Technical Note

Configuring Allen-Bradley Cards

This Technical Note addresses legacy devices. For new installations, the 1782-U2-DHP cable with Kepware's Allen-Bradley DF1 driver is recommended.

Refer to the associated Knowledge Base article:

https://www.kepware.com/support/knowledge-base/default.asp?solution=/_ui/selfservice/pkb/PublicKnowledgeSolution/d?&id=50140000000I7udCsY

1.   Hardware Setup

This note covers the following topics:

- 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

2.   Hardware Configuration of 5136-SD-ISA (SST) Card

⬤ **Important**: Users must ground themselves by touching a grounded object (such as the chassis of the computer) before handling the card.

2.1   I/O Port Configuration

The 5136-SD-ISA card uses I/O ports. The default address is 250. DIP switches are available on the card to configure a unique I/O port address in case another device is already using that address. The I/O space required is 8 bytes. The setting of 250 selects ports 250-257.

The table below displays some of the DIP switch settings options that may be selected for the port addresses. *If another address is required, refer to the SST card's 5136-SD-ISA User's Guide.*

PORT ADDRESS IN HEX	SW1	SW2	SW3	SW4	SW5	SW6	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	

2.2   Transmit Jumper

The 5136-SD-ISA card uses jumper JB2 to enable or disable transmission from the card. Position "DISA" disables transmission; position "ENB" enables it. Set the jumper to "ENB" to enable message transmission through the DH+ network.

● **Note**: Install the card on an ISA slot in the computer.

3.   Hardware Configuration of Memory and Interrupt on 1784 KTXD Card

Users must select a unique memory address and Interrupt Request Level (IRQ). The valid memory address range is C800-D700. The valid interrupt levels are 3, 4, 5, and 7. To make sure that the value chosen for the interrupt is unique, users should check the Device Manager.

3.1   Memory Configuration

The Allen Bradley 1784-KTX (D) card has two channels for communication.
When planning to use channel 1, users must turn the knobs (sw3 and sw4) under Channel 1 to reflect the selected memory address. For example, if address D000 is chosen, then the sw3 should point to "D" and sw4 should point to "0." Similarly, when planning to use channel 2, users must turn the knobs (sw1 and sw2) to reflect the selected memory address.

3.2   Interrupt Configuration

When using interrupts, users should choose an interrupt level. As mentioned above, valid interrupt levels are 3, 4, 5 and 7. The KTX (D) card comes with two jumpers. Each jumper is used for selecting the interrupt level for each of the channels. The jumper should be placed corresponding to the chosen channel number, horizontally across the

two pins next to the selected interrupt level. For example, if using channel 1 with interrupt level 3 selected, users should place one of the jumpers horizontally across pin 3 under channel number 1. If not using interrupts, the jumper should be placed vertically, connecting pins of two different interrupt levels (such as 3 and 5).

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

⬤ **Important**: Before handling the card, users must ground themselves by touching a grounded object (such as the chassis of the computer).

4.1 Requirements for the 1784-KT (ISA Bus) card:

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

4.2 1784-KT Card DIP Switch Configuration for DH+

MEMORY ADDRESS IN HEX		SW1	SW2	SW3	SW4	SW5	SW6
Use these addresses only if an EGA or VGA display adapter is not installed.	A0000	OPEN	OPEN	OPEN	CLOSED	OPEN	CLOSED
	A4000	CLOSED	OPEN	OPEN	CLOSED	OPEN	CLOSED
	A8000	OPEN	CLOSED	OPEN	CLOSED	OPEN	CLOSED
	AC000	CLOSED	CLOSED	OPEN	CLOSED	OPEN	CLOSED
Use these addresses only if an MDA display adapter is not installed.	B0000	OPEN	OPEN	CLOSED	CLOSED	OPEN	CLOSED
	B4000	CLOSED	OPEN	CLOSED	CLOSED	OPEN	CLOSED
	B8000	OPEN	CLOSED	CLOSED	CLOSED	OPEN	CLOSED
Use these addresses only if the Dxxxx addresses do not work (since one of the Cxxxx addresses may be used by the AT BIOS).	C0000	OPEN	OPEN	OPEN	OPEN	CLOSED	CLOSED
	C4000	CLOSED	OPEN	OPEN	OPEN	CLOSED	CLOSED
	C8000	OPEN	CLOSED	OPEN	OPEN	CLOSED	CLOSED
	CC000	CLOSED	CLOSED	OPEN	OPEN	CLOSED	CLOSED
These addresses will yield the best results. The default address is shown in bold.	D0000	OPEN	OPEN	CLOSED	OPEN	CLOSED	CLOSED
	D4000	CLOSED	OPEN	CLOSED	OPEN	CLOSED	CLOSED
	D8000	OPEN	CLOSED	CLOSED	OPEN	CLOSED	CLOSED

## 4.3   DIP Switches on 1784-KT Card (D4000 Default Shown)
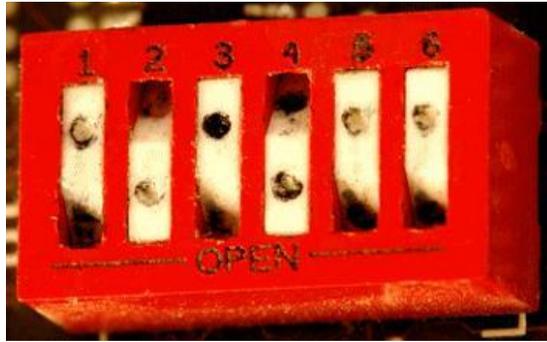
1. Configure the 1784-KT card DIP switches by pressing each switch in at the top or in at the bottom. Descriptions of the settings are as follows:

   - **Open**: Pressed in at the top.

   - **Closed**: Pressed in at the bottom.

