

# KPS2204 Programmable Protocol Converter

## Hardware Installation Manual



**KYLAND**

**Kyland Technology Co., LTD.**

Publication Date: Apr. 2012

Version: V2.0

Customer Service Hotline: (+8610) 88796676

FAX: (+8610) 88796678

Website: <http://www.kyland.cn>

E-mail: support@kyland.biz

**KPS2204 Programmable Protocol Converter  
Hardware Installation Manual**

**Disclaimer:** Kyland Technology Co., Ltd. tries to keep the content of this manual as accurate and as updated as possible. This document is not guaranteed to be error-free, and we reserve the right to amend it without notice to users.

**Copyright © 2012 KYLAND Technology CO., LTD.  
All rights reserved.**

No part of this documentation may be excerpted, reproduced, translated, annotated or duplicated, in any form or by any means without the prior written permission of KYLAND Corporation.

## Notice for Safety Operation

This product performs reliably as long as it is used according to the guidance. Artificial damage or destruction of the equipment should be avoided.

- Read this manual carefully and keep it for future reference;
- Do not place the equipment near water sources or damp areas;
- Do not place anything on power cable or put the cable in unreachable places;
- Do not tie or wrap the cable, which may cause a fire risk;
- Power connectors and other equipment connectors should be firmly interconnected and checked frequently;
- Do not repair the equipment by yourself, unless it is clearly specified in the manual;
- Please keep the equipment clean; if necessary, wipe the equipment with soft cotton cloth.

In the following cases, please immediately shut down your power supply and contact your Kyland representative:

- Water gets into the equipment;
- Equipment damage or shell damage;
- Equipment operation or performance has abnormally changed;
- The equipment emits odor, smoke or abnormal noise.

---

## Contents

1	Product Overview .....	4
2	Structure and Interface .....	5
2.1	Front Panel .....	5
2.2	Top Panel.....	6
3	Mounting.....	7
3.1	Dimension Drawing .....	7
3.2	Mounting Modes and Steps.....	7
3.2.1	DIN Rail Mounting .....	7
3.2.2	Panel Mounting .....	9
4	Cable Connection .....	11
4.1	Ports .....	11
4.1.1	10/100Base-T(X) Port .....	11
4.1.2	RS232/422/485 Serial Port.....	12
4.2	Grounding .....	13
4.3	Power Terminal Block .....	14
4.4	Default/Reset Button .....	15
5	Secondary Development .....	16
5.1	Programmable Push Switch .....	16
5.2	Level Detection Terminal.....	16
5.3	Programmable LEDs.....	17
6	LEDs .....	17
7	Device Access .....	18
7.1	Access through Telnet.....	18
7.2	Access through Web .....	19
8	Product Configuration Information .....	20
9	Basic Features and Specifications .....	21

## **1 Product Overview**

KPS2204 includes a series of programmable protocol converters designed by Kyland for serial device networks. It integrates Ethernet and serial data transmission, realizing direct conversion between the serial port protocol and Ethernet protocol.

KPS2204 provides powerful network management functions. The device can be managed through Telnet and Web.

KPS2204 is applicable to harsh and hazardous industrial environments due to its solid closed housing, fanless but heat dissipation-capable single-rib shaped chassis, overcurrent, overvoltage, and EMC protection for power input, and sound EMC protection of both RJ45 ports and RS232/RS422/RS485 serial data ports. Additionally, redundant power supply secures the reliable operation of the device.

The device supports both DIN rail and panel mounting. The front panel provides two 10/100Base-T(X) ports and four serial data ports.

