KODT2200 Optical Fiber Terminal

Hardware Installation Manual

KYLAND

Kyland Technology Co., LTD.

KODT2200 Optical Fiber Terminal

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.

Notice for Safety Operation

The product performs reliably as long as it is used according to the guidance. Artificial damage or destruction of the device should be avoided. Before using the device, read this notice carefully for personal and equipment safety. Please keep the manual for further reference. Kyland is not liable to any personal or equipment damage caused by violation of this notice.

- Do not place the device near water sources or damp areas. Keep the ambient relative humidity within the range from 5% to 95% (non-condensing).
- Do not place the device in an environment with high magnetic field, strong shock, or high temperature. Keep the working and storage temperatures within the allowed range.
- Install and place the device securely and firmly.
- Please keep the device clean; if necessary, wipe it with soft cotton cloth.
- Do not place any irrelevant materials on the device or cables. Ensure adequate heat dissipation and tidy cable layout without knots.
- Avoid any exposed metal wires because they may be oxidized or electrified.
- Before power-on, make sure the power supply is within the allowed range of the device. Overhigh voltage may damage the device.
- Power connectors and other connectors should be firmly interconnected.
- Do not plug in or out the power supply with wet hands. When the device is powered on, do not touch the device or any parts with wet hands.
- If any part is lost, contact our sales or technical support personnel to purchase the substitute. Do not purchase parts from other channels.
- Dispose of the device in accordance with relevant national provisions, preventing environmental pollution.

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

KODT2200 is an optical data communication product developed by Kyland specifically for power distribution network automation, sewage treatment automation, industrial process control, SCADA, and transportation control. It provides the following features:

- Flexible networking

  Ring, chain, or tangent ring network.

- Diversified functions

  Fast (recovery time<20ms) dual-fiber ring redundancy technology: enhances communication reliability.

  Dual master for backup: When the master device is faulty, the backup device can take over services within 0.2s to ensure normal network operation.

  Eight full-duplex data channels and 8×8 cross connection function.

  Bus arbitration function: resolves conflicts of data sent by remote devices proactively.

- Extensive data ports

  Provide two remote communication data output ports for fiber port alarms. The output capacity is 120mA, DC350V/AC250V.

  The bus data ports meet RS232, RS422, and RS485 standards.

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2 Structure and Interface
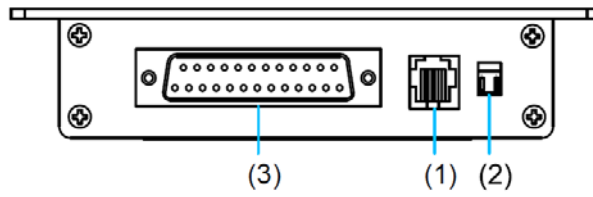

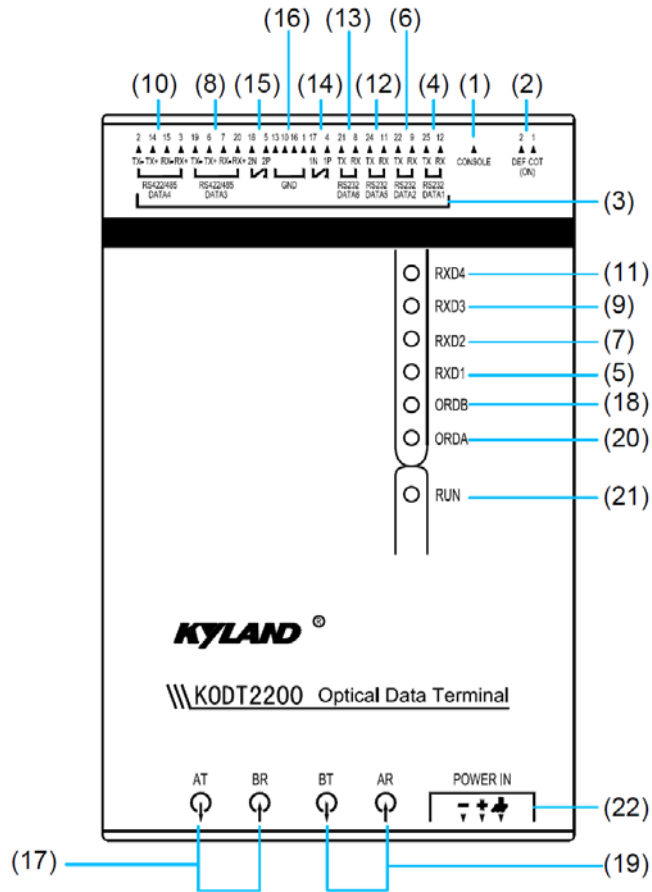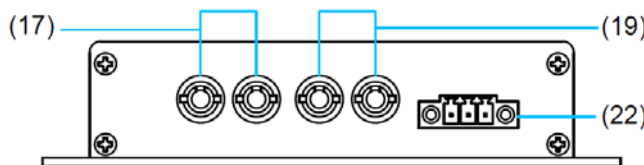Figure 1 Top Panel of KODT2200