2. Select an interrupt by placing the jumper on the two pins for the setting that has been chosen. Settings include IRQ3, IRQ4, IRQ5, IRQ7, or no interrupt. The default setting is no interrupt.
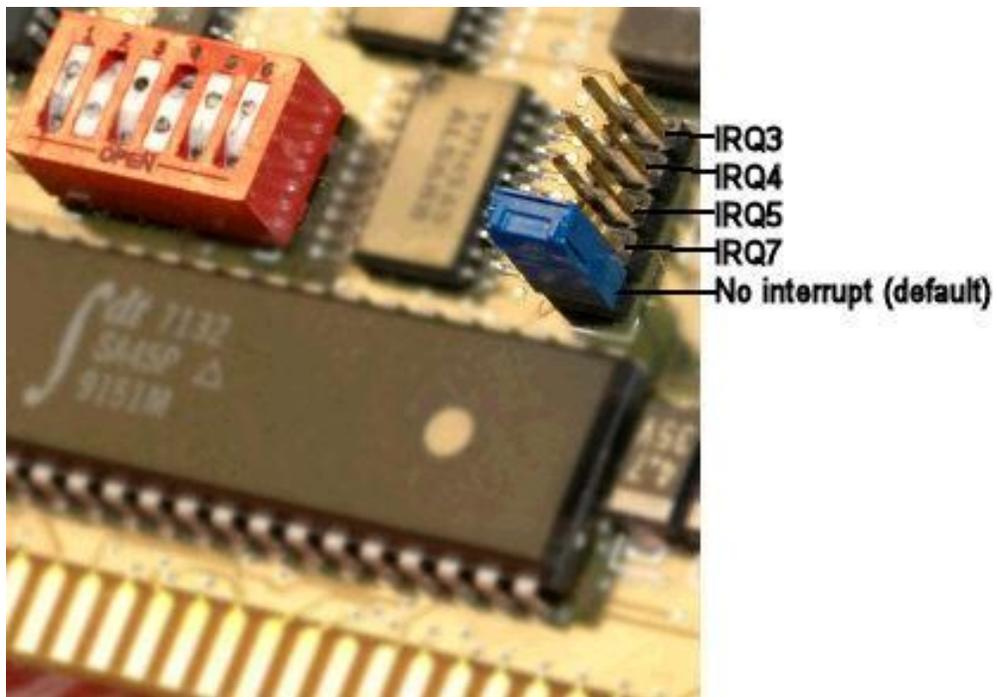
3. Carefully slide the 1784-KT card into the I/O expansion slot, and then press firmly until the card is seated in the slot.

4. Install the retaining screw into the retaining bracket.

5. Check Device Manager

1. Launch the **Device Manager** (In Windows XP, accessible via **My Computer | Properties** | **Hardware.** In Windows 2007, accessible via **Control Panel | Device Manager**).

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

3. Expand **Interrupt Request** (IRQ). All interrupt levels being used by other devices should be visible. If the device is using an interrupt, pick a level that is not already being used by any other device. For example, if the device allows an interrupt level of 3, 5, 7 and 9, and the list suggests that the levels 3 and 7 are already being used, then users should select either interrupt level 5 or interrupt level 9. Choosing levels 3 and 7 would produce a resource conflict error, which might cause the device to act erroneously.
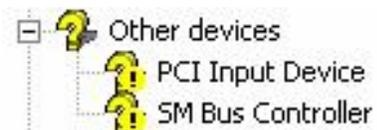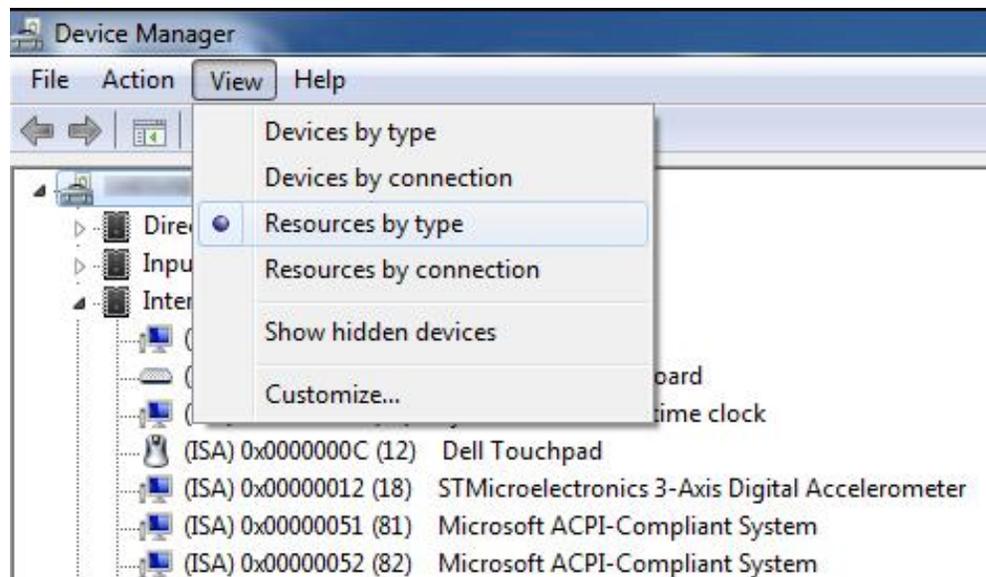
6. Install and Connect KTX(D) to the Network

6.1 Installing the KTX(D) Card

1. Shut down the computer.

2. Touch 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) to be grounded.

3. Properly insert the card on an available ISA slot.

6.2 Connecting the Card to the Network

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

7. Software Setup

7.1 Setup for the Allen Bradley - 1784 KT Card

The KT card must be configured for a unique memory address and interrupt on the hardware before the Channel Properties may be selected. Note the chosen address and interrupt, as these parameters will be used when setting up the properties in the server.

1. Install the KT card on an available ISA slot, then connect to the appropriate network.

2. In the server configuration, select the channel, right-click and select **Properties**.

3. Select the Interface Card group and set the following:

   - **Board Type**: Select "KT" from the drop-down menu.

   - **Network Type**: Select the type of network that is being used. This driver currently only supports the DH+ Network.