## 2 Structure and Interface

### 2.1 Front Panel

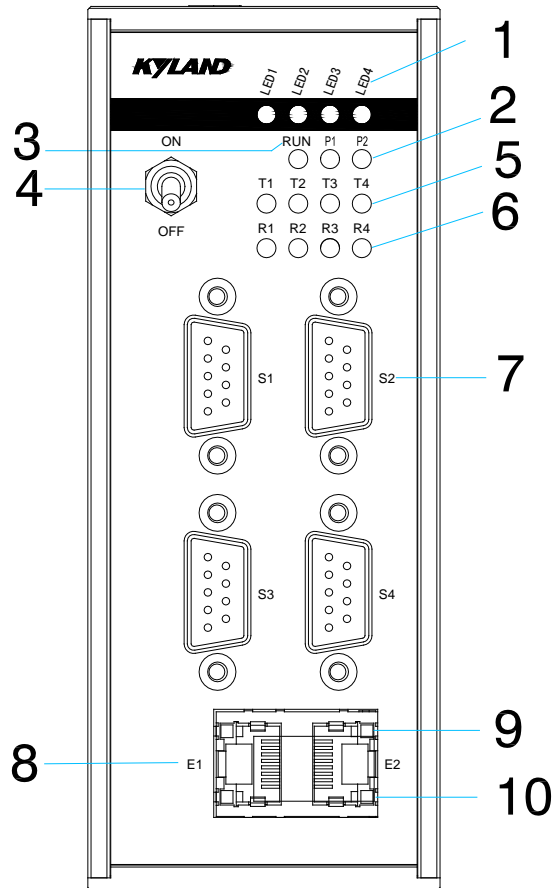


Figure 1 Front Panel

Table 1 Front Panel of KPS2204-2T-4D-232/422/485

No.	Identifier	Description
1	LED1-LED4	Programmable LED
2	P1, P2	Power 1 LED, power 2 LED
3	RUN	Running LED
4	--	Programmable push switch
5	T1-T4	RS232/422/485 serial port TX LED
6	R1-R4	RS232/422/485 serial port RX LED
7	S1-S4	RS232/422/485 serial data port
8	E1, E2	10/100Base-T(X) port
9	--	10/100Base-T(X) RJ45 port Link/ACT LED

10	--	10/100Base-T(X) RJ45 port Speed LED
----	----	-------------------------------------

## 2.2 Top Panel

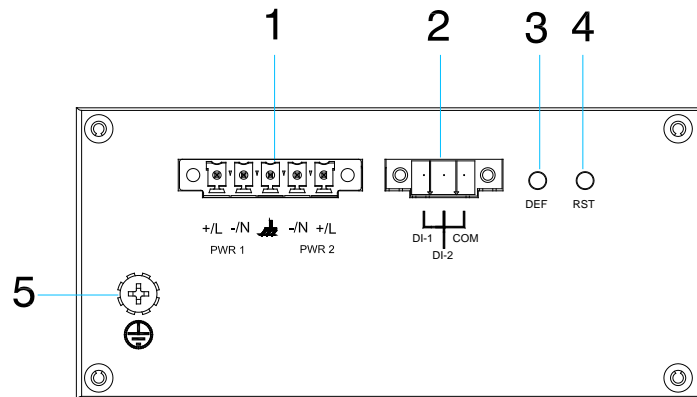

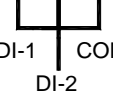



Figure 2 Top Panel

Table 2 Top Panel of KPS2204

No.	Identifier	Description
1	+/L -/N  -/N +/L PWR 1 PWR 2	Power terminal block
2	 DI-1 COM DI-2	Level detection terminal
3	DEF	Default button
4	RST	Reset button
5		Grounding screw

### 3 Mounting

#### 3.1 Dimension Drawing

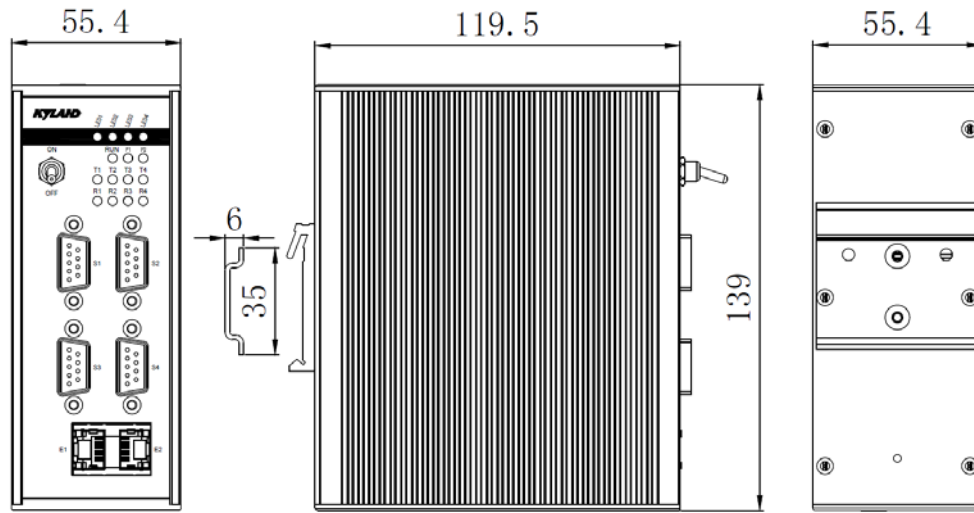


Figure 3 Dimensions for DIN Rail Mounting (Unit: mm)

