

# **Instructions for Use of Industrial RS485 Opto-isolated Hub**

## 1. Overview

This 4-Port RS485 bus split hub is specially designed to meet the requirements of RS485 large-scale systems in complex electromagnetic environments. Its transmission reaches up to 115.2Kbps. In order to ensure the safety and reliability of data communication, the RS485 interface adopts photoelectric isolation technology to prevent the lightning surges from being introduced into converters and equipment. The built-in opto-isolator and 600W surge protection circuit can provide an isolation voltage of 2500V, which can effectively suppress interference such as surge and electrostatic discharge. Besides, the product adopts an external switch power supply, safe and reliable, which makes it suitable for outdoor engineering applications.

In the RS485 working mode, the hub can provide more than 1200m transmission distance while working stably. The discrimination circuit inside can automatically sense the data flow direction, and switch the enable control circuit, which solves the problem of RS485 transmission and reception conversion delay, and can be widely used in power acquisition systems. It is a data interface conversion module with excellent performance.



The hub provides a star RS485 bus connection, and each port has short-circuit and open-circuit protection. The optical isolation voltage is up to 2500V, and users can easily improve the RS485 bus structure, divide network segments, and improve communication reliability. When lightning strikes or equipment malfunctions occur, the faulty network segment will be isolated to ensure that other network segments

can work normally, which greatly improves the reliability of the existing RS485 network and effectively shortens the maintenance time of the network.

## **2. Product Parameters**

### **2.1 Product Specifications**

(1) Product Dimensions: 120\*77\*23mm / 4.72\*3.03\*0.91 inch(excluding rail mounting base)

(2) Product Dimensions: 120\*77\*40mm / 4.72\*3.03\*1.57 inch (including rail mounting base)

### **2.2 Normal Working Conditions**

(1) Ambient Temperature: -25°C ~ +70°C

(2) Environmental Relative Humidity: 5% ~ 95% (no condensation and no water inside the product)

(3) Altitude: ≤3000m

### **2.3 Main Technical Parameters**

(1) Interface Characteristics: compatible with EIA/TIA's RS-232C and RS-485 standards

(2) Electrical Interface: 10-position pluggable terminal blocks on both sides

(3) Transmission Medium: twisted pair or shielded wire

(4) Working Mode: asynchronous half-duplex

(5) Working Power Supply: 9V ~ 30VDC/150mA

(6) Signal Indication: 7 signal indicator lights, power (PWR), sending (TXD), receiving (RXD), malfunction (E1-E4)

(7) Isolation: isolation voltage 2500V

(8) Transmission Rate: 300bps ~ 115.2Kbps

(9) Protection Level: RS-232 port ±15kV ESD protection, RS-485 port 600W lightning surge protection per line

(10) Transmission Distance: 0 ~ 5km (115.2Kbps ~ 300bps)

(11) Usage Environment: temperature -25°C ~ 70°C, relative humidity 5% ~ 95%

### 3. Product Information and Signal Indication

(1) The front of the industrial RS485 opto-isolated hub has a total of 7 indicators, and there are 10 pluggable terminals on either side. TXD and RXD on the left are RS-232 signal terminals, 485+ and 485- are RS-485 signal terminals, VCC and GND are 12/24V power supply switch terminals, and GND1 is RS-485/RS-232 ground terminal. T/R1+, T/R1-, T/R2+, T/R2-, T/R3+, T/R3-, T/R4+, T/R4- on the right are 4 way RS-485 signal terminals respectively, GND2 is the RS-485 ground terminal. Note: GND, GND1, and GND2 cannot be connected to each other.

(2) The meanings of the indicators on the front of the industrial RS485 opto-isolated hub are as follows:

PWR: Power indicator, red->normal.

TXD: Data transmitting indication, flashing green->normal.

RXD: Data receiving indication, flashing yellow->normal.

E1: Indicator of the first RS-485 data transmitting and receiving, flashes green->normal, and goes out->faulty.

E2: Indicator of the second RS-485 data transmitting and receiving, flashes green->normal, and goes out->faulty.

E3: Indicator of the third RS-485 data transmitting and receiving, flashes green->normal, and goes out->faulty.

E4: Indicator of the fourth RS-485 data transmitting and receiving, flashes green->normal, and goes out->faulty.