Figure 2 Front Panel of KODT2200

Figure 3 Bottom Panel of KODT2200

Table 1 Description of the Identifiers on KODT2200

No.	Identifier	Description
(1)	CONSOLE	CONSOLE port
(2)	1/COT	DIP switch for device role
	2/DEF	DIP switch for default/current configuration
(3)	--	Data port
(4)	DATA1	DATA1 port (pin 25/12)
(5)	RXD1	Communication status LED of DATA1 port
(6)	DATA2	DATA2 port (pin 22/9)
(7)	RXD2	Communication status LED of DATA2 port
(8)	DATA3	DATA3 port (pin 19/6/7/20)
(9)	RXD3	Communication status LED of DATA3 port
(10)	DATA4	DATA4 port (pin 2/14/15/3)
(11)	RXD4	Communication status LED of DATA4 port
(12)	DATA5	DATA5 port (pin 24/11)
(13)	DATA6	DATA6 port (pin 21/8)
(14)	--	Remote communication data output port[*] for BR (pin 17/4)
(15)	--	Remote communication data output port[*] for AR (pin 18/5)
(16)	GND	Grounding (pin 13/10/16/1)
(17)	AT, BR	Fiber port 1
(18)	ORDB	Receiving status LED of BR
(19)	BT, AR	Fiber port 2
(20)	ORDA	Receiving status LED of AR
(21)	RUN	Running LED
(22)	POWER IN	Power terminal block

Note:

● For details about the pin definitions and wiring sequence of data ports, see section 4.2.

● Remote communication data output port indicates the two output ports for fiber port alarms. The output capacity is 120mA (MAX), DC350V/AC250V (MAX).
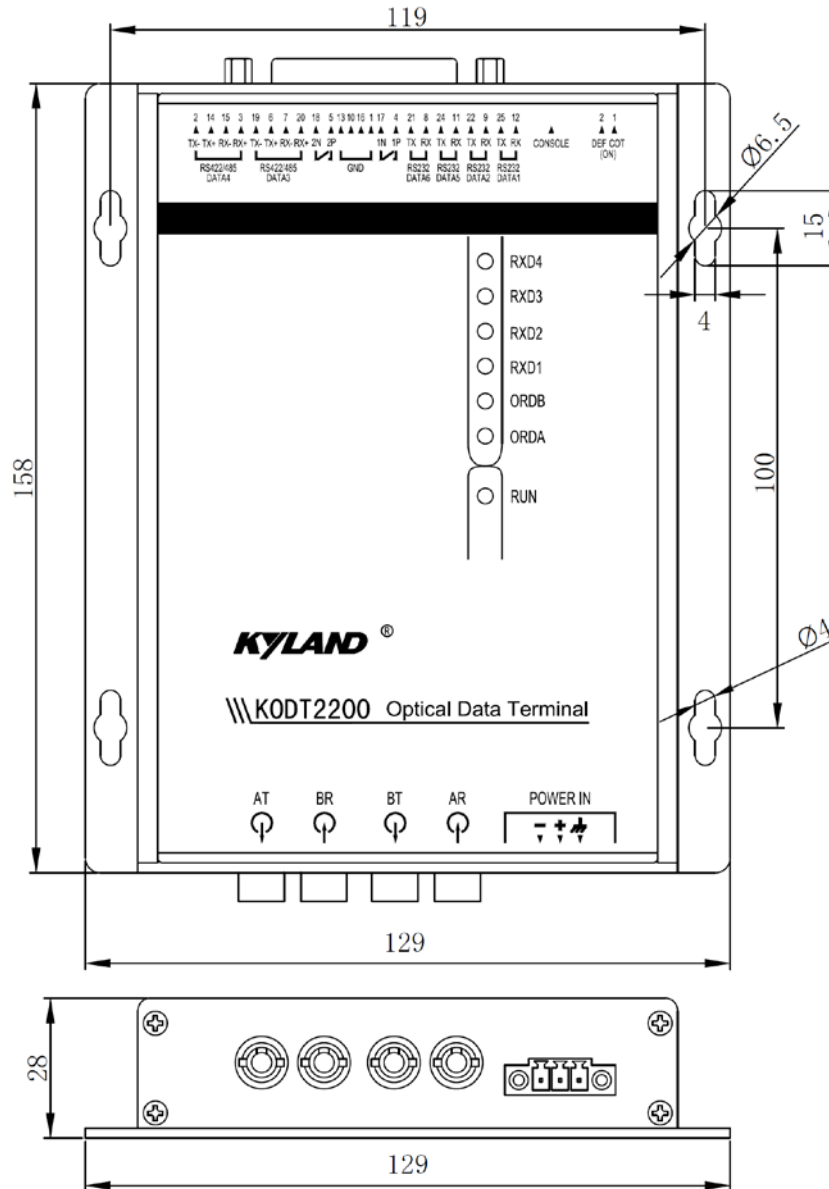
3 Mounting

3.1 Dimension Drawing

Figure 4 Dimensions (Unit: mm)

> ⚠ **Caution:**
>
> As part of the heat dissipation system, the device housing becomes hot during operation. Please use caution when coming in contact and avoid covering the device housing when the device is running.

3.2 Mounting Modes and Steps

KODT2200 supports panel mounting. Before installation, make sure that the following requirements are met.

4

1) Environment: temperature (-40℃ to 85℃), ambient relative humidity (5% to 95%, non-condensing)

2) Power requirement: The power input is within the voltage range of the device.

3) Grounding resistance: <5Ω

4) No direct sunlight, distant from heat source and areas with strong electromagnetic interference.

● Mounting

Step 1: Select the mounting position (on a wall or inner wall of a cabinet) for the device and guarantee adequate space and heat dissipation for it (dimensions: 129mm×158mm×28mm).

Step 2: Punch four holes in the selected position according to the dimensions of KODT2200. Insert four screws into the four holes respectively, and turn the screws with a 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 Φ6.5 positions in the following figure. Move the device downwards until the four screws are in the Φ4 positions. Then tighten the screws to complete mounting.