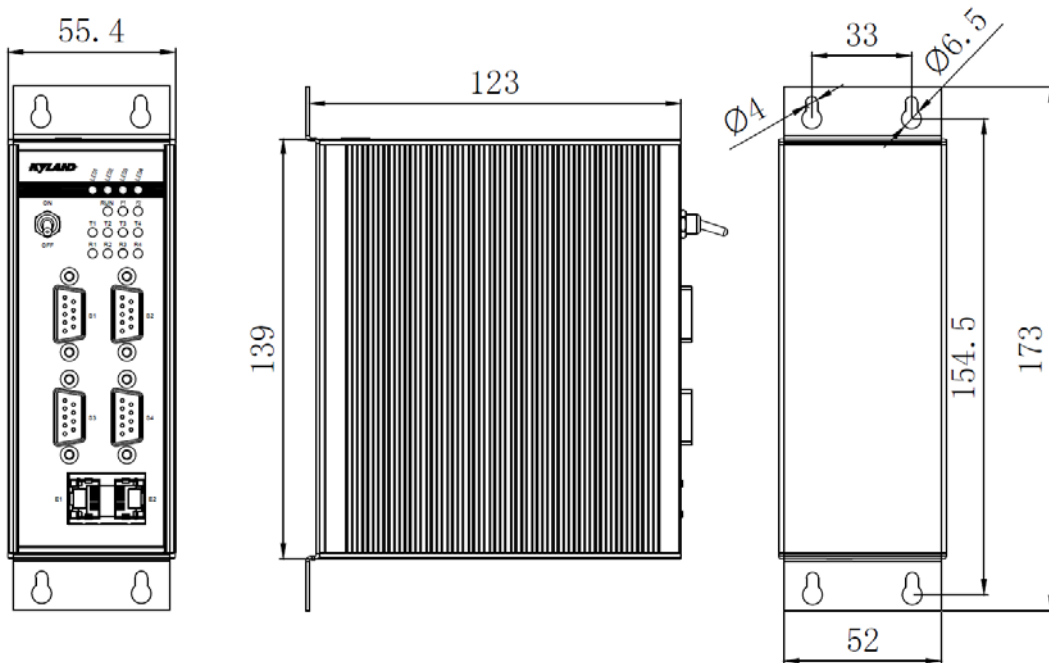


Figure 4 Dimensions for Panel Mounting (Unit: mm)

#### 3.2 Mounting Modes and Steps

KPS2204 supports both DIN rail and panel mounting.

##### 3.2.1 DIN Rail Mounting

- Mounting



Detailed steps are as follows:

Step 1: Select the mounting position for KPS2204 and guarantee adequate space for it.

Step 2: Insert the connecting seat of KPS2204 into the top of the DIN rail, and push the bottom of the device inward and upward to ensure the DIN rail fits in the connecting seat, as shown on the left of the following figure. Make sure that KPS2204 is firmly installed on the DIN rail, as shown on the right of the following figure.

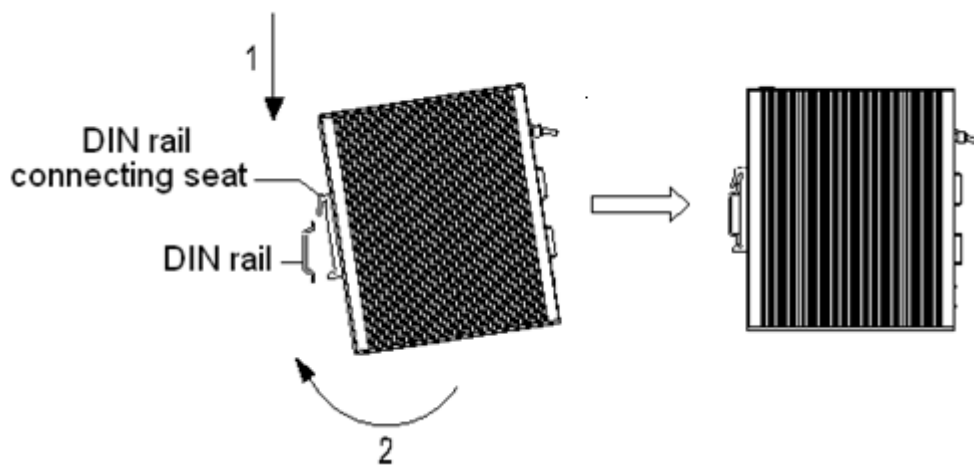


Figure 5 DIN Rail Mounting

- Dismounting

Detailed steps are as follows:

Step 1: As shown in Figure 6, press the connecting seat of KPS2204 downward to ensure adequate space below the seat for KPS2204 to move.

Step 2: Move the bottom of the connecting seat in the direction of arrow 2 to detach it from the DIN rail. Then move the top of the connecting seat in the direction of arrow 3. In this way, you can remove KPS2204 from the DIN rail.

