1784-KT<sup>x</sup> Communication Interface Card
(Cat. Nos. 1784-KTX, -KTXD, and -KTS)
Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Allen-Bradley does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley publication SGI-1.1, Safety Guidelines for the Application, Installation and Maintenance of Solid-State Control (available from your local Allen-Bradley office), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

Reproduction of the contents of this copyrighted publication, in whole or part, without written permission of Rockwell Automation, is prohibited.

Throughout this manual we use notes to make you aware of safety considerations:

ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage or economic loss

Attention statements help you to:

- identify a hazard
- avoid a hazard
- recognize the consequences

Important: Identifies information that is critical for successful application and understanding of the product.
Adherence to European Union Directive Compliance

If this product or package is marked with the CE mark, the product complies with the following European Union Directives:

**Installation Requirements:** If this product is installed within the European Union or EEA regions, the following regulations apply.

**EMC Directive**
This product is tested to meet Council Directive 89/336/EEC Electromagnetic Compatibility (EMC) using a technical construction file and the following standards, in whole or in part:

- EN 50082-2 EMC – Generic Immunity Standard, Part 2 – Industrial Environment

The product described in this manual is intended for use in an industrial environment.

**Low Voltage Directive**

For specific information required by EN 61131-2, see the appropriate sections in this publication, as well as the following Allen-Bradley publications:

- Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1
- Guidelines for Handling Lithium Batteries, publication AG-5.4
- Automation Systems Catalog, publication B111

This equipment is classified as open equipment and must be installed (mounted) in an enclosure as a means of providing safety protection.
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Use this document to install and use the 1784-KTX, 1784-KTXD, and 1784-KTS Communication Interface Cards. This document introduces the cards and outlines these procedures.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Refer to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>configure the card</td>
<td>Chapter 2</td>
</tr>
<tr>
<td>install the card inside the computer</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>connect the card to devices and networks</td>
<td>Chapter 4</td>
</tr>
<tr>
<td>run card diagnostics for Windows NT</td>
<td>Appendix A</td>
</tr>
<tr>
<td>run card diagnostics for DOS</td>
<td>Appendix B</td>
</tr>
</tbody>
</table>

In this document, we refer to the 1784-KTX, 1784-KTXD, and 1784-KTS cards collectively as “1784-KTx card” or KTx card.” When one card differs from the other, this document individually calls out the cards by name.

Contents of Your Order

With this package you should receive:

- one 1784-KTx communication interface card
- one 1784-KTx Communication Interface Card User Manual, publication 1784-6.5.22
- one 3 1/2” 1784-KTx Utility diskette containing the installation and diagnostic programs, and the README.TXT file
- one 3 1/2” 1784-KTx Diagnostics for Microsoft Windows NT diskette

If you are missing any of these pieces, contact your Allen-Bradley sales representative.
If you ordered a 1784-KTS Interface Card

The contents of your order will differ slightly from what is listed on page P-1 of the user manual. 1784-KTS customers do not receive the utility disk.

With the 1784-KTS package, you should receive:

- one 1784-KTS communication interface card

- one 1784-KTx Communication Interface Card User Manual, publication 1784-6.5.22

If you are missing either of these pieces, contact your Allen-Bradley/Rockwell Automation sales representative.

Handle the Card

**ATTENTION:** The NetLinx 1784-KTx card uses CMOS technology, which is highly sensitive to electrostatic discharge (ESD). ESD may be present whenever you are handling the card. Handling the card without any ESD protection can cause internal circuit damage that may not be apparent during installation or initial use.

Take these precautions to guard against ESD damage:

- Before handling the card touch a grounded object to discharge any built-static charge.

- Avoid touching the backplane connector or interface connector pins on the 1784-KTx card.

