Allen-Bradley DH+ Driver Help

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Help version 1.023

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Overview

The Allen-Bradley DH+ Driver was specifically designed for use with 32 bit OPC server products running on Intel microprocessor based computers. For operating system (OS) requirements, please refer to the OPC server help documentation.

This driver supports the Allen Bradley SLC family and PLC5 series PLCs, excluding the PLC5/250 series. Address ranges are open to support future models of these series of PLCs.

Channel Setup

Supported Network Cards

AB 1784-KT
AB 1784-KTX(D)
AB 1784-PKTX
AB-1784-PKTX(D)
AB 1784-PCMK/B
SST 5136-SD-ISA
SST 5136-SD-PCI and SST 5136-DHP-PCI

Supported Networks

Data Highway Plus (DH+)
Data Highway-485 (DH-485): applicable to AB cards only.

Channel Properties

Board Type

This driver supports 8 different board types. They are KT, KTX, KTX-D, PKTX, PKTX-D and PCMK/B by Allen-Bradley and 5136-SD-ISA and 5136-SD-PCI by SST.

Note: In our board type selection, we will be choosing KTX (D) for both the KTX and KTX-D card.

Network Type

This driver supports both the DH+ and DH-485 network types. Each of the Allen-Bradley cards (KT, KTX, KTX-D, PKTX, PKTX-D and PCMK/B) support both DH+ and DH-485 networks. SST cards (5136-SD-ISA and 5136-SD-PCI) support only the DH+ network.

Station address

This is a unique node ID (0-77 octal for DH+ and 0-31 decimal for DH-485) of your device. You must make sure that this ID doesn't conflict with any other node ID on the network.

Baud Rate

There are several different baud rates that each of the card types support. The Allen-Bradley cards support 57.6K, 115K and 230K for the DH+ network. For the DH-485 Network, the Allen-Bradley cards support 300, 600, 1.2K, 2.4K, 4.8K, 9.6K and 19.2K. The SST cards as mentioned above support only the DH+ network, and the supported baud rates are 57.6K, 115K and 230K.

Memory Address

The ISA cards (KT, KTX, KTX-D and 5136-SD-ISA) require the user to manually set the memory address on the card. For more information on memory address setup, please refer to the appropriate catalogue. **See Also:** **KTX (D) channel setup** and**5136-SD-ISA channel set up**.

Interrupt

Each of the card types support interrupts. The PCI card types automatically set up the interrupts for your card. The ISA cards (KT, KTX, KTX-D and 5136-SD-ISA) require you to select a unique interrupt level from the drop down menu next to the **Interrupt** label. Make sure it matches what you have selected while performing **hardware configuration**. If you don't want to use interrupts, select **None**.

I/O Port Address

In addition to configuring the memory address on your 5136-SD-ISA card, you must also select a port address manually. Refer to the link below for more information.
Please configure the I/O port and jumper settings on your SST ISA card. If the link does not provide your answer, please refer to the appropriate SST catalogue that came with your card.

PCI Card Instance

This number depends on the number of similar PCI Card Instances on your computer. If the card is the first PCI you are installing, your PCI Card Instance should be 0. If the next PCI card you are installing is from the same vendor, the PCI Card Instance for that card should be 1, etc. If, however, the next PCI card is from a different vendor and is the first card of that type you are installing, the PCI Card Instance should be 0. We currently allow up to 4 card instances at a time. Hence, the maximum PCI Card Instance you can select is 3.

PKTX Channel ID

PKTX cards come in two forms. It can either be a single channel (PKTX) or it can be a dual channel card (PKTX-D). Therefore, when a PKTX/PKTX-D card is used, the driver needs to know what channel it should be using. Selecting one of the channels that shows up in the PKTX Channel ID drop down menu helps the driver know which channel to talk to. If you are using the PKTX-D card, select the channel (1 for PKTX Channel 1A and 2 for PKTX Channel 2) that you want to use for your device.

Channel Setup for the Allen Bradley- 1784 KT card

Before setting the channel properties, you must have the KT card configured for a unique memory address and interrupt on the hardware. The selected address and interrupt should be noted, as these parameters will be used for setting up the channel properties in the server.

Step 1: Configuration

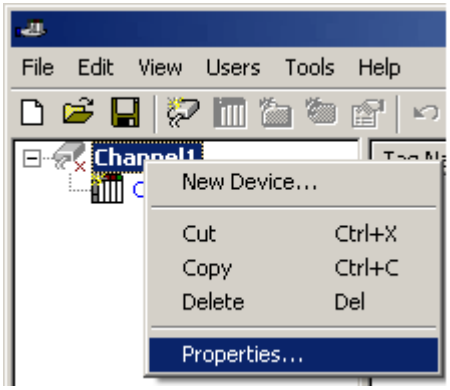
Refer to your KT documents for Hardware configurations (Memory and Interrupt setup).

Step 2: Installation

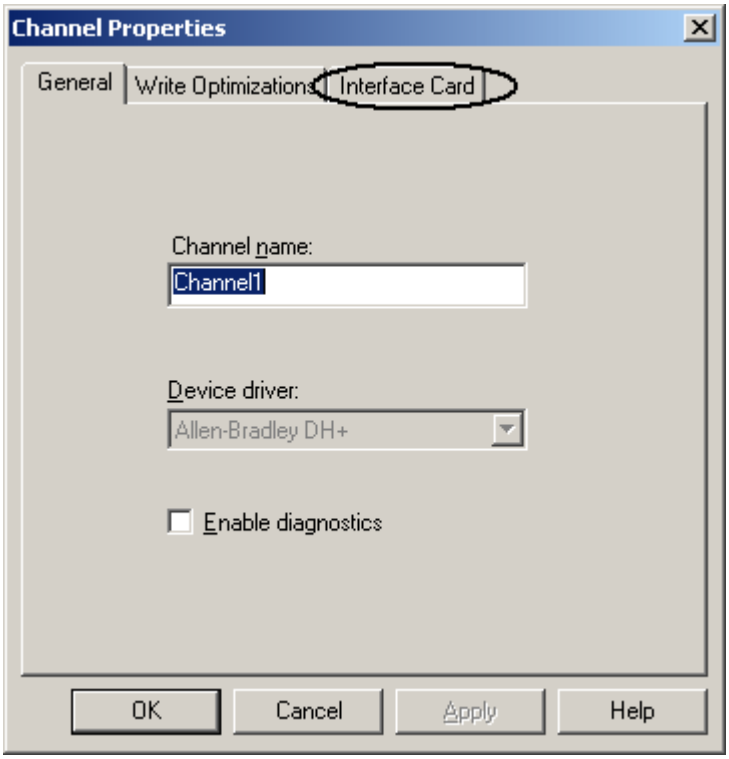
Install the KT card on an available ISA slot and connect to the appropriate network.

Step 3: Channel Properties Setup for the KT Card.

1. In the server application, right-click on the channel. Select **Properties**.

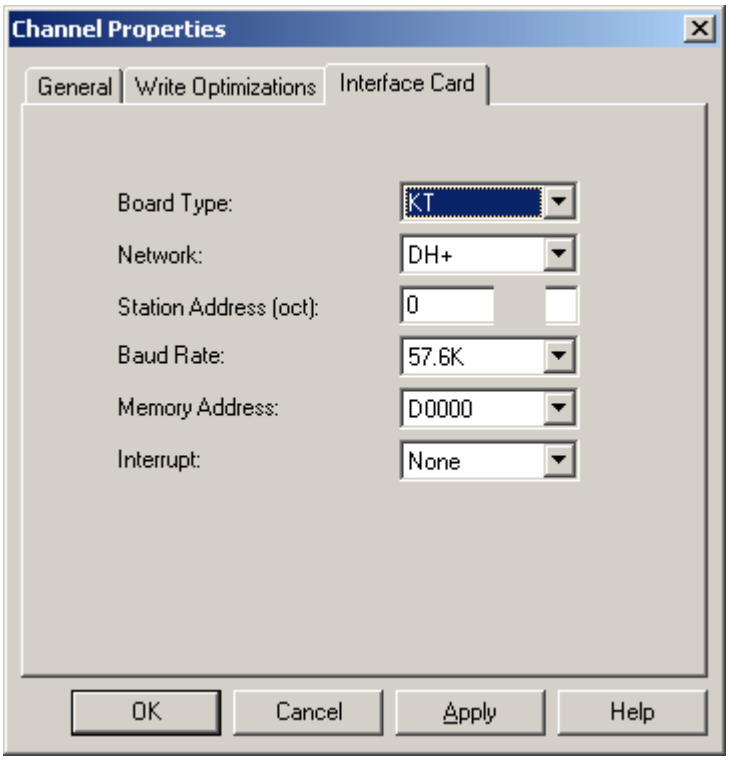


2. Select **Interface Card tab** from the Channel Properties window.



3. Configure the properties.
   - **Select the Board Type:** Select "KT" as the "Board Type" from the drop down menu next to the "Board Type" label.
   - **Select the Network Type:** Select the type of network you are using. This driver currently supports DH+ Network only.
   - **Select the Station Address:** This is a unique node ID (0-77 octal) of your device. You must make sure that this ID doesn't conflict with any other node ID on the network.
   - **Select the Baud Rate:** The only available baud rate for the DH+ network on a KT card is 57.6K.
   - **Select the Memory Address:** You must select the exact memory address that you set up on your card while performing the hardware configurations.
   - **Select the Interrupt:** If you are using Interrupts, you must select a unique Interrupt level from the drop down menu next to the "Interrupt" label. Make sure it matches what you have selected while performing the hardware

configuration. If you don't want to use interrupts, please select "None"



4. Click **OK**.

Channel Setup for the Allen Bradley- 1784 KTX/KTX-D card

Before setting the channel properties, you must have the KTX/KTX-D card configured for a unique memory address and interrupt on the hardware. The selected address and interrupt (if used) should be taken note of, as these parameters will be used for setting up the channel properties in the server.

Step 1: Configuration

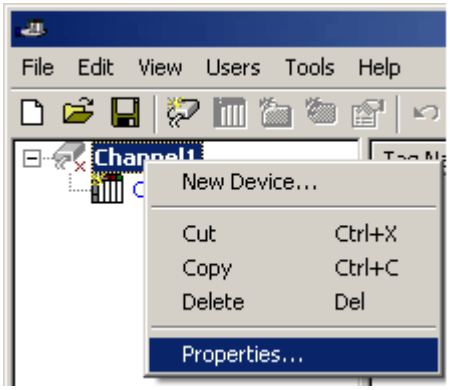
Hardware configuration of the KTX/KTX-D card. Skip this step if already completed, and/or refer to **Configuring Memory and Interrupt on 1784 KTX** for more information.

Step 2: Installation

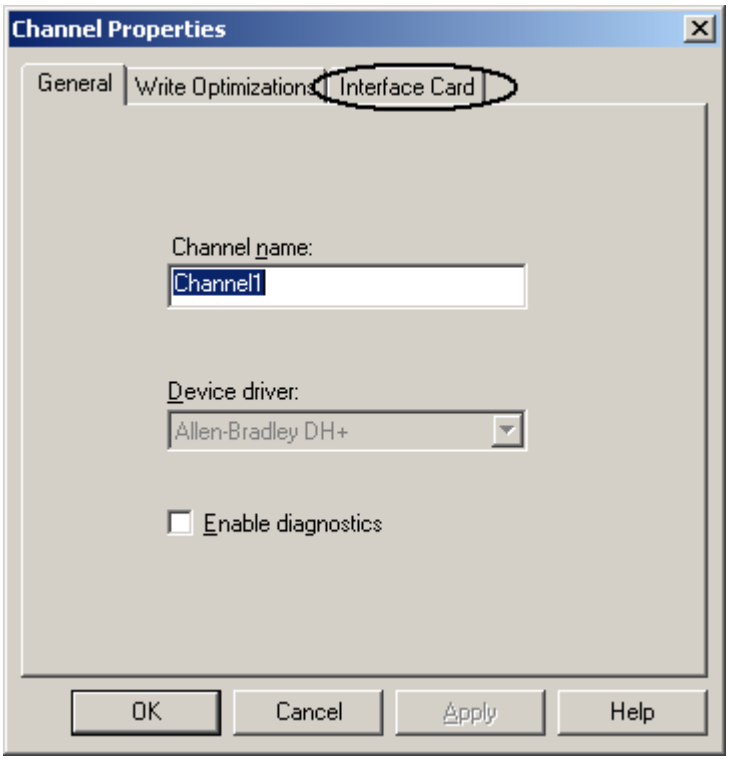
Install the KTX/KTX-D card on an available ISA slot and connect to the appropriate network.

Step 3: Channel Properties Setup for the KTX/KTX-D Card

1. In the server application, right-click on the channel and select **Properties**.

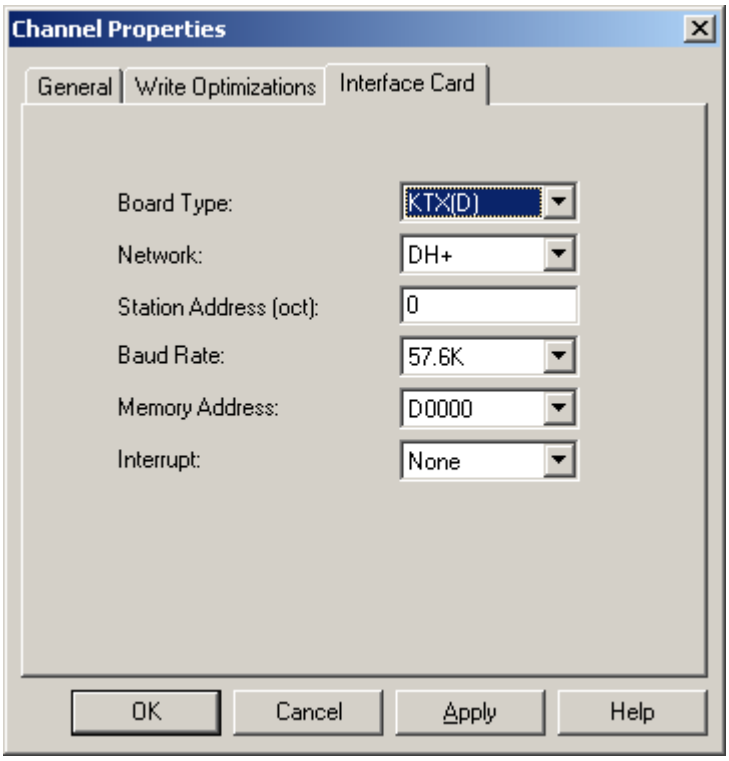


2. Select the **Interface Card tab** from the Channel Properties window.



3. In the **Interface Card tab**, configure the properties.
   - **Select the Board Type:** Select "KTX(D)" as the "Board Type" from the drop down menu next to the "Board Type" label. **Note:** In our board type selection, we will be choosing KTX (D) for both the KTX and KTX-D cards.
   - **Select the Network type:** Select the type of network you are using. This driver currently supports DH+ and DH-485 Network.
   - **Enter the station address:** This is a unique node ID (0-77 octal for DH+ and 0-31 decimal for DH-485) of your device. You must make sure that this ID doesn't conflict with any other node ID on the network.
   - **Select the Baud Rate:** The available baud rates for the DH+ network are 57.6K, 115K and 230K. The Baud rates 115K and 230K under the DH+ network may not be supported by the card you are using or the device you are talking to. Check the card and device vendor specifications. The available baud rates for the DH-485 network are 300, 600, 1.2K, 2.4K, 4.8K, 9.6K, 19.2K. Select the one that matches your device configuration.
   - **Select the Memory Address:** You must select the exact memory address that you set up on your card while performing the **hardware configuration**.
   - **Select the Interrupt:** If you are using interrupts, you must select a unique interrupt level from the drop-down menu next to the **Interrupt label**. Make sure it matches what you have selected while performing **hardware**

configuration. If you don't want to use interrupts, select **None**.



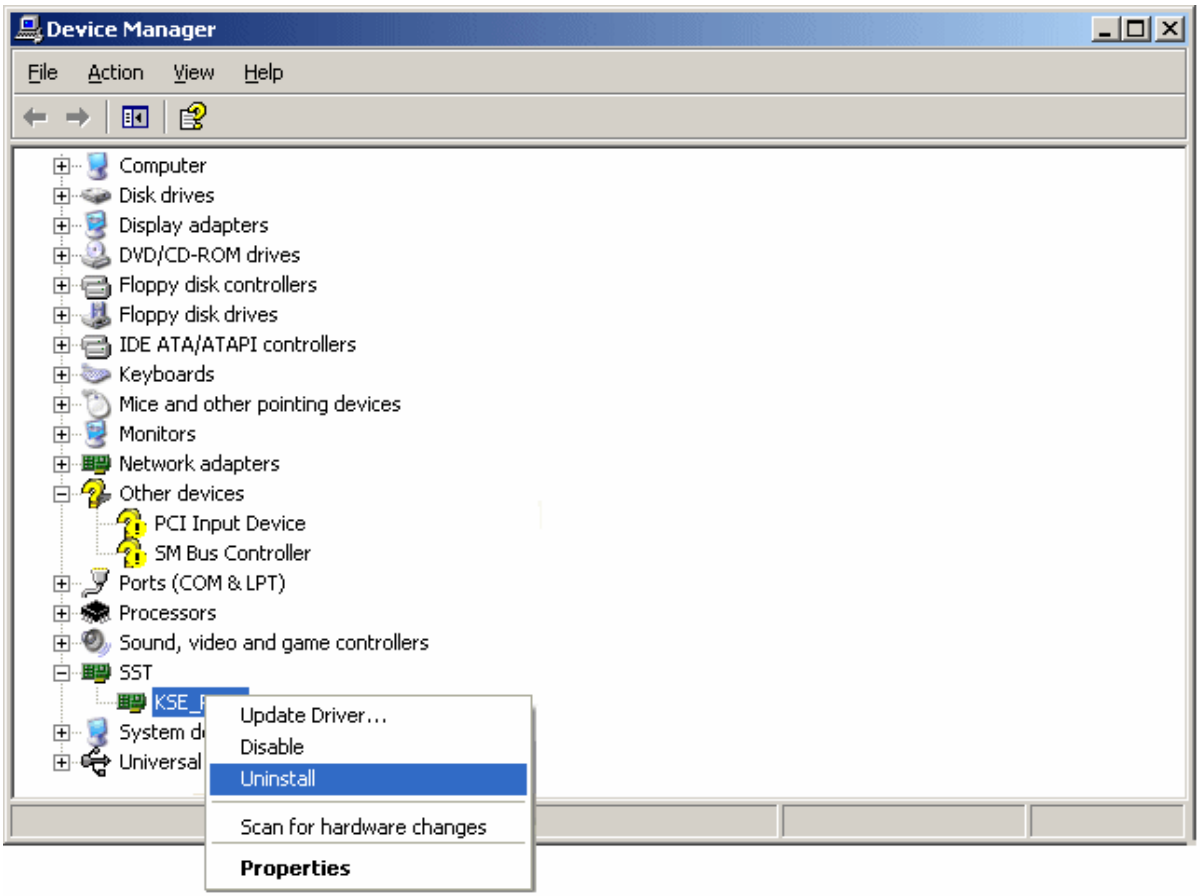
4. Click **OK**.

Channel Setup for the Allen Bradley- 1784 PKTX/PKTX-D card

Caution: Before you install the PKTX/PKTX-D driver, make sure you have uninstalled any drivers (i.e. RSLinx) that you may have used previously for this card and then restart your computer. Failure to do so may result in unexpected consequences. We strongly recommend you use a fresh PCI slot that has not been used previously with other DH+ cards. **This is not required for Windows NT**.

Note to Windows NT users: Windows NT users must be logged in as an administrator the first time they use the driver. This is because the driver needs to write some information to the registry before it can start loading the protocol to the cards.

Example Procedure for removing old driver: If you have used SST or similar cards before, you may see something like the following picture under **Device Manager**.



1. Expand SST and select any driver under it. Right-click and select **uninstall**. You must do this for all the drivers that are installed under SST.