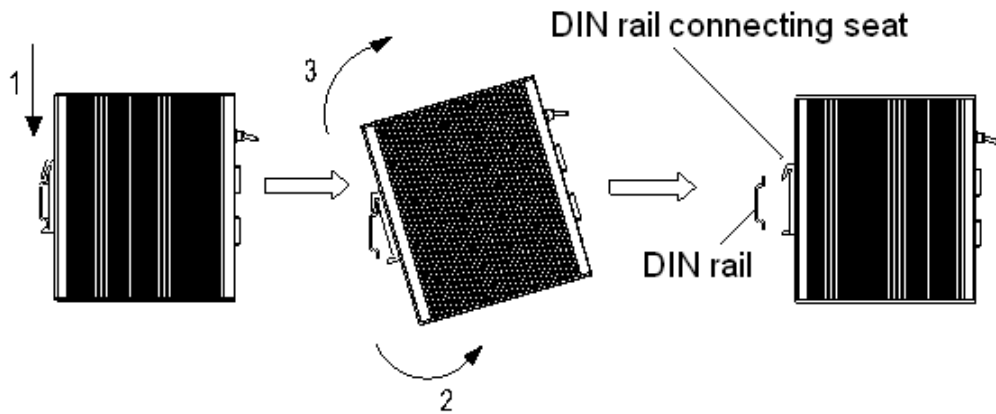


Figure 6 Removing KPS2204 from a DIN Rail

### 3.2.2 Panel Mounting

- Mounting

Detailed steps are as follows:

Step 1: Select the mounting position on a wall or an inner wall of a cabinet for KPS2204 and guarantee adequate space for it.

Step 2: Punch four holes in the selected position according to the panel mounting dimensions of KPS2204. Insert four M3×10 screws into the four holes respectively, and turn the screws with a Philips screwdriver until about a 5mm distance is left between each screw head and the wall.

Step 3: Align the four mounting holes on the plate for panel mounting with the four screws. Make the screws pass through the  $\Phi 6.5$  position, as shown in the following figure. Move KPS2204 in the direction of arrow 2 until the four screws are in the  $\Phi 4$  position. Then tighten the screws. In this way, KPS2204 is firmly mounted to the wall or inner wall of a cabinet.

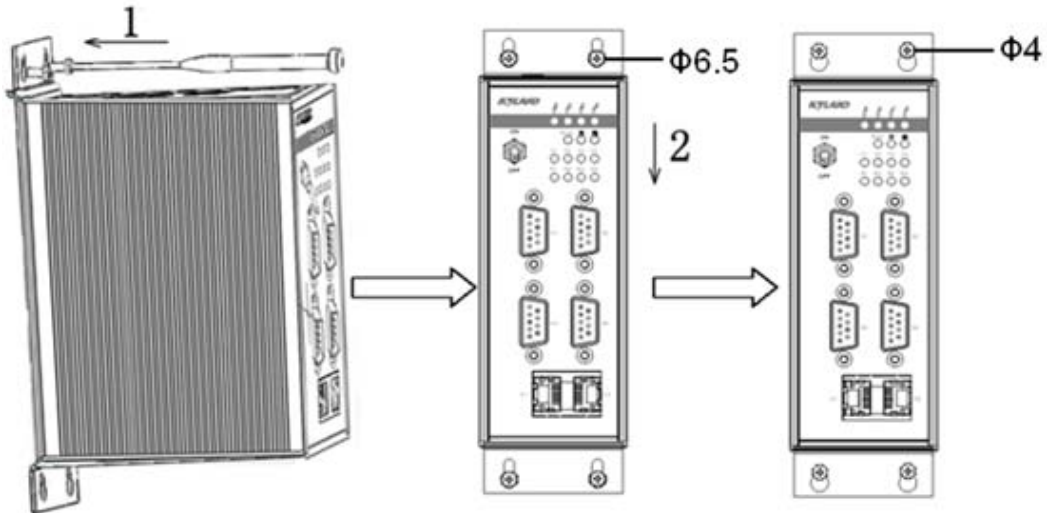


Figure 7 Panel Mounting

- Dismounting

Step 1: Loosen the four screws (not completely) with a screwdriver. Move the device upward until the four screws are in the  $\Phi 6.5$  position, as shown in the following figure. Then remove the plate for panel mounting from the four screws to detach the device from the wall or inner wall of the cabinet.

Step 2: Loosen the screws completely with a screwdriver. Remove them from the wall or inner wall of the cabinet. In so doing, you have completed dismounting the device.