- If the card is not in use, store it in the anti-static plastic-molded clamshell in which it was shipped.
Specifications
The operation parameters describe the environment within the KT\textsubscript{x} slot. Refer to the documentation for your computer for environmental requirements. The KT\textsubscript{x} card should not exceed those specifications.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational slot temperature</td>
<td>0 to 60ºC (32 to 140ºF)</td>
</tr>
<tr>
<td>Non-operational slot temperature</td>
<td>-40 to 85ºC (-40 to 185ºF)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>5 - 95% without condensation</td>
</tr>
<tr>
<td>Vibration</td>
<td>10 - 60 Hz, constant 0.012 in displacement</td>
</tr>
<tr>
<td>Operational shock</td>
<td>30 G peak for 11 ± 1 ms</td>
</tr>
<tr>
<td>Non-operational shock</td>
<td>50 G peak for 11 ± 1 ms</td>
</tr>
<tr>
<td>Power dissipation (for the 1784-KTXD)</td>
<td>600 mA @ 5V dc 3.15 W</td>
</tr>
<tr>
<td></td>
<td>20 mA @ +12V dc 240 mW</td>
</tr>
<tr>
<td></td>
<td>20 mA @ -12V dc 240 mW</td>
</tr>
</tbody>
</table>

Agency Certification
(when product or package is marked)

- •
- •

Marked for all applicable directives

Conventions
We use these conventions in this manual:

For Windows applications screen displays and prompts are shown as screen and button captures:
For DOS applications screen displays and prompts are shown as screen captures and text instructions.

- Press ENTER to continue with the installation
- F10

Text that you type is shown as:

\texttt{a:\install c:}

**Summary of Changes**

Several additions and changes to the KT\textsubscript{x} card and software information have been made. The additions and changes to this manual include:

<table>
<thead>
<tr>
<th>Information on:</th>
<th>Is in:</th>
</tr>
</thead>
<tbody>
<tr>
<td>how to handle the card</td>
<td>Preface</td>
</tr>
<tr>
<td>Rockwell Software support</td>
<td>Preface</td>
</tr>
<tr>
<td>supported features</td>
<td>Chapter 1</td>
</tr>
<tr>
<td>diagnostics for Windows NT</td>
<td>Appendix A</td>
</tr>
</tbody>
</table>

**Revision Bars**

We use revision bars to call your attention to new or revised information. A revision bar appears as a thick black line on the outside edge of the page as indicated here.
Worksheet Tables
We recommend that you make one copy of each worksheet for each KTx card or channel (1784-KTXD). See Chapter 2.

Related Publications

<table>
<thead>
<tr>
<th>Publication Title</th>
<th>Pub. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1784-KTx Scanner Reference Manual</td>
<td>1784-6.5.20</td>
</tr>
<tr>
<td>1784-KTx Dual-port Reference Manual</td>
<td>1784-6.5.21</td>
</tr>
<tr>
<td>1784-CP12 Cable Packing Data</td>
<td>1784-2.41</td>
</tr>
<tr>
<td>1784-CP13 Cable Packing Data</td>
<td>1784-2.44</td>
</tr>
<tr>
<td>1784-CP14 Cable Packing Data</td>
<td>1784-2.45</td>
</tr>
<tr>
<td>1784-CP15 Cable Packing Data</td>
<td>1784-2.43</td>
</tr>
<tr>
<td>1784-CP16 Cable Packing Data</td>
<td>1784-2.42</td>
</tr>
<tr>
<td>Data Highway/Data Highway Plus/Data Highway II/Data Highway-485 Cable Installation Manual</td>
<td>1770-6.2.2</td>
</tr>
</tbody>
</table>

Rockwell Software Supports KTx Cards

<table>
<thead>
<tr>
<th>Technical Support</th>
<th>Access at</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet Web Site</td>
<td><a href="http://www.ab.com">www.ab.com</a> - for non-registered members</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.ab.com/mem/technotes/techmain.html">www.ab.com/mem/technotes/techmain.html</a> - registered members</td>
</tr>
<tr>
<td>Autofax System</td>
<td>440.646.5436 - requires a touch-tone telephone</td>
</tr>
<tr>
<td>Rockwell Software</td>
<td>440.646.5800 - For post-sales support and information on which Rockwell Software products support the KTx card.</td>
</tr>
</tbody>
</table>
1784-6.5.22 - November 1999

Chapter 1

Introduction to the 1784-KTx Communication Interface Cards

Your 1784-KTx communication interface card (cat. nos. 1784-KTX, 1784-KTXD, and 1784-KTS) is an ISA half-sized card that must be inserted into a 16-bit ISA or EISA expansion slot.

**Important:** You **must not** place this card in an 8-bit expansion slot. Improper operation and damage to the card will result.

Table 1.A shows the 1784-KTx card features.