   - **Station Address**: Select the device's unique Node ID, which ranges from 0-77 octal. Make sure that this ID does not conflict with any other Node ID on the network.

   - **Baud Rate**: The available baud rate for the DH+ network on a KT card is 57.6K.

   - **Memory Address**: Select the memory address that was specified on the card during hardware configuration.

   - **Interrupt**: If using interrupts, select a unique interrupt level from the drop-down menu. Make sure that it matches what was specified during hardware configuration. For no interrupts, select "None."

4. Click **Apply**.

5. Click **OK**.

7.2   Setup for the Allen Bradley - 1784 KTX/KTX-D Card

The KTX/KTX-D card must be configured for a unique memory address and interrupt on the hardware before the Channel Properties may be selected. Note the chosen address and interrupt, as these parameters will be used when setting up the Channel Properties in the server.

For information on hardware configuration, refer to Configuring Memory and Interrupt on 1784 KTX. Users may skip this step if it is already completed.

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

2. In the server configuration interface, right-click on the channel and select **Properties**.

3. Select the **Interface Card** group and configure the following properties:

   - **Board Type**: Select KTX(D) from the drop-down menu.

     - **Note**: In this example, KTX (D) has been chosen for both the KTX and KTX-D cards.

   - **Network Type**: Select the type of network that is being used. This driver currently supports DH+ and DH-485 networks.

   - **Station Address**: This is the device's unique Node ID: 0-77 octal for DH+ and 0-31 decimal for DH-485. Users must make sure that this ID does not conflict with any other Node ID on the network.

   - **Baud Rate**: The available baud rates for the DH+ network are 57.6K, 115K and 230K. Under the DH+ network, the baud rates 115K and 230K may not be supported by the card or device. For more information, check the card and device vendor's specifications. The available baud rates for the DH-485 network are 300, 600, 1.2K, 2.4K, 4.8K, 9.6K, 19.2K. The selected baud rate should match the device configuration.

   - **Memory Address**: Select the exact memory address that was specified on the card during hardware configuration. *For more information, refer to Hardware Configuration of Memory and Interrupt on 1784 KTXD Card.*

   - **Interrupt**: If using Interrupts, select a unique interrupt level from the drop-down menu. Make sure it matches what was specified during hardware configuration. If not using interrupts, select "None."

4. Click **Apply**.

5. Click **OK**.

## 7.3   Setup for the Allen Bradley - 1784 PKTX/PKTX-D Card

Before installing the PKTX/PKTX-D driver, make sure that any drivers that may have been used previously for this card (such as RSLinx) have been uninstalled. Then restart the computer.

Caution: Failure to do so may result in unexpected consequences. It is recommended that a fresh PCI slot (which has not been used with other DH+ cards before) be used. This is not required for Windows NT.

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

Removing Old Drivers: An Example Procedure

Users familiar with SST or similar cards may have seen something like the following image under Device Manager before.
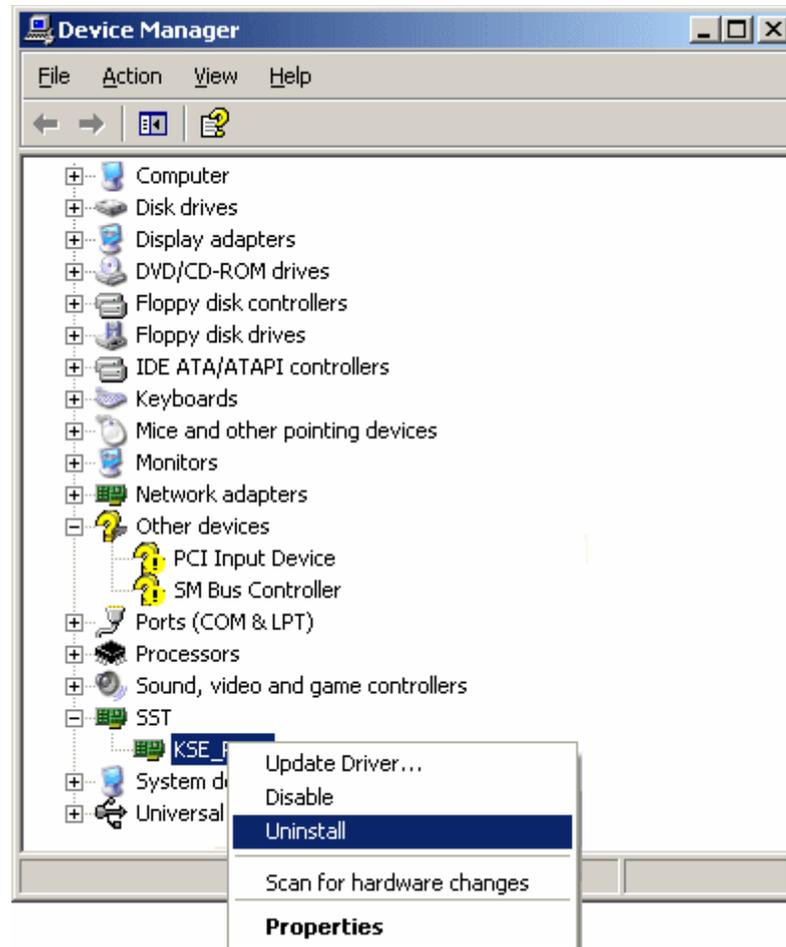

1. To start, expand SST. Select any driver beneath it, right-click and select Uninstall. This must be done for all the drivers that are installed under SST.

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

3. Before setting the channel properties, install an additional driver for the PKTX/PKTX-D card.

◉ **Note**: If the driver is being installed on Windows NT, the 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.

4. After the card has been installed, restart the PC.

5. The Found New Hardware Wizard prompts to configure the newly detected hardware.

⬤ **Note**:   The images 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 to the device as KSE_PKTXD2000.

