



HighTek HK-5208B

USB/RS-485/422 8-Port

Industrial Grade Opto-Isolated Interface Converter

User Manual

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I. Summary

With rapid development of computer industry, USB is taking the place of various kinds of traditional low speed peripheral interfaces. However, RS-485/422 interface designs are still used in many of the important facilities under current industrial environment; therefore, converter is used by many users to implement the data transmission from USB of a computer to RS-485/422 equipment.

HK-5208B is a universal USB/RS-485/422 converter which does not need external power supply and has built-in opto-isolator and DC/DC power isolation module. It is compatible with USB, RS-422 and RS-485 standards, and it can convert single-end USB signal to balanced differential RS-422 or 485 signal. The built-in photoelectric isolator can provide isolating voltage up to 2500Vrms and it equips with high-speed transient voltage suppressor which is designed to protect the RS-422/RS-485 interface. The advanced TVS (TRANSIENT VOLTAGE SUPPRESSOR) presents high-impedance state under normal conditions, and it can rapidly decrease the resistance between its two ends while it's withstanding transient high-power impulse so as to absorb the high current and clamp the voltage across it to a preset value, and then the following components will not be damaged by the transient high-voltage impulse. This suppressor can effectively restrain lightning and ESD (electro-static discharge) with lightning surge protection power of 600W for each line, and it also can restrain surge voltage and transient over-voltage on the lines for any reason. Extremely small interelectrode capacitance ensures high speed data transmission of RS-422/RS-485 interface. The RS-422/RS-485 end is connected through male DB9 connector. It has built-in automatic transmit-receive switch without time delay. The unique I/O circuit can be used to automatically control the direction of data flow without any hand-shaking signals (such as RTS and DTR) and full-duplex (RS-422) and half-duplex (RS-485) can be implemented without jumper configuration, so as to make it plug-and-play and applicable to all existing communication software and interface hardware.

HK-5208B industrial photoelectric isolated interface converter can provide reliable connection for point-to-point or point-to-multipoint communication. Maximum 128 RS-422 or RS-485 interface devices can be supported for the point-to-multipoint communication. Data communication rate can be 300-128000BPS, and the power indicator light and data traffic indicator light can be used for malfunction indication. USB to RS-422 and USB to RS-485 conversions are supported

II. Functions

Following communication modes are supported by HK-5208B interface converter:

- 1) Point-to-point/4-wire full-duplex
- 2) Point-to-multipoint/4-wire full-duplex
- 3) Point-to-point/2-wire half-duplex
- 2) Point-to-multipoint/2-wire half-duplex

When the converter is connected for full-duplex or half-duplex communication, a matching resistor (120 Ohm, 1/4W) should be connected to the wire terminal for avoiding signal reflection and interference.

III. Hardware installment and application

Please read this manual thoroughly and connect the USB cable to the USB port of computer before the installation of HK-5208B interface converter. USB/DB9 connectors are adopted for the input/output terminal and twisted cable or screened cable can be used. RS-422 or RS-485 communication mode can be implemented without any configuration and the connection and disassembly are very convenient. T/R+ and T/R- represent transmit and receive A+/B-, RXD+/RXD- represent receive A+/B-, GND means common ground. T/R+ and T/R- should be connected for point-to-point, point-to-multipoint half-duplex communication, and T/R+、T/R-、RXD+、RXD- should be connected for point-to-point, point-to-multipoint full-duplex communication.