**Table 1.A Features supported by KTx cards**

<table>
<thead>
<tr>
<th>KTx card catalog #:</th>
<th># of channels:</th>
<th>Active node on these networks:</th>
<th>Acts as remote I/O scanner:</th>
<th>Supported by this Allen-Bradley software:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1784-KTX</td>
<td>1</td>
<td>DH+ or DH-485</td>
<td>yes</td>
<td>• 1784-KTx Scanner Reference Set</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PLC-2 and PLC-3 direct-connect(1)</td>
<td></td>
<td>• 6200 Series(3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• INTERCHANGE™</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• AI</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• RS Logix5 and RSLogix 500 via RSLinx</td>
</tr>
<tr>
<td>1784-KTXD</td>
<td>2</td>
<td>DH+ and/or DH-485(2)</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1784-KTS</td>
<td>1</td>
<td></td>
<td>yes</td>
<td>• 1784-KTx Scanner Reference Set</td>
</tr>
</tbody>
</table>

(1) Available via 6200 Series software
(2) Available only on channel 1
(3) Available in version 4.5 or later
How the 1784-KTx Card Operates

The 1784-KTX and -KTXD cards:

- communicate with nodes on Data Highway networks, including PLC-2®, PLC-3®, and on Data Highway Plus networks, including PLC-5®, and SLC 5/04 processors, and SLC 5/01™, SLC5/02, and SLC 5/03 processors (only via 1784KA5)

- communicate with SLC™ processors on DH-485 networks

- act as a remote I/O scanner

The 1784-KTS card acts only as a remote I/O scanner.

The 1784-KTx performs data transmission, management, and local network diagnostics. The interface to the host processor is through a board-resident dual-port memory.

Allen-Bradley interface software (including RSLogix via RSLinx, AI, 6200, and INTERCHANGE) manages data transmission and reception through dual-port memory.

Remember to set the base memory address on the KTx card so that it does not interfere with selected addresses of other expansion cards in your computer. On dual-channel cards, set two addresses.

**Important:** Although the 1784-KTXD has two channels, you cannot use the card to directly bridge between two networks.

What to Do Next

Chapter 2 tells you how to configure the card hardware.
Configure the Card Hardware

Before you install the KTx card inside your computer, you must set the:

- base memory address - the card’s physical addresses for the expansion memory area of the host processor’s system memory, that enables the KTx card and the host computer to exchange data through the dual-port interface
- card’s interrupt setting

Select the Base Memory Address Location

The host computer and the KTx card exchange data via a dual-port interface. The dual-port interface requires 4 Kbytes of memory (2 Kbytes for dual-port and 2 Kbytes for the rest of the interface). It begins at the specified base memory address location. You must select an area where there is at least a 4 Kbyte memory block available. If you have MS-DOS 6.0 or later, use the memory option in Microsoft Diagnostics (MSD) to identify available memory.

The 1784-KTx cards come set to memory address(es):

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Channel</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>1784-KTS</td>
<td>1</td>
<td>D700:</td>
</tr>
<tr>
<td>1784-KTX</td>
<td>1</td>
<td>D700:</td>
</tr>
<tr>
<td>1784-KTXD</td>
<td>1</td>
<td>D700:</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>D600:</td>
</tr>
</tbody>
</table>
ATTENTION: If you have a two-channel card, you must set the base addresses to different values—each channel must have a unique address. Setting the base addresses to the same address can damage the KTx card. If another card or channel is already using a channel’s default memory address, you must pick a new address for the channel. Each channel on each card must have a separate and unique address.

Important: When selecting configuration settings, check for conflicts with other interface cards and system memory. If there is a conflict, the system will not operate properly. To avoid the conflict, you must change the base address of the channel via rotary switch settings to an open memory address.

Important: If you have a 386, 486, or Pentium host computer, you must find a way to disable caching and shadow memory for at least the 4K of memory space occupied by the KTx. This can usually be accomplished through your CMOS set-up program or memory manager, and must be done before running application with the KTx card.

To configure the base memory address, you turn rotary switches on the 1784-KTx card.