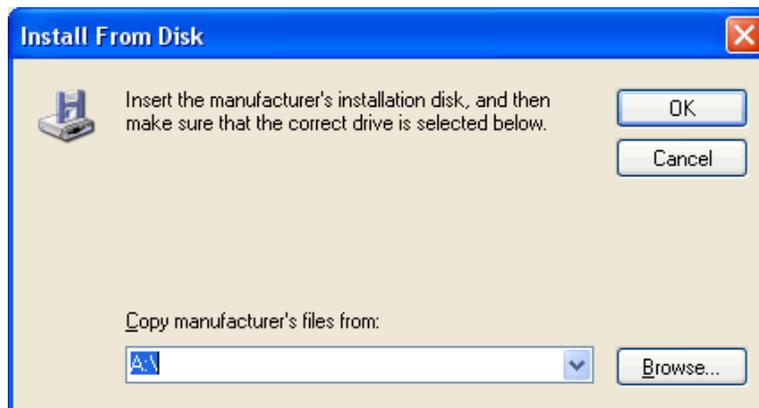6. Select **Install from a list or specific location (Advanced)** and click **Next**.

7. Select **Don't search. I will choose the driver to install** and click **Next**.
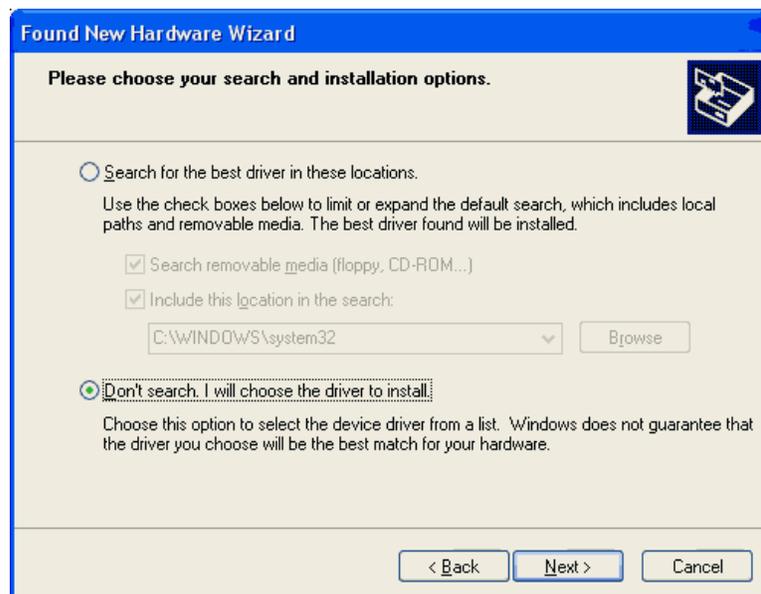
8. Select **Have Disk** regardless of whether or not the name PKTX appears on the list.
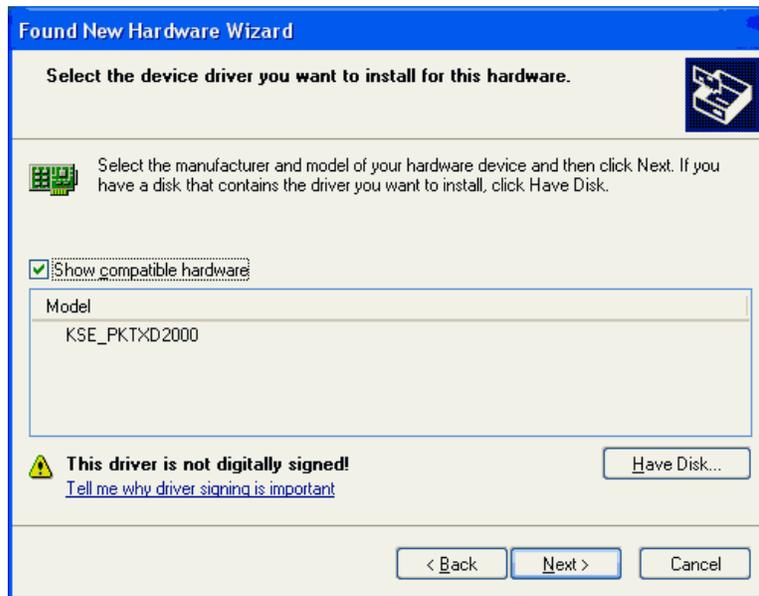
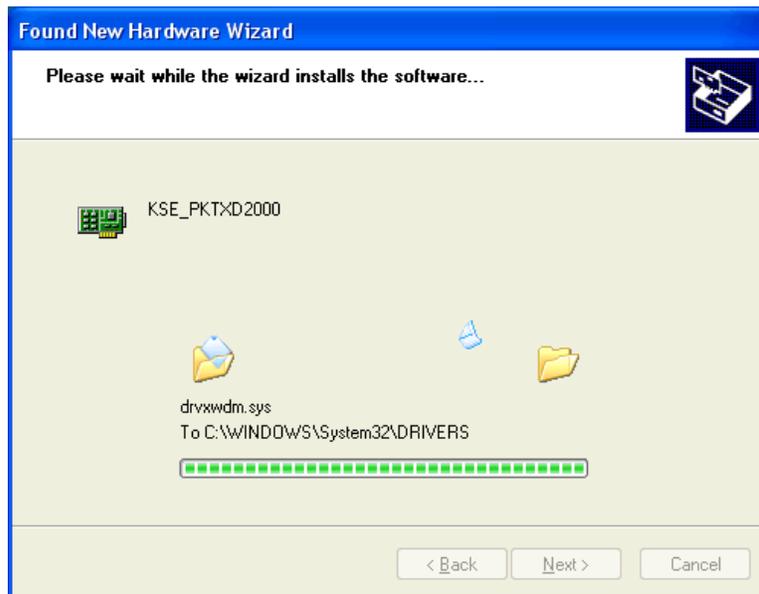9. Click **Browse**… and go to the C:\Program Files\<yourOPCserver>\drivers\Allen-Bradley DH+ directory.