IV. Performance parameters

1. Standards: USB1.1, 1.0 and 2.0 standards and EIA RS-485 and RS-422 standard
2. USB signals: VCC, DATA+, DATA-, GND, FG
3. RS-485 signals: T/R+, T/R-, GND
4. RS-422 signals: T/R+, T/R-, RXD+, RXD-, GND
5. Industrial grade, adopt UK FTDI master chip
6. Operating mode: Asynchronous mode, point-to-point or point-to-multipoint mode, 2-wire half-duplex, 4-wire full-duplex
7. Data flow control: Automatic data flow control technique is adopted to automatically determine and control the data flow
8. Baud rate: 300-128000bps, automatically detecting the data rate
9. Load capacity: point-to-multipoint communication mode is supported, maximum 128 RS-422 or RS-485 devices are supported
10. Communication distance: 5000 meters for RS-485/422 interface (128000bps-9600bps) and no more than 5 meters for the USB port
11. Interface protection: 600W lightning and surge protection for each port, $\pm 15\text{KV}$ ESD protection
12. Isolation degree: 2500Vrms isolation voltage for each port, 500DC continuous specialized DC/DC module
13. Isolation type: master/slave isolation, slave/slave isolation
14. Interface connection: B type female connector at USB side and DB9 male connector at RS-485/422 side
15. Signal indication: 9 signal indicator lights Power(PWR) transmit (TXD) receive (RXD)
16. Transmission media: twisted-pair or shielded cable
17. Baud rate: 128000bps to 300M
38400bps to U2.4KM
9600bps to U5KM
18. Dimension: 440mm*200mm*47mm
19. Environmental temperature: -40°C to 85°C , relative humidity of 5% to 95%

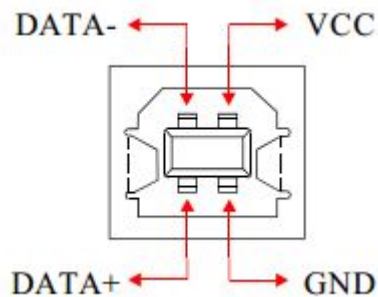
20. Supported OS: Win98/Win2000/Win XP/Win7/8/Linux

V. Connector and signal

1) DB9 PIN type: Signal output and pin assignment of RS-485/RS-422

DB9 pin type(PIN)	Signal output	RS-422 full-duplex connection	RS-485 half-duplex connection
1	T/R+	Transmit(A+)	RS-485(A+)
2	T/R-	Transmit(B-)	RS-485(B-)
3	RXD+	Receive(A+)	Not connected
4	RXD-	Receive(B-)	Not connected
5	GND	Ground	Ground
6	N/A		
7	N/A		
8	N/A		
9	N/A		

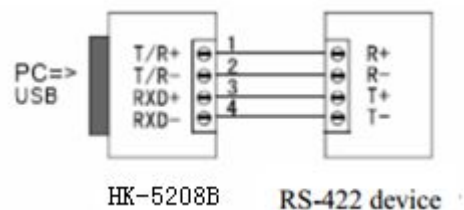
2. USB-B female: USB output signals and PIN assignment



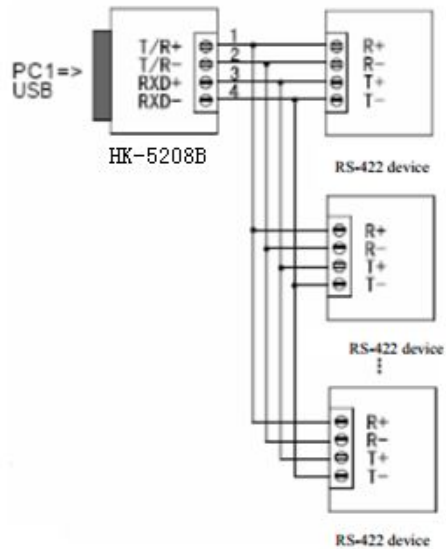
VI. Communication Connection Chart

USB to RS-422 conversion

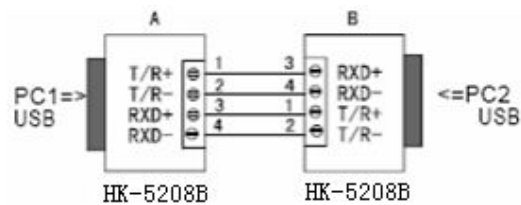
1.RS-422 point-to-point 4 wires communication



