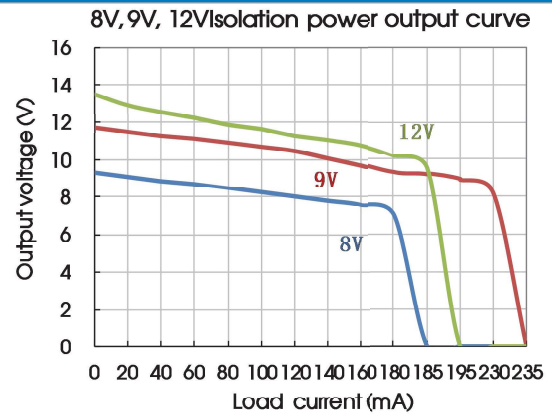
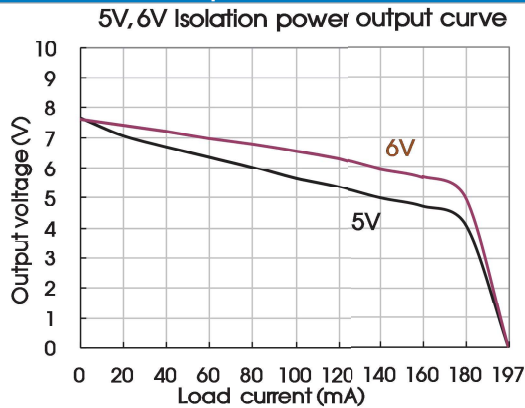
### EMC Specifications

EMI	RE	CISPR22/EN55022 CLASS A		
	CE	CISPR22/EN55022 CLASS A		
EMS	ESD	IEC/EN61000-4-2	Contact $\pm 4$ KV/Air $\pm 8$ KV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	power supply port $\pm 2$ KV	perf. Criteria A
		IEC/EN61000-4-4	signal port $\pm 1$ KV	perf. Criteria A
	Surge	IEC/EN61000-4-5	power port $\pm 1$ KV(line-to-line)	perf. Criteria B
		IEC/EN61000-4-5	signal port $\pm 1$ KV (line-to-ground)	perf. Criteria B
CS	IEC/EN61000-4-6	3 V <sub>r.m.s</sub>	perf. Criteria A	

Application Precautions

1. Please read the instructions carefully before use; contact our technical support if you have any problem;
2. Do not use the product in hazardous areas;
3. Use DC power supply for the product, and 220V AC power supply is prohibited;
4. Do not disassemble or assemble the product without permission to avoid explosion protection failure or malfunction of product.

Isolation Power Output Curve

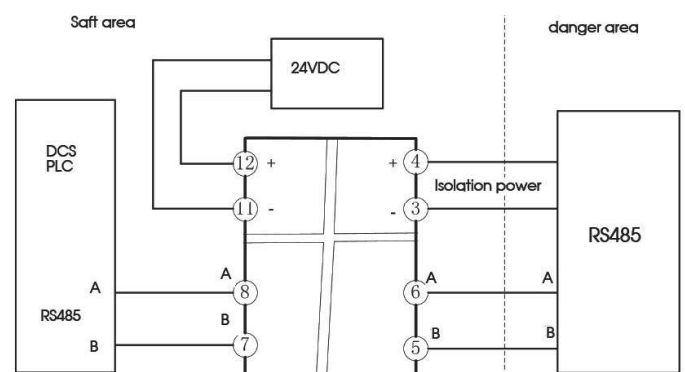
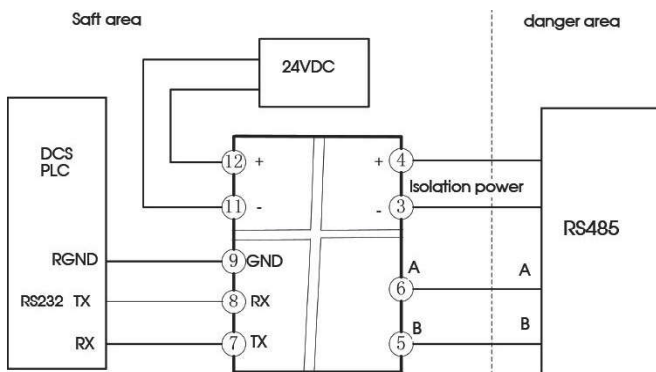


Design Reference

1. Wiring diagram for product application

TD101W-EX-485(TD101W-EX-485-00 NO Isolation power output)

TD100W-EX-485(TD100W-EX-485-00 NO Isolation power output)



2. Application in the intrinsically safe explosion protection system

In the intrinsically safe explosion protection system, the isolated safety barrier belongs to related equipment and is installed in a safe location for connecting the intrinsically safe equipment in hazardous location and non-intrinsically safe equipment in safe location, which is capable of limiting the energy entering into the site in safe value, so as to ensure the safety of site equipment, personnel and production.

The selection principles for the safety barrier in the intrinsically safe explosion protection system:

- 1) The grade of the explosion-proof marker of safety barrier must be not less than that of the intrinsically safe site equipment.
- 2) The terminal resistor and loop resistance of safety barrier should be taken into consideration so as to ensure the output voltage of safety barrier can meet the requirements of the min. operating voltage of the intrinsically safe site equipment.
- 3) The safety parameters of the intrinsically safe terminal of safety barrier can meet:
 
$$U_o \leq U_i, \quad I_o \leq I_{in}$$

$$C_o \geq C_{in}, \quad L_o \geq L_{in}$$
- 4) Select the matched safety barrier according to the power supply polarity and signal type of intrinsically safe site equipment as well as its transmission mode.
- 5) Well carry out corresponding protection to avoid leakage current of the safety barrier affecting the normal operation of intrinsically safe site equipment.

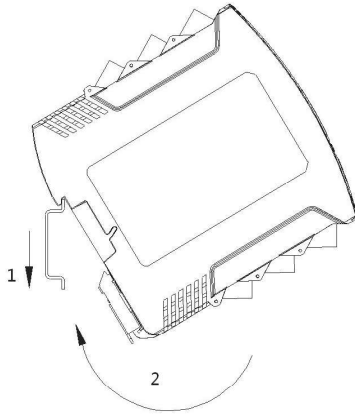
3. For more information please find the application notes on [www.mornsun-power.com](http://www.mornsun-power.com)

Installation & disassembly

Installation

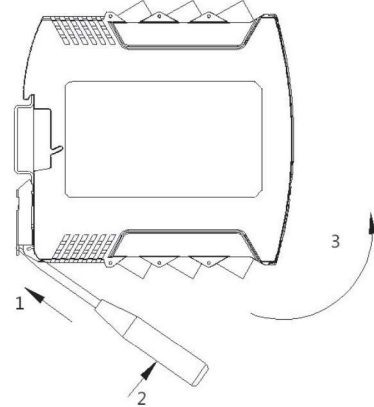
DIN35mm standard rail installation

1. Insert the top of the instrument card in the rail;
2. Push the bottom of the instrument into the rail.



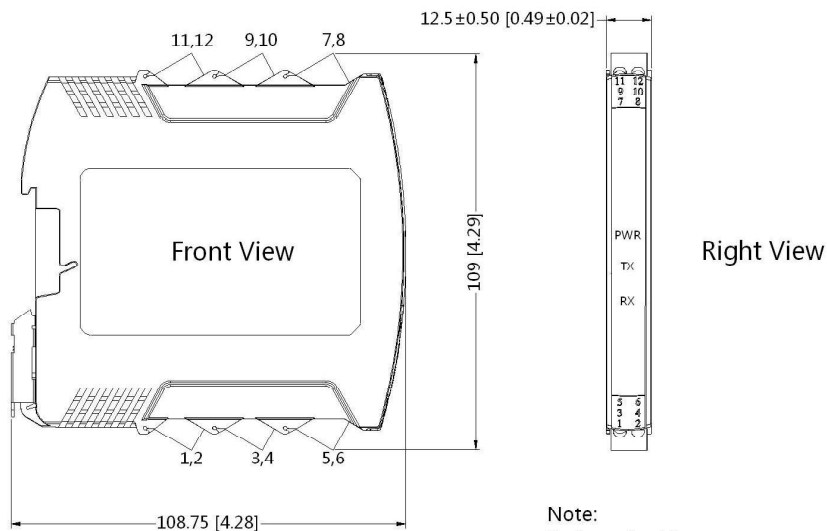
Disassembly

1. Insert to the clamp on the lower end of instrument with a screw driver (tool edge width  $\leq 6\text{mm}$ );
2. Push the screw driver up, and pry the clamp down;
3. Pull the instrument up out of the guide rail.



Dimensions

THIRD ANGLE PROJECTION



Note:  
Unit:mm[inch]  
General tolerances:±1.00[±0.039]  
Installed on DIN rail TS35  
Wire range:28~12AWG  
PWR Power light  
TX Transmit Indicate light  
RX Receive Indicate light

(RS485↔RS485)Pin mode			
Pin	Safe Port mode	Pin	Hazardous Area mode
7	RS_485 B line	1	NC
8	RS_485 A line	2	NC
9	NC	3	Isolation power output -
10	NC	4	Isolation power output +
11	Power Supply Input -	5	RS_485 B line
12	Power Supply Input +	6	RS_485 A line
Indicator Light Instruction			
Indicator Light	Instruction		
PWR Light	Power Indicator Light(Green)		
Tx Light	Safe Port have date to transmit Indicator Light(Yellow)		
Rx Light	Safe Port have date to receive Indicator Light(Red)		

(RS232↔RS485)Pin mode			
Pin	Safe Port mode	Pin	Hazardous Area mode
7	RS_232 TX	1	NC
8	RS_232 RX	2	NC
9	RS_232 GND	3	Isolation power output -
10	NC	4	Isolation power output +
11	Power Supply Input -	5	RS_485 B line
12	Power Supply Input +	6	RS_485 A line
Indicator Light Instruction			
Indicator Light	Instruction		
PWR Light	Power Indicator Light(Green)		
Tx Light	Safe Port have date to transmit Indicator Light(Yellow)		
Rx Light	Safe Port have date to receive Indicator Light(Red)		

### Notes:

1. Packing Information please refer to 'Product Packing Information'. Packing bag number: 58040010;
2. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta=25℃, humidity<75% when inputting nominal voltage and outputting rated load;
3. All index testing methods in this datasheet are based on our Company's corporate standards;
4. The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technician for specific information;
5. We can provide product customization service;
6. Specifications of this product are subject to changes without prior notice.

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