10. Multiple .inf files are shown. If using Windows NT or Windows XP, select KSE_PKTX.inf as the driver.

11. Select the appropriate driver for the device being used. If using a PKTXD card, select KSE_PKTXD2000; if using a PKTX card, select KSE_PKTX2000.

12. Wait while the Found New Hardware Wizard installs the software.

13. Click **Finish** and restart the computer.

🌑 **Note**:   If the computer still cannot detect the PKTX device, try a different slot and/or completely uninstall any driver installed under the current slot.

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

2. Select the **Interface Card** group.

3. In the Interface Card tab, configure the following

- **Board Type**: Select PKTX or PKTX-D from the drop-down menu, depending on which card is being used.

- **Network Type**: This driver currently supports the DH+ and DH-485 networks for PKTX/PKTX-D cards.

- **Station Address**: This is the device's unique Node ID: 0-77 octal for DH+ and 0-31 decimal for DH-485. Users must make sure that this value does not conflict with any other Node ID on the network.

- **Baud Rate**: The available baud rates for the DH+ network are 57.6K, 115K and 230K. Under the DH+ network, the baud rates 115K and 230K under may not be supported by the card or device. For more information, check the card and device vendor's specifications. The available baud rates for the DH-485 network are 300, 600, 1.2K, 2.4K, 4.8K, 9.6K and 19.2K. The selected baud rate should match the device configuration.

- **PCI Card Instance**: On Windows XP, this number depends on the number of PKTX/PKTX-D card instances on the computer. If the card being installed is the first PKTX/PKTX-D, the PCI Card Instance should be 0. The PCI Card Instance for the next PKTX/PKTX-D card will be 1, and so forth. On Windows NT, however, PKTX and PKTX-D cards are treated as two different types of cards. Thus, if two cards are 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. Up to 4 card instances are allowed at a time. Thus, the maximum PCI Card Instances available for selection is 3.

- **PKTX Channel**: This number depends on the number of channels on the PKTX Card. If a PKTX card is being used, there would only be one channel. If a PKTX-D card is being used, there would be two different channels. When using the PKTX-D card, select the channel (1 for PKTX Channel 1A and 2 for PKTX Channel 2) that will be used for the device.

4. Click **Apply**.

5. Click **OK**.

7.4   Setup for the AB 1784 PCMK/B Card

An additional driver must be installed for the PCMK/B card before the Channel Properties may be set.

⬭ **Note**:   The PCMK/B card is currently supported for WindowsXP and Windows2000 only. Before installing the PCMK/B driver, verify any drivers that have previously been used for this card have been uninstalled and restart the computer.

Installing an Additional Driver

1. After the card has been installed, restart the computer. The utility for Found New Hardware Wizard is invoked, prompting to configure the newly detected hardware. Select **No, not this time** and click **Next**.
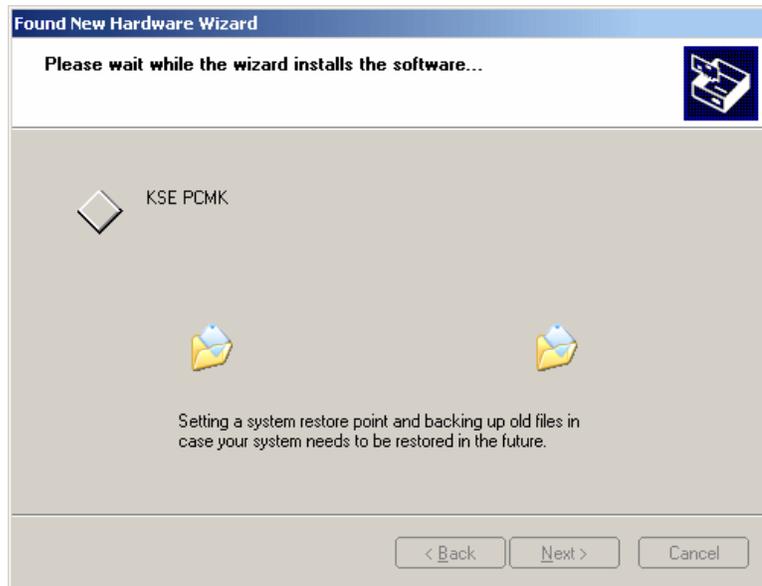

2. Select **Install from a list or specific location (Advanced)** and then click **Next**.
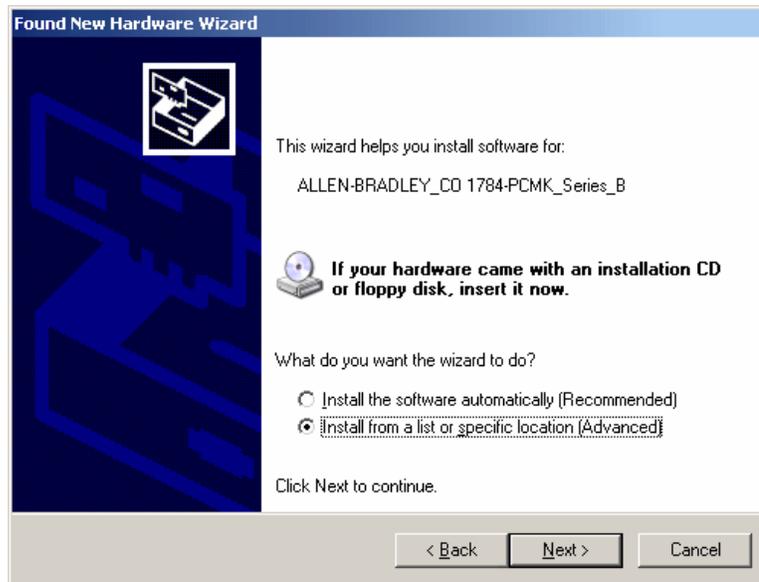
3. Select **Search for the best driver in these locations** and check **Include this location in the search**.
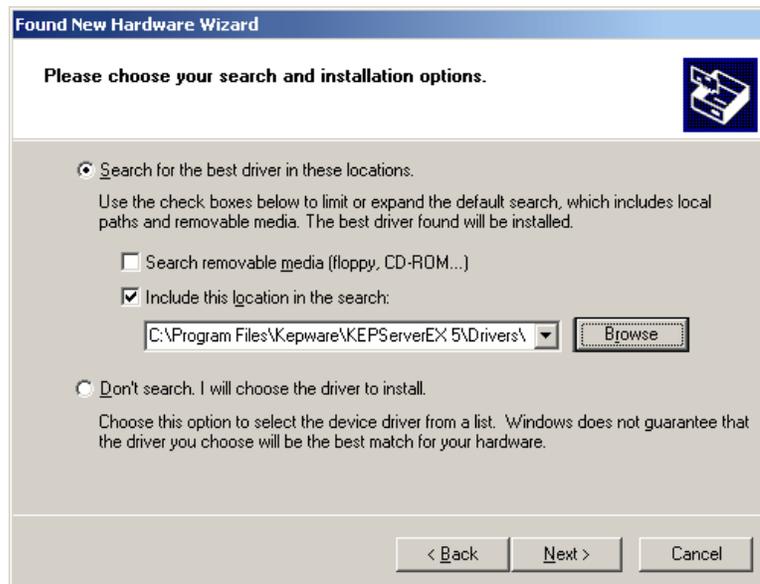
4. Click **Browse** and navigate to the C:\Program Files\<yourOPCserver>\drivers\Allen-Bradley DH+ directory and click **Next**. This starts the driver installation.