1. Determine addresses for the channel(s) on your KTx card.
   
   A. Use Table 2.A on page 2-3 to determine the recommended memory address settings for your Allen-Bradley products.

   B. Use Table 2.B on page 2-4 to determine which addresses are available for the KTx card channel(s).
Table 2.A Recommended memory address settings

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Channel #</th>
<th>Recommended Memory Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1784-T35</td>
<td>1</td>
<td>C800:</td>
</tr>
<tr>
<td>1784-T50</td>
<td>2</td>
<td>C800:</td>
</tr>
<tr>
<td>1784-T50</td>
<td>1</td>
<td>C300:</td>
</tr>
<tr>
<td>1784-T50</td>
<td>2</td>
<td>C400:</td>
</tr>
<tr>
<td>T53 Industrial Programming Terminal</td>
<td>1</td>
<td>D700:</td>
</tr>
<tr>
<td>T53 Industrial Programming Terminal</td>
<td>2</td>
<td>D600:</td>
</tr>
<tr>
<td>T60 Industrial Workstations</td>
<td>1</td>
<td>D300:, D700:, or D800:</td>
</tr>
<tr>
<td>T60 Industrial Workstations</td>
<td>2</td>
<td>D200:, D600:, or D800:</td>
</tr>
<tr>
<td>6180 Workstations</td>
<td>1</td>
<td>D800:</td>
</tr>
<tr>
<td>6180 Workstations</td>
<td>2</td>
<td>D800:</td>
</tr>
<tr>
<td>6181 Workstations</td>
<td>1</td>
<td>D800:</td>
</tr>
<tr>
<td>6181 Workstations</td>
<td>2</td>
<td>D800:</td>
</tr>
<tr>
<td>6155 Workstations</td>
<td>1</td>
<td>D700:</td>
</tr>
<tr>
<td>6155 Workstations</td>
<td>2</td>
<td>D600:</td>
</tr>
</tbody>
</table>

**Important:** Verify within the 6155 workstations bios that any memory shadowing is disabled to prevent conflict with the dual port memory of the KTx.
Table 2.B System Memory Allocation

<table>
<thead>
<tr>
<th>System Memory Address</th>
<th>Typical PC Assignments:</th>
<th>Your System:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000:0000-07000:FFFF</td>
<td>521 Read/Write Memory on System Board</td>
<td></td>
</tr>
<tr>
<td>8000:0000-09000:FFFF</td>
<td>128K Read/Write Memory Expansion in I/O Channel</td>
<td></td>
</tr>
<tr>
<td>A000:0000-C700:0FFF</td>
<td>Video Buffer</td>
<td></td>
</tr>
<tr>
<td>C800:0000-</td>
<td>Expansion Card Area</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Area Available for KTx Memory Addresses)</td>
<td></td>
</tr>
<tr>
<td>CF00:0000-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D300:0000-</td>
<td>White areas are available for KTx card</td>
<td></td>
</tr>
<tr>
<td>D700:0000-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E000:0000-F000:FFFF</td>
<td>128K ROM Reserved on System Board</td>
<td></td>
</tr>
<tr>
<td>10000:0000-FF000:FFFF</td>
<td>Unavailable for KTx</td>
<td></td>
</tr>
</tbody>
</table>

2. Record your selection(s) in Table 2.C on page 2-5.

Remember that switches 1 and 3 represent the high order digits and that switches 2 and 4 represent the low order digits.

For example:

![Diagram of switch positions]
**Table 2.C Address Selections**

**Record the base memory address for the 1784-KTx card's channel 1:**

<table>
<thead>
<tr>
<th>Card:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Slot number</td>
<td></td>
</tr>
</tbody>
</table>

Using default address:
- Yes [ ]
- No [ ]

Channel 1

If no, new memory address:

**Record the base memory address for the 1784-KTx card's channel 2:**

<table>
<thead>
<tr>
<th>Card:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Slot number</td>
<td></td>
</tr>
</tbody>
</table>

Using default address:
- Yes [ ]
- No [ ]

Channel 2

If no, new memory address:
Set the Card’s Switches

**ATTENTION:** When you set the switches, be certain to avoid touching other components on the card.

To set the card’s switches, follow these steps:

1. Follow the card handling instructions on page P-2.
2. Remove the 1784-KTx card from the anti-static clamshell.
3. Use the decision table below.

<table>
<thead>
<tr>
<th>If you need to:</th>
<th>Then:</th>
</tr>
</thead>
<tbody>
<tr>
<td>use the card’s default memory address settings shown on page 2-1</td>
<td>go to the next section, Selecting the Interrupt Setting</td>
</tr>
<tr>
<td>set a new base memory address</td>
<td>turn the knobs to reflect the address(es) from Table 2.C on page 2-5</td>
</tr>
</tbody>
</table>

Your switches might resemble the switches shown here.