### 4. Operation and Display

(1) RS-232/RS-485 interface function description

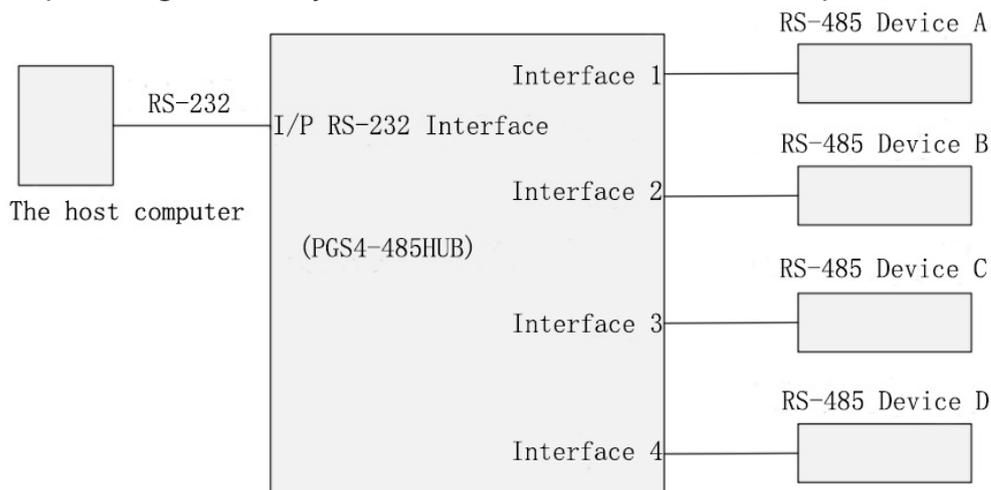
10-position terminal block	Definition	Signal description
1	GND1	RS-232/RS-485 ground wire
2	GND1	RS-232/RS-485 ground wire
3	GND1	RS-232/RS-485 ground wire
4	485-	RS-485 signal negative
5	485+	RS-485 signal positive
6	GND1	RS-232/RS-485 ground wire
7	RXD	RS-232 signal receiver
8	TXD	RS-232 signal transmitter
9	VCC	Power DC9-30V input
10	GND	Power line ground

(2) RS-485 Port interface function description

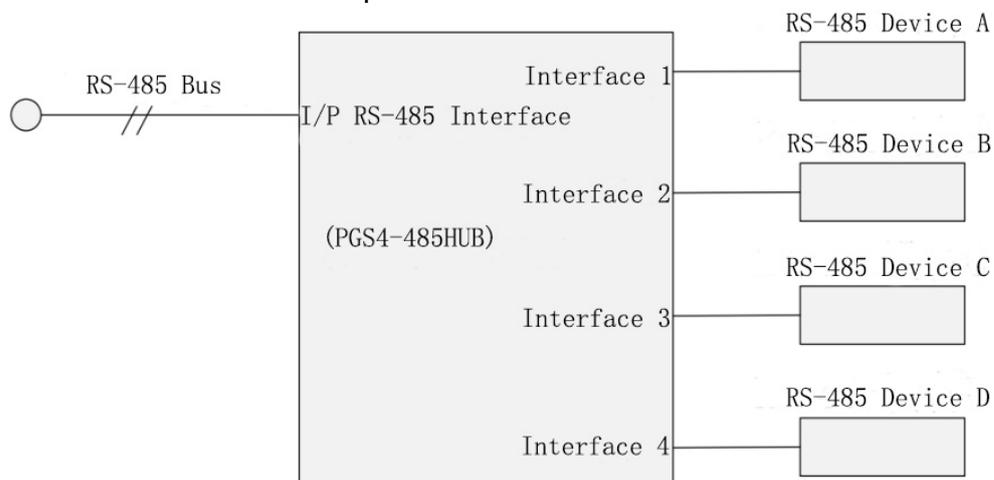
10-position terminal block	Definition	Signal description
1	T/R1+	The first RS-485 signal positive
2	T/R1-	The first RS-485 signal negative
3	T/R2+	The second RS-485 signal positive
4	T/R2-	The second RS-485 signal negative
5	T/R3+	The third RS-485 signal positive
6	T/R3-	The third RS-485 signal negative
7	T/R4+	The fourth RS-485 signal positive
8	T/R4-	The fourth RS-485 signal negative
9	GND2	RS-485 isolated ground wire
10	GND2	RS-485 isolated ground wire