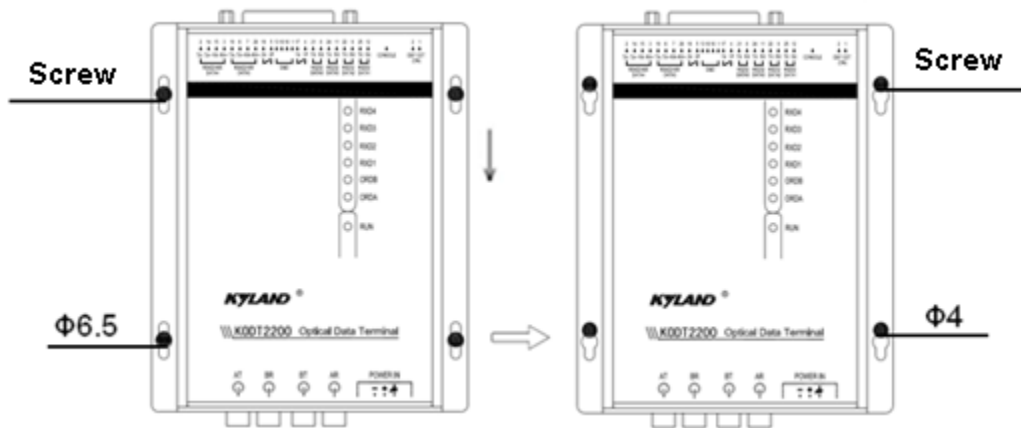Figure 5 Mounting

● Dismounting

Step 1: Loosen the four screws with a screwdriver. Move the device upward until the four screws are in the Φ6.5 positions 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

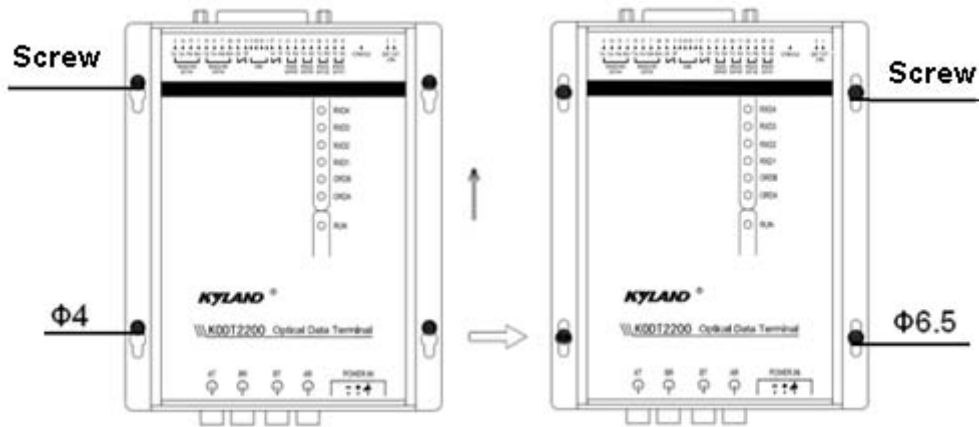wall of the cabinet. In so doing, you have completed dismounting the device.

Figure 6 Dismounting

4 Connection

4.1 Fiber Port

KODT2200 provides two fiber ports, AT/BR (fiber port 1) and BT/AR (fiber port 2). Both ports support the FC/ST/SC connector (for the actual connector, see your device). Each port consists of a transmitting port (AT/BT) and a receiving port (AR/BR).To ensure normal communication, you need to connect the transmitting port (AT/BT) of the local device to the receiving port (AR/BR) of the peer device, and the receiving port (AR/BR) of the local device to the transmitting port (AT/BT) of the peer device.
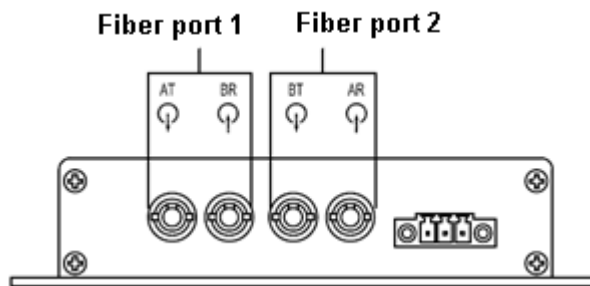

Figure 7 Fiber Ports of KODT2200

● Connection of Fiber Ports

The device adopts the fast dual-fiber ring redundancy technology to realize dual-fiber recovery. To be specific, in a dual-fiber network, remote devices and the network management device in the data center form a closed circuit. When a device is faulty or a certain fiber is disconnected, the dual-fiber ring redundancy technology of KODT2200 helps to connect the network, ensuring continuous communication and improving network reliability.

When the dual-fiber ring redundancy technology is used, the connection between devices is as follows (COT is the network management device and ROT is a remote device):
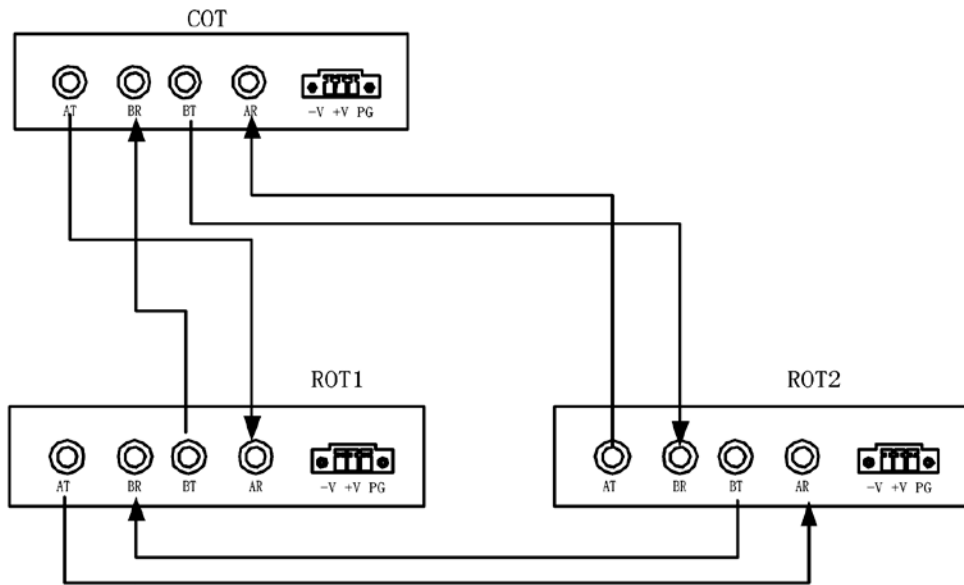
Figure 8 Connection of Fiber Ports