Channel 2
SW1 SW2

Channel 1
SW3 SW4

Channel 2 address shown in DB00: position

Channel 1 address shown in D700: position

42069
Select the Interrupt Setting

**Important:** If you need to use the KT\(x\) as a remote I/O scanner within a SoftLogix5 system, you must set an interrupt for the scanner channel.

**Important:** When selecting configuration settings, check for conflicts with other interface cards and system memory. If there is a conflict, the system will not operate properly. To avoid the conflict, select a unique interrupt setting for each channel. If another card is already using a channel’s default interrupt, you *must* pick a new interrupt for the channel.

**About KT\(x\) Interrupts**

The 1784-KT\(x\) cards are set to these interrupt(s):

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Channel</th>
<th>Interrupt</th>
</tr>
</thead>
<tbody>
<tr>
<td>1784-KTS</td>
<td>1</td>
<td>no interrupt</td>
</tr>
<tr>
<td>1784-KTX</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1784-KTXD</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
### Configure the Card Hardware

**If you are:** | **Then:**
--- | ---
Using the card’s default interrupt settings, i.e., no interrupt | Go to the next section, Installing the Card Inside the Computer
Setting new interrupts | Move the jumper to the new interrupt location(s) (as entered on Table 2.E, page 2-10)

---

**Important:** If you are using the “no interrupt” setting, you must place the jumper vertically over two pins on the right-side row as shown. This way you can save the jumper for future use. Placing the jumper on the left-side row will cause interrupt problems on the motherboard.
1. Determine the interrupt(s) for the channel(s) on your KTx card. Use Table 2.D to determine which interrupts are available for the KTx card channel(s).

**Important:** If you are using the KTx for remote I/O scanner emulation, you must set an interrupt for the scanner channel.

**Table 2.D Host Computer IRQ Assignments**

<table>
<thead>
<tr>
<th>Interrupts</th>
<th>Assignments</th>
<th>Your System</th>
</tr>
</thead>
<tbody>
<tr>
<td>IRQ0</td>
<td>Timer Output</td>
<td></td>
</tr>
<tr>
<td>IRQ1</td>
<td>Keyboard (Output Buffer Full)</td>
<td></td>
</tr>
<tr>
<td>IRQ2</td>
<td>Interrupt from Controller 2</td>
<td></td>
</tr>
<tr>
<td>IRQ3</td>
<td>Serial Port 2</td>
<td></td>
</tr>
<tr>
<td>IRQ4</td>
<td>Serial Port 1</td>
<td></td>
</tr>
<tr>
<td>IRQ5</td>
<td>Parallel Port 2</td>
<td></td>
</tr>
<tr>
<td>IRQ6</td>
<td>Diskette Controller</td>
<td></td>
</tr>
<tr>
<td>IRQ7</td>
<td>Parallel Port 1</td>
<td></td>
</tr>
<tr>
<td>IRQ8</td>
<td>Real-time Clock Interrupt</td>
<td></td>
</tr>
<tr>
<td>IRQ9</td>
<td>Software Redirected to INT 0AH (IRQ2)</td>
<td></td>
</tr>
<tr>
<td>IRQ10</td>
<td>Available</td>
<td></td>
</tr>
<tr>
<td>IRQ11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IRQ12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IRQ13</td>
<td>Co-processor</td>
<td></td>
</tr>
<tr>
<td>IRQ14</td>
<td>Fixed Disk Controller</td>
<td></td>
</tr>
<tr>
<td>IRQ15</td>
<td>Available</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** White areas are available for KTx card if you disable the function within the PC's BIOS.

2. Record your selection(s) in Table 2.E
### Important:
If you are using the “no interrupt” setting, you must place the jumper vertically over two pins on the right-side row as show on page 2-7. This way you can save the jumper for future use. Placing the jumper on the left-side row will cause interrupt problems on the motherboard.