5. Once it completes, click **Finish**.

6. Restart the computer.

⚙ **Note**:   If the computer still cannot detect the PCMK/B device, try a different slot and/or uninstall a driver installed under the current slot.

Channel Setup for the AB 1784 PCMK/B Card

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

2. Select the **Interface Card** group.

3. Under Interface Card properties, set the following:

- **Board Type**: Select "PMCB/K" from the drop-down menu.

- **Network Type**: Select the DH+ network.

- **Station Address**: This is the device's unique Node ID: 0-77 octal for DH+ and 0-31 decimal for DH-485. Users must make sure that this ID does not conflict with any other Node ID on the network.

- **Baud Rate**: The available baud rates are 57.6K, 115K and 230K. Select the rate that matches the device configuration.

4. Click **Apply**.

5. Click **OK** to close.

7.5   Setup for the AB-1784-U2DHP USB Card

The 1784-U2DHP USB adapter converts DF1 to DH+. *For more information on configuration, refer to the Allen-Bradley DF1 Driver help file.*

7.6   Setup for 5136-SD-ISA Card

⬤ **Note**:   Users do not need any additional drivers or additional software from any other vendor. Any additional drivers/software that may be required are either supplied or recommended.

⬤ *For more information on configuring the I/O port and jumper settings on the SST ISA card, refer to Hardware Configuration of the 5136-SD-ISA (SST) Card.*

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

2. Select the **Interface Card** group.

3. Under Interface Card properties, set the following:

- **Board Type**: Select 5136-SD-ISA from the drop-down menu.

- **Network Type**: SST cards only support the DH+ network.

- **Station Address**: This is the device's unique Node ID: 0-77 octal for DH+ and 0-31 decimal for DH-485. Users must make sure that this ID does not conflict with any other Node ID on the network.

- **Baud Rate**: The available baud rates are 57.6K, 115K and 230K. Select the rate that matches the device configuration.

- **Memory Address**: Users must choose a unique memory address for the 5136 - SD- ISA card from the range A0000-FC000.

- **I/O Port Address**: Users must select the exact I/O port that was selected for the DIP switches while installing the 5136-SD-ISA card.

- **Interrupt**: If using interrupts, a unique interrupt level must be selected from the drop-down menu. To check for any conflicts, check the Device Manager. If not using interrupts, select None.

6. Click **Apply**.

7. Click **OK**.

7.7   Setup for 5136-SD-PCI Card

Before installing the 5136-SD-PCI driver, make sure that any drivers that have been used for this card previously (such as RSLinx or SST) have been uninstalled. Then restart the computer.

⬤ **Caution**: Failure to do so may result in unexpected consequences. A fresh PCI slot that has not been used with other DH+ cards before is recommended. This is not required for Windows NT.

⬤ **Note**:   Multiple instances of the SST PCI card are not currently supported. It is not recommended that users run multiple PCI cards of similar category (such as PKTX and PKTXD) while the SST PCI is running.

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

Removing Old Drivers: Example Procedure

Users familiar with the PKTX or the SST card may have seen something like the following image under Device Manager before.
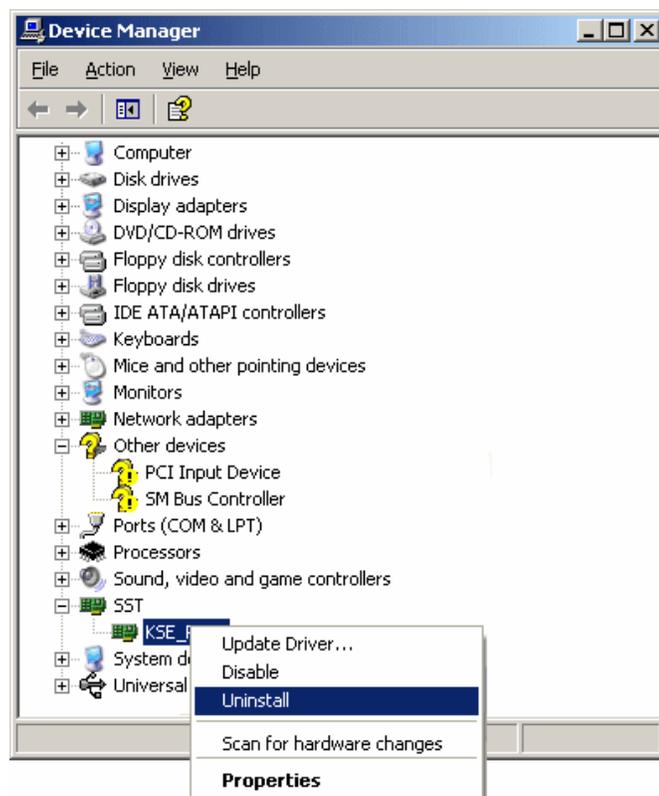
1. Expand SST. Select any driver beneath it and right-click and select **Uninstall**. This must be done for all drivers that are installed under SST.