Caution:

A laser is used to transmit signals in fibers. The laser meets the requirements of level-1 laser products.

Routine operation is not harmful to your eyes, but do not look directly at the fiber port when the device

is powered on.

4.2 Data Port

KODT2200 provides data ports (through the DB25 multi-pin connector) on the top panel. The

connector consists of four RS232 ports and two RS422/485 ports.

Table 2 Mapping between Ports and Pins

Port Type	Port	Pin
RS232 port	DATA1	13/25/12
	DATA2	10/22/9
	DATA5	13/24/11
	DATA6	10/21/8
RS422/485 port	DATA3	6/19/7/20
	DATA4	14 /2/15/3

Note:

For details about the pin definitions and wiring sequence of data ports, see section 4.2.1.

4.2.1 Pin Definition and Wiring Sequence

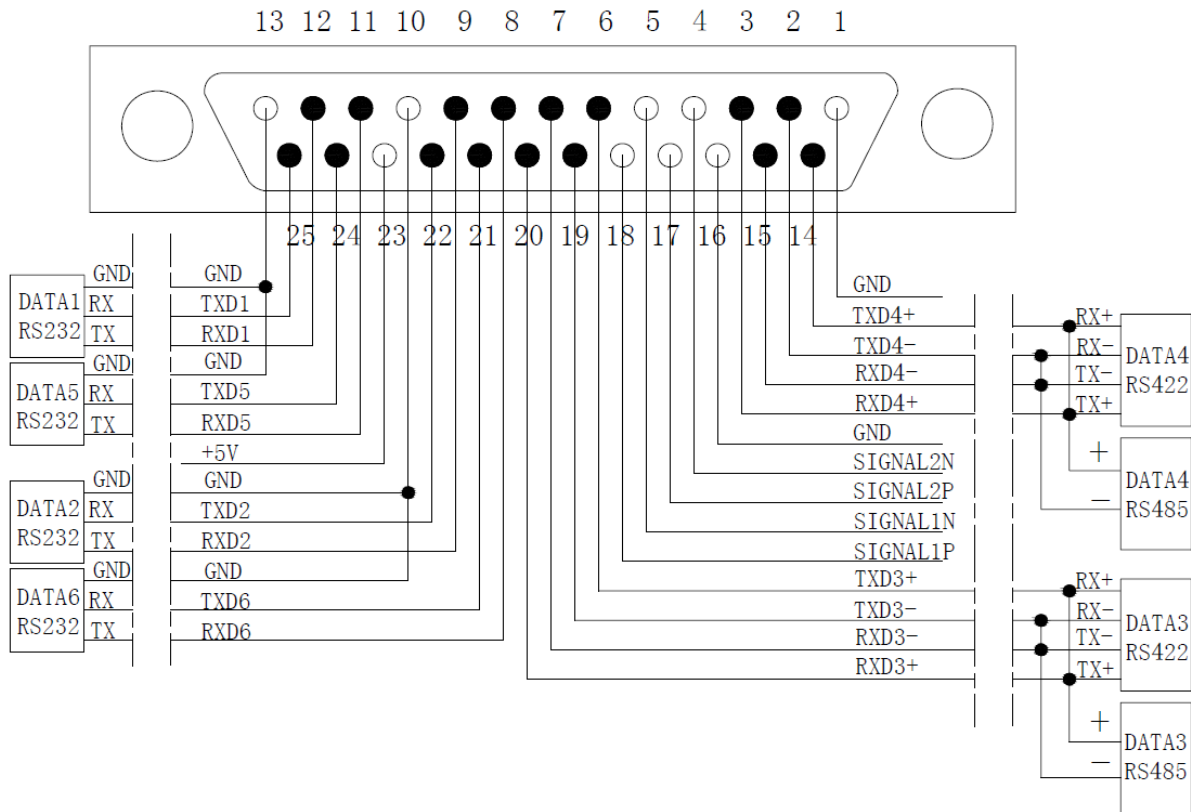The following figure shows the pin definitions and wiring sequence of data ports.

Figure 9 Pin Definition and Wiring Sequence of Data Ports

4.2.2 Wiring

● RS232 Port

The RS232 port of KODT2200 is a 3-pin port. The three pins are used to connect the signal transmitting wire, signal receiving wire, and grounding wire. The following table shows how to connect the RS232 port of KODT2200 to the serial port of a user device.

Table 3 Connecting the Serial Port of a User Device

RS232 Port of KODT2200	Serial Port of the User Device
TXD	RXD (Signal receiving wire of the user device)
RXD	TXD (Signal transmitting wire of the user device)
GND	GND (GND of the user device)

● RS422 Port

The RS422 port of KODT2200 is a 4-pin port. The four pins are used to connect the positive and negative ends of signal transmitting and receiving wires. The following table shows how to connect the RS422 port of KODT2200 to that of a user device.