2.RS-422 point-to-multipoint 4 wires full-duplex communication

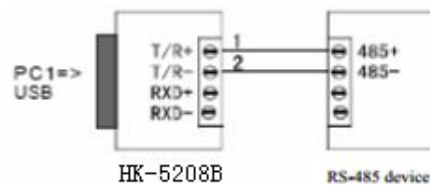


3.Full-duplex communication connection between HK-5208B interface converters

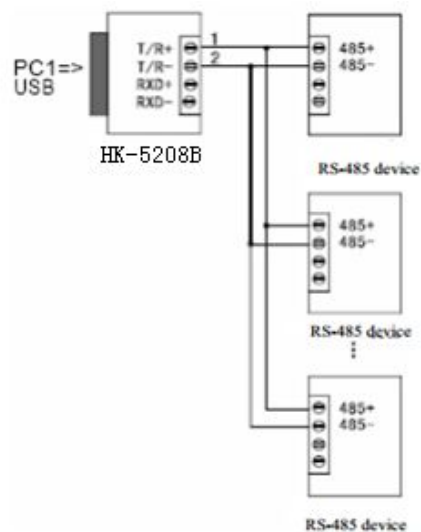


USB to RS-485 conversion

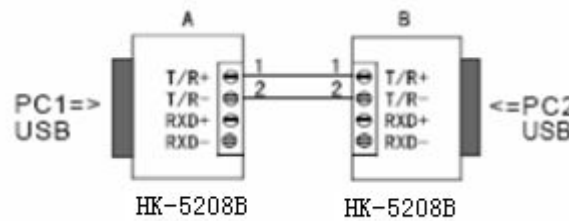
1. RS-485 point-to-point 2 wires half-duplex



2.RS-485 point-to-point 2 wires half-duplex



3. Half-duplex communication connection between HK-5208B interface converters



VII. Problems and troubleshooting

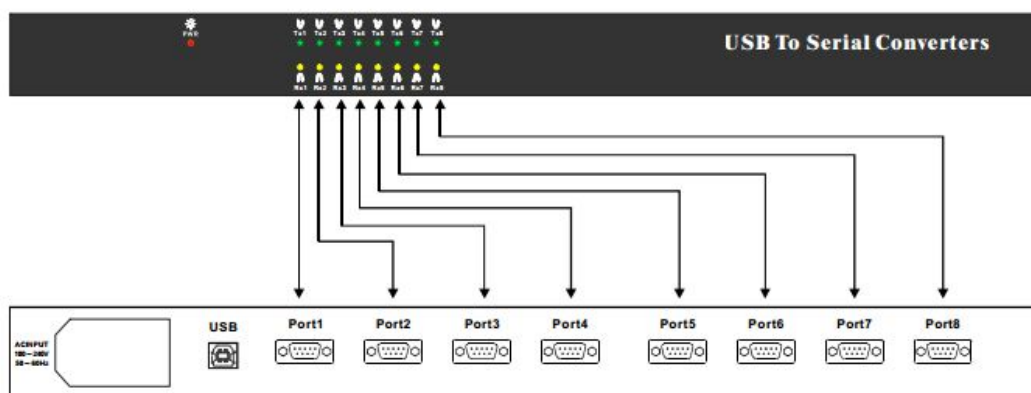
1. Data communication failure

- Check to make sure USB cable is OK.
- Make sure RS-485/422 output interface connection is correct.
- Make sure power supply is OK.
- Make sure the wire terminal connection is OK.
- Make sure the indicator lights flash when receiving.
- Make sure the indicator lights flash when sending.

2. Data missing or incorrect

- Check to see whether the data rate and format at both ends of the communication equipment are consistent.