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

3. Before the channel properties are set, users must have an additional driver installed for the SST PCI card.

Note: No other drivers or software are needed from any other vendor. Any additional driver/software that may be required are either supplied or recommended. When using Windows NT, the instructions described in are not required and should not be performed. The driver should automatically take care of the steps required for the NT installation.
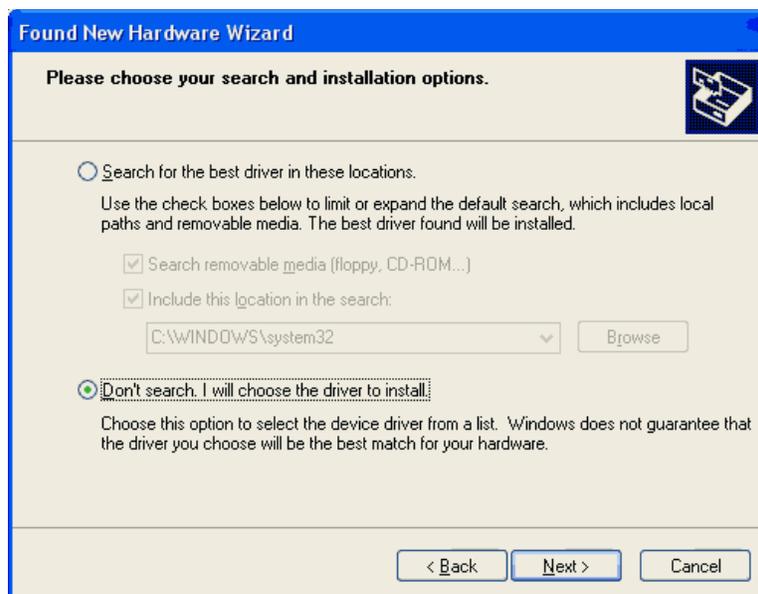
1. After the card has been installed, restart the PC. At start up, the Found New Hardware Wizard prompts to configure the newly detected hardware.

Note: The images below refer to "KSE_PKTXD2000" as an example, but names vary.

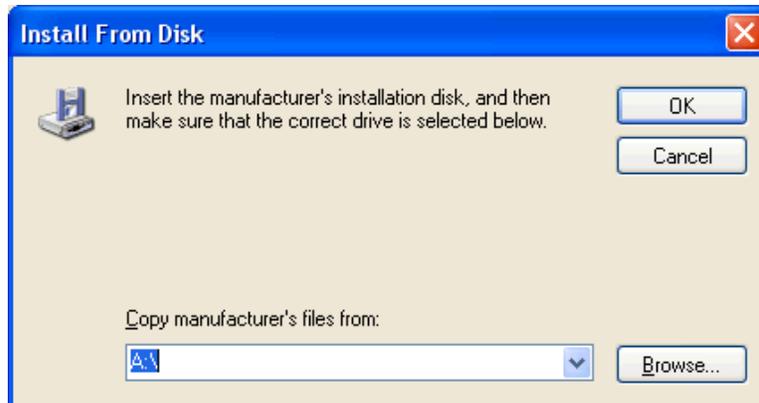2. Select **Install from a list or specific** location (Advanced) and click **Next**.

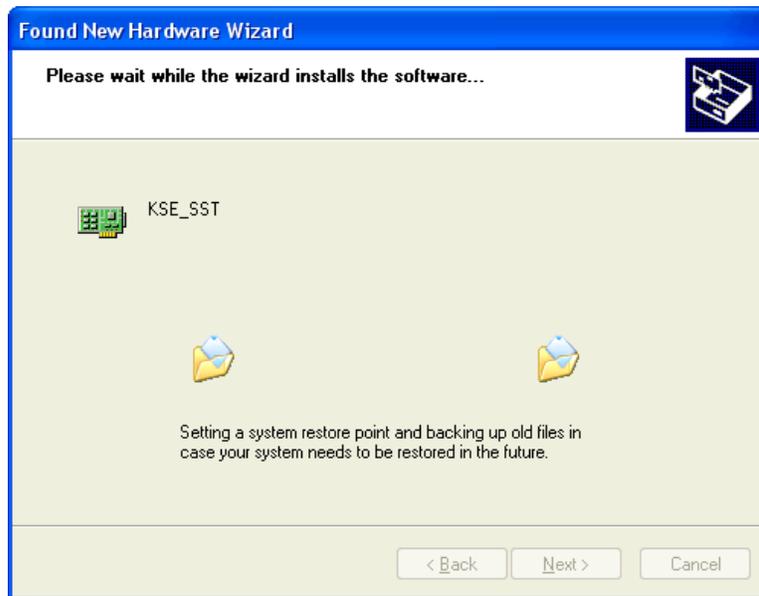3. Select **Don't search. I will choose the driver to install** and click **Next**.