Table 4 Connecting the RS422 Port of a User Device

RS422 Port of KODT2200	RS422 Port of the User Device
TXD+	RXD+ (Positive end of the signal receiving wire of the user device)
TXD-	RXD- (Negative end of the signal receiving wire of the user device)
RXD+	TXD+ (Positive end of the signal transmitting wire of the user device)
RXD-	TXD- (Negative end of the signal transmitting wire of the user device)

● RS485 Port

The RS485 port of KODT2200 is a 2-pin port. The two pins are used to connect the positive and negative ends of signal wires. The following table shows how to connect the RS485 port of KODT2200 to that of a user device.

Table 5 Connecting the RS485 Port of a User Device

RS485 Port of KODT2200	RS485 Port of the User Device
Signal wire+	Positive end of the signal wire of the user device
Signal wire-	Negative end of the signal wire of the user device-

● GND

As shown in the following figure, pin 13, 10, 16, and 1 of the DB25 connector is used for grounding. Connect one end of a grounding wire to any of the GND pins of the delivered plug. Insert the plug into the DB25 connector on the top panel. Then connect the other end of the grounding wire to the GND of the peer device.
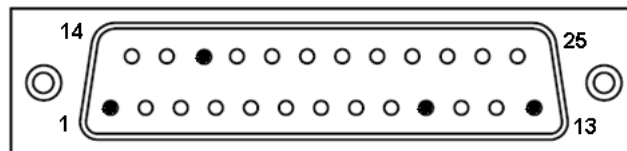

Figure 10 GND Pins

● Remote Communication Data Output Port (1N/1P, 2N/2P)

The device provides two remote communication data output ports. One port consists of SIGNAL1N (pin 17) and SIGNAL1P (pin 4), and the other port consists of SIGNAL2N (pin 18) and SIGNAL2P (pin 5), as shown in the following figure. SIGNAL1N and SIGNAL1P are used for the alarm output of fiber port 1, and SIGNAL2N and SIGNAL2P are used for the alarm output of fiber port 2. The output capacity is 120mA (MAX), DC350V/AC250V (MAX).
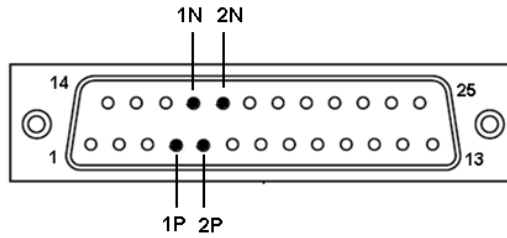
Figure 11 Alarm Pins

The following table shows the mapping among pins, LEDs, and ports.

Alarm Pin	Pin Definition	LED	Description
1N (17)	Alarm- of fiber port 1	ORDB	When a receive (rx) Loss Of Signal (LOS) alarm occurs on the BR fiber port, SIGNAL1P and SIGNAL1N of the relay are closed.
1P (4)	Alarm+ of fiber port 1		
2N (18)	Alarm- of fiber port 2	ORDA	When a receive (rx) Loss Of Signal (LOS) alarm occurs on the AR fiber port, SIGNAL2P and SIGNAL2N of the relay are closed.
2P (5)	Alarm+ of fiber port 2		

4.2.3 Plug Assembly

The following figure shows the components for connecting data ports, including the shells, screws, and nuts.
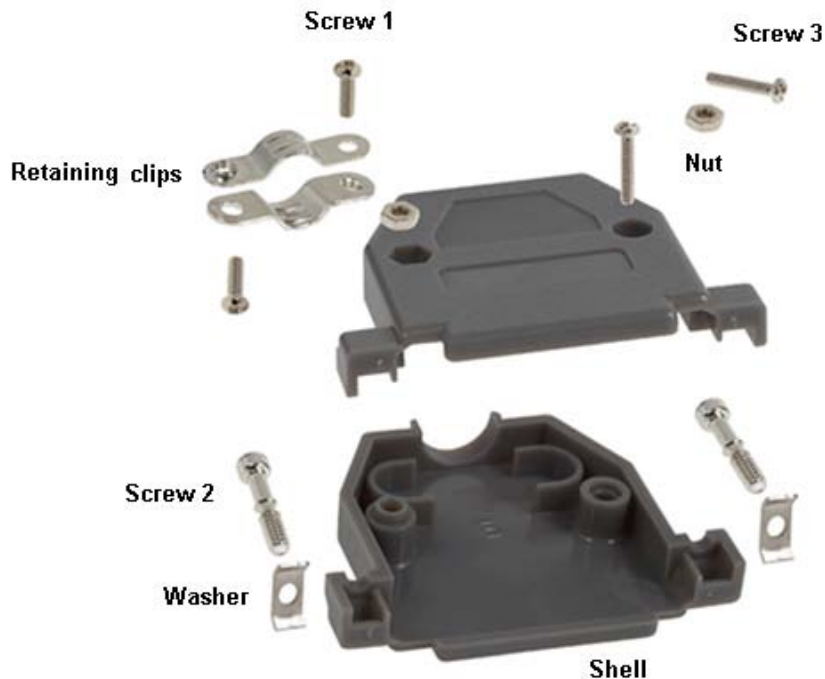

Figure 12 Components for Connecting Data Ports

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The plug assembly procedure is as follows (the figures are only for reference):

Step 1: Solder wires.

Solder one end of a wire to the desired pin of the data port plug and use a shrinkable tube to secure the soldering point. Repeat the operation to solder the other necessary wires to the data port plug. Then use insulation tapes to bind the wires together into a harness. If the harness is too thin, you can use more insulation taps to make it thick, so that it can be stuck in the assembled shells.