VIII. Product image

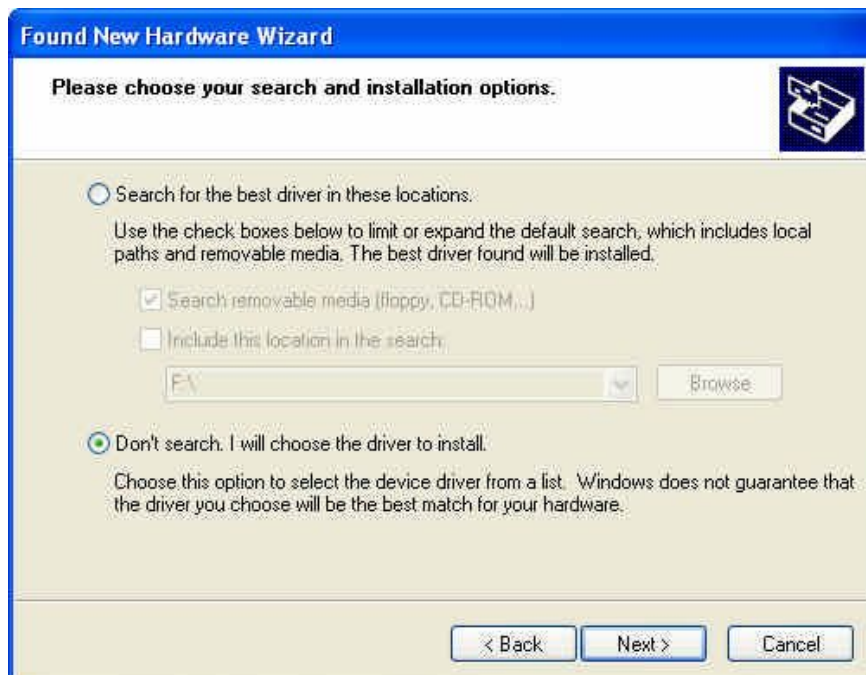


IX. Driver installation

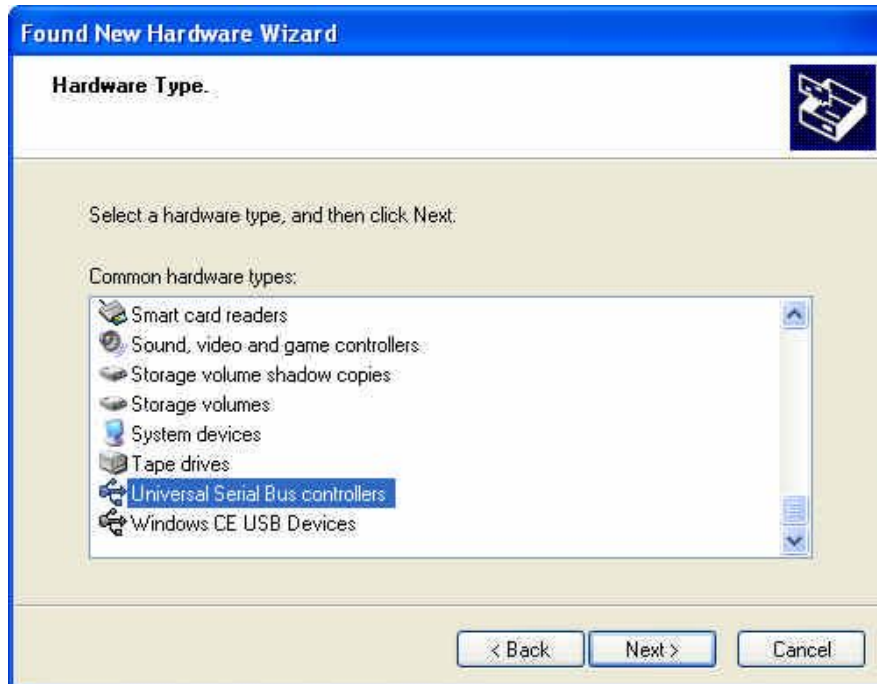
Once a HK-5208B converter is connected with the USB port, the following Window will pop up. Select Install from a list or specific location (Advanced), then click Next to continue.



Then a window pops up to choose search and installation options as following, please select "Don't search. I will choose the driver to install." and then click "Next to continue".