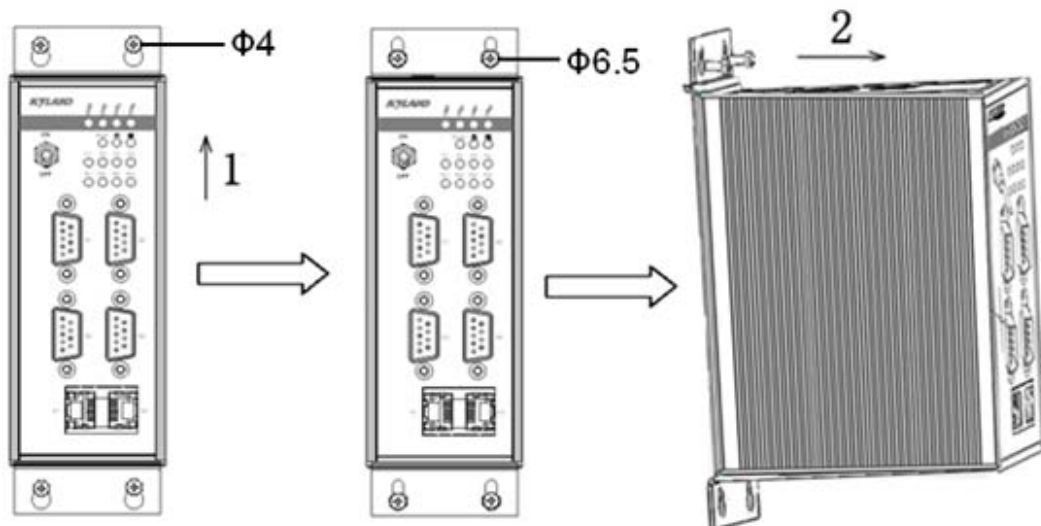


Figure 8 Removing KPS2204 from a Panel

## 4 Cable Connection

### 4.1 Ports

#### 4.1.1 10/100Base-T(X) Port

10/100Base-T(X) ports are equipped with standard RJ45 connectors. The ports are numbered E1 and E2. Both ports have IP addresses. The default IP address of E1 is **192.168.0.3**, and that of E2 is **192.168.1.3**.

The 10/100Base-T(X) port is self-adaptive. It can automatically configure itself to work in 10M or 100M state, full or half duplex mode. The port can also adapt to MDI or MDI-X connection automatically. You can connect the port to a terminal or network device with a straight-through or cross-over cable.

Figure 9 shows the pin numbers of the 10/100Base-T(X) RJ45 port.

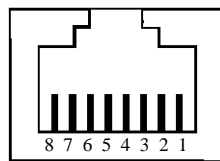


Figure 9 RJ45 Port

Table 3 lists the pin definitions of the 10/100Base-T(X) RJ45 port.

Table 3 Pin Definitions of 10/100Base-T(X) RJ45 Port

Pin	MDI-X Signal	MDI Signal
1	Receive Data+ (RD+)	Transmit Data+ (TD+)
2	Receive Data- (RD-)	Transmit Data- (TD-)
3	Transmit Data+ (TD+)	Receive Data+ (RD+)
6	Transmit Data- (TD-)	Receive Data- (RD-)
4, 5, 7, 8	Unused	Unused
<b>Note:</b> "+" and "-" indicate level polarities.		

- Wiring Sequence

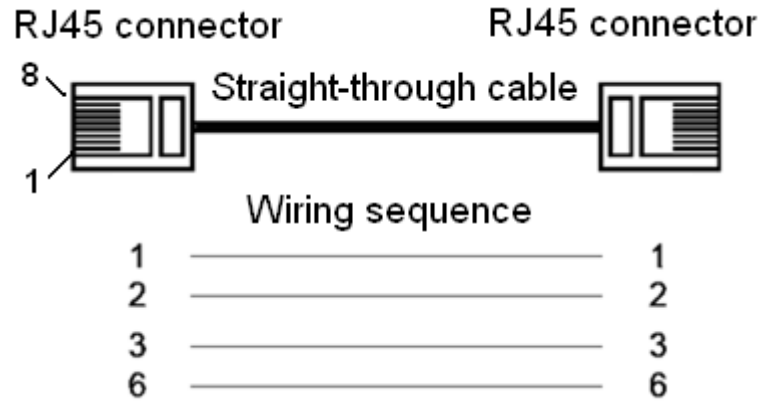


Figure 10 Connection Using Straight-through Cable

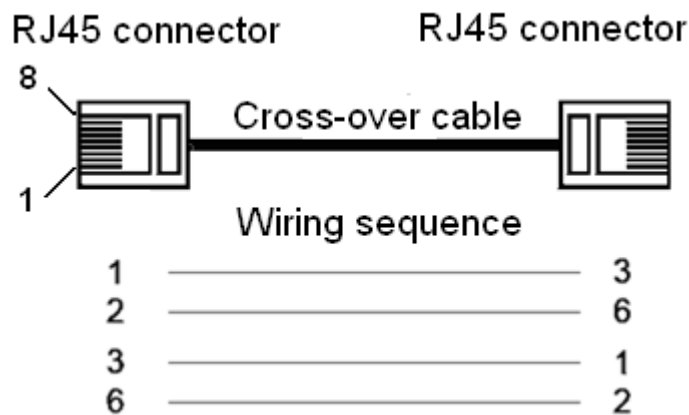


Figure 11 Connection Using Cross-over Cable

**Note:** The color of the cable for RJ45 connector meets the 568B standard: 1-orange and white, 2-orange, 3-green and white, 4-blue, 5-blue and white, 6-green, 7-brown and white, and 8-brown.