2. Once the procedure is complete, **restart** your computer.

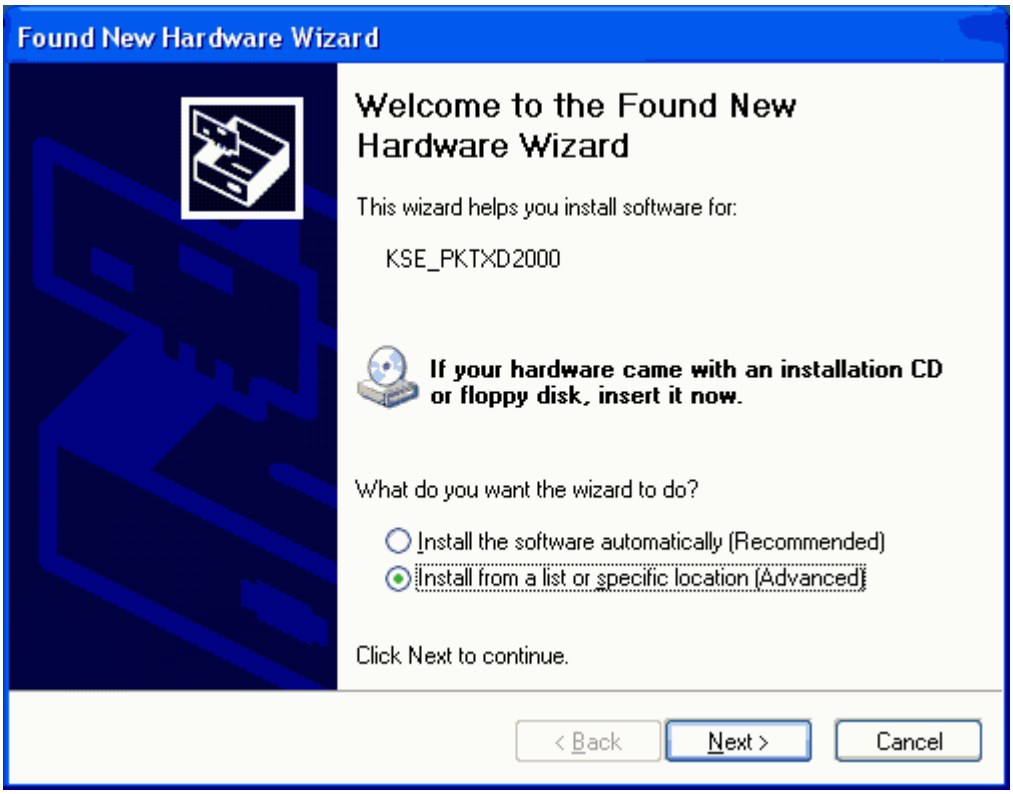
Before setting the channel properties, you have to have an additional driver installed for the PKTX/PKTX-D card.

Note: If you are installing the driver on **Windows NT**, instructions described in **Step 1 are not required** and should not be performed. The driver should automatically take care of the steps required for installation.

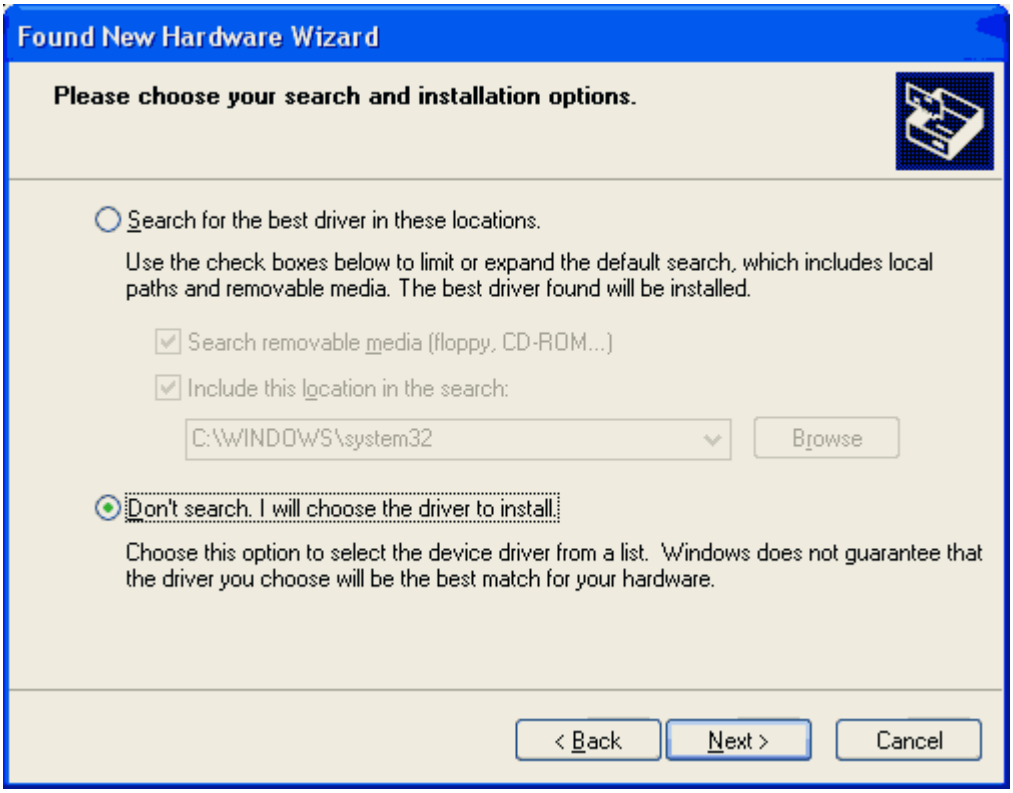
Step 1 : Additional Driver Installation

1. After you have installed the card, restart your PC. At start up, the **Found New Hardware Wizard** will pop up to configure the new detected hardware.
(**Note:** The pictures below refer to KSE_PKTXD2000. This name can vary from computer to computer. When installing the device for the first time, some computers might say **Network Controller**. In this case, it is referring the device as **KSE_PKTXD2000**.)

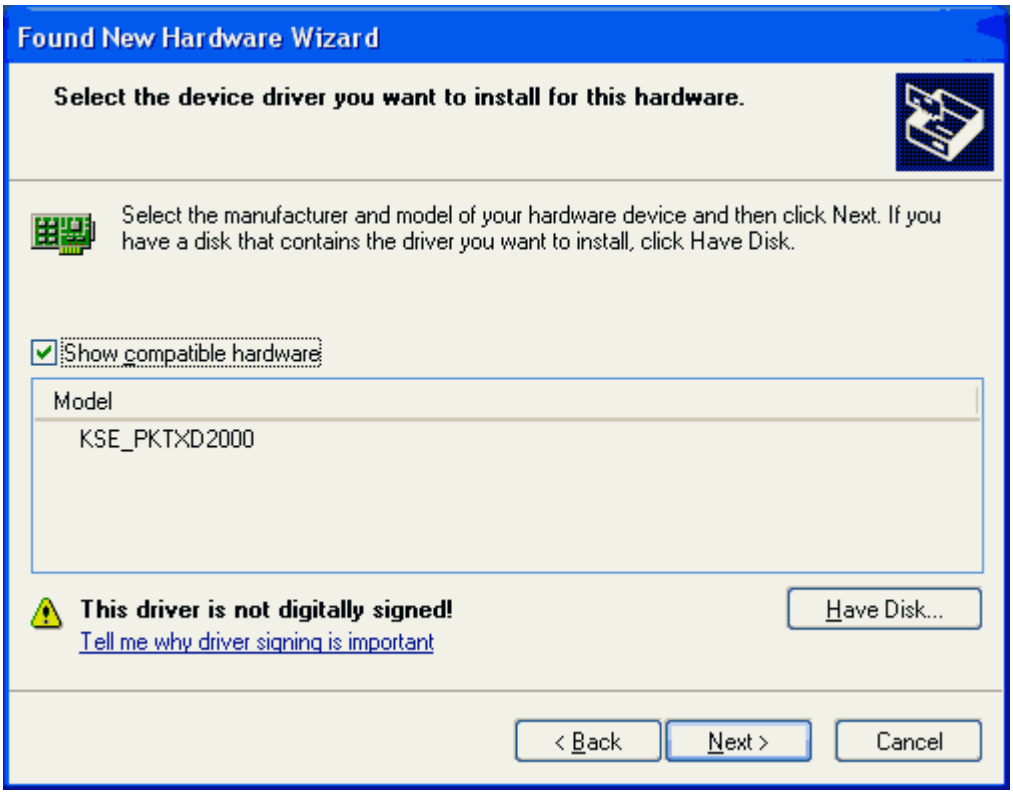
2. Select **Install from a list or specific location (Advanced)**. Click **Next**.



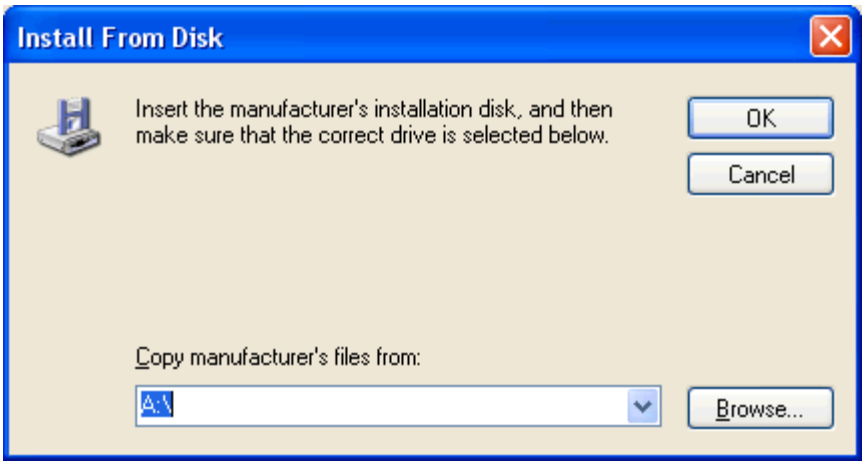
3. Select **Don't search. I will choose the driver to install** and click on **Next**.



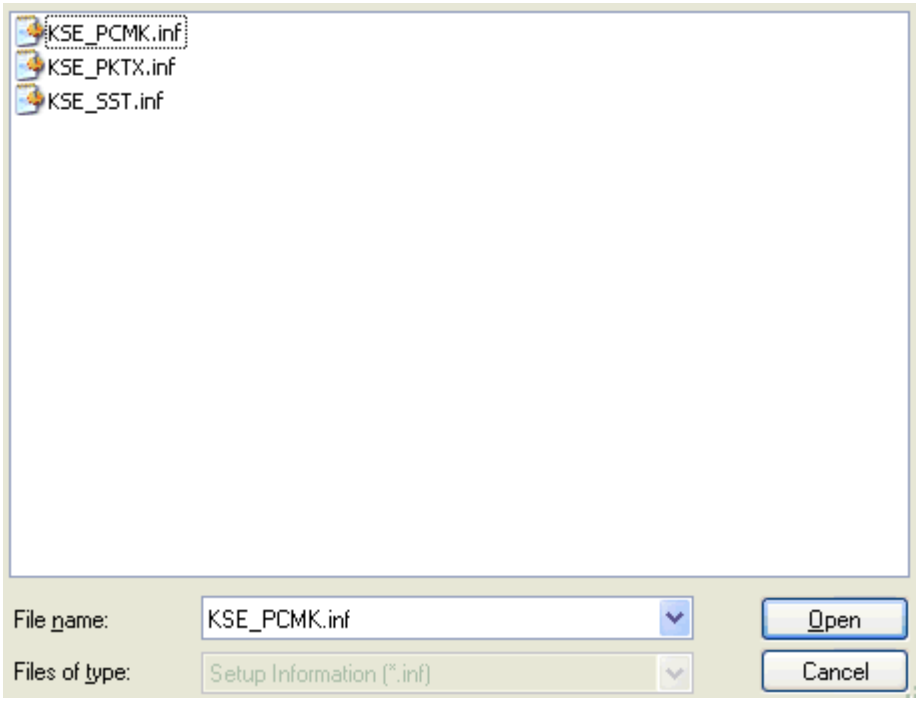
4. Click **Have Disk**, regardless of whether or not the name **PKTX** appears on the list.



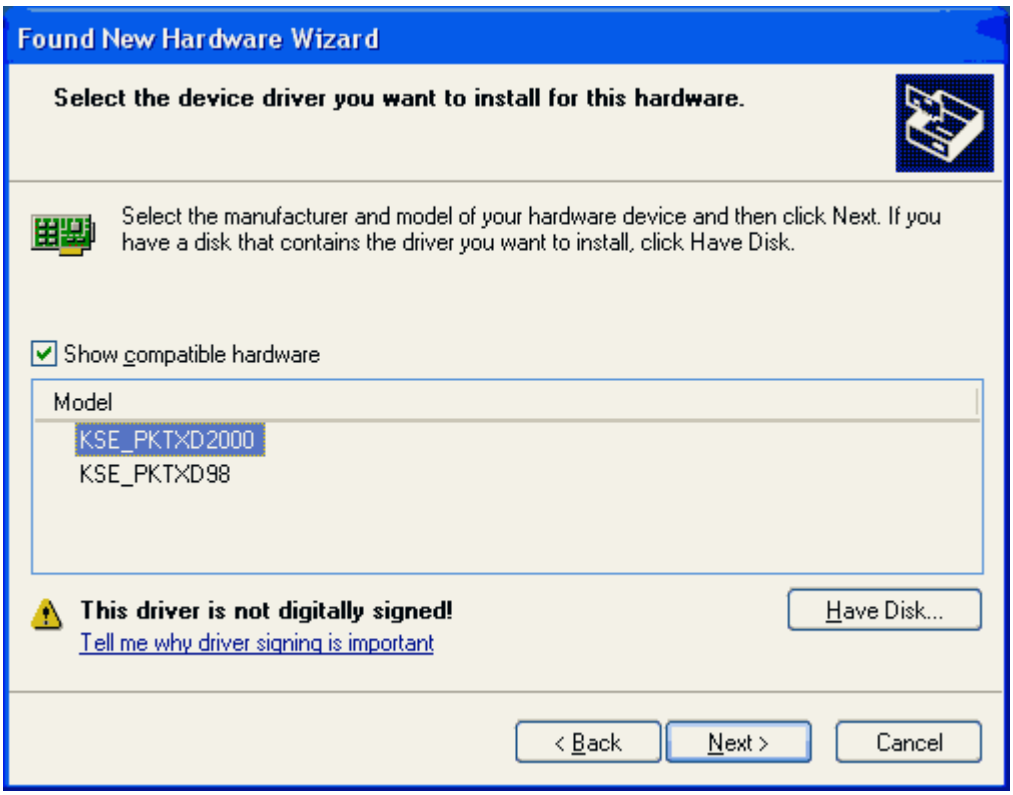
5. Click **Browse...** and go to the **C:\Program Files\yourOPCserver\drivers\Allen-Bradley DH+** directory.



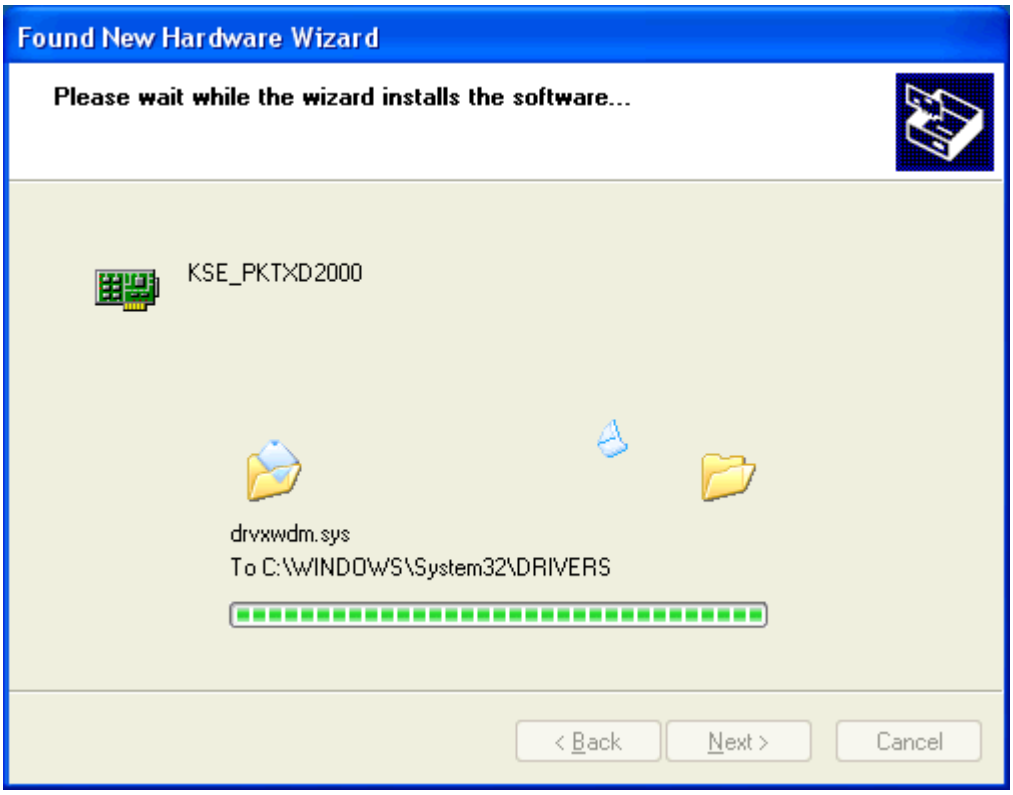
6. Multiple .inf files will be shown. If you are on **Windows2000**, **Windows NT** or **Windows XP**, select **KSE_PKTX.inf** as your driver.



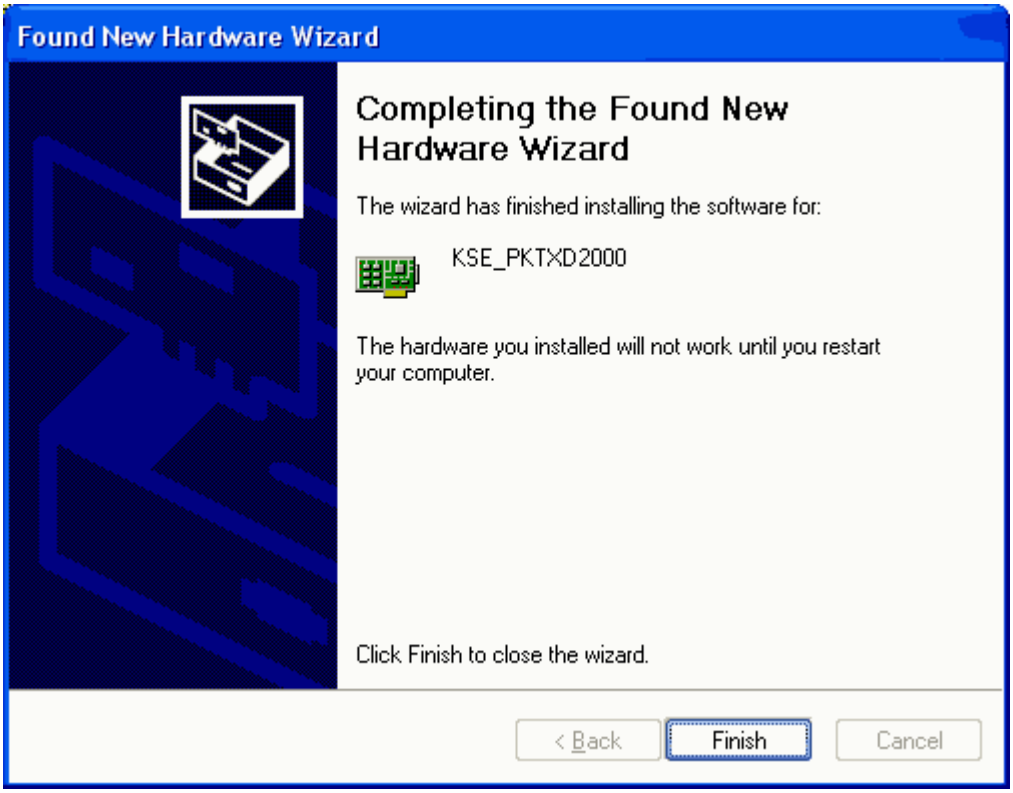
7. Select the appropriate driver for the device you are using. If you are using a **PKTXD card**, select KSE_PKTXD2000. If you are using a **PKTX card**, select KSE_PKTX2000.



8. Wait while the **Found New Hardware Wizard** installs the software.



9. Click **Finish** and **restart** your computer.



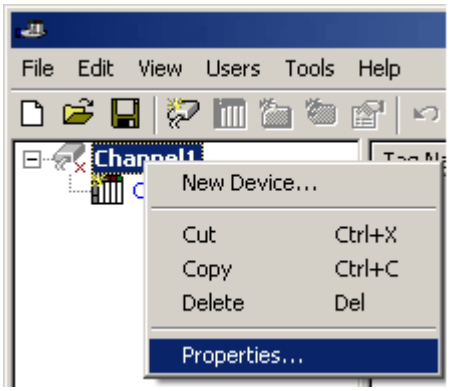
Note: If your computer still doesn't detect the PKTX device, you may have to try one or both of the following:

1. Completely uninstall any driver installed under the current slot.
2. Try a different slot.

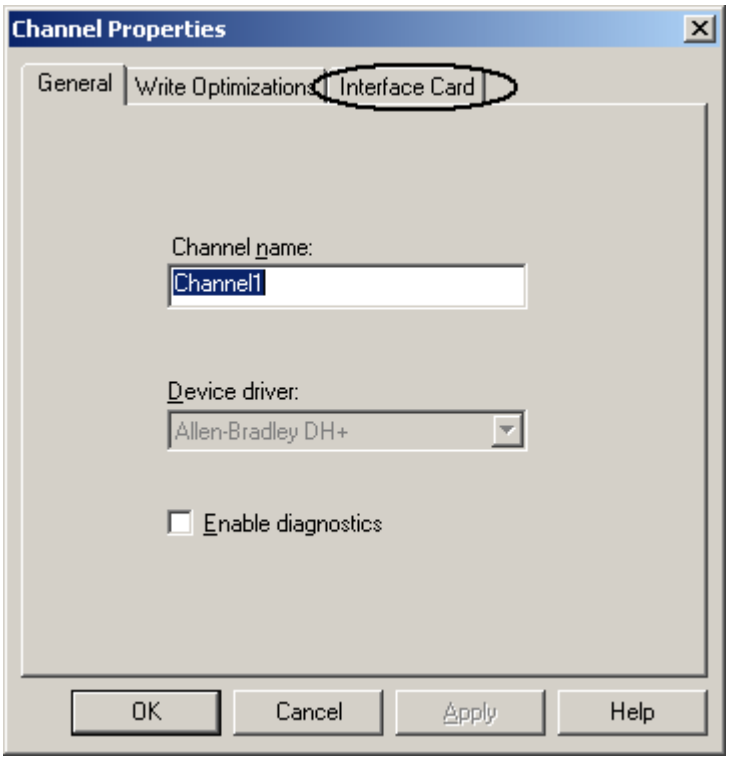
Step 2: Channel Configuration

Note: The following steps should be performed after the computer has been restarted (following Step 1).