## 5. Common Applications of Industrial RS485 Opto-Isolated Hub

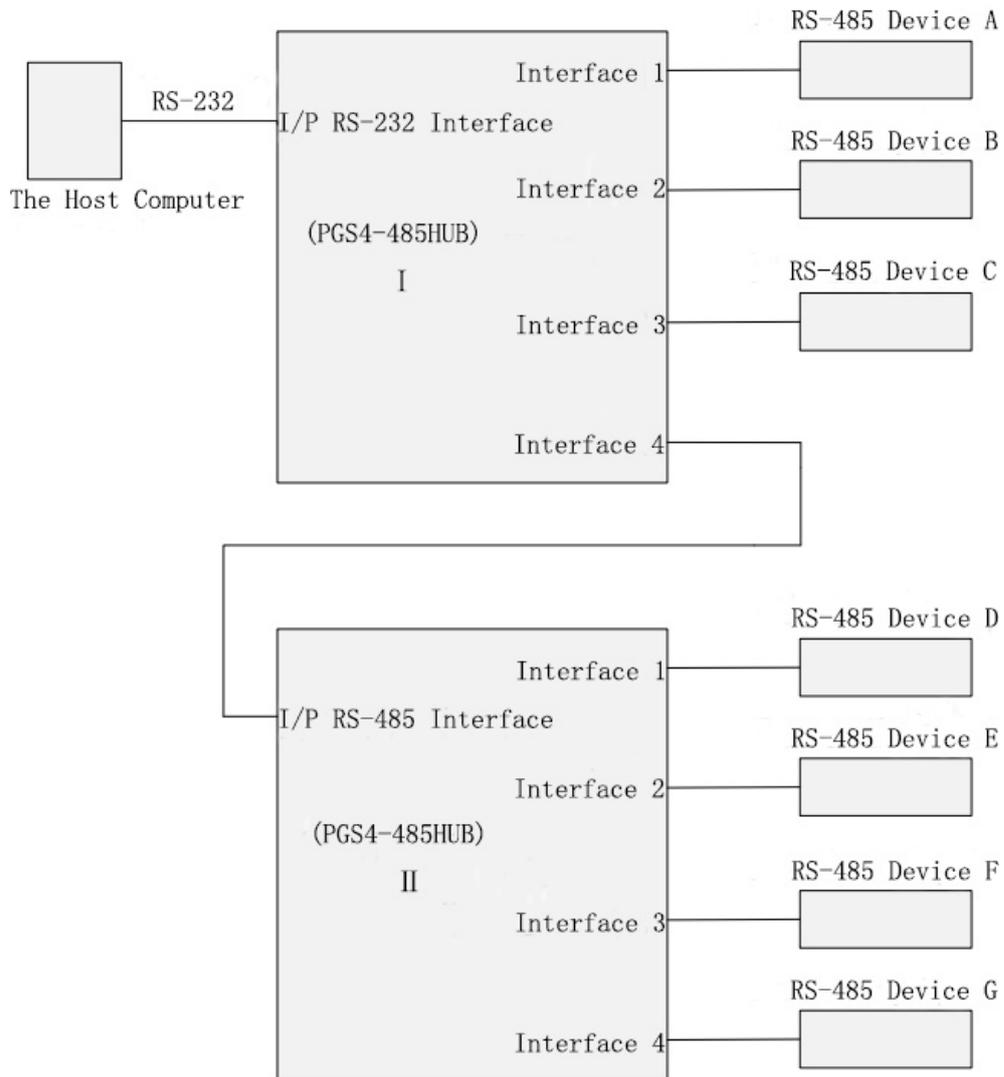
1) Up to 4 high-reliability RS-485 interfaces for Host PC serial port(RS-232C).