#### 4.1.2 RS232/422/485 Serial Port

KPS2204 provides four serial data ports, numbered S1, S2, S3, and S4. You can configure the ports to work in RS232, RS422, or RS485 mode by software. The serial data ports are equipped with DB9 connectors. Figure 12 shows the pin numbers of a DB9 connector.

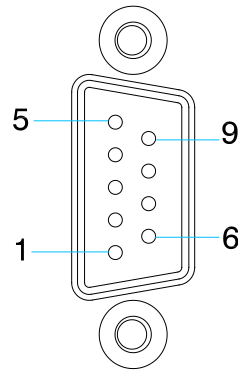


Figure 12 Pin Numbers of DB9 Connector

Table 4 Pin Definitions of DB9 Connector

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	–	TXD-(A)	–
2	RXD	TXD+(B)	–
3	TXD	RXD+(B)	Data+(B)
4	–	RXD-(A)	Data-(A)
5	GND	GND	GND
6	–	–	–
7	–	–	–
8	–	–	–

**Note:** RXD and TXD are defined based on KPS2204.

## 4.2 Grounding

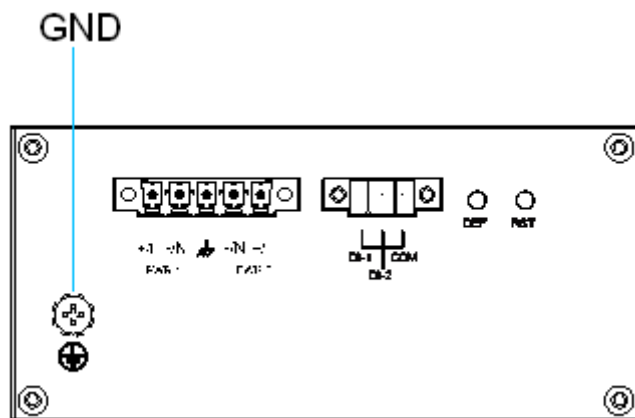


Figure 13 GND

There is a grounding screw on the top panel of KPS2204. The screw is for chassis grounding. Connect one end of the grounding cable to the grounding screw and the other end to the earth firmly (cross-sectional area of the chassis grounding cable > 2.5mm<sup>2</sup>; grounding resistance < 5Ω).

### 4.3 Power Terminal Block

KPS2204 adopts 5-pin 3.81mm-spacing plug-in terminal block. You need to connect the power cable to the terminal block (as shown in Figure 14) to provide power for the device.

**Note:** 0.75mm<sup>2</sup> < Cross-sectional area of the power cable < 2.5mm<sup>2</sup>;  
Grounding resistance: < 5Ω

- 5-Pin 3.81mm-Spacing Plug-in Terminal Block

Figure 14 shows the pin numbers of the 5-pin 3.81mm-spacing plug-in terminal block.

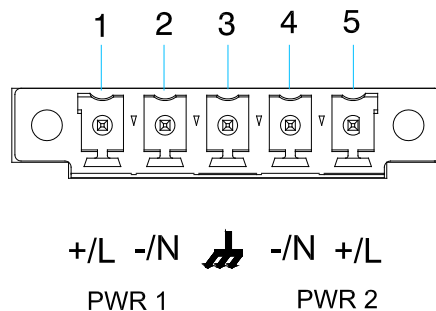


Figure 14 5-Pin 3.81mm-Spacing Plug-in Terminal Block (socket)

Table 5 lists the pin definitions of the 5-pin 3.81mm-spacing plug-in terminal block.

Table 5 Pin Definitions of 5-Pin 3.81mm-Spacing Plug-in Terminal Block

Pin	Definition	Description
1	+/L	PWR1+
2	-/N	PWR1-
3		PGND
4	-/N	PWR2+
5	+/L	PWR2-

KPS2204 supports dual power inputs for redundancy. When one power input is faulty, the device can continue operating properly, thereby improving reliability.

- Wiring and mounting

Step 1: Ground the device properly according to section 4.2.

Step 2: Remove the power terminal block from the device.

Step 3: Insert the power cable into the power terminal block according to Table 5 to fix the power cable.

Step 4: Insert the terminal with the connected cable into the terminal block on the device.

Step 5: Check the status of the power LED on the front panel. If the LED is on, the power is connected properly.

---

**Caution:** The device supports 24DC (18-36VDC) and 48DC (36-72VDC) power input. Before connecting the device to power supply, make sure that the power input meets the power requirement. If connected to an incorrect power input, the device may be damaged.

---

#### 4.4 Default/Reset Button

The top panel of the device provides one default button (DEF) and one reset button (RST). You can press and hold either of the buttons for operation with a screwdriver or thin hard object.