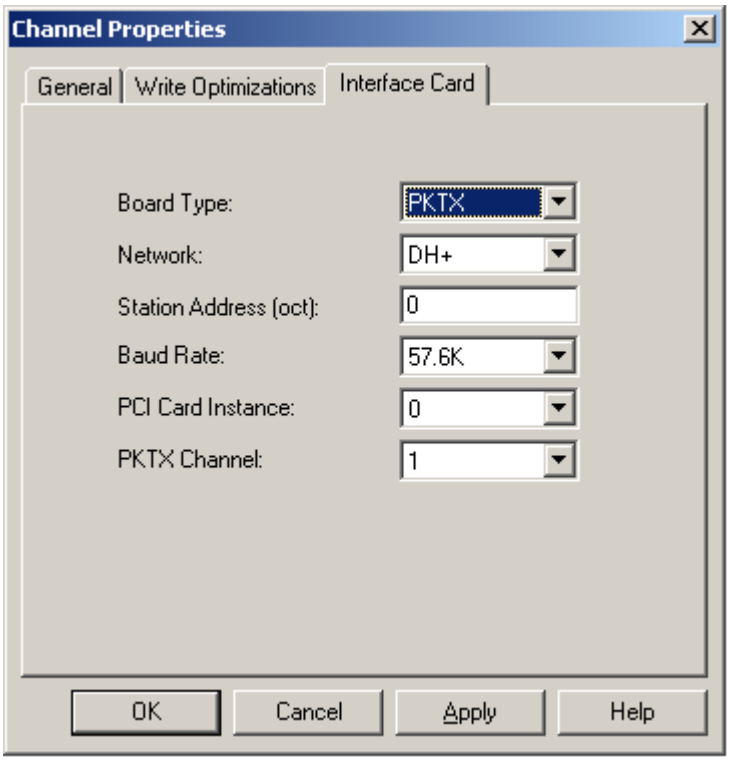
1. In the server application, right-click on the channel and select **Properties**..



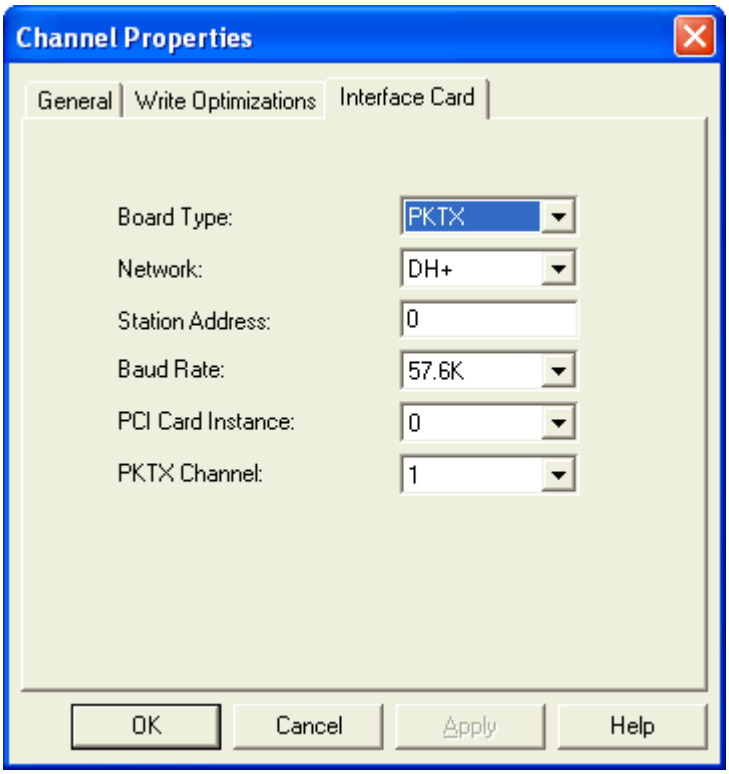
2. Select the **Interface Card tab** from the Channel Properties window.



3. In the **Interface Card tab**, complete the following:



- **Select the Board Type:** Select "PKTX" or " PKTX-D" as the "Board Type" (depending on whether you are using PKTX or PKTX-D card) from the drop down menu next to the "Board Type" label.
- **Select the Network type:** This driver currently supports DH+ and DH-485 networks for PKTX/PKTX-D cards.
- **Enter the station address:** This is a unique node ID (0-77 octal for DH+ and 0-31 decimal for DH-485) of your device. You must make sure that this ID doesn't conflict with any other node ID on the network.
- **Select the Baud Rate:** The available baud rates for the DH+ network are 57.6K, 115K and 230K.The Baud rates 115K and 230K under the DH+ network may not be supported by the card you are using or the device you are talking to. Check the card and device vendor specifications. The available baud rates for the DH-485 network are 300, 600, 1.2K, 2.4K, 4.8K, 9.6K, 19.2K. Select the one that matches your device configuration.
- **PCI Card Instance:** On Windows XP/2000, this number depends on the number of PKTX/PKTX-D card instances on your computer. If the card you are installing is the first PKTX/PKTX-D, your PCI Card Instance should be 0. The PCI Card Instance for the next PKTX/PKTX-D card will be 1 etc. On Windows NT however, PKTX and PKTX-D cards are treated as two different types of cards. Hence, if you have two cards installed (one PKTX and one PKTX-D), the PCI Card Instance for both cards will be 0. The PCI Card Instance for the next PKTX will be 1 and for the next PKTX-D card will also be 1 etc. We currently allow up to 4 card instances altogether at a time. Hence, the maximum PCI Card Instance you can select is 3.
- **PKTX Channel:** This number depends on the number of channels on your PKTX Card. If you are using a PKTX card, you would have only one channel. However, if you are using PKTX-D, you would have two different channels. If you are using the PKTX-D card, please select the channel (1 for PKTX Channel 1A and 2 for PKTX Channel 2) that you would want to use for your device.



4. Click **OK**.

Channel Setup for 5136-SD-ISA card

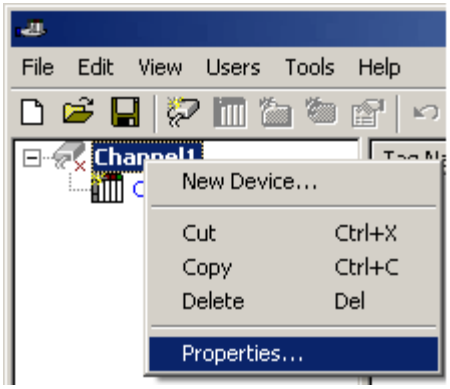
Note: You will not need any additional drivers or additional software from any other vendor. Any additional drivers/ software that may be required will either be supplied or recommended and described in this help file.

Step 1: Configuration

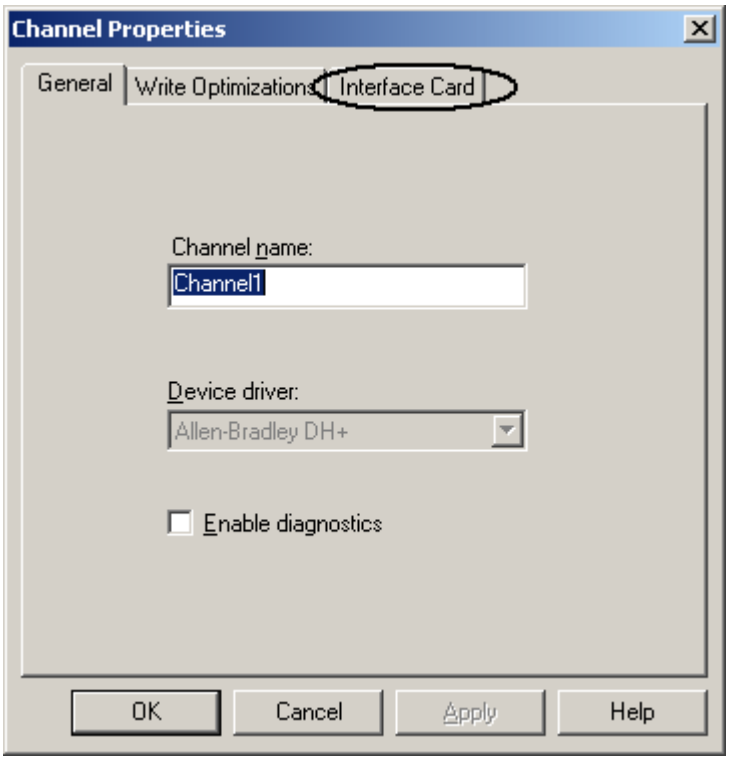
Please configure the I/O port and jumper settings on your SST ISA card. You can refer to **Hardware Configuration of the 5136-SD-ISA (SST) card** for more information.

Step 2: Channel Properties Setup

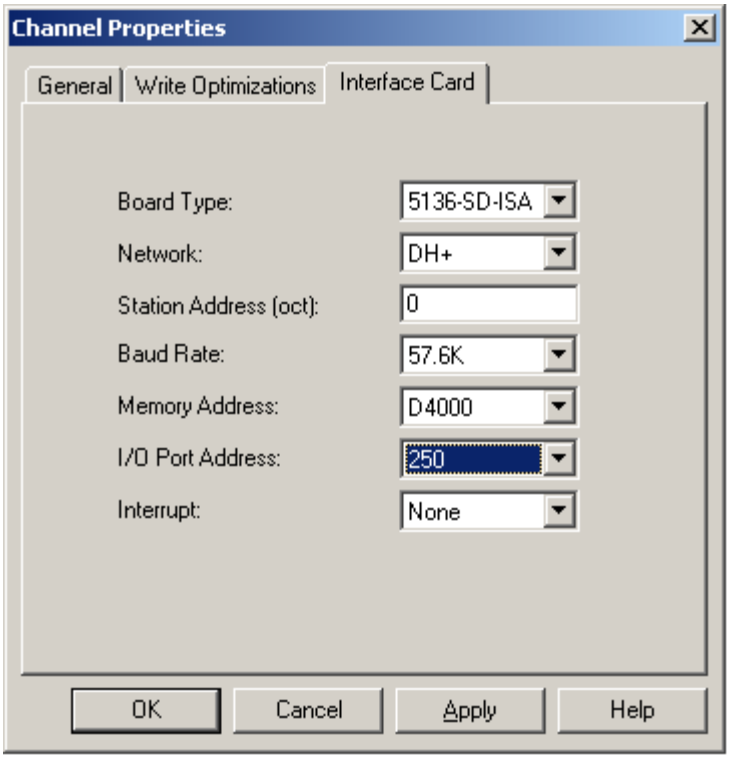
1. In the server application, right-click on the channel. Select **Properties.**



2. Select the **Interface Card tab** from the Channel Properties window.



3. Under the **Interface Card tab,** complete the following:
   - **Select the Board Type:** Select "5136-SD-ISA" as the "Board Type" from the drop down menu next to the "Board Type" label.
   - **Select the Network Type:** Only the DH+ network is supported for the SST cards.
   - **Enter the Station Address:** This is the unique node ID (0-77 octal for DH+ and 0-31 decimal for DH-485) of your device. You must make sure that this ID doesn't conflict with any other node ID on the network.
   - **Select the Baud Rate:** The available baud rates are 57.6K, 115K and 230K. Select the one that matches your device configuration.
   - **Select the Memory Address:** You must chose a unique memory address for your 5136 -SD- ISA card from the range "A0000-FC000".
   - **Select the I/O PORT Address:** You must select the exact I/O port that you set up with the DIP switches while installing your 5136-SD-ISA card.
   - **Select the Interrupt:** If you are using Interrupts, you must select a unique Interrupt level from the drop down menu next to the "Interrupt" label. To check for any conflicts, check the **Device Manager.** If you are not using any interrupts, select "none" from the drop down menu.



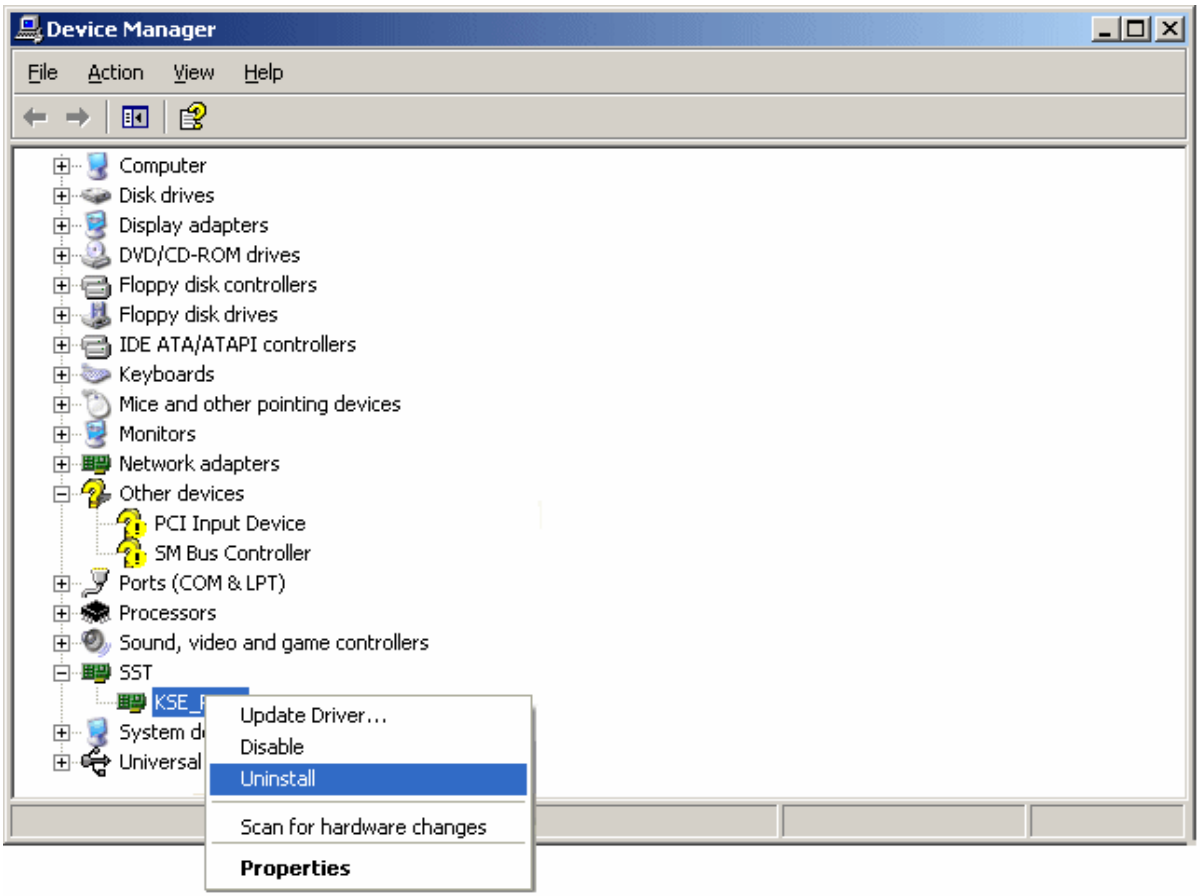
Channel Setup for 5136-SD-PCI card

Caution: Before you install the 5136-SD-PCI driver, make sure you have uninstalled any drivers (i.e. RSLinx or SST) that you may have used previously for this card and then restart your computer. Failure to do so may result in unexpected consequences. We strongly recommend you use a fresh PCI slot that has not been used previously with other DH+ cards. **This is not required for Windows NT**.

Note: We do not currently support multiple instances of the SSTPCI card. We do not recommend running multiple PCI cards of similar category (PKTX, PKTXD) while the SSTPCI is running.

Note to Windows NT Users: Windows NT Users must be logged in as an administrator the first time they use the driver. This is because the driver needs to write some information to the registry before it can start loading the protocol to the cards.

Example Procedure for removing old driver:
If you have used the PKTX or the SST card before, you may see something like the following picture under **Device Manager**.



1. Expand SST and select any driver under it. Right-click and select **uninstall**. You must do this for all drivers that are installed under SST.

2. Once the procedure is complete, **restart** your computer.

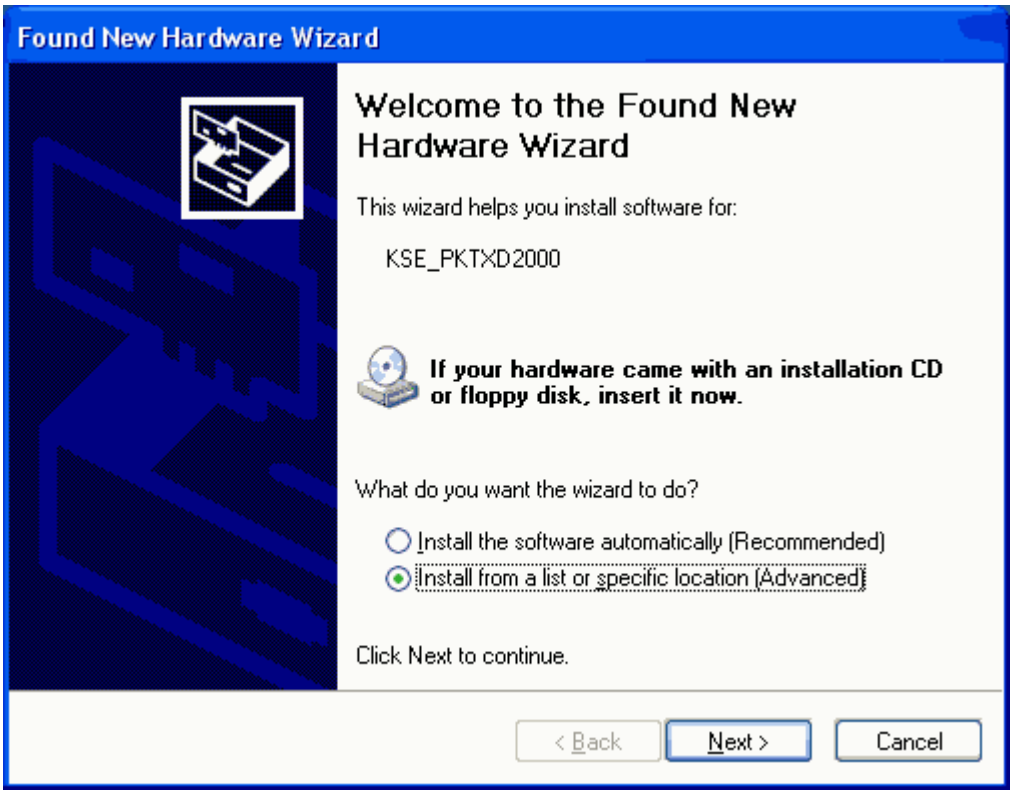
Before setting the channel properties, you have to have an additional driver installed for the SST PCI card.

Note: You will not need any other drivers or software from any other vendor. Any additional driver/software that may be required will either be supplied or recommended and described in this help file. Also, if you are using **Windows NT**, instructions described in **Step 1 are not required** and should not be performed. The driver should automatically take care of the steps required for the NT installation.