#### Record the interrupt setting for the 1784-KTx card’s channel 1:

<table>
<thead>
<tr>
<th>Card:</th>
<th>Slot number</th>
<th>Using default address:</th>
<th>If no, new interrupt:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes [□] No [□]</td>
<td></td>
</tr>
</tbody>
</table>

#### Record the interrupt setting for the 1784-KTx card’s channel 2:

<table>
<thead>
<tr>
<th>Card:</th>
<th>Slot number</th>
<th>Using default address:</th>
<th>If no, new interrupt:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes [□] No [□]</td>
<td></td>
</tr>
</tbody>
</table>
New DH+™ Specification - Link Baud Rate

Allen-Bradley has added 230k baud rate enhancements to the DH+™ firmware of the KTx.

Note this update to the KTx dualport memory map for DH+, which is documented in publication 1784-6.5.21

<table>
<thead>
<tr>
<th>:0007h</th>
<th>Link Baud Rate</th>
<th>INI</th>
<th>FCh = 57.6 Kbaud</th>
<th>FEh = 230.4 Kbaud</th>
<th>R.........W</th>
<th>Host writes a valid value (KTx baud rate) to byte:00007h. KTx reads at start-up.</th>
</tr>
</thead>
</table>

**Important:** Check the product documentation for your RSI communication software to see if the product supports 230k baud rate.

**What to Do Next**
Chapter 3 tells you how to install the card inside your computer.


Chapter 3

Install the Card Inside the Computer

You’ve set the memory addresses and interrupts; you’re ready to place the KTx card inside your computer.

Before You Begin

Consider these points before you begin:

• Do I know everything I need to know to accomplish my task?
• Do I have the proper tools at hand?
• Do I understand where I can and can’t put this card?

On the Right Track?

Be certain that you know how to:

• configure the computer’s options before you install the 1784-KTx
• install hardware into your computer’s expansion slots

Consult your computer’s documentation for specific information.

Where’s Your Screwdriver?

You need one of these tools to remove the cover from your central processing unit (CPU):

• Phillips-head screwdriver
• flat-head screwdriver
The KT\textsubscript{x} Skirt Area

**Important:** As shown in Figure 3.1, placing the card in certain computers may cause mechanical interference with improperly placed components on the motherboard of the computer. Be certain to position the card away from components that can touch the KT\textsubscript{x}’s skirt area.

**Figure 3.1 How Mechanical Interference Occurs**
Access the Computer’s Expansion Slots

To install the KTx card, you must have access to the computer’s bus. Refer to your computer’s hardware manual for instructions about how to:

1. Shut down and halt the host computer.

2. Turn off power to the computer.

**Important:** If you disconnect the ac power from the computer, you lose the chassis ground. Electrostatic damage (ESD) protection is lost.

3. Remove the computer’s CPU cover (according to the manufacturer’s instructions).

4. Select a vacant 16-bit ISA or EISA expansion slot.

**Important:** The 1784-KTx will function only in a 16-bit ISA or EISA expansion slot.

5. Remove the rear bracket slot’s expansion cover by loosening the screw on the back of the computer.
E3 Jumper Sets Operating Mode

The E3 jumper sets the card to 8- or 16-bit mode.

**Important:** You must place the card in a 16-slot connector regardless of the chosen mode of operation. Eight-bit mode is included only as a fall-back in case of system issues with 16-bit operation; you should run the card in 16-bit mode.

<table>
<thead>
<tr>
<th>To set this mode:</th>
<th>Jumper these pins:</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-bit*</td>
<td>pins 2 and 3, the two left-most pins</td>
</tr>
<tr>
<td>8-bit</td>
<td>pins 1 and 2, the two right-most pins</td>
</tr>
</tbody>
</table>

*Shipped from the factory in default 16-bit mode*
**Insert the Card**

To insert the card inside the computer:

1. Follow the instructions on how to handle the card on page P-2.

2. Be certain that you have set correctly all of the switches and jumpers on the card. See Chapter 2.

3. Turn off power to the computer.

**Important:** If you disconnect the ac power from the computer, you lose the chassis ground. Electrostatic damage (ESD) protection is lost.

4. Loosen the expansion slot screw and remove shield outside retaining bracket (ORB).

5. Insert the KTx card into the edge connector and tighten the expansion slot screw on the KTx ORB.

6. Restore power to the computer.

7. Run the appropriate version (DOS or NT) of the KTx diagnostics from the appropriate disk now. For instructions on installing the Windows NT diagnostic see Appendix A and see Appendix B for the DOS diagnostic.

8. Activate the application software.

9. Be certain that the KTx settings are compatible with the application software program.

   If it does not come up correctly, you may have to change the switch settings. When the unit