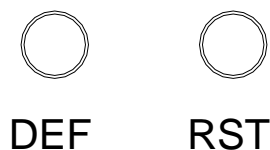


Figure 15 Default/Reset Button

The default button is used for restoring system default settings. After you press and hold the button for five seconds (default value), the device restores the factory default settings, covering the parameters of the serial data ports, IP addresses, user name, and password.

The reset button is used for resetting the device. After you press and hold the button for five seconds (default value), the device resets itself.



Therefore, make sure you have saved all required configurations before pressing this button.

**Note:** You can configure the duration for holding the default/reset button by software as needed.

## 5 Secondary Development

The device supports secondary development with reserved switch, terminal, and LEDs. There hardware resources allow you to develop and implement functions conveniently.

### 5.1 Programmable Push Switch

A programmable push switch, as shown in Figure 16, is reserved on the front panel of the device. The switch supports two triggering statuses: pushing down and pushing up. You can define and view the statuses of the switch for secondary development.

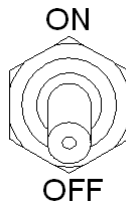


Figure 16 Programmable Push Switch

### 5.2 Level Detection Terminal

Two terminals DI-1 and DI-2 are reserved on the top panel of the device for detecting and receiving external power input. If external power input (5-24VDC) is detected, you can see the power input value is 1; if no external power input is detected, you can see the power input value is 0.

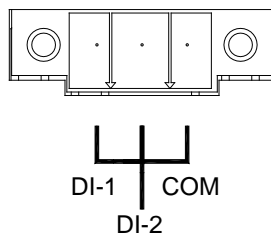


Figure 17 Level Detection Terminal

### 5.3 Programmable LEDs

Four LEDs are reserved on the front panel. You can write programs to control the four LEDs. For example, you can configure 1 to indicate the LED is on, and 0 to indicate it is off.

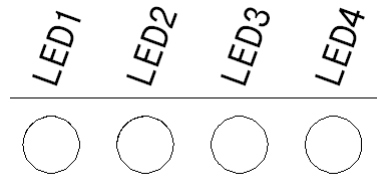


Figure 18 Programmable LEDs

## 6 LEDs

Table 6 lists the descriptions of KPS2204 LEDs.

Table 6 LEDs

LED	State	Description
<b>Running LED</b>		
RUN	Blinking	The CPU operates properly.
	On	The CPU operates abnormally.
	Off	The CPU operates abnormally or does not start up.
<b>Power LEDs</b>		
P1	On	Power 1 is connected and operates properly.
	Off	Power 1 is not connected or operates abnormally.
P2	On	Power 2 is connected and operates properly.
	Off	Power 2 is not connected or operates abnormally.
<b>RS232/422/485 serial data port LED</b>		
T1-T4	Blinking	Sending data
	Off	No data transmission
R1-R4	Blinking	Receiving data
	Off	No data transmission

10/100Base-T(X) RJ45 port LED		
Each RJ45 port has two LEDs. The yellow one indicates port rate while the green one indicates port connection state.		
Speed (yellow)	On	100M working state
	Off	10M working state or no connection
Link/ACT (green)	On	Effective port connection
	Blinking	Ongoing network activities
	Off	No effective port connection
<b>Note:</b> The status of programmable LEDs can be defined in programming for secondary development.		

## 7 Device Access

You can access the device through Telnet or Web:

### 7.1 Access through Telnet

Step 1: Connect the network port of a PC to the 10/100Base-T(X) port E1 or E2 of the device with an RJ45-RJ45 network cable.

Step 2: On the Windows desktop, click Start and Run. The Run Dialog box is displayed. Enter "telnet *IP-address*". *IP-address* is the IP address of the Ethernet port on the device connected to the network port of the PC.

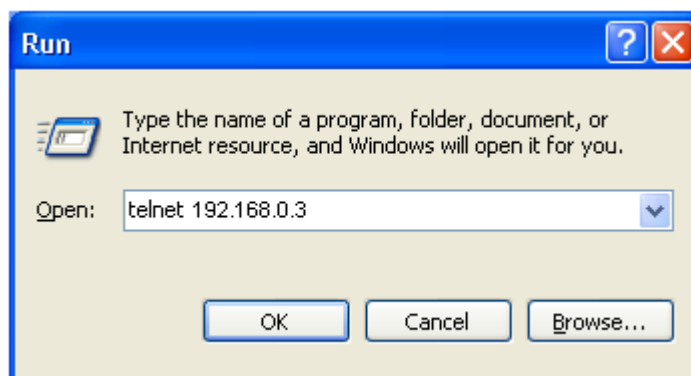


Figure 19 Access through Telnet

**Note:** The default IP address of E1 is **192.168.0.3**, and that of E2 is **192.168.1.3**.

Step 3: Click OK. The Telnet CLI is displayed. Enter the default user name "**root**" and password "**123**". The configuration view is displayed. Then you

can enter commands (as shown in Table 7) to perform operations.