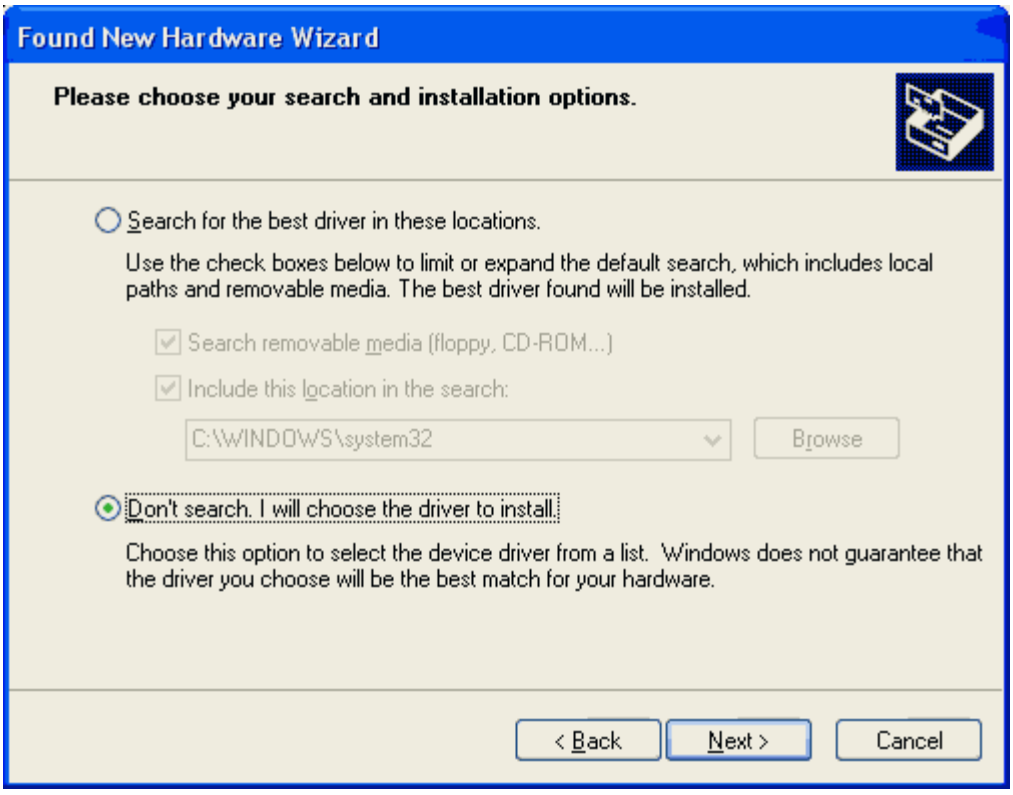
Step 1: Additional Driver Installation

1. After you have installed the card, restart your PC. At start up, the **Found New Hardware Wizard** will pop up to configure the new detected hardware.
(**Note:** The pictures below refer to KSE_PKTXD2000 and are taken from a different case. They are presented here as an example. Names vary from case to case.)

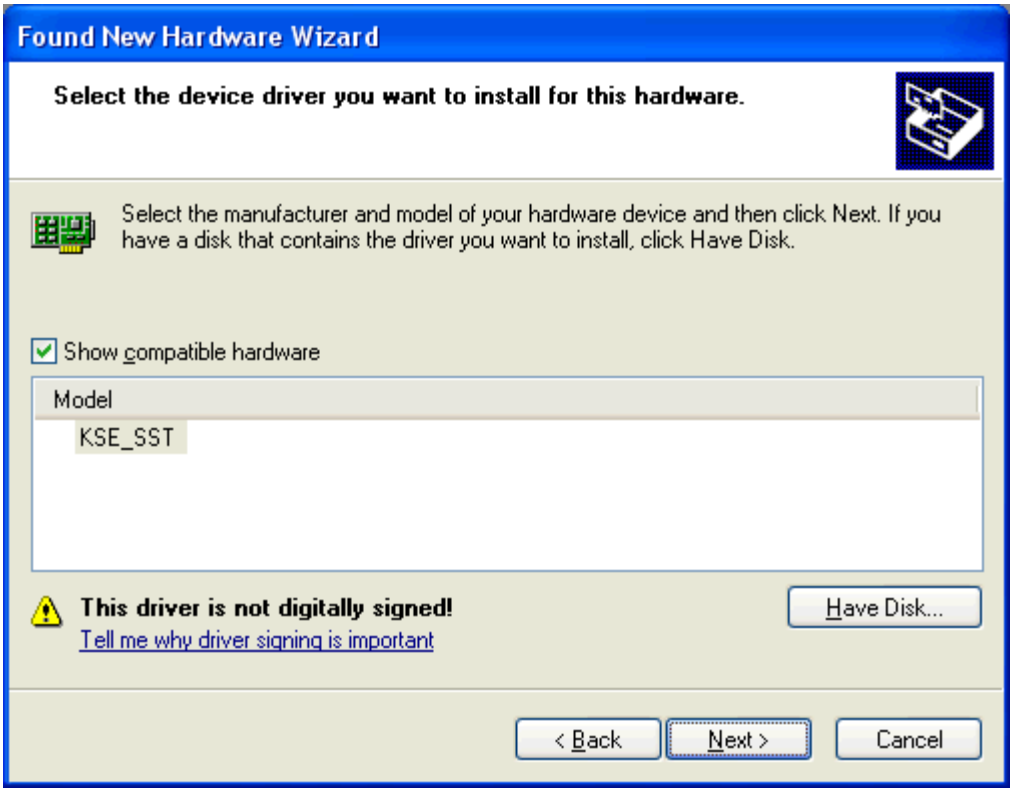
2. Select **Install from a list or specific location (Advanced)**. Click **Next**.



3. Select **Don't search. I will choose the driver to install** and click on **Next**.

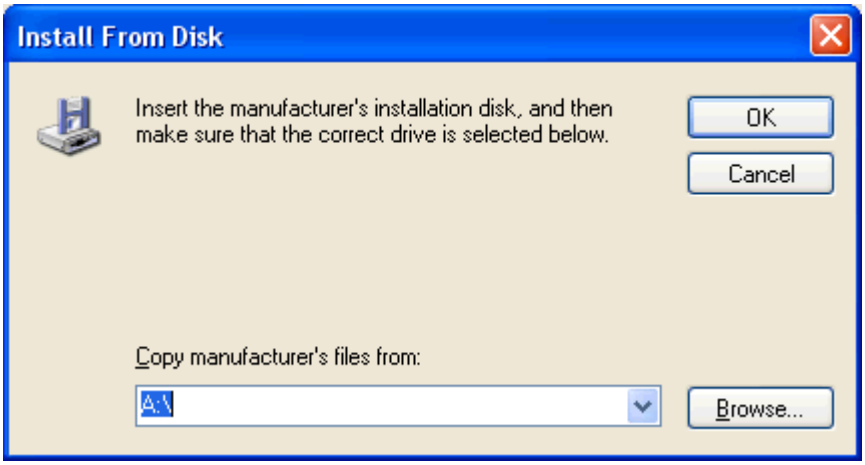


4. Click **Have Disk**, regardless of whether or not the driver **KSE** is there.

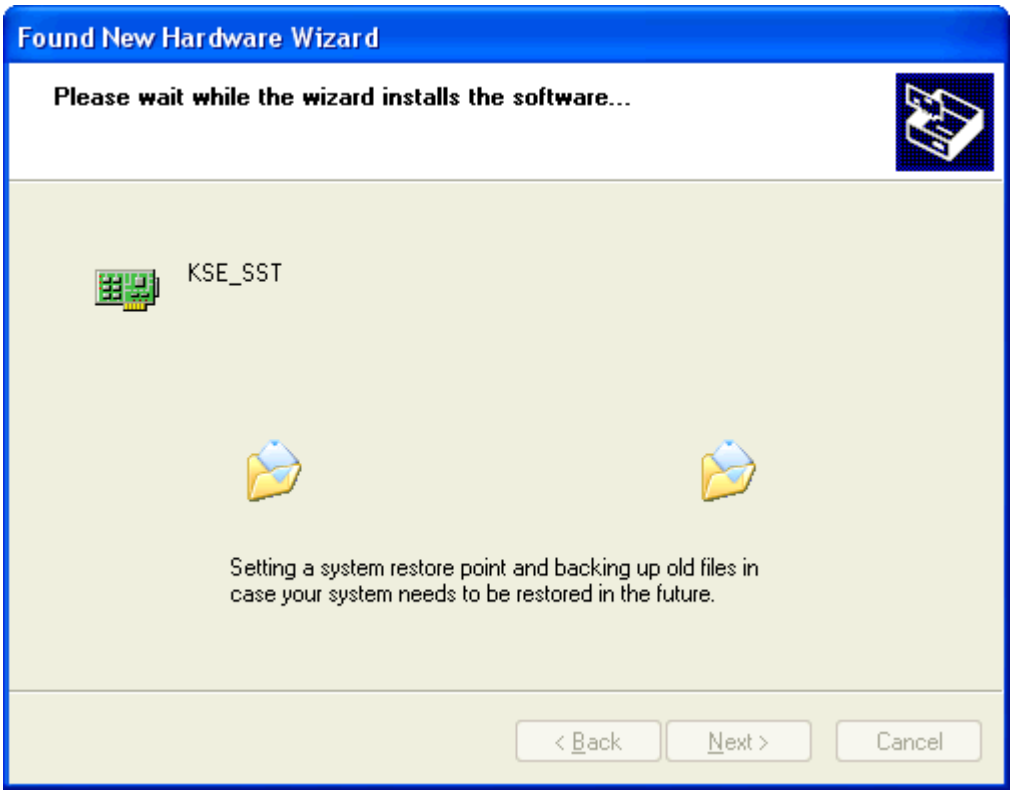


5. Click **Browse...** and go to the **C:\Program Files*yourOPCserver*\drivers\Allen-Bradley DH+** directory. Multiple .inf files will be shown. Select the **KSE_SST2000.inf** file.

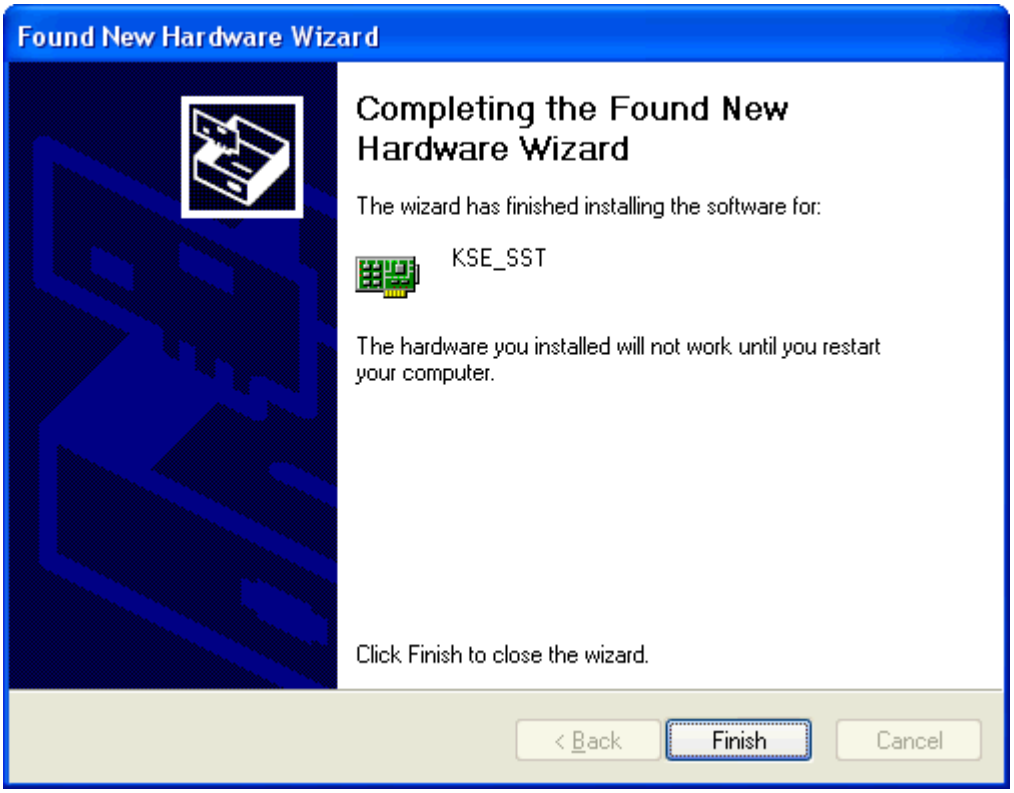
6. Click **OK**.



7. Wait while the **Found New Hardware Wizard** installs the software.



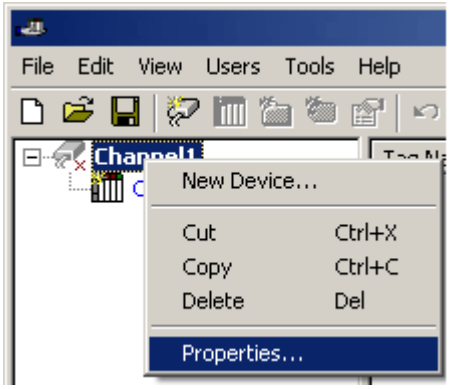
8. Click **Finish** and **Restart** your computer.



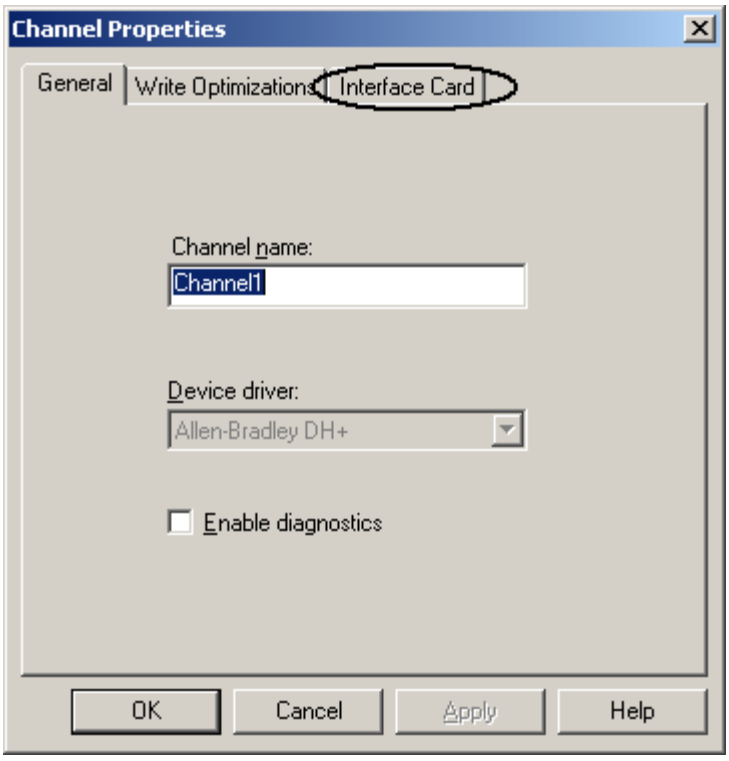
Note: If your computer still doesn't detect the SST-PCI device, you may have to try one or both of the following:
1. Completely uninstall any driver installed under the current slot.
2. Try a different PCI slot.

Step 2: Channel Properties Setup

1. In the server application, right-click on the channel and select **Properties**.

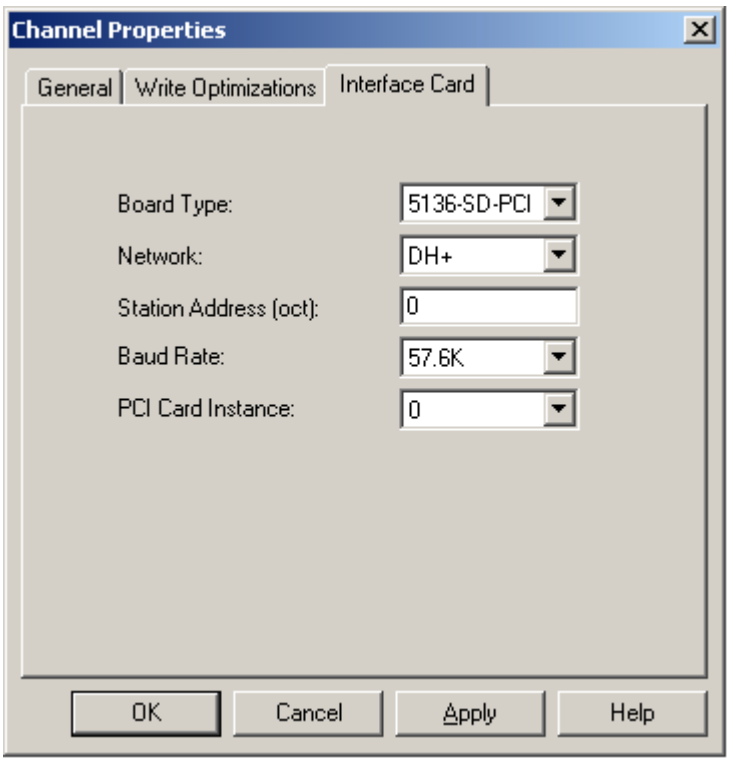


2. Select the **Interface Card tab** from the Channel Properties window.



3. Under the **Interface Card tab**, complete the following:
   - **Select the Board Type:** Select "5136-SD-PCI" as the "Board Type" from the drop down menu next to the "Board Type" label.
   - **Select the Network type:** This driver currently supports only DH+ networks for 5136-SD-PCI cards.
   - **Select the station address:** This is a unique node ID (1-77 octal for DH+) of your device. You must make sure that this ID doesn't conflict with any other node ID on the network.
   - **Select the Baud Rate:** The available baud rates are 57.6K, 115K and 230K. Select the one that matches your device configuration.

- **PCI Card Instance:** We currently support only single instance of the SSTPCI card. Hence, the PCI Card Instance number for SSTPCI will always be zero.



4. Click **OK**.

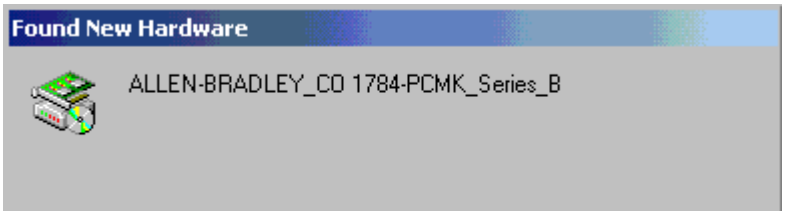
Channel Setup for 1784 PCMK/B card

Before setting the channel properties, you have to have an additional driver installed for the PCMK/B card.

Note: We currently support the PCMK/B card for WindowsXP and Windows2000 only. Before you install the PCMK/B driver, make sure you have uninstalled any drivers that you may have used previously for this card; then, restart your computer.

Step 1: Additional Driver Installation

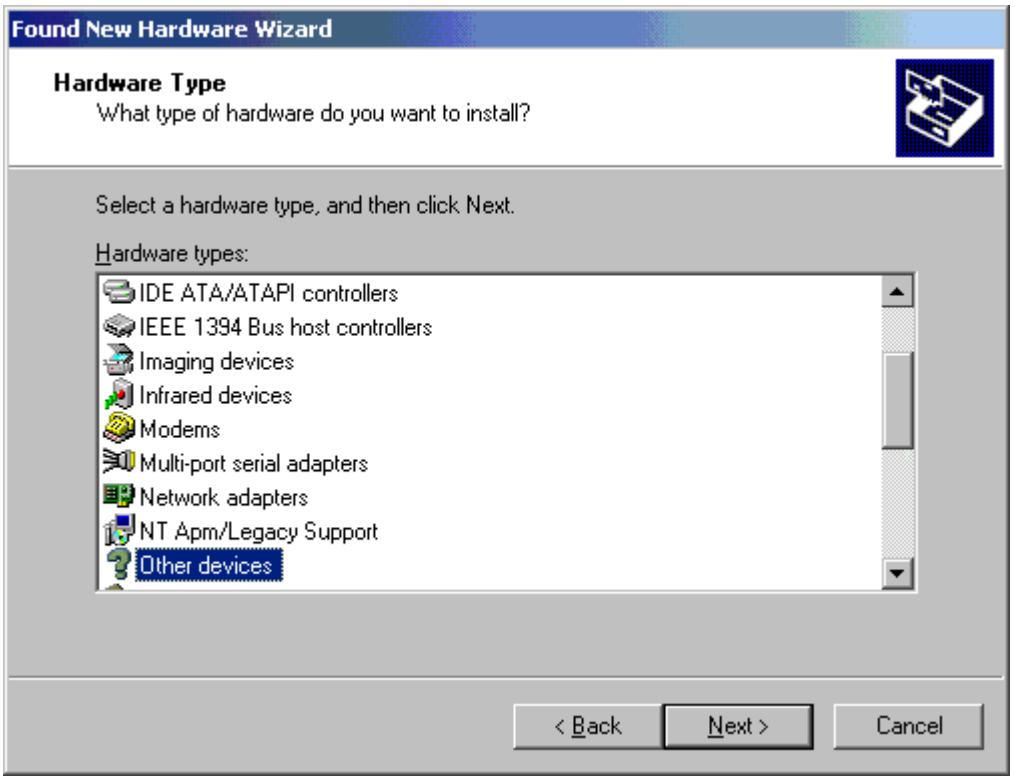
1. After you have installed the card, **restart** your computer. A **Found New Hardware** window will pop up and ask you to configure the newly detected hardware.