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

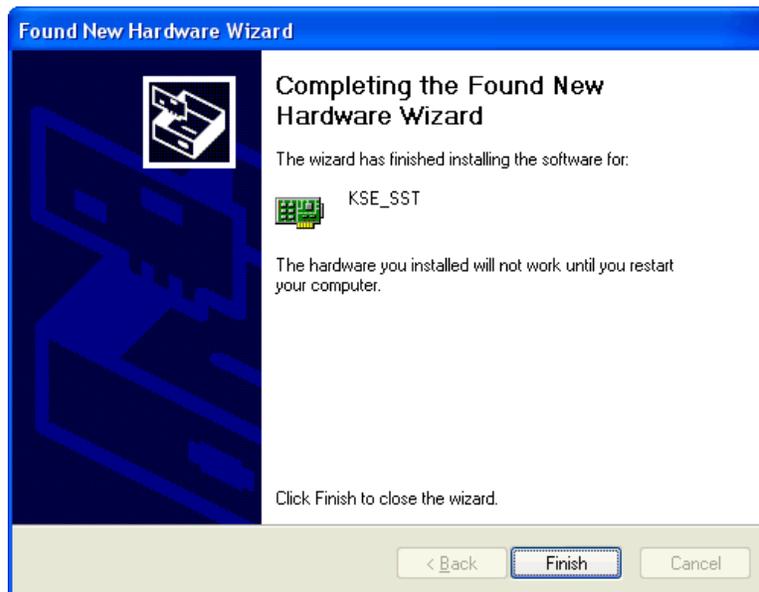5. Click **Browse...** and go to the C:\Program Files\<yourOPCserver>\drivers\Allen-Bradley DH+ directory. Multiple .inf files will be shown.

6. Select the KSE_SST2000.inf file and click **OK**.

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

8. Click **Finish** and restart the computer.

☀ **Note**:   If the computer still doesn't detect the SST-PCI device, users may have to try a different PCI slot and/or completely uninstall any driver installed under the current slot.

Channel Properties Setup

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

2. Select the **Interface Card** group.

3. Under the Interface Card, set the following:

*   **Board Type**: Select "5136-SD-PCI" from the drop-down menu.

*   **Network Type**: This driver currently supports only DH+ networks for 5136-SD-PCI cards.

- **Station Address**: This is the device's unique Node ID: 1-77 octal for DH+. Users must make sure that this ID doesn't conflict with any other Node ID on the network.

- **Baud Rate**: The available baud rates are 57.6K, 115K and 230K. Select the baud rate that matches the device configuration.

- **PCI Card Instance**: Currently, only a single instance of the SST PCI card is supported. Thus, the PCI Card Instance number for SST PCI will always be zero.

4. Click **Apply**.

5. Click **OK**.

8. Logix Device IDs

For information on ENI device ID setup, refer to 1761-NET-ENI Setup.

ControlLogix 5500 Ethernet

The device ID specifies the device IP address, as well as the slot number in which the controller CPU resides. Device IDs are specified as the following:

<IP or hostname>,1,[<optional routing path>],<CPU Slot>

Designator	Designator Type*	Description	Formats	Range
IP/Host Name	N/A	IP Address or host name.	Decimal	0-255
1	Port ID	Port to backplane.	Decimal	1
Optional Routing Path	Multiple Link, port pairs	Specifies a way out of the EtherNet/IP interface module and must equal 1 (port to the backplane).	Decimal	*
CPU Slot	Link Address	Slot number of the ControlLogix processor.	Decimal	0-255

For more information, refer to Connection Path Specification.

Example

123.123.123.123,1,0

This equates to an Ethernet/IP of 123.123.123.123. The port ID is 1 and the CPU resides in slot 0.

9. CompactLogix 5300 Ethernet Device ID

The device ID specifies the device IP address, as well as the slot number in which the controller CPU resides. Device IDs are specified as the following:

<IP or hostname>,1,[<optional routing path>],<CPU Slot>

Designator	Designator Type*	Description	Formats	Range
IP/Host Name	N/A	CompactLogix Ethernet IP Address or host name.	Decimal	0-255
1	Port ID	Port to backplane.	Decimal	1
Optional Routing Path	Multiple Link, port pairs	Specifies a way out of the Ethernet port and must equal 1 (port to the backplane).	Decimal	*
CPU Slot	Link Address	Slot number of the CompactLogix processor.	Decimal	0-255

For more information, refer to Connection Path Specification.

Example

123.123.123.123,1,0

This equates to CompactLogix IP of 123.123.123.123. The port ID is 1 and the CPU resides in slot 0.

FlexLogix 5400 Ethernet Device ID

The device ID specifies the device IP address, as well as the slot number in which the controller CPU resides. Device IDs are specified as the following:

<IP or hostname>,1,[<optional routing path>],<CPU Slot>

Designator	Designator Type*	Description	Formats	Range
IP/Host Name	N/A	1788-ENBT IP Address or host name.	Decimal	0-255
1	Port ID	Port to backplane.	Decimal	1
Optional Routing Path	Multiple Link, port pairs	Specifies a way out of the 1788-ENBT interface module and must equal 1 (port to the backplane).	Decimal	*
CPU Slot	Link Address	Slot number of the FlexLogix processor.	Decimal	0-255

*For more information, refer to Connection Path Specification.

Example

123.123.123.123,1,0

This equates to 1788-ENBT IP of 123.123.123.123. The port ID is 1 and the CPU resides in slot 0.

SoftLogix 5800 Device ID

The device ID specifies the SoftLogix PC IP address, as well as the virtual slot number in which the controller CPU resides. Device IDs are specified as the following:

<IP or hostname>,1,[<optional routing path>],<CPU Slot>

Designator	Designator Type*	Description	Formats	Range
IP/Host Name	N/A	SoftLogix PC NIC IP Address or host name.	Decimal	0-255
1	Port ID	Port to backplane.	Decimal	1
Optional Routing Path	Multiple Link, port pairs	Specifies a way out of the EtherNet/IP Messaging module and must equal 1 (port to the virtual backplane).	Decimal	*
CPU Slot	Link Address	Slot number of the SoftLogix processor in the virtual backplane.	Decimal	0-255

*For more information, refer to Connection Path Specification.

Example

123.123.123.123,1,1

This equates to SoftLogix PC IP Address of 123.123.123.123. The port ID is 1 and the CPU resides in slot 1.

🔹 *For information on supplementing a device ID with a routing path to a remote backplane, refer to Communications Routing.*

🔹 ***See Also:*** *SoftLogix 5800 Connection Notes*