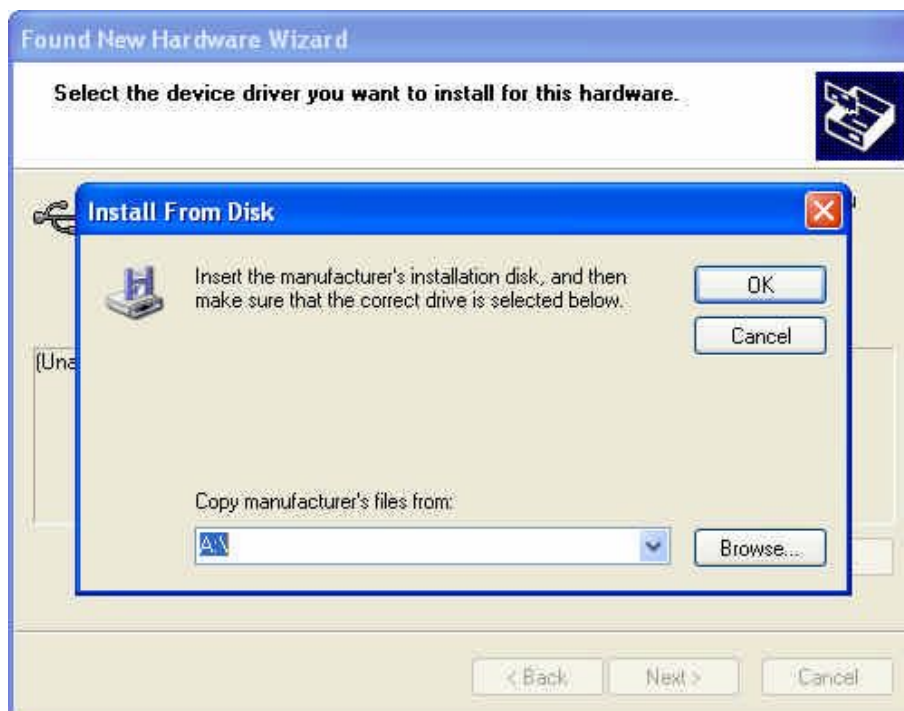
Then a window pops up for Hardware Type listing, pull the scroll bar to select Universal Serial Bus Controllers and click Next to continue.



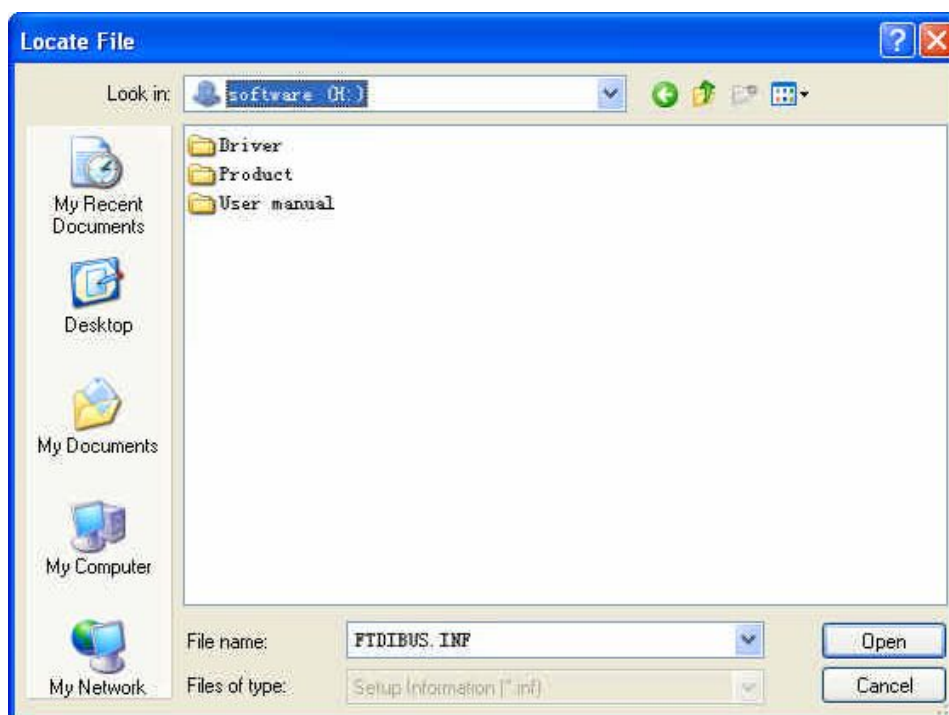
In the following “Select the device driver you want to install for this hardware, click Have Disk” to continue.