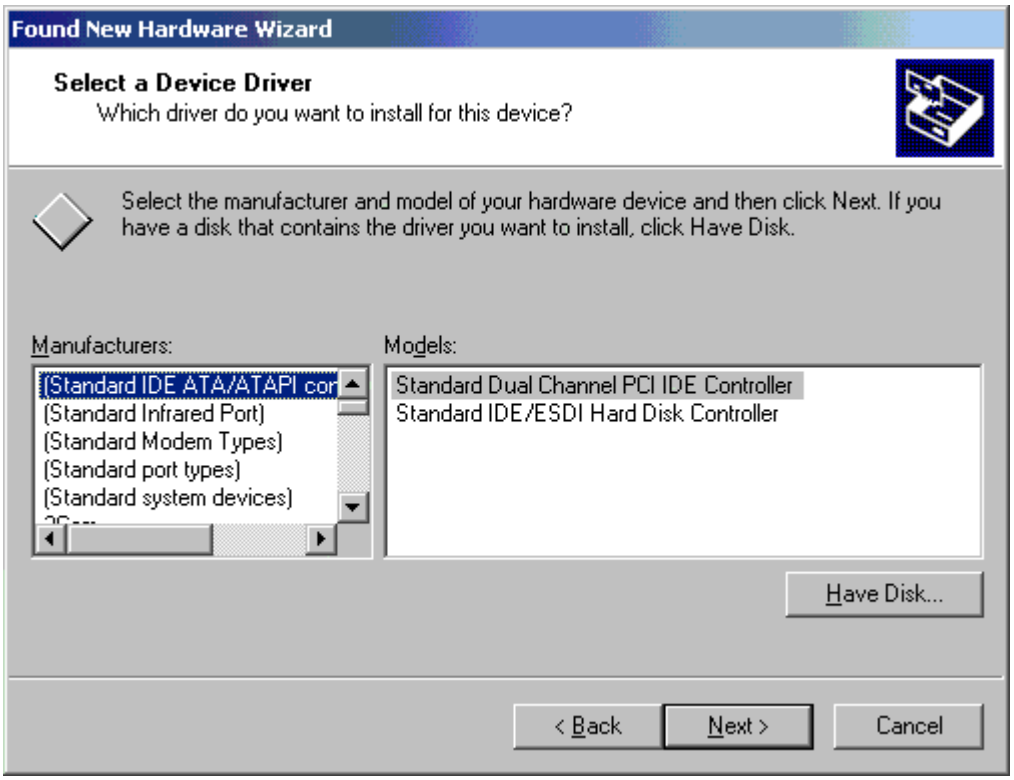
2. To continue in the **Add/Remove Hardware Wizard**, click **Next**.

3. Select **Display a list of the known drivers for this device so that I can choose a specific driver**. Click **Next**.

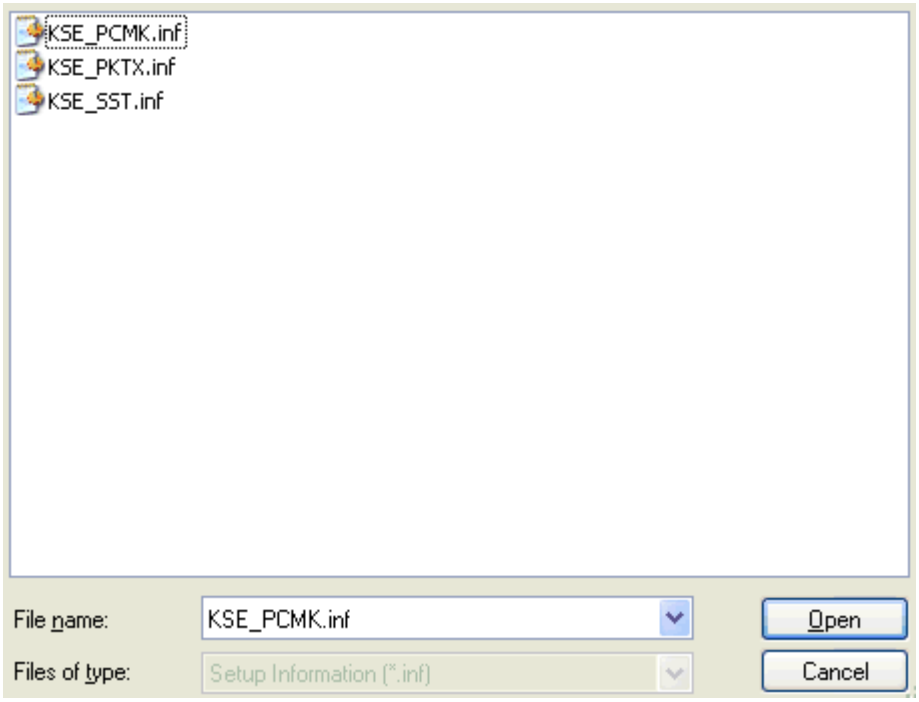
4. Select **Other Devices** from the Hardware Types list and then click **Next**.



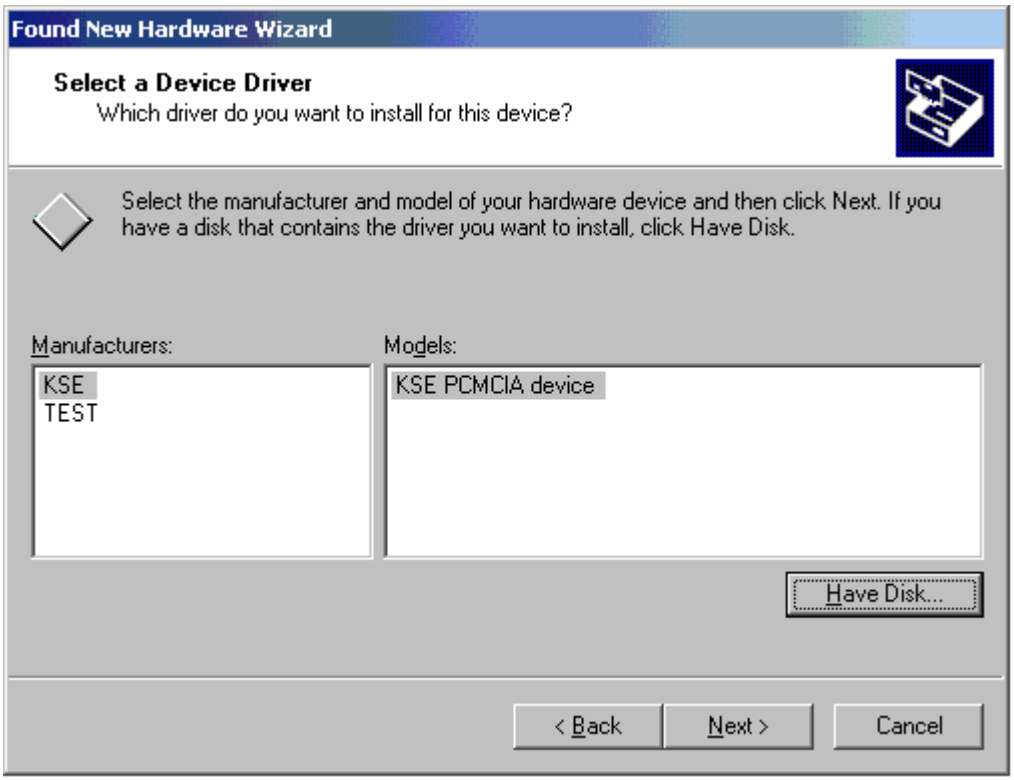
5. Click on **Browse...** and select the **C:\Program Files*yourOPCserver*\drivers\Allen-Bradley DH+** directory.



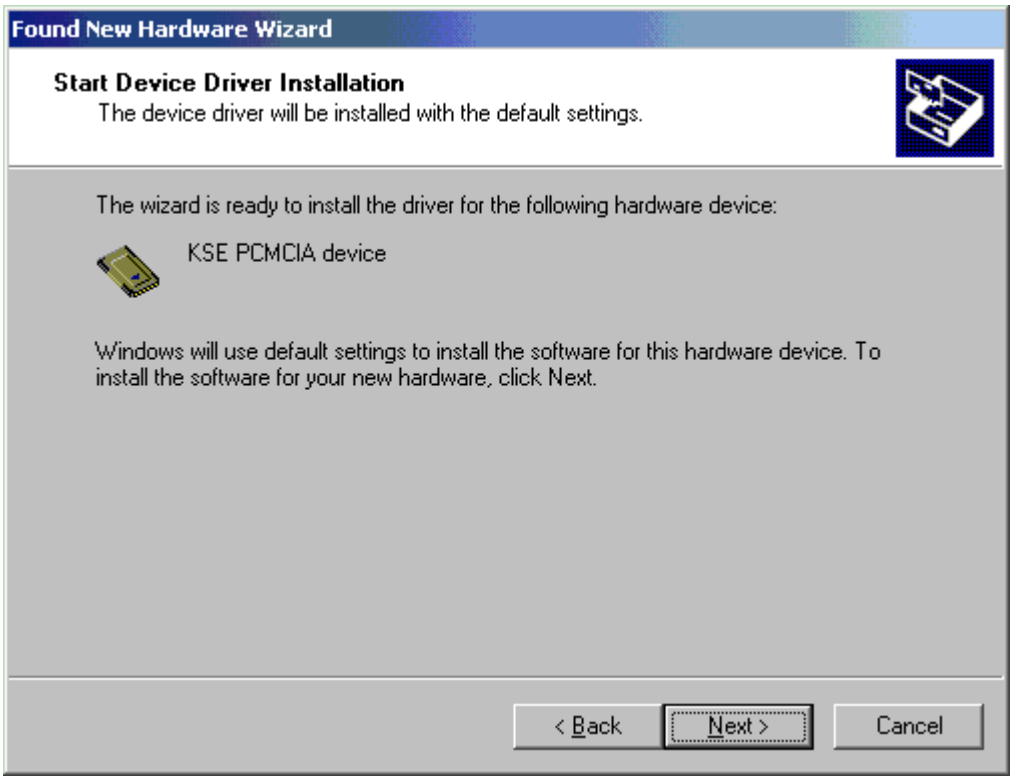
6. Locate the **KSE_PCMK** file and click **Open**.



7. The **KSE PCMCIA** device will be selected. Click **Next**. The window that opens will inform you that the installation procedure is ready to be performed.



8. Click **Next**.



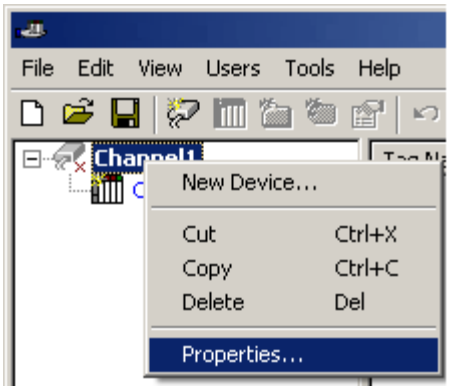
9. Click **Finish** and **Restart** your computer.

Note: If your computer still doesn't detect the PCMK/B device, you may try one of the following.
1. You may need to uninstall any driver installed under the current slot.

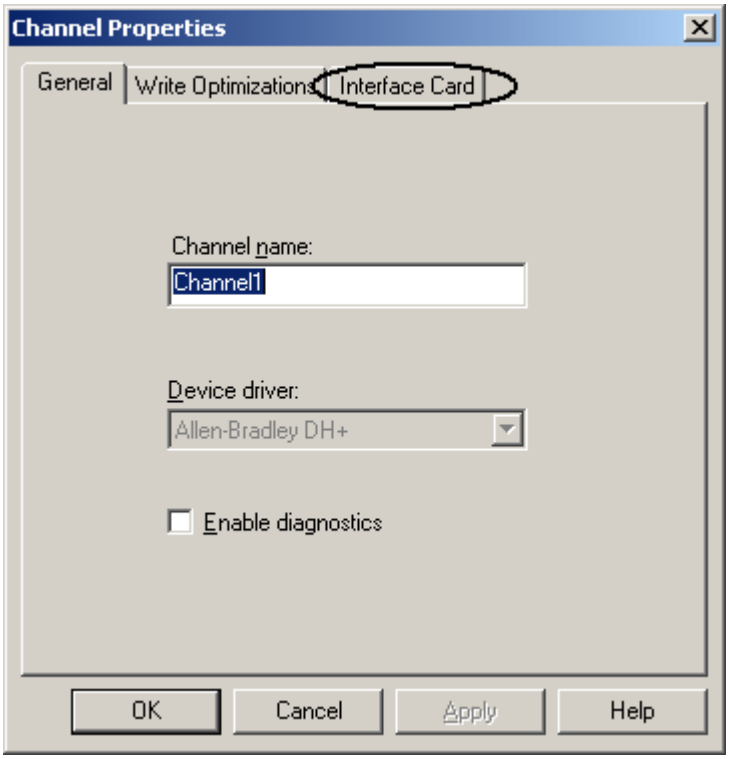
2. You may need to try a different slot.

Step 2: Channel Properties Setup

1. In the server application, right-click on the channel. Select **Properties.**

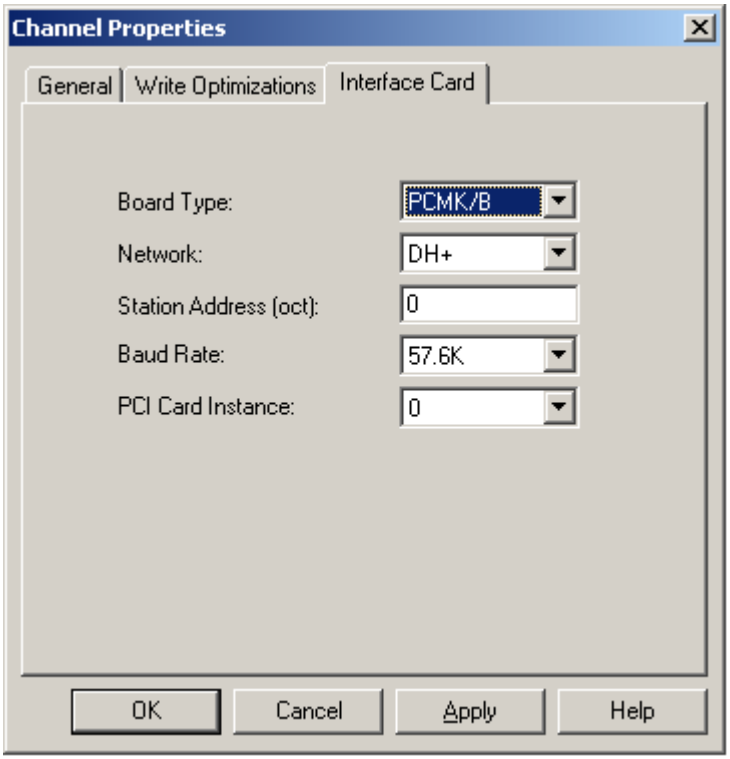


2. Select the **Interface Card tab** from the Channel Properties window.



3. Under the **Interface Card tab**, make the following changes:
   - **Select the Board Type:** Select "PCMK/B" as the "Board Type" from the drop down menu next to the "Board Type" label.
   - **Select the Network type:** This driver currently supports DH+ and DH-485 networks for PCMK/B cards.
   - **Enter the station address:** This is a unique node ID (0-77 octal for DH+ and 0-31 decimal for DH-485) of your device. You must make sure that this ID doesn't conflict with any other node ID on the network.
   - **Select the Baud Rate:** The available baud rates for the DH+ network are 57.6K, 115K and 230K. The Baud rates 115K and 230K under the DH+ network may not be supported by the card you are using or the device you are talking to. Check with the card and device vendor specifications. The available baud rates for the DH-485 network are 300, 600, 1.2K, 2.4K, 4.8K, 9.6K,and 19.2K. Select the one that matches your device configuration.

- **PCI Card Instance:** This number depends on the number of PCMK card instances on your computer. If the card you are installing is the first PCMK you are installing, your PCI Card Instance ID should be 0. We currently allow up to 4 card instances at a time. Hence, the maximum PCI Card Instance you can select is 3.



4. Click **OK**.

Device Setup

Supported Devices

SLC Family processors*
PLC5 series excluding the PLC5/250 series

*Address ranges have been opened up in the driver to allow for future devices. Therefore, if your device is not listed above, the driver may still support it.

Communication Protocol

Allen-Bradley DH+/DH-485

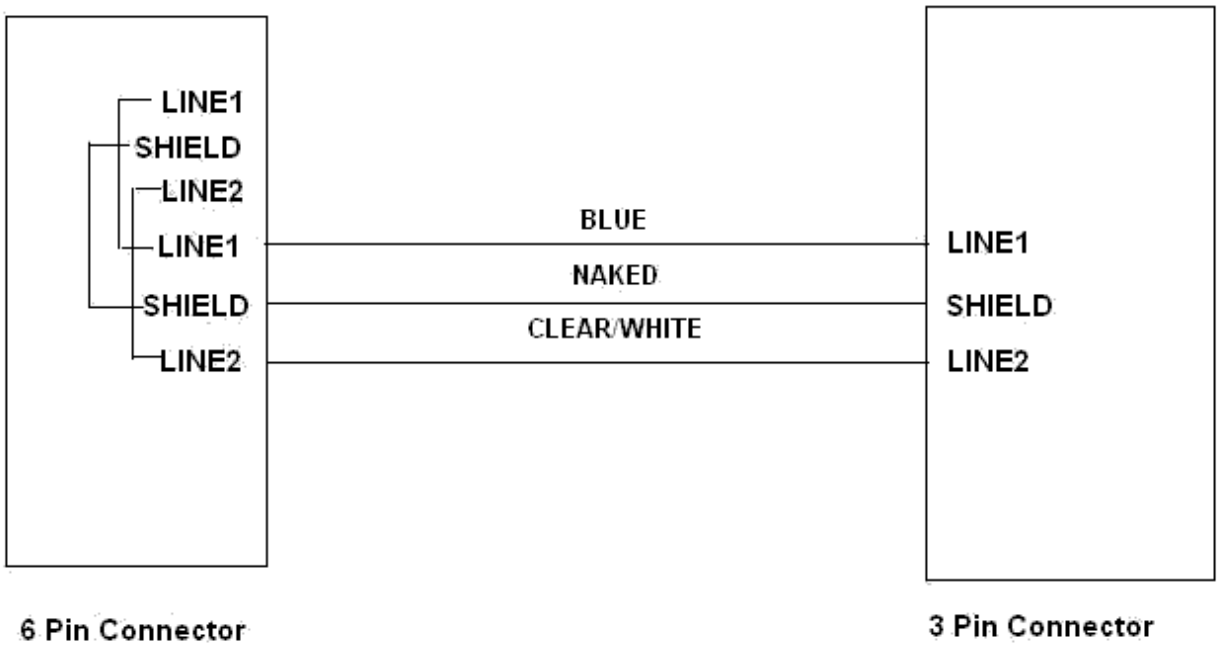
Timeout Parameters

Connect timeout: 1 to 60 seconds
Request timeout: 100 to 30000 milliseconds
Attempts: 1 to 10

See Also: **Cable Diagrams**, **SLC500 Slot Configuration** and **Communications Parameters**.

Cable Connections

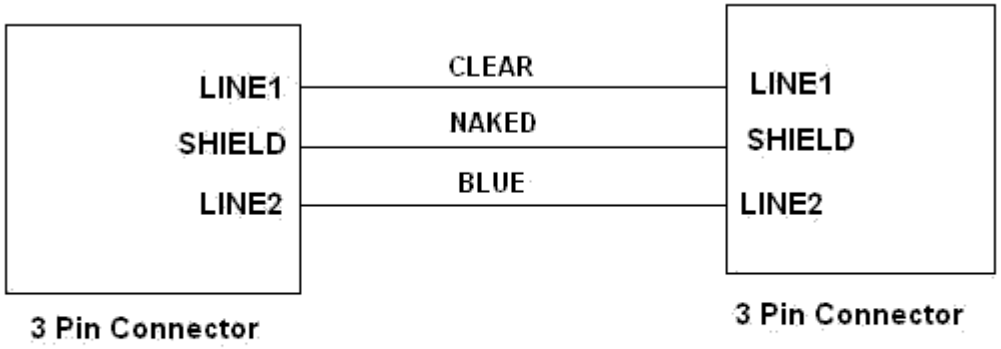
SST card connection to the DH+ Network



SST card connection to the DH+ Network.

* 6 pin connector connects to the card and 3 pin connector connects to the device.
* Line 2 of the 6 pin connector is the line closest to the LED on the SST PCI card. However, on the ISA card, it is line 1 that is closest to the LED.

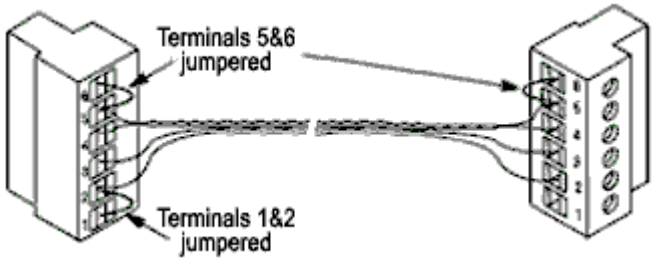
KTX(D) and PKTX(D) Connection to DH+ Network



KTX(D) and PKTX(D) connection to DH+ Networks.
One end connected to card and the other to the device.

KTX(D) and PKTX(D) Connection to DH-485 Network

As shown in the following diagram, terminals 5 and 6 should be jumpered together at both ends of the link, and terminals 1 and 2 should be jumpered together only at one end.