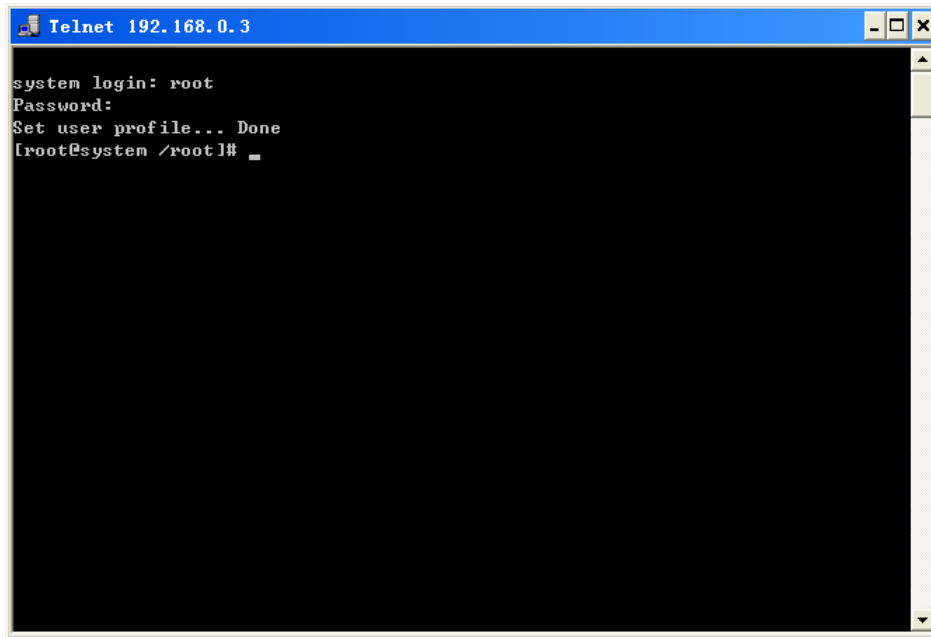


Figure 20 Telnet CLI

Table 7 CLI Commands

Command	Function
[root@system /root]# channelc -c [channel-id] -show Description: [channel-id] indicates the serial data port number. The value ranges from 1 to 4.	View the configuration of the specified serial data port.
[root@system /root]# ifconfig	View the IP and MAC addresses of the two network ports.
[root@system /root]# cat /etc/version	View the version of the device.
[root@system /root]# reboot	Restart the device.
[root@system /root]#loadfactory.sh	Restore the factory default settings.

## 7.2 Access through Web

Step 1: Connect the network port of a PC to the 10/100Base-T(X) port E1 or E2 of the device with an RJ45-RJ45 network cable.

Step 2: Enter the IP address of the Ethernet port connected to the PC in the address box of the browser. The user login interface is displayed, as shown in Figure 21. You can log in to the Web UI of the device by default user name "root" and password "123".



Figure 21 Login Dialog Box

**Note:** IE8.0 or a later version is recommended.

The default IP address of E1 is **192.168.0.3**, and that of E2 is **192.168.1.3**.

## 8 Product Configuration Information

Table 8 lists the models supported by KPS2204.

Table 8 KPS2204 Configuration

Model	Interface	Power
KPS2204-2T-4D-232/422/4 85-with switch	Two 10/100Base-T(X) RJ45 ports, four DB9 serial data ports (can be configured in RS232, RS422, or RS485 mode), and one programmable push switch	24DC, 48DC
KPS2204-2T-4D-232/422/4 85-without switch	Two 10/100Base-T(X) RJ45 ports, four DB9 serial data ports (can be configured in RS232, RS422, or RS485 mode)	(redundant)

Table 9 KPS2204 Optional Accessories

Model	Description
DT-FCZ-RJ45-01	RJ45 dustproof shield
DT-BGAZ-04	Panel mounting plate

## 9 Basic Features and Specifications

- Power Requirements

Power input: 24DC (18-36VDC)

48DC (36-72VDC)

Power terminal: 5-pin 3.81mm-spacing plug-in terminal block

- Power Consumption

5W

- Physical Characteristics

Housing: Aluminum, fanless

Installation: DIN rail or panel mounting

Dimensions (W×H×D): 55.4mm×139mm×119.5mm (excluding DIN rail  
and panel mounting component)

Weight: 0.5kg

- Environmental Limits

Operating temperature: -40°C to +85°C

Storage temperature: -40°C to +85°C

Ambient relative humidity: 5% to 95% (non-condensing)

- MTBF

333,755 hours

- Warranty

5 years

For more information about KYLAND products, please visit our website:

<http://www.kyland.cn/>