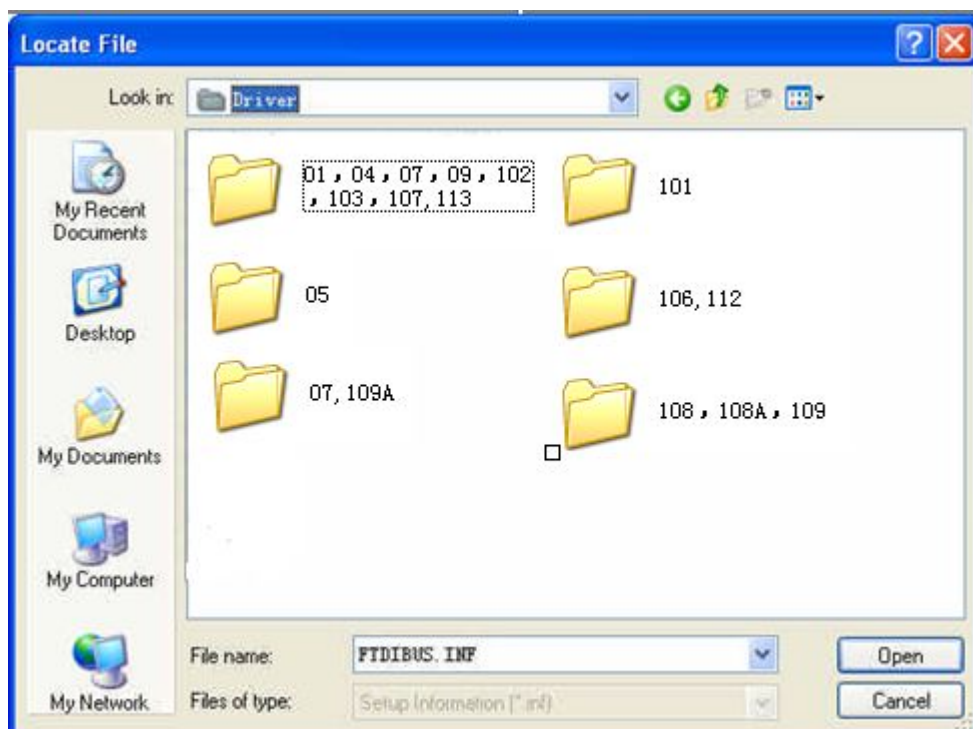
In the “Install From Disk” window, click “Browse” to select the path of the device Driver.



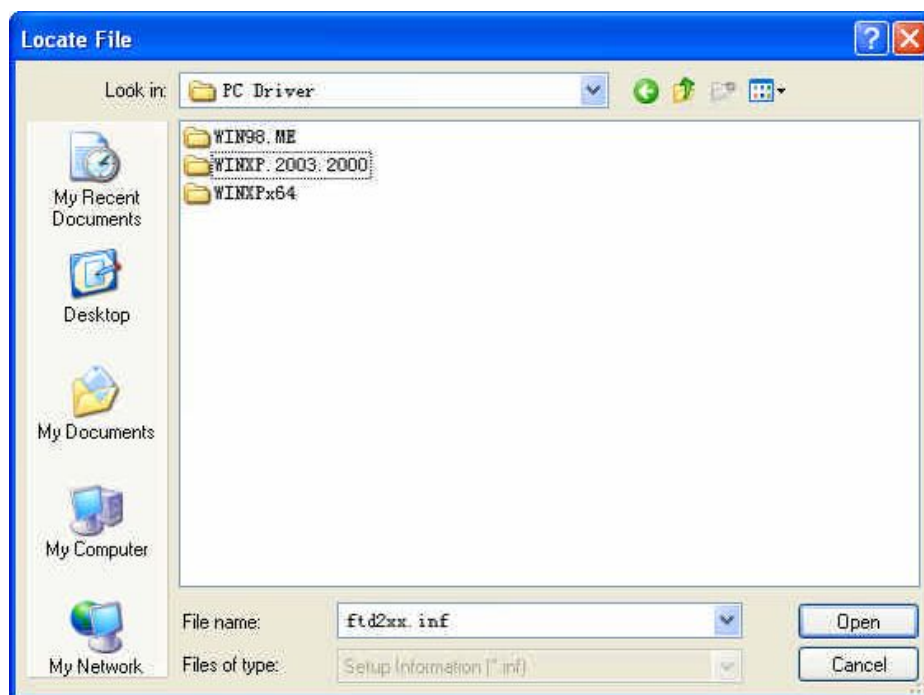
In the Locate File window, select CD path, then choose the directory Driver and click the button Open or double click to open.