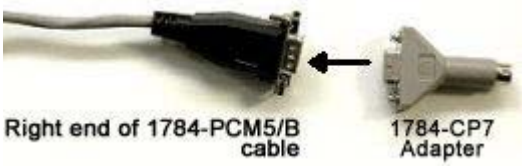
1784 KTX(D) and PKTX(D) cable connection to the DH-485 Network
Note: Line 1 is nearest to the "1784" label on the card.

1784 PCMK/B Connection to DH+ Network

Items Required:
1. 1784-PCM5/B Cable, which can be obtained from Allen Bradley. The PCM5/B cable is used with a DH+ network.
2. 1784-CP7 Adapter, which can be obtained from Allen Bradley.

Connection:
1. Connect the left end of the 1784-PCM5/B Cable to the PCMK card. The silver side of the left end of the cable should face the top of the PCMK card.

2. Attach the 9-Pin end of the 1784-CP7 Adapter to the right end of the 1784-PCM5/B Cable (a 9-Pin D-shell), then attach the 8-pin end of the adapter (an 8-pin mini DIN connector) of the adapter to the device.



1784 PCMK/B Connection to DH-485 Network

Items Required:
1784-PCM4/B Cable, which can be obtained from Allen Bradley. The PCM4/B cable is used with a DH-485 network.

Connection:
1. Connect the left end of the 1784-PCM4/B Cable to the PCMK card. The silver side of the left end of the cable should face the top of the card.

2. Connect the right end of the cable (an RJ-45 connector) to the Device.

Right end of 1784-PCM4/B cable

Communications Parameters

Block Request Size

Request size refers to the number of bytes that may be requested from a device at one time. You can refine the performance of this driver by configuring the request size to one of the following settings: 32, 64, 128 and 230 bytes. The default value is 230 bytes.

Hardware Setup

Hardware Configuration of 5136-SD-ISA (SST) card
Hardware configuration of memory and interrupt on 1784 KTX
Configuring the 1784-KT (ISA Bus) Communication Interface Card for DH+
Check Device Manager
Install and Connect KTXD to Network

Hardware Configuration of the 5136-SD-ISA (SST) card

Note: You must ground yourself by touching a grounded object (such as the chassis of your computer) before handling the card.

I/O Port Configuration: The 5136-SD-ISA card uses I/O ports (the default address is 250). If another device is already using address 250, DIP switches are available on the card to configure a unique I/O port address.

The I/O space required is 8 bytes. Thus, the setting of 250 will select ports 250-257. Below are some of the options of the DIP switch settings that you have for selecting the Port addresses. If you need to select some other address, refer to the 5136-SD-ISA User's Guide that came with your SST card.

PORT ADDRESS IN HEX	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	REMARKS
200	ON	ON	ON	ON	ON	ON	Game Port
208	ON	ON	ON	ON	ON	OFF	
210	ON	ON	ON	ON	OFF	ON	
218	ON	ON	ON	ON	OFF	OFF	
220	ON	ON	ON	OFF	ON	ON	
228	ON	ON	ON	OFF	ON	OFF	
230	ON	ON	ON	OFF	OFF	ON	
238	ON	ON	ON	OFF	OFF	OFF	
240	ON	ON	OFF	ON	ON	ON	
248	ON	ON	OFF	ON	ON	OFF	
250	ON	ON	OFF	ON	OFF	ON	DEFAULT
258	ON	ON	OFF	ON	OFF	OFF	

Transmit Jumper: The 5136-SD-ISA card uses jumper JB2 to enable or disable transmission from the card. Position "DISA" disables transmission and position "ENB" enables it. The jumper must be set to "ENB" to enable message transmission through the DH+ network.

You should now be all set to install the card on an ISA slot in your computer.

Hardware Configuration of Memory and Interrupt on 1784 KTXD card

Select a unique memory address from the range C800-D700 and a unique Interrupt Request Level (IRQ). The Interrupt levels allowed are (3,4,5, and 7).

Make sure that the value chosen for the Interrupt is unique by checking the **Device Manager**.

Memory Configuration

There are two channels on the Allen Bradley 1784-KTX (D) card that you can communicate with (see the **Cable Connections** file for more information). If you are planning to use channel 1, turn the knobs (sw3 and sw4) under Channel 1 to reflect your selected memory address. For example: If you choose address D000, then your sw3 should point to "D" and sw4 should point to "0." Similarly, if you choose channel 2, turn the knobs (sw1 and sw2) to reflect your selected memory address.

Interrupt Configuration

If you are using interrupts, you should choose an interrupt level as mentioned above. The KTX (D) card comes with two jumpers. Each jumper is used for selecting the interrupt level for each of the channels. You should place the jumper corresponding to your chosen channel number, horizontally across the two pins next to your selected interrupt level. For example: if you are using channel 1 and you have selected interrupt level 3, you should place one of the jumpers horizontally across pin 3 under channel number 1. If you are not using interrupts, you should place the jumper vertically, thus connecting pins of two different interrupt levels (such as 3 and 5).

Configuring the 1784-KT (ISA Bus) Communication Interface Card for DH+

Note: Before handling the card, you must ground yourself by touching a grounded object such as the chassis of your computer.

Please note the following requirements for the 1784-KT (ISA Bus) card:

- The 1784-KT card has a DIP switch configuration which must be configured to match the driver's KT communications address settings.
- The selected address must not conflict with any other address used by your computer.
- If you plan to use multiple 1784-KT cards, each one needs to be assigned a unique address.

1784-KT Card DIP Switch Configuration for DH+

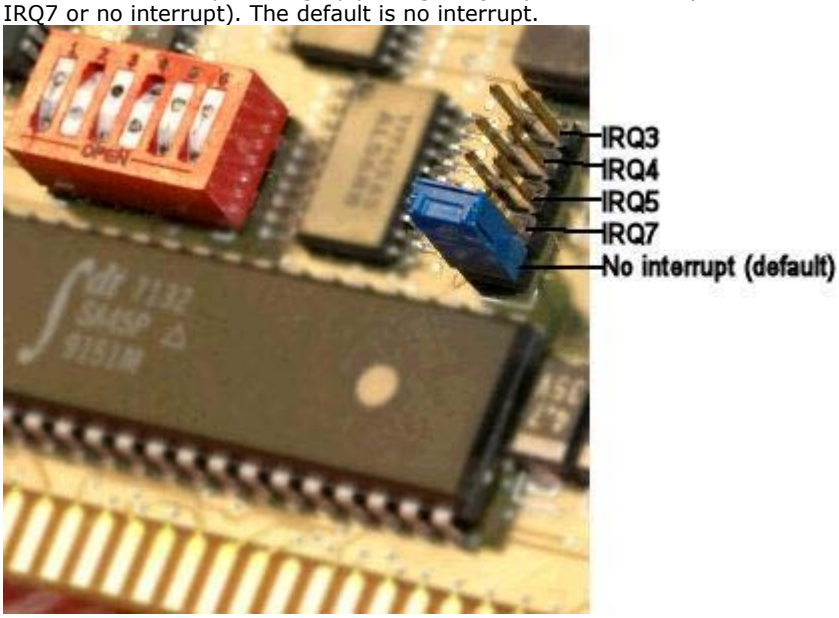
MEMORY ADDRESS IN HEX		SW1	SW2	SW3	SW4	SW5	SW6
Use these addresses only if you do not have an EGA or VGA display adapter installed.	A0000 A4000 A8000 AC000	OPEN CLOSED OPEN CLOSED	OPEN OPEN CLOSED CLOSED	OPEN OPEN OPEN OPEN	CLOSED CLOSED CLOSED CLOSED	OPEN OPEN OPEN OPEN	CLOSED CLOSED CLOSED CLOSED
Use these addresses only if you do not have an MDA display adapter installed.	B0000 B4000 B8000	OPEN CLOSED OPEN	OPEN OPEN CLOSED	CLOSED CLOSED CLOSED	CLOSED CLOSED CLOSED	OPEN OPEN OPEN	CLOSED CLOSED CLOSED
Use these addresses only if the D *xxxx* addresses do not work, as one of the C*xxxx* addresses	C0000 C4000 C8000 CC000	OPEN CLOSED OPEN CLOSED	OPEN OPEN CLOSED CLOSED	OPEN OPEN OPEN OPEN	OPEN OPEN OPEN OPEN	CLOSED CLOSED CLOSED CLOSED	CLOSED CLOSED CLOSED CLOSED

may be used by the AT BIOS.							
These addresses will yield the best results. The default address, D4000, is shown in bold.	D0000 **D4000** D8000	OPEN **CLOSED** OPEN	OPEN **OPEN** CLOSED	CLOSED **CLOSED** CLOSED	OPEN **OPEN** OPEN	CLOSED **CLOSED** CLOSED	CLOSED **CLOSED** CLOSED

DIP Switches on the 1784-KT Card Shown for Default D4000
Open=press in at the **top.**
Closed=press in at the **bottom**

1. Configure the 1784-KT card DIP switches as described above. Press each switch in at the top (OPEN), or in at the bottom (CLOSED).

2. Select an interrupt setting by placing the jumper on the two pins for the setting you have chosen (IRQ3, IRQ4, IRQ5, IRQ7 or no interrupt). The default is no interrupt.



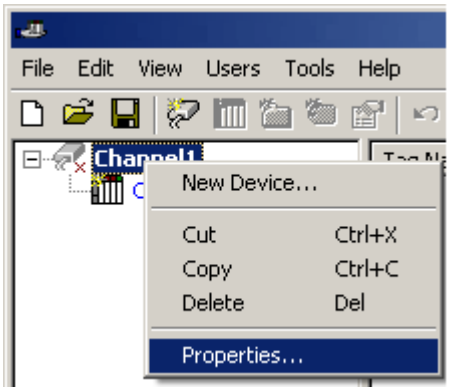
3. Carefully slide the 1784-KT card into the I/O expansion slot. Press firmly until the card is seated in the slot.

4. Install the retaining screw into the retaining bracket.

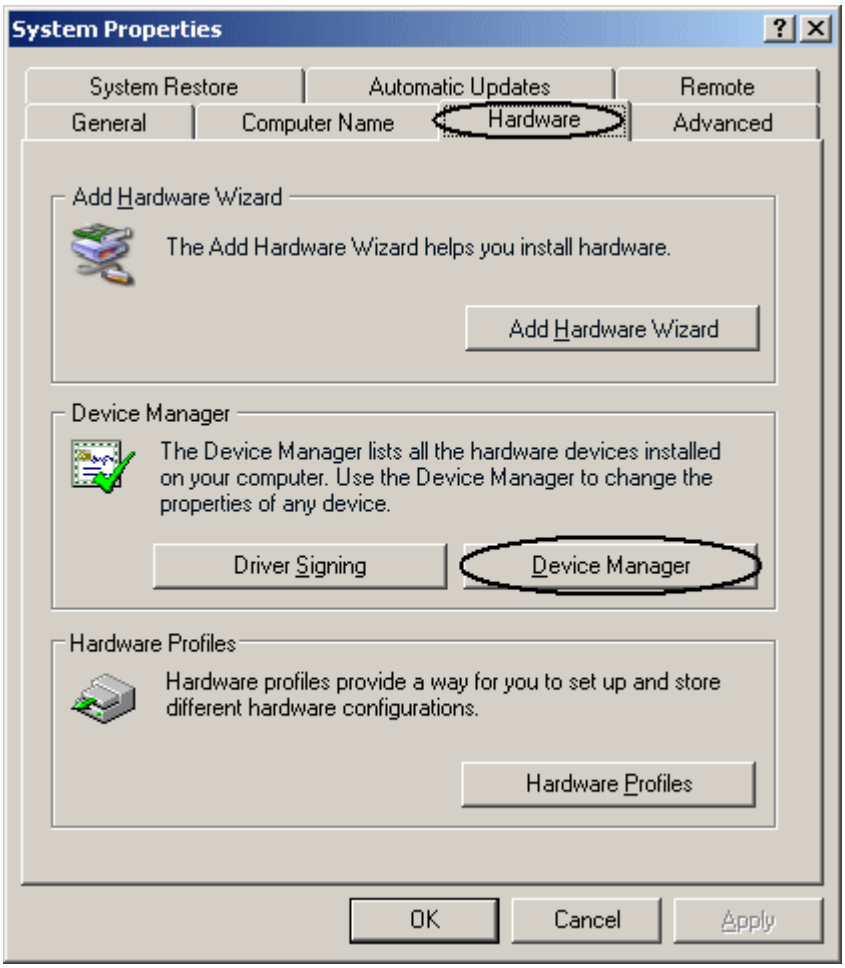
Check Device Manager

Windows XP/2000

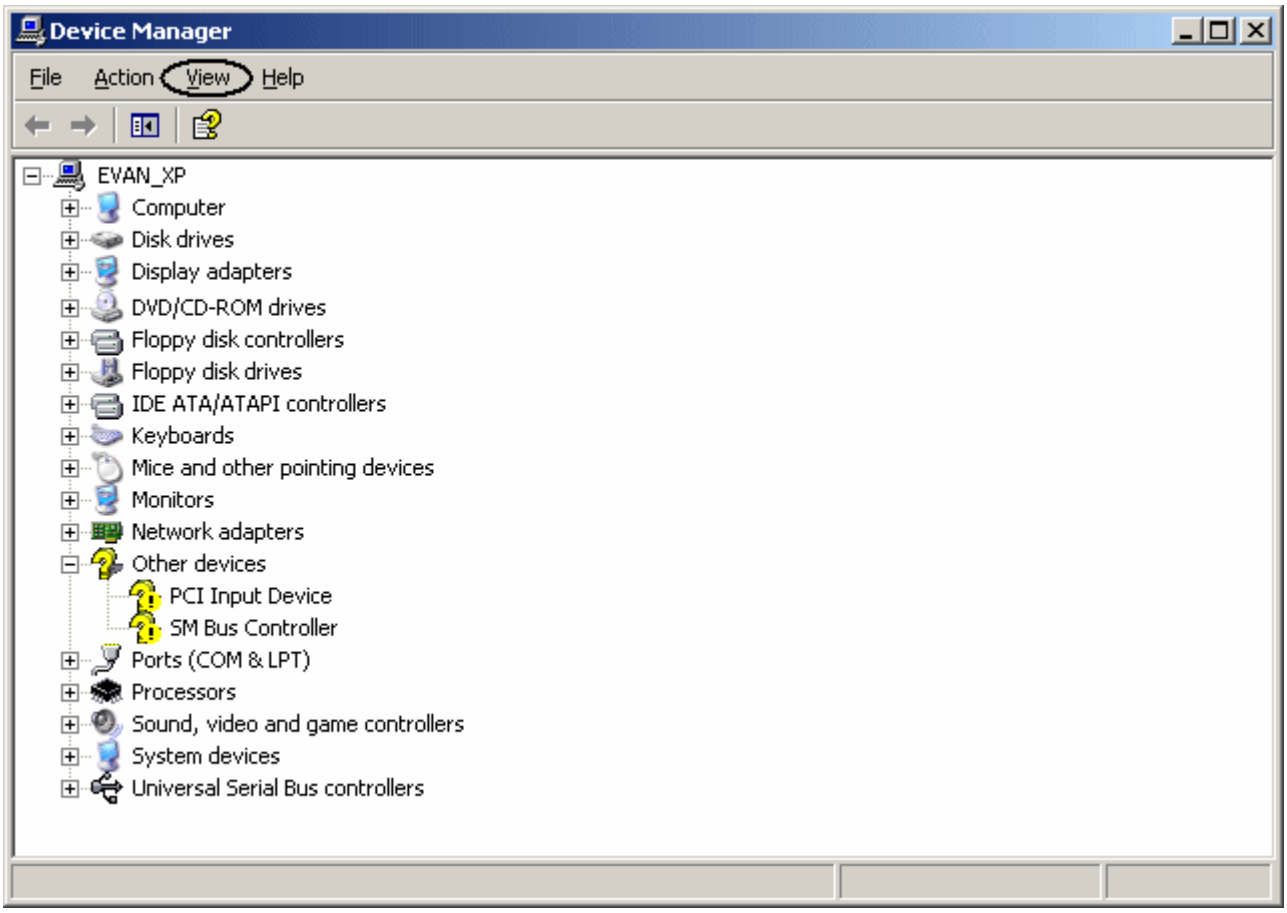
1. Right-click on the **My Computer** icon on your desktop and select **Properties**. Alternatively, you can press the **Windows** button on your keyboard simultaneously with the **Pause/Break** button.



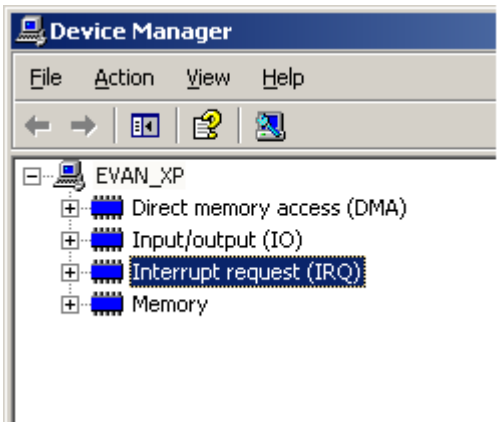
2. Click on the **Hardware** tab and select **Device Manager**.



3. Click on **View** in the toolbar and select **Resources by Type**.



4. Expand **Interrupt Request** (IRQ) by right-clicking the plus sign (if it is not already expanded). All interrupt levels being used by other devices should be visible. If your device is using an interrupt, you should pick a level that is not already being used by any other device. For example: If your device allows you to pick an interrupt level of 3,5,7 and 9, and the list suggests that the levels 3 and 7 are already being used, then you have a choice to pick either interrupt level 5 or interrupt level 9. Choosing levels 3 and 7 would produce a **resource conflict** error which might cause your device to act erroneously.



Install and Connect KTX(D) to the Network

Install the KTX (D) card:

1. Shut down the computer.
2. Ground yourself by touching something conductive connected to the ground line of AC power, such as the chassis of

the computer while it is plugged to the AC power.
3. Insert the card on an available ISA slot. Make sure the card is inserted properly.

Connect the card to the Network:

The KTX (D) has two channels. Channel 2 can have connections to either a DH+ or DH-485 network. Channel 1 can only connect to DH+. Thus, you can have two different DH+ network connections, or one DH+ and one DH-485 network connection to the KTX (D) card.

Modular I/O Selection Guide

The following table lists the number of input and output words available for each I/O module in the Slot Configuration list.