Step 2: Make harness fastener.

Buckle the two retaining clips and lead the harness through the channel in the middle of the two retaining clips. Then insert two screws 1 into the holes at both sides of the retaining clips.
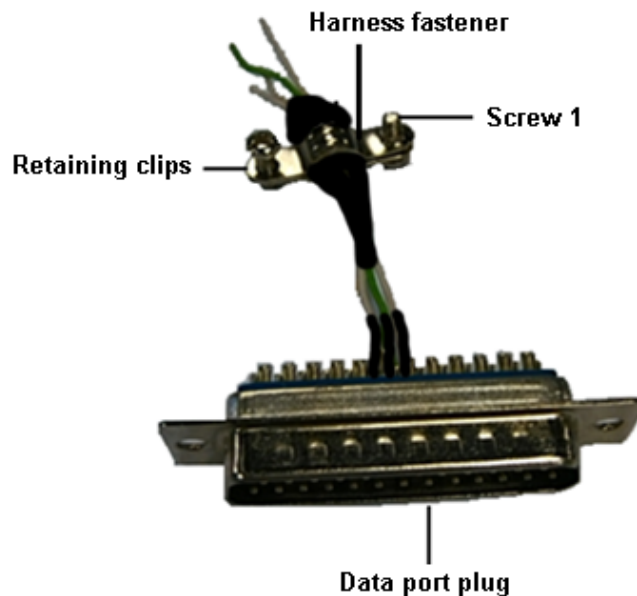
Figure 13 Making a Fastener for the Harness

Step 3: Assemble the data port plug and shells.

Put the plug and fastener into one shell so that the fastener is within the slot in the shell. Insert the two screws 2 into the two washers to connect the plug and the shell, as shown in the following figure. Then buckle the other shell.
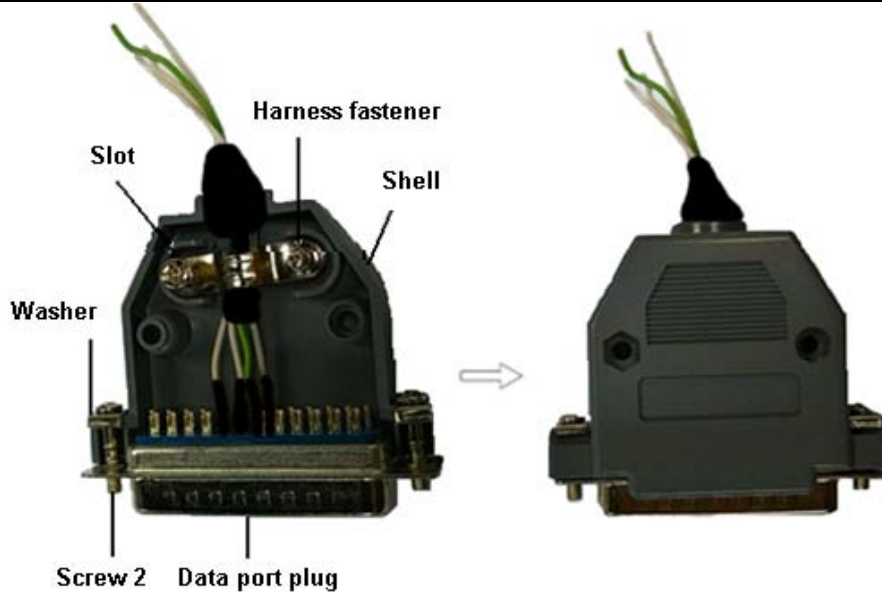
Figure 14 Assembling a Plug for Data Ports

Step 4: Fasten the two shells together.

> Put the hex nuts into the hex recesses of the shells, and insert and fasten two screws 3
>
> respectively, as shown in the following figure.
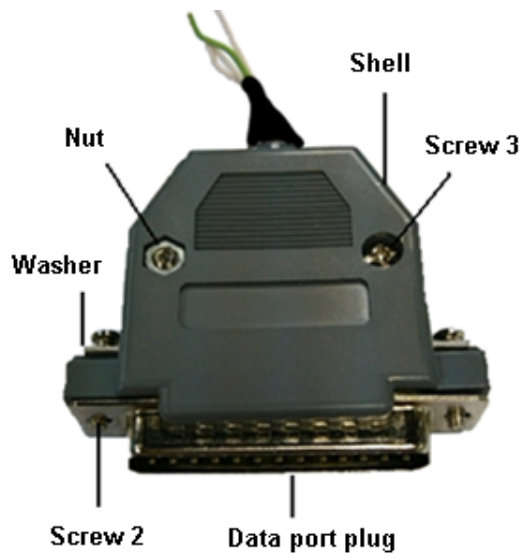
Figure 15 Finished Plug

> **Caution:**
>
> After inserting a plug into the DB25 connector on the top panel, you need to insert two screws 2 into the
>
> screw holes on both sides of the connector to secure the plug.

4.3 **CONSOLE Port**

KODT2200 provides the CONSOLE port on the top panel. You can use a RJ11-DB9 cable to

connect the device and a PC. One end of the RJ11-DB9 cable is a crimped RJ11 connector to be

inserted into the CONSOLE port of the device, and the other end is the DB9 connector to be

inserted into the 9-pin serial port of a PC. Run the network management software, that is,

kylandodt, in the delivered disk. Then you can configure and manage the device by using the

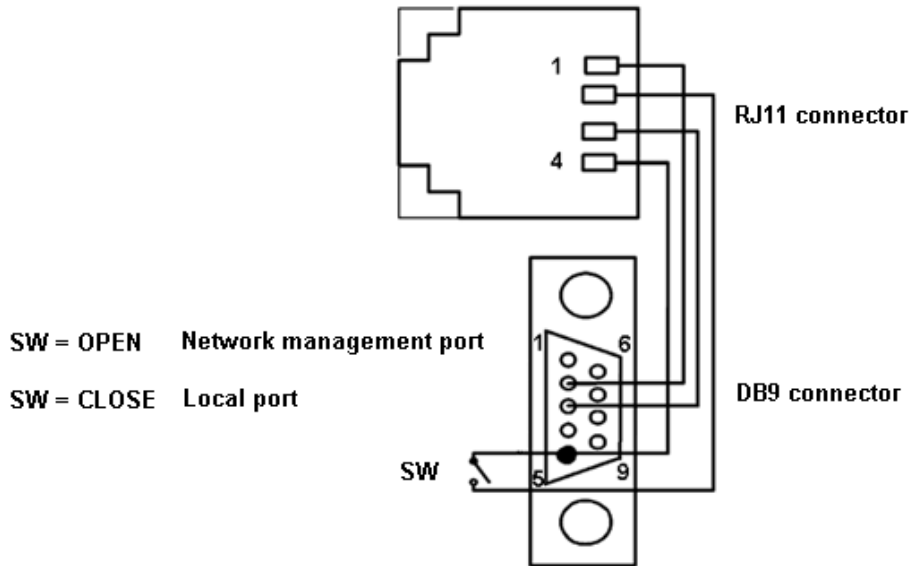software.

● Wiring Sequence of the CONSOLE Port

Figure 16 Wiring Sequence of RJ11- DB9 Network Management/Local Cable
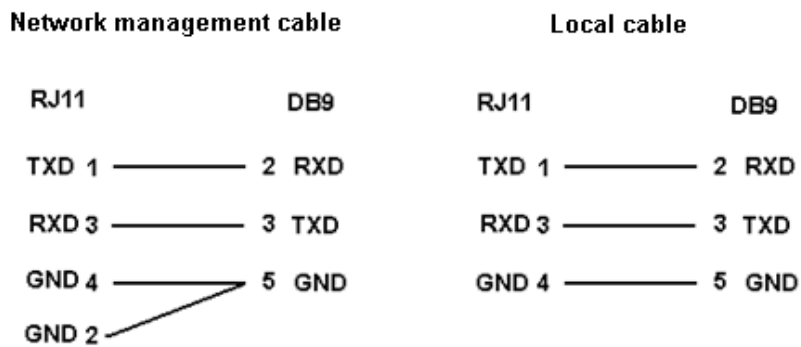

Figure 17 Schematic Diagram for the Wiring Sequence of RJ11- DB9 Network Management/Local Cable

The following table lists the mapping between RJ11-DB9 network management/local cable and kylandodt.

Table 6 Functions of RJ11-DB9 Network Management/Local Cable

CONSOLE Cable	Kylandodt	Type of Devices Connected to PC	Description
Local cable	Local configuration	Remote/Network management/Backup device	Configure the current device.
Network management cable	Network management system of KODT2000	Network management device	Query, manage, and configure devices on the network.

> **Note:**
>
> For details about configurations for using the local/network management cable, see the software manual in the delivered disk.

4.4 Power

There is a power terminal block on the bottom panel of the device. You need to connect the power wires to the terminal block to provide power for the device. The device adopts a 3-pin 3.81mm-spacing plug-in terminal block.

> **Note:**
>
> 0.75mm^2<Cross-sectional area of the power wire<2.5mm^2; grounding resistance<5Ω.

● 3-Pin 3.81mm-Spacing Plug-in Terminal Block

The following figure shows the pin numbers of the 3-pin 3.81mm-spacing plug-in terminal block.
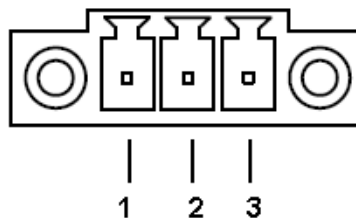

Figure 18 3-Pin 3.81mm-Spacing Plug-in Terminal Block (Socket)

The following table lists the pin definitions of the 3-pin 3.81mm-spacing plug-in terminal block.

Table 7 Pin Definitions of 3-Pin 3.81mm-Spacing Plug-in Terminal Block

No.	DC Definition	AC Definition (only for 220AC/DC)
1	PWR1: -	PWR1: N
2	PWR1: +	PWR1: L
3	PGND	PGND

● Wiring and Mounting

Step 1: Remove the power terminal block from the device.

Step 2: Insert the power wires into the power terminal block according to Table 7 to fix the power wires.

Step 3: Insert the terminal block with the connected wires into the terminal block socket on the device.

Step 4: Connect the other end of the power wires to the external power supply system according to the power supply requirements of the device.
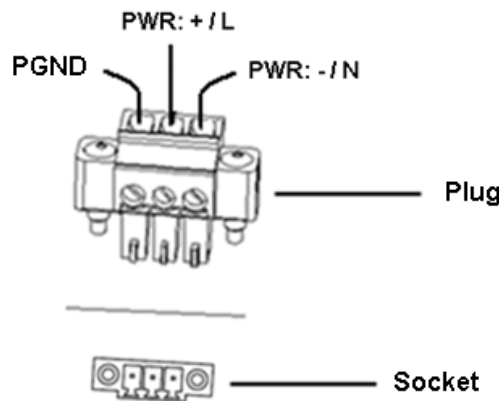

Figure 19 Wiring Sequence of 3-Pin 3.81mm-Spacing Plug-in Terminal Block

Caution:

The device supports 12DC, 24DC, 48DC, 110DC, and 220AC/DC power input (subject to the label on the device). 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.

Warning:

● Do not touch any exposed conducting wire, terminal block, or component with a voltage warning sign, because it may cause damage to humans.

● The device must be grounded properly through pin 3 to protect the device from lightning and interference. You need to ground the device before it is powered on and disconnect the grounding wires after the device is powered off.

● Do not remove any part or plug in or out any connector when the device is powered on.

5 DIP Switches

As shown in the following figure, KODT2200 provides two DIP switches on the top panel: 1/COT (DIP switch for device role) and 2/DEF (DIP switch for default/current configuration).
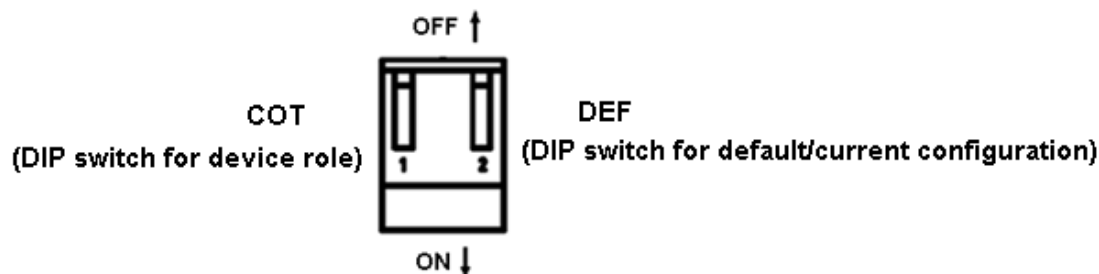

Figure 20 DIP Switches

● 1/COT (DIP switch for device role)

The function of the DIP switch is as follows:

ON: The device serves as the network management device.

OFF: The role of the device can be configured through the network management software.

When the switch is OFF, the device can be configured as the network management device, remote device (default), or backup network management device. A network must have a network management device. A backup network management device is optional. When the network management device is faulty, the backup network management device will become the new network management device and take over network management tasks within 0.2s to ensure normal network operation. Once the fault is rectified, the original network management device takes over network management tasks and the backup network management device returns to the backup state.

● 2/DEF (DIP switch for default/current configuration)

The function of the switch is as follows:

ON: default configuration

OFF: current configuration

6 LEDs

Table 8 LEDs

LED	State	Description
DATA4 port communication status LED (RXD4)	Blinking	Ongoing data transmission
DATA3 port communication status LED (RXD3)	Blinking	Ongoing data transmission
DATA2 port communication status LED (RXD2)	Blinking	Ongoing data transmission
DATA1 port communication status LED (RXD1)	Blinking	Ongoing data transmission
BR receiving status LED (ORDB)	On	Receive loss of signal
	Blinking	Out of frame
	Off	Working properly
AR receiving status LED (ORDA)	On	Receive loss of signal
	Blinking	Out of frame
	Off	Working properly
Running LED (RUN)	On	Network management device
	Blinking (1s)	Remote device
	Blinking (4s)	Backup device

7 **Access**

Step 1: Install kylandodt. You can find the software in the delivered disk.

Step 2: Connect the 9-pin serial port of a PC to the CONSOLE port of the device with an RJ11-DB9 cable. For details about the mapping between RJ11-DB9 network management/local cable and kylandodt, see section 4.3.

Step 3: Open kylandodt. Click Start → All Programs → KODT Management → KODT 2000 Local Management/KODT 2000 Network Management.

Step 4: Follow the instructions for configuration on the UI. For details about operations on kylandodt, see the software manual in the delivered disk.

8 Basic Features and Specifications

Power Requirements

Rated voltage range	12DC: 12VDC 24DC: 24VDC 48DC: 48VDC 110DC: 110VDC 220AC/DC: 100-240VAC, 50/60Hz; 220VDC
Maximum voltage range	12DC: 9-18VDC 24DC: 18-36VDC 48DC: 36-72VDC 110DC: 77-154VDC 220AC/DC: 85-264VAC/120-300VDC
Terminal block	3-pin 3.81mm-spacing plug-in terminal block

Ports

Fiber port	Optical power: -13dbm (SM, MIN); -20dbm (MM, MIN) Receiving sensitivity: -28dbm (SM, MAX); -34dbm (MM, MAX) Line rate: 32Mbit/s Port connector: FC/ST/SC (optional)
Data port	Bit error rate: 10^{-10} (MAX) Asynchronous rate: 0~115.2Kbps (self-adaptive) Electrical standards: RS232, RS422, and RS485 Physical port: DB25F
Remote communication data output port	Two electronic contacts: Voltage: DC350V/AC250V (MAX) Current: 120mA (MAX)
CONSOLE port	Physical port: RJ11 Electrical standard: RS232 Port speed parameters: 9600bps, 8, N, 1

Rated Power Consumption

Rated power consumption	2W (MAX)

Maximum Number of Devices for Cascading

Maximum number of devices for cascading	200

Physical Characteristics

Housing	Metal, fanless
Installation	Panel mounting
Dimensions (W×H×D)	129mm×158mm×28mm (excluding projections, such as ports, sockets, and screws)
Weight	0.6Kg

Environmental Limits

Operating temperature	-40℃~+85℃
Storage temperature	-40℃~+85℃
Ambient relative humidity	5%~95% (non-condensing)

MTBF

MTBF	318,653 hours

Warranty

Warranty	5 years

For more information about KYLAND products, please visit our website: http://www.kyland.cn/