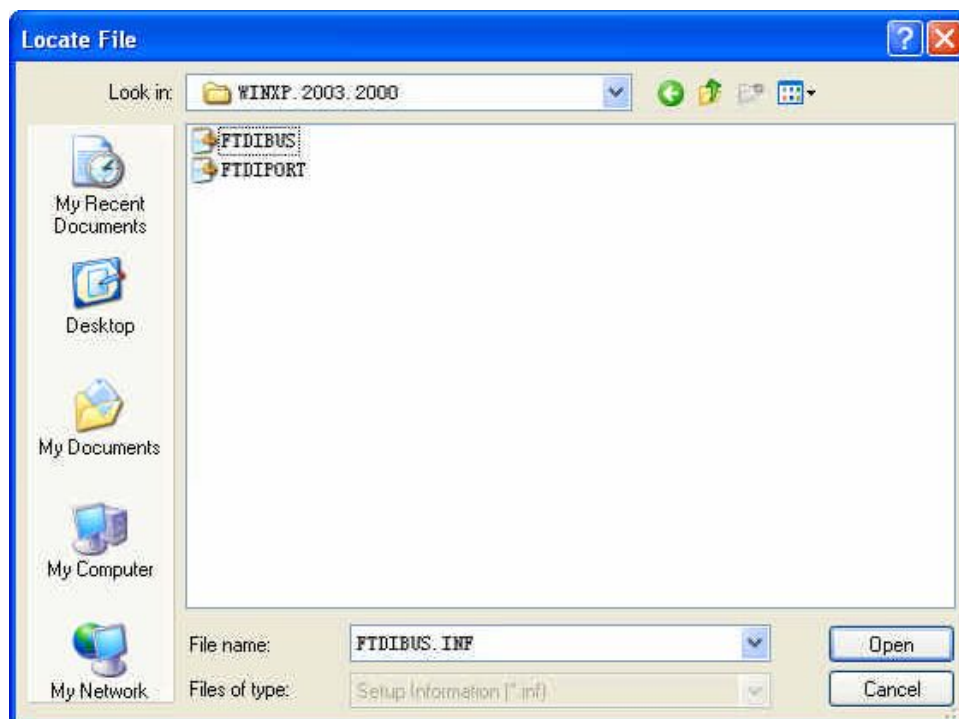
Select the driver model as the following, then click the directory HighTek HK-5208B to open, select PC Driver directory



Select the applicable operation system, e.g. select and double click to open WINXP.2003.2000 for Windows XP.



Select the file FTDIBUS.INF, and then click Open.



In the following Install From Disk window, just click OK.
Select the file FTDIBUS.INF, then click Open.



Installation information has been located by the system as the following, just click Next to continue.



The following shows that the USB Serial Converter installation is finished, then the system wizard will detect USB Serial Port automatically.



The following is the Found New Hardware Wizard for USB Serial Port, click Next as for USB Serial Converter, the same steps are omitted here.



Installation information has been located by the system as the following, just click Next to continue.



The following shows the USB Serial Port installation is finished. Up to now, all the drivers for HK-5208B are installed.



After installation, you can open Device Manager to check if there are COM ports available now, if no USB drivers have been installed previously. System default COM ports are COM3, as illustrated below. Now, all the installation is finished.

The following shows the USB Serial Port installation is finished. Up to now, all the drivers for HK-5208B are installed.