Module Type	Input Words	Output Words
1746-I*8 Any 8 pt Discrete Input Module	1	0
1746-I*16 Any 16 pt Discrete Input Module	1	0
1746-I*32 Any 32 pt Discrete Input Module	2	0
1746-O*8 Any 8 pt Discrete Output Module	0	1
1746-O*16 Any 16 pt Discrete Output Module	0	1
1746-O*32 Any 32 pt Discrete Output Module	0	2
1746-IA4 4 Input 100/120 VAC	1	0
1746-IA8 8 Input 100/120 VAC	1	0
1746-IA16 16 Input 100/120 VAC	1	0
1746-IB8 8 Input (Sink) 24 VDC	1	0
1746-IB16 16 Input (Sink) 24 VDC	1	0
1746-IB32 32 Input (Sink) 24 VDC	2	0
1746-IG16 16 Input [TTL] (Source) 5VDC	1	0
1746-IM4 4 Input 200/240 VAC	1	0
1746-IM8 8 Input 200/240 VAC	1	0
1746-IM16 16 Input 200/240 VAC	1	0
1746-IN16 16 Input 24 VAC/VDC	1	0
1746-ITB16 16 Input [Fast] (Sink) 24 VDC	1	0
1746-ITV16 16 Input [Fast] (Source) 24 VDC	1	0
1746-IV8 8 Input (Source) 24 VDC	1	0
1746-IV16 16 Input (Source) 24 VDC	1	0
1746-IV32 32 Input (Source) 24 VDC	2	0
1746-OA8 8 Output (Triac) 100/240 VAC	0	1
1746-OA16 16 Output (Triac) 100/240 VAC	0	1
1746-OB8 8 Output [Trans] (Source) 10/50 VDC	0	1
1746-OB16 16 Output [Trans] (Source) 10/50 VDC	0	1
1746-OB32 32 Output [Trans] (Source) 10/50 VDC	0	2
1746-OBP16 16 Output [Trans 1 amp] (SRC) 24 VDC	0	1
1746-OV8 8 Output [Trans] (Sink) 10/50 VDC	0	1
1746-OV16 16 Output [Trans] (Sink) 10/50 VDC	0	1
1746-OV32 32 Output [Trans] (Sink) 10/50 VDC	0	2
1746-OW4 4 Output [Relay] VAC/VDC	0	1
1746-OW8 8 Output [Relay] VAC/VDC	0	1
1746-OW16 16 Output [Relay] VAC/VDC	0	1
1746-OX8 8 Output [Isolated Relay] VAC/VDC	0	1
1746-OVP16 16 Output [Trans 1 amp] (Sink) 24VDC3	0	1
1746-IO4 2 In 100/120 VAC 2 Out [Rly] VAC/VDC3	1	1

1746-IO8 4 In 100/120 VAC 4 Out [Rly] VAC/VDC4	1	1
1746-IO12 6 In 100/120 VAC 6 Out [Rly] VAC/VDC	1	1
1746-NI4 4 Ch Analog Input	4	0
1746-NIO4I Analog Comb 2 in & 2 Current Out	2	2
1746-NIO4V Analog Comb 2 in & 2 Voltage Out	2	2
1746-NO4I 4 Ch Analog Current Output	0	4
1746-NO4V 4 Ch Analog Voltage Output	0	4
1746-NT4 4 Ch Thermocouple Input Module	8	8
1746-NR4 4 Ch Rtd/Resistence Input Module	8	8
1746-HSCE High Speed Counter/Encoder	8	1
1746-HS Single Axis Motion Controller	4	4
1746-OG16 16 Output [TLL] (SINK) 5 VDC	0	1
1746-BAS Basic Module 500 5/01 Configuration	8	8
1746-BAS Basic Module 5/02 Configuration	8	8
1747-DCM Direct Communication Module (1/4 Rack)	2	2
1747-DCM Direct Communication Module (1/2 Rack)	4	4
1747-DCM Direct Communication Module (3/4Rack)	6	6
1747-DCM Direct Communication Module (Full Rack)	8	8
1747-SN Remote I/O Scanner	32	32
1747-DSN Distributed I/O Scanner 7 Blocks	8	8
1747-DSN Distributed I/O Scanner 30 Blocks	32	32
1747-KE Interface Module, Series A	1	0
1747-KE Interface Module, Series B	8	8
1746-NI8 8 Ch Analog Input, Class 1	8	8
1746-NI8 8 Ch Analog Input, Class 3	16	12
1746-IC16 16 Input (Sink) 48 VDC	1	0
1746-IH16 16 Input [Trans] (Sink) 125 VDC	1	0
1746-OAP12 12 Output [Triac] 120/240 VDC	0	1
1746-OB6EI 6 Output [Trans] (Source) 24 VDC	0	1
1746-OB16E 16 Output [Trans] (Source) Protected	0	1
1746-OB32E 32 Output [Trans] (Source) 10/50 VDC	0	2
1746-OBP8 8 Output [Trans 2 amp] (Source) 24 VDC	0	1
1746-IO12DC 6 Input 12 VDC, 6 Output [Rly	1	1
1746-INI4I Analog 4 Ch. Isol. Current Input	8	8
1746-INI4VI Analog 4 Ch. Isol. Volt./Current Input	8	8
1746-INT4 4 Ch. Isolated Thermocouple Input	8	8
1746-NT8 Analog 8 Ch Thermocouple Input	8	8
1746-HSRV Motion Control Module	12	8
1746-HSTP1 Stepper Controller Module	8	8
1747-MNET MNET Network Comm Module	0	0
1747-QS Synchronized Axes Module	32	32
1747-QV Open Loop Velocity Control	8	8
1747-RCIF Robot Control Interface Module	32	32
1747-SCNR ControlNet SLC Scanner	32	32
1747-SDN DeviceNet Scanner Module	32	32
1394-SJT GMC Turbo System	32	32
1203-SM1 SCANport Comm Module - Basic	8	8
1203-SM1 SCANport Comm Module - Enhanced	32	32

AMCI-1561 AMCI Series 1561 Resolver Module	8	8

SLC500 Slot Configuration

Slot Configuration

SLC500 models (modular I/O racks) need to be configured for use with the Allen-Bradley DH+ driver if the I/O is to be accessed by the driver. Up to 30 slots can be configured per device.

To use the slot configuration dialog:

1. Left-click on the row in the **Slot/module list box** to select the slot to configure.
2. Select a module from the **Available modules list box** by left-clicking on it.
3. Finally, click the **Add** button to add the module.

Note: You can remove a module by first selecting the slot in the slot/module list box and then clicking the **Remove** button. The available module selections are the same as those in the Allen Bradley APS software.

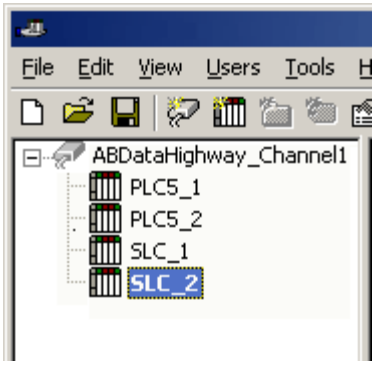
Knowledge of the number of input and output words in each slot is necessary for the driver to correctly address the I/O. Only the number of input and output words in slots (up to the slot of interest) is needed to address I/O in that slot. For example, if you are only going to access slot 3, you would have to configure slots 1, 2 and 3.

See Also: **Modular I/O Selection Guide**

Optimizing Your Allen-Bradley DH+ Communications

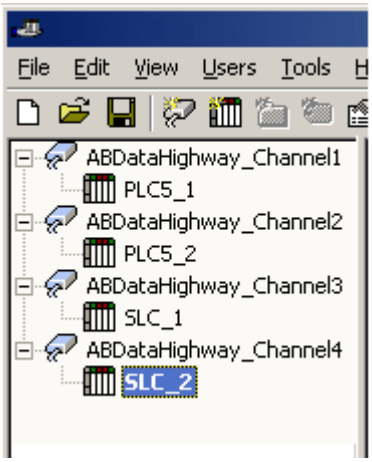
The Allen-Bradley DH+ driver has been designed to provide the best performance with the least amount of impact on the system's overall performance. While the Allen-Bradley DH+ driver is fast, there are a couple of guidelines that can be used in order to control and optimize the application and gain maximum performance.

Our server refers to communications protocols like Allen-Bradley DH+ as a channel. Each channel defined in the application represents a separate path of execution in the server. Once a channel has been defined, a series of devices must then be defined under that channel. Each of these devices represents a single Allen-Bradley PLC from which data will be collected. While this approach to defining the application will provide a high level of performance, it won't take full advantage of the Allen-Bradley DH+ driver or the network. An example of how the application may appear when configured using a single channel is shown below.



Each device appears under a single XXXX channel. In this configuration, the driver must move from one device to the next as quickly as possible in order to gather information at an effective rate. As more devices are added or more information is requested from a single device, the overall update rate begins to suffer.

If the Allen-Bradley DH+ driver could only define one single channel, then the example shown above would be the only option available; however, the Allen-Bradley DH+ driver can define up to 16 channels. Using multiple channels distributes the data collection workload by simultaneously issuing multiple requests to the network. An example of how the same application may appear when configured using multiple channels to improve performance is shown below.



Each device has now been defined under its own channel. In this new configuration, a single path of execution is dedicated to the task of gathering data from each device. If the application has 16 or fewer devices, it can be optimized exactly how it is shown here.

The performance will improve even if the application has more than 16 devices. While 16 or fewer devices may be ideal, the application will still benefit from additional channels. Although by spreading the device load across all channels will cause the server to move from device to device again, it can now do so with far less devices to process on a single channel.

Address Descriptions

Address specifications vary depending on the model in use. To obtain specific address information for the model you are interested in, select the link from the following list.

SLC Family Open Addressing
PLC-5 Family Addressing
General Addressing (for both models)

General Addressing

These general addresses pertain to both the SLC50/5 and PLC-5.

Output Files
Input Files
Status Files
Binary Files
Timer Files
Counter Files
Control Files
Integer Files
Float Files
ASCII Files
String Files

See Also: **SLC Family Open Addressing** and **PLC-5 Family Addressing**.

Output Files

The syntax for accessing data in the output file differs depending on the PLC model. Arrays are not supported for output files. Data locations are read/write for PLC-5 models, read-only for all other models. The default data type for all syntax is shown in **bold**.

The syntax for PLC-5 models:

Syntax	Data Type
O:<word>	Short, **Word**, BCD
O:<word>/<bit>	**Boolean**
O/bit	**Boolean**

Note: Word and bit address information is in octal for PLC-5 models. This follows the convention of the programming software.

The syntax for SLC Family Open models (modular I/O):

Syntax	Data Type
O:<slot>	Short, **Word**, BCD
O:<slot>.<word>	Short, **Word**, BCD
O:<slot>/<bit>	**Boolean**
O:<slot>.<word>/<bit>	**Boolean**

The following slot and word locations are allowed for each model.

PLC Model	Min Slot	Max Slot	Max Word
SLC Family	1	30	*
PLC-5 Family	NA	NA	277 (octal)

*The number of Input or Output words available for each I/O module can be found in the **Modular I/O Selection Guide**.

For slot configuration help see the **Device Setup** page of this help file.

Examples

PLC-5	Addresses are in octal
O:0	word 0
O:37	word 31 (37 octal=31 decimal)
O/42	bit 34 (42 octal=34 decimal)
O:2/2	bit 2 word 2 (same as O/42)

SLC Family	
O:1	word 0 slot 1
O:1.0	word 0 slot 1 (same as O:1)
O:12	word 0 slot 12
O:12.2	word 2 slot 12
O:4.0/0	bit 0 word 0 slot 4
O:4/0	bit 0 slot 4 (same as O:4.0/0)
O:4.2/0	bit 0 word 2 slot 4
O:4/32	bit 32 slot 4 (same as O:4.2/0)

Input Files

The syntax for accessing data in the input file differs depending on the PLC model. Arrays are not supported for input files. Data locations are Read/Write for PLC-5 models, Read Only for all other models. The default data type for all syntax is shown in **bold**.

The syntax for PLC-5 models:

Syntax	Data Type
I:<word>	Short, **Word**, BCD
I:<word>/<bit>	**Boolean**
I/bit	**Boolean**

Note: Word and bit address information is in octal for PLC-5 models. This follows the convention of the programming software.

The syntax for SLC Family Open models (modular I/O):

Syntax	Data Type
I:<slot>	Short, **Word**, BCD
I:<slot>.<word>	Short, **Word**, BCD
I:<slot>/<bit>	**Boolean**
I:<slot>.<word>/<bit>	**Boolean**

The following slot and word locations are allowed for each model.

PLC Model	Min Slot	Max Slot	Max Word
SLC 5/05	1	30	*
PLC5 Family	NA	NA	277 (octal)

*The number of Input or Output words available for each I/O module can be found in the **Modular I/O Selection Guide**.

For slot configuration help, refer to **Device Setup**.

Examples

PLC-5	Addresses are in octal
I:0	word 0
I:10	word 8 (10 octal=8 decimal)
I/20	bit 16 (20 octal=16 decimal)
I:1/0	bit 0 word 1 (same as I/20)

SLC Family	
I:1	word 0 slot 1
I:1.0	word 0 slot 1 (same as I:1)
I:12	word 0 slot 12
I:12.2	word 2 slot 12
I:4.0/0	bit 0 word 0 slot 4
I:4/0	bit 0 slot 4 (same as I:4.0/0)
I:4.2/0	bit 0 word 2 slot 4
I:4/32	bit 32 slot 4 (same as I:4.2/0)

Binary Files

The syntax for accessing a binary file is to specify a file number, a word and (optionally) a bit within the word. The default data type for all syntax is shown in **bold**.

Syntax	Data Type
B<file>:<word>	Short, **Word**, BCD, DWord, Long, LBCD
B<file>:<word> [rows][cols]	Short, **Word**, BCD, DWord, Long, LBCD (array types)
B<file>:<word> [cols]	Short, **Word**, BCD, DWord, Long, LBCD (array types)
B<file>:<word>/<bit>	**Boolean**
B<file>/bit	**Boolean**

The number of array elements (in bytes) cannot exceed the **block request size** specified. This means that array size cannot exceed 16 words given a block request size of 32 bytes.

The following file numbers and maximum word locations are allowed for each model. The maximum word location is one less when accessing as a 32 bit data type (Long, DWord or Long BCD).

PLC Model	File Number	Max Word
SLC 5/05 Open	3, 9-999	999
PLC-5 Family	3-999	1999

Example	Description
B3:0	word 0
B3/26	bit 26
B12:4/15	bit 15 word 4
B3:10 [20]	20 element array starting at word 10
B15:0 [6] [6]	6 by 6 element array starting at word 0

Status Files

The syntax for accessing a status file is to specify a word and (optionally) a bit within the word. The default data type for all syntax is shown in **bold**.

Syntax	Data Type
S:<word>	Short, **Word**, BCD, DWord, Long, LBCD
S:<word> [rows][cols]	Short, **Word**, BCD, DWord, Long, LBCD (array types)
S:<word> [cols]	Short, **Word**, BCD, DWord, Long, LBCD (array types)
S:<word>/<bit>	**Boolean**
S/bit	**Boolean**

The number of array elements (in bytes) cannot exceed the **block request size** specified. This means that array size cannot exceed 16 words given a block request size of 32 bytes.

The following word locations are allowed for each model. The maximum word location is one less when accessing as a 32 bit data type (Long, DWord or Long BCD).

PLC Model	Max Word
SLC Family	999
PLC-5 Family	999

Example	Description
S:0	word 0
S/26	bit 26
S:4/15	bit 15 word 4
S:10 [16]	16 element array starting at word 10
S:0 [4] [8]	4 by 8 element array starting at word 0

Timer Files

Timer files are a structured type whose data is accessed by specifying a file number, an element and a field. The default data type depends on the field being accessed. Integer fields receive a default data type of Word.

Syntax	Data Type
T<file>:<element>.<field>	Depends on field

The following file numbers and maximum element are allowed for each model.

PLC Model	File Number	Max Element
SLC Family	4, 9-999	999
PLC-5 Family	3-999	1999

The following fields are allowed for each element. Refer to the PLC documentation for the meaning of each field.

Element Field	Data Type	Access
ACC	Short, Word	Read/Write
PRE	Short, Word	Read/Write
DN	Boolean	Read Only
TT	Boolean	Read Only
EN	Boolean	Read Only

Example	Description
T4:0.ACC	Accumulator of timer 0 file 4
T4:10.DN	Done bit of timer 10 file 4
T15:0.PRE	Preset of timer 0 file15

Counter Files

Counter files are a structured type whose data is accessed by specifying a file number, an element and a field. The default data type depends on the field being accessed. Integer fields receive a default data type of Word.

Syntax	Data Type
C<file>:<element>.<field>	Depends on field

The following file numbers and maximum element are allowed for each model.

PLC Model	File Number	Max Element
SLC Family	5, 9-999	999
PLC-5 Family	3-999	1999

The following fields are allowed for each element. Refer to the PLC documentation for the meaning of each field. The default is shown in **bold**.

Element Field	Data Type	Access
ACC	**Word**, Short	Read/Write
PRE	**Word**, Short	Read/Write
UA	**Boolean**	Read Only
UN	**Boolean**	Read Only
OV	**Boolean**	Read Only
DN	**Boolean**	Read Only
CD	**Boolean**	Read Only
CU	**Boolean**	Read Only

Example	Description
C5:0.ACC	accumulator of counter 0 file 5
C5:10.DN	done bit of counter 10 file 5
C15:0.PRE	preset of counter 0 file 15

Control Files

Control files are a structured type whose data is accessed by specifying a file number, an element and a field. The default data type depends on the field being accessed. Integer fields receive a default data type of Word.

Syntax	Data Type

R<file>:<element>.<field>	Depends on field

The following file numbers and maximum element are allowed for each model.

PLC Model	File Number	Max Element
SLC Family	6, 9-999	999
PLC-5 Family	3-999	1999

The following fields are allowed for each element. Refer to the PLC documentation for the meaning of each field. The default is shown in **bold**.

Element Field	Data Type	Access
LEN	**Word**, Short	Read/Write
POS	**Word**, Short	Read/Write
FD	**Boolean**	Read Only
IN	**Boolean**	Read Only
UL	**Boolean**	Read Only
ER	**Boolean**	Read Only
EM	**Boolean**	Read Only
DN	**Boolean**	Read Only
EU	**Boolean**	Read Only
EN	**Boolean**	Read Only

Example	Description
R6:0.LEN	length field of control 0 file 6
R6:10.DN	done bit of control 10 file 6
R15:18.POS	position field of control 18 file 15

Integer Files

You can access an integer file by specifying a file number, a word and an optional bit in the word. The default data type for all syntax is shown in **bold**.

Syntax	Data Type
N<file>:<word>	Short, **Word**, BCD, DWord, Long, LBCD
N<file>:<word> [rows][cols]	Short, **Word**, BCD, DWord, Long, LBCD (array types)
N<file>:<word> [cols]	Short, **Word**, BCD, DWord, Long, LBCD (array types)
N<file>:<word>/<bit>	**Boolean**
N<file>/bit	**Boolean**

The number of array elements (in bytes) cannot exceed the **block request size** specified. This means that array size cannot exceed 16 words given a block request size of 32 bytes.

The following file numbers and maximum word locations are allowed for each model. The maximum word location is one less when accessing a 32 bit data type (Long, DWord or Long BCD).

PLC Model	File Number	Max Word
SLC Family	7, 9-999	999
PLC-5 Family	3-999	1999

Example	Description
N7:0	word 0
N7/26	bit 26

N12:4/15	bit 15 word 4
N7:10 [8]	8 element array starting at word 10
N15:0 [4] [5]	4 by 5 element array starting at word 0

Float Files

You can access Float files by specifying a file number and an element. The only data type allowed is Float.

Syntax	Data Type
F<file>:<element>	Float
F<file>:<element> [rows][cols]	Float array
F<file>:<element> [cols]	Float array

The number of array elements (in bytes) cannot exceed the **block request size** specified. This means that array size cannot exceed 8 Floats given a block request size of 32 bytes)

The following file numbers and maximum word locations are allowed for each model.

PLC Model	File Number	Max Word
SLC Family	8-999	999
PLC-5 Family	3-999	1999

Example	Description
F8:0	Float 0
F8:10 [16]	16 element array starting at word 10
F15:0 [4] [4]	16 element array starting at word 0

ASCII Files

You can access data in an ASCII file by specifying a file number and character location. The default data type for all syntax is shown in **bold**.

Syntax	Data Type
A<file>:<char>	**Char**, Byte (1)
A<file>:<char> [rows][cols]	**Char**, Byte (1)
A<file>:<char> [cols]	**Char**, Byte (1)
A<file>:<word> offset>/length	**String (2)**

The number of array elements cannot exceed the **block request size** specified.

Internally, the PLC packs two characters per word in the file, with the high byte containing the first character and the low byte containing the second character. The **PLC programming software** allows access at the word level or two-character level. The **Allen-Bradley DH+/DH-485** driver allows accessing to the character level. This means that if you use the programming software A10:0=AB, 'A' would be stored in the high byte of A10:0 and'B' would be stored in the low byte. If you use the Allen-Bradley DH+ driver, you would make two assignments, A10:0=A and A10:1=B, which would result in the same data being stored in the PLC memory.

Referencing this file as string data allows access to data at word boundaries like the programming software. The length can be up to 236 characters. If a string that is sent to the device is smaller in length than the length specified by the address, the driver null terminates the string before sending it down to the controller.

The following file numbers and maximum character locations are allowed for each model.

PLC Model	File Number	Max Character
SLC Family	9-999	1999
PLC-5 Family	3-999	1999

All SLC Family PLCs do not support ASCII file types. Refer to PLC documentation.

Example	Description
A9:0	Character 0 (high byte of word 0)
A27:10 [80]	80 character array starting at character 10
A15:0 [4] [16]	4 by 16 character array starting at character 0
A62:0/32	32 character string starting at word offset 0

String Files

You can access data in a string file by specifying a file number and an element. The only data type allowed is string, which are 82 character null terminated arrays. The driver places the null terminator based on the string length returned by the PLC.

Syntax	Data Type
ST<file>:<element>	String

Note: Arrays of strings are not supported.

The following file numbers and maximum word locations are allowed for each model.

PLC Model	File Number	Max Word
SLC Family	9-999	999
PLC-5 Family	3-999	999

Example	Description
ST9:0	string 0
ST18:10	string 10

SLC Family Open Addressing

Open Addressing

The actual number of addresses available depends on the model of the PLC being used. The ranges have been opened up to allow for maximum flexibility with future models. If, at runtime, the driver finds that an address is not present in the device, the driver will post an error message and remove the tag from its scan list.

Note: This model has no model specific addressing.

See Also: General Addressing

PLC-5 Family Addressing

General Addressing

General Addressing

Model Specific Addressing

BCD Files
PID Files
Message Files
Block Transfer Files

BCD Files

You can access BCD files by specifying a file number and a word. The only data types allowed are BCD and long BCD. The default data type is always BCD.

Syntax	Data Type
D<file>:<word>	**BCD**, LBCD
D<file>:<word> [rows][cols]	**BCD**, LBCD (array types)
D<file>:<word> [cols]	**BCD**, LBCD (array types)

The number of array elements (in bytes) cannot exceed the **block request size** specified. This means that array size cannot exceed 16 BCDs given a block request size of 32 bytes.

The following file numbers and maximum word locations are allowed for each model.

PLC Model	File Number	Max Word
SLC 5/05 Open	NA	NA
PLC-5 Family	3-999	999

Example	Description
D9:0	word 0
D27:10 [16]	16 element array starting at word 10
D15:0 [4] [8]	32 element array starting at word 0

PID Files

PID files are a structured type whose data is accessed by specifying a file number, an element and a field. The default data type depends on the field being accessed. Integer fields receive a default data type of Word.