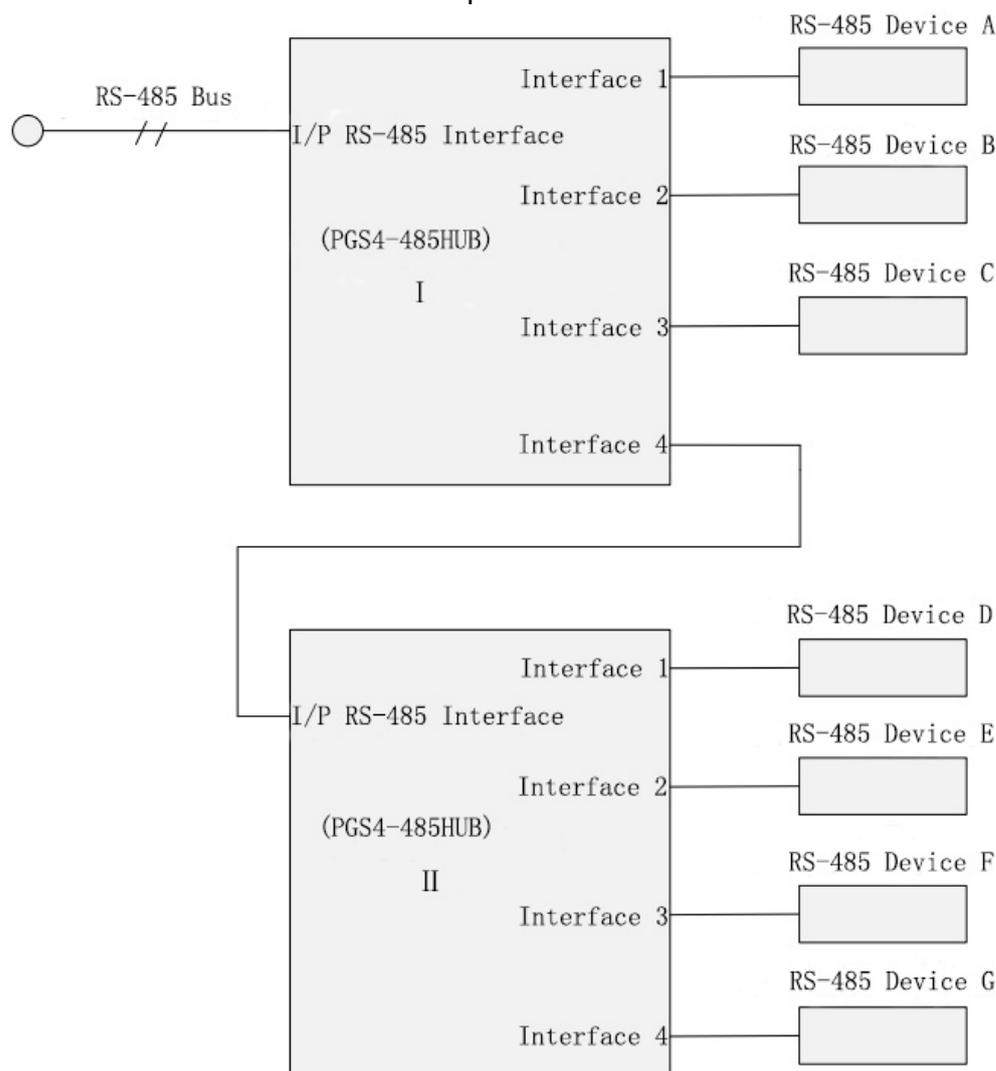
2) Extend 4 high-reliability RS-485 interfaces for RS-485 Bus, and up to 128 RS-485 hubs can be connected in parallel on the RS-485 bus at the same time.



3) Multiple highly reliable RS-485 interfaces for host computer serial port (RS-232C).



4) Extend multiple high-reliability RS-485 interfaces for RS-485 Bus, and up to 128 RS-485 hubs can be connected in parallel on the RS-485 bus at the same time.



## 6. Alarm and Protection Mechanism of RS-485 Port failure

The RS-485 port failure alarm and protection mechanism is an effective method to enhance the reliability of multiple RS-485 devices in the system. The industrial RS485 opto-isolated hub has four lower computer ports, and each port has short-circuit protection function and can work in off mode. When any RS-485 port is short-circuited, it will only affect the RS-485 bus system where it is located, and will not affect the normal operation of the RS-485 system connected to other interfaces. Users can quickly determine the faulty port and other connected faulty equipment based on the status of the fault warning indicator.

## 7. Power Supply and Lightning Protection

Industrial RS485 opto-isolated hub can be powered by DC power equipment. The power supply voltage is +9V~+30V DC, and the minimum operating current is

150mA. All RS-485 interfaces have 600W lightning protection, which can effectively suppress interferences such as surge and electrostatic discharge. In order to ensure the safety of communication, it should be grounded reliably during use and avoid hanging in the air.

## **8. Storage**

Packaged equipment shall be stored in a warehouse of ambient temperature – 25°C ~ +65°C and humidity not more than 85%. And there shall be free from acid, alkali, salt, corrosive or explosive gas, or the erosion from dust, rain or snow.