Syntax	Data Type
PD<file>:<element>.<field>	Depends on field

The following file numbers and maximum element are allowed for each model.

PLC Model	File Number	Max Element
SLC 5/05 Open	NA	NA
PLC-5 Family	3-999	999

The following fields are allowed for each element. Refer to the PLC documentation for the meaning of each field.

Element Field	Data Type	Access
SP	Real	Read/Write
KP	Real	Read/Write
KI	Real	Read/Write
KD	Real	Read/Write
BIAS	Real	Read/Write
MAXS	Real	Read/Write
MINS	Real	Read/Write
DB	Real	Read/Write
SO	Real	Read/Write
MAXO	Real	Read/Write
MINO	Real	Read/Write
UPD	Real	Read/Write
PV	Real	Read/Write
ERR	Real	Read/Write
OUT	Real	Read/Write
PVH	Real	Read/Write
PVL	Real	Read/Write

DVP	Real	Read/Write
DVN	Real	Read/Write
PVDB	Real	Read/Write
DVDB	Real	Read/Write
MAXI	Real	Read/Write
MINI	Real	Read/Write
TIE	Real	Read/Write
FILE	Word, Short	Read/Write
ELEM	Word, Short	Read/Write
EN	Boolean	Read/Write
CT	Boolean	Read/Write
CL	Boolean	Read/Write
PVT	Boolean	Read/Write
DO	Boolean	Read/Write
SWM	Boolean	Read/Write
CA	Boolean	Read/Write
MO	Boolean	Read/Write
PE	Boolean	Read/Write
INI	Boolean	Read/Write
SPOR	Boolean	Read/Write
OLL	Boolean	Read/Write
OLH	Boolean	Read/Write
EWD	Boolean	Read/Write
DVNA	Boolean	Read/Write
DVHA	Boolean	Read/Write
PVLA	Boolean	Read/Write
PVHA	Boolean	Read/Write

Example	Description
PD14:0.SP	setpoint field of PD 0 file 14
PD18:6.EN	status enable bit of PD 6 file 18

Message Files

Message files are a structured type whose data is accessed by specifying a file number, an element and a field. The default data type depends on the field being accessed. Integer fields receive a default data type of Word.

Syntax	Data Type
MG<file>:<element>.<field>	Depends on field

The following file numbers and maximum element are allowed for each model.

PLC Model	File Number	Max Element
SLC 5/05 Open	NA	NA
PLC-5 Family	3-999	999

The following fields are allowed for each element. Refer to the PLC documentation for the meaning of each field. The defeaults are shown in **bold**.

Element Field	Data Type	Access
ERR	Short, **Word**	Read/Write

RLEN	Short, **Word**	Read/Write
DLEN	Short, **Word**	Read/Write
EN	Boolean	Read/Write
ST	Boolean	Read/Write
DN	Boolean	Read/Write
ER	Boolean	Read/Write
CO	Boolean	Read/Write
EW	Boolean	Read/Write
NR	Boolean	Read/Write
TO	Boolean	Read/Write

Example	Description
MG14:0.RLEN	requested length field of MG 0 file 14
MG18:6.CO	continue bit of MG 6 file 18

Block Transfer Files

Block transfer files are a structured type whose data is accessed by specifying a file number, an element and a field. The default data type depends on the field being accessed. Integer fields receive a default data type of Word.

Syntax	Data Type
BT<file>:<element>.<field>	Depends on field

The following file numbers and maximum element are allowed for each model.

PLC Model	File Number	Max Word
SLC 5/05 Open	NA	NA
PLC-5 Family	3-999	1999

The following fields are allowed for each element. Refer to the PLC documentation for the meaning of each field.

Element Field	Data Type	Access
RLEN	**Word**, Short	Read/Write
DLEN	**Word**, Short	Read/Write
FILE	**Word**, Short	Read/Write
ELEM	**Word**, Short	Read/Write
RW	**Boolean**	Read/Write
ST	**Boolean**	Read/Write
DN	**Boolean**	Read/Write
ER	**Boolean**	Read/Write
CO	**Boolean**	Read/Write
EW	**Boolean**	Read/Write
NR	**Boolean**	Read/Write
TO	**Boolean**	Read/Write

Example	Description
BT14:0.RLEN	requested length field of BT 0 file 14
BT18:6.CO	continue bit of BT 6 file 18

Data Types Description

Type	Description
Boolean	Single bit
Byte	Unsigned 8 bit value
Char	Signed 8 bit value
Word	Unsigned 16 bit value
Short	Signed 16 bit value
DWord	Unsigned 32 bit value
Long	Signed 32 bit value
BCD	Two byte packed BCD, four decimal digits
LBCD	Four byte packed BCD, eight decimal digits
Float	32 bit IEEE Floating point
String	Null terminated character array

Note: The DWord, Long and LBCD data types are not native to any of the PLC models.

When referencing a 16 bit location as a 32 bit value, the location referenced will be the low word, and the next successive location will be the high word. For example: If N7:10 is selected as a DWord data type, N7:10 would be the low word and N7:11 would be the high word.

Error Descriptions

The following error/warning messages may be generated. Click on the link for a description of the message.

Address Validation

Missing address
Device address '<address>' contains a syntax error
Address '<address>' is out of range for the specified device or register
Device address '<address>' is not supported by model '<model name>'
Data Type '<type>' is not valid for device address '<address>'
Device address '<address>' is read only
Array size is out of range for address '<address>'
Array support is not available for the specified address: '<address>'

Configuration Error Messages

File Corruption
Interrupt not configured

Device Status Messages

Device '<device name>' is not responding
Unable to write to '<address>' on device '<device name>'
Failed to Connect to device '<device name>'

Device Specific Messages

Unable to read data starting at address <address> on device '<device name>'. Frame received contains errors
Unable to read data starting at address <address> on device '<device name>'. [STS=<value>, EXT STS=<value>]. Tag deactivated
Unable to write to address <address> on device '<device name>'. Frame received contains errors
Unable to write to address <address> on device '<device name>'. [STS=<value>, EXT STS=<value>]

Allen-Bradley Card Specific Error Messages

Failed to locate PKTX Channel 'Channel ID' of card 'PKTX Card ID'
Failed to write to Dual Port memory for device: <Device Name>
Failed to clear dual port memory while performing functionality test

SST Specific Error Messages

Address Validation

The following error/warning messages may be generated. Click on the link for a description of the message.

Address Validation

Missing address

Error Type:
Warning

Possible Cause:
A tag address that has been specified dynamically has no length.

Solution:
Re-enter the address in the client application.

Device address '<address>' contains a syntax error

Error Type:
Warning

Possible Cause:
A tag address that has been specified dynamically contains one or more invalid characters.

Solution:

Re-enter the address in the client application.

Address '<address>' is out of range for the specified device or register

Error Type:
Warning

Possible Cause:
A tag address that has been specified dynamically references a location that is beyond the range of supported locations for the device.

Solution:
Verify the address is correct; if it is not, re-enter it in the client application.

Device address '<address>' is not supported by model '<model name>'

Error Type:
Warning

Possible Cause:
A tag address that has been specified dynamically references a location that is valid for the communications protocol but not supported by the target device.

Solution:
Verify that the address is correct; if it is not, re-enter it in the client application. Also verify that the selected model name for the device is correct.

Data Type '<type>' is not valid for device address '<address>'

Error Type:
Warning

Possible Cause:
A tag address that has been specified dynamically has been assigned an invalid data type.

Solution:
Modify the requested data type in the client application.

Device address '<address>' is read only

Error Type:
Warning

Possible Cause:
A tag address that has been specified dynamically has a requested access mode that is not compatible with what the device supports for that address.

Solution:
Change the access mode in the client application.

Array size is out of range for address '<address>'

Error Type:
Warning

Possible Cause:
A tag address that has been specified dynamically is requesting an array size that is too large for the address type or

block size of the driver.

Solution:
Re-enter the address in the client application to specify a smaller value for the array or a different starting point.

Array support is not available for the specified address: '<address>'

Error Type:
Warning

Possible Cause:
A tag address that has been specified dynamically contains an array reference for an address type that doesn't support arrays.

Solution:
Re-enter the address in the client application to remove the array reference or correct the address type.

Configuration Error Messages

The following error/warning messages may be generated. Click on the link for a description of the message.

Configuration Error Messages
File Corruption
Interrupt not configured

File Corruption

Error Type:
Fatal

Possible Cause:
One or more binary files that came with your driver may have been corrupted.

Solution:
Contact Technical Support.

Interrupt not configured

Error Type:
Fatal

Possible Cause:
1. The interrupt may not be configured on the device.
2. The interrupt configured on the device may not match with the one selected in Channel setup.

Solution:
1. Enable the interrupt by setting the correct jumper/DIP switch combination.
2. Set the interrupt parameter on the chanel properties matching the one set up on the card.

Device Status Messages

The following error/warning messages may be generated. Click on the link for a description of the message.

Device Status Messages
Device '<device name>' is not responding
Unable to write to '<address>' on device '<device name>'
Failed to Connect to device '<device name>'

Device '<device name>' is not responding

Error Type:
Warning

Possible Cause:
1. The connection between the card and the device may be broken.
2. The connection between the PC and the card may be broken.
3. The card may have been loaded with an incorrect protocol.
4. The named device may have been assigned an incorrect memory address.
5. The channel may have been set up incorrectly.

Solution:
1. Verify that the card is inserted correctly onto the right slot.
2. Verify the Device ID given to the named device matches that of the actual device.
3. Make sure the channel settings (such as baud rate, card type and etc.) match that of your card and device settings.

Unable to write to '<address>' on device '<device name>'

Error Type:
Warning

Possible Cause:
1. The connection between the device and the card is broken.
2. The connection between the host PC and the card is broken.
3. The card may have been loaded with incorrect module.

Solution:
1. Verify the cabling between the device and the card.
2. Verify that the card is inserted properly onto the right slot.
3. Verify that all the parameters (card, memory address, I/O port, etc) are correctly chosen while creating the project.

Failed to connect to device '<device name>'

Error Type:
Fatal

Possible Cause:
1. The card may not have been installed correctly.
2. An inappropriate "inf" file may have been loaded for this device.

Solution:
1. Verify that all the card pins are comfortably connected to the slot.
2. Go to Device Manager and make sure you do not have the wrong driver installed for this device.

Device Specific Messages

The following error/warning messages may be generated. Click on the link for a description of the message.

Device Specific Messages

Unable to read data starting at address <address> on device '<device name>'. Frame received contains errors

Unable to read data starting at address <address> on device '<device name>'. [STS=<value>, EXT STS=<value>]. Tag deactivated

Unable to write to address <address> on device '<device name>'. Frame received contains errors

Unable to write to address <address> on device '<device name>'. [STS=<value>, EXT STS=<value>]

Unable to read data starting at address <address> on device '<device name>'. Frame received contains errors

Error Type:
Warning

The Error Could Be:
1. Incorrect frame size received.
2. TNS mismatch.
3. Invalid response command returned from device.

Possible Cause:
1. Misalignment of packets due to connection/disconnection between PC and device.
2. There is bad cabling connecting the devices causing noise.

Solution:
The driver will recover from this error without intervention. If this error occurs frequently, there may be an issue with the cabling or the device itself.

Unable to read data starting at address <address> on device '<device name>'. [STS=<value>, EXT STS=<value>]. Tag deactivated

Error Type:
Warning

Possible Cause:
The address requested in the block does not exist in the PLC.

Solution:
Check the status and extended status codes that are being returned by the PLC. Note that an extended status code may not always be returned and thus the error information is contained within the status code. The codes are displayed in hexadecimal.

Status code errors in the low nibble of the status code indicate errors found by the local node. The driver will continue to retry reading these blocks of data periodically. Errors found by the local node occur when the KF module cannot see the destination PLC on the network for some reason.

Status code errors in the high nibble of the status code indicate errors found by the PLC. These errors are generated when the block of data the driver is asking for is not available in the PLC. The driver will not ask for these blocks again after receiving this kind of error. This kind of error can be generated if the address does not exist in the PLC.

Note:
The block starting at address <address> may be deactivated in the process depending on the severity of the error. The error message will state this as it does above.

Unable to write to address <address> on device '<device name>'. Frame received contains errors

Error Type:
Warning

The Error Could Be:
1. Incorrect frame size received.
2. TNS mismatch.
3. Invalid response command returned from device.

Possible Cause:
1. Misalignment of packets due to connection/disconnection between PC and device.
2. There is bad cabling connecting the devices causing noise.

Solution:
The driver will recover from this error without intervention. If this error occurs frequently, there may be an issue with the cabling or the device itself.

Unable to write to address <address> on device '<device name>'. [STS=<value>, EXT STS=<value>]

Error Type:
Warning

Possible Cause:
The address written to does not exist in the PLC.

Solution:
1. Check the status and extended status codes that are being returned by the PLC. Note that an extended status code may not always be returned and thus the error information is contained within the status code. The codes are displayed in hexadecimal.
2. Status code errors in the low nibble of the status code indicate errors found by the local node. Errors found by the local node occur when the card cannot see the destination PLC on the network for some reason.
3. Status code errors in the high nibble of the status code indicate errors found by the PLC. These errors are generated when the data location is not available in the PLC or not write able.

Allen-Bradley Card Specific Error Messages

The following error/warning messages may be generated. Click on the link for a description of the message.

Allen-Bradley Card Specific Error Messages

Failed to locate PKTX Channel 'Channel ID' of card 'PKTX card ID'

Error Type:
Fatal

Possible Cause:
1. Card is not installed properly.
2. Card instance ID may be used by other card.
3. The parameters selected for Channel setup may be incorrect.
4. Card is corrupted.

Solution:
1. Verify all the pins are hooked into the slot comfortably.
2. Verify that the Instance ID is not used by any other PKTX card.
3. Modify the channel properties with appropriate values.
4. Replace the card.

Failed to write to Dual port memory for device: <device name>

Error Type:
Fatal

Possible Cause:
1. Network failure.
2. Memory Conflict.
3. The parameters selected for the Channel setup may be incorrect.
4. The parameters selected for the Channel setup may be incorrect.
5. Card is corrupted.

Solution:
1. Check for any broken links between the card and the host. Make sure that the card is inserted properly on the appropriate slot and then restart the driver.
2. Assign a different memory base address.
3. Change the channel setup parameters with appropriate values.
4. Modify the channel properties with appropriate values.
5. Replace the card.

Failed to clear dual port memory while performing functionality test

Error Type:
Fatal

Possible Cause:
This error may occur due to a conflict between this OPC server and any other OPC servers supporting Allen-Bradley Data Highway drivers. For example: RSLinx.

Possible Solutions:
Make sure that all other OPC servers (e.g., RSLinx) are completely uninstalled, and then restart the PC.

Failed to start Board <board name>. Possible Resource Conflict

Error Type:
Fatal

Possible Cause:
1. Memory Conflict.
2. Temporary network problem.
3. Bad memory address selected.
4. The parameters selected for Channel setup may be incorrect.
5. Card is corrupted.

Solution:
1. Some other device may be using the same memory address. Configure device with different memory address.
2. Restart the driver.
3. Memory address selected is not within the range. Try a different memory address.
4. Modify the channel properties with appropriate values.
5. Replace the card.

M16 Diagnostic 8-bit mode failure

Error Type:
Fatal

Possible Cause:
This occurs when the jumper settings on the KTXD card are in 8 bit mode.

Solution:

Change it to 16-bit mode. Refer to KTXD user's guide for more information.

Failed RAM, CTC or SIO Test

Error Type:

Fatal

Possible Cause:

1. Memory Conflict.
2. Temporary network problem.
3. Bad memory address selected.
4. The parameters selected for Channel setup may be incorrect.
5. Card Corrupted.

Solution:

1. Some other device may be using the same memory address. Configure the device with a different memory address.
2. Restart the driver.
3. The memory address selected is not within the range: try a different memory address.
4. Modify the channel properties with appropriate values.
5. Replace the card.

Failed to enable card for Device <Device Name>

Error Type:

Fatal

Possible Cause:

1. Network failure.
2. Memory conflict.
3. The channel properties may have been set inaccurately.
4. Corrupted card.

Solution:

1. Check for any broken links between the card and the host. Make sure that the card is inserted properly on the appropriate slot and then restart the driver.
2. Assign a different memory base address.
3. Modify the channel properties with appropriate values.
4. Replace the card.

Failed to perform M16 Key Write for device <Device Name>

Error Type:

Fatal

Possible Cause:

1. The jumper settings on the KTXD card may be in 8 bit mode.
2. The ISA bus slot may be corrupted
3. The card memory may be corrupted.

Solution:

1. Change it to 16-bit mode. Refer to KTXD user's guide for more information.
2. Try a different ISA slot.
3. Replace the card.

Failed to complete diagnosis while performing M16 Diagnosis for device <device name>

Error Type:

Fatal

Possible Cause:
You should only see this error when one of the following error occurs. Click on the errors to review the possible solutions.

Failed to perform M16 Diagnostic for base address <memory address>'
Failed to perform M16 Key write for device, <Device Name>
Failed to complete loading protocol file while performing M16 diagnosis for device <Device name>

Failed to complete loading protocol while performing M16 diagnosis for device <device name>

Error Type:
Fatal

Possible Cause:
One or more binary files related to M16 Diagnosis that came with the driver may have been corrupted.

Solution:
Contact Technical Support.

Failed to load binary resource <Resource ID> for device <Device>

Error Type:
Fatal

Possible Cause:
One of the binary files required for loading the protocol may be corrupted.

Solution:
Contact Technical Support.

Failed to allocate device for board '<channel>'

Error Type:
Fatal

Possible Cause:
1. The interface card is being used by another application.
2. The interface card is not functional.
3. If it is an ISA interface card, the memory address selected may be inappropriate.

Solution:
1. Uninstall any other application (such as RSLinx) that might be using the same interface card.
2. Verify that the card is functional and inserted properly in the appropriate slot.
3. Assign the correct memory address.

Error performing diagnostics test on channel <channel name>

Error Type:
Fatal

Possible Cause:
1. Card is not installed properly
2. Card is corrupted

Solution:
1. Verify that all the pins are hooked into the slot comfortably.
2. Replace the card.

SST Specific Error Messages

The following error/warning messages may be generated. Click on the link for a description of the message.

SST Specific Error Messages

Duplicate Station ID detected by device <Device Name>

Error Type:
Fatal

Possible Cause:
This indicates that there is more than one device with the same Device ID.

Solution:
Assign a different Station ID (Device ID) to one of the duplicate stations.

Invalid Station ID detected by device <Device Name>

Error Type:
Fatal

Possible Cause:
This occurs when the device with the specified ID could not be located in the network.

Solution:
1. Check if the specified Device ID is correct.
2. Check for broken connections between the card and the device.
3. Check if the device is on the appropriate network.
4. Check if the device is powered on.

Error writing to SST ports for device <Device Name>

Error Type:
Fatal

Possible Cause:
This indicates that the ports selected are not working properly, which usually results from conflicts with other devices.

Solution:
Assign a different port range and then restart the driver.

Failed to take the SST card offline for device <Device Name>

Error Type:
Fatal

Possible Cause:

This occurs when the driver has trouble taking the card off-line due to a bad/nonexistent device.

Solution:
1. Check for memory conflicts. If there is a conflict, try a different memory address.
2. Check for broken connections between the card and the host. Make sure that the card is installed correctly.
3. Restart the driver.
4. Restart the computer.

Bad port/memory detected on SST card while loading module on device <Device Name>

Error Type:
Fatal

Possible Cause:
This occurs when there is a conflict on memory/ports between devices.

Solution:
1. Check for memory conflicts. (If so, try different memory address).
2. Check for I/O ports conflicts. (If so, try different port address).
3. The card or section of a card may be corrupted. (If so, try different memory/port address).

Protocol is not reflected onto memory after being loaded on device <Device Name>

Error Type:
Fatal

Possible Cause:
This could occur for many different reasons.

1. The device may not be configured properly.
2. There might be a memory conflict.
3. There might have been a problem with the network. (temporary network hiccups)
4. The card may be corrupted.

Solution:
1. Reconfigure the device with appropriate parameters.
2. Assign different unique memory address.
3. Restart the driver.
4. Replace the card.

SST card execution error occurred on device <Device Name>

Error Type:
Fatal

Possible Cause:
1. There may be a memory conflict.
2. There might have been a temporary problem with the network.
3. Some binary file for your driver may be corrupted.
4. The card may be corrupted.

Solution:
1. Reconfigure the device with a different memory address.
2. Restart the driver.
3. Contact Technical Support.
4. Replace the card.

Failed to allocate device for board '<channel>'

Error Type:

Fatal

Possible Cause:

1. The interface card is being used by another application.
2. The interface card is not functional.
3. If it is an ISA interface card, the memory address selected may be inappropriate.

Solution:

1. Uninstall any other application (such as RSLinx) that might be using the same interface card.
2. Verify that the card is functional and inserted properly in the appropriate slot.
3. Assign the correct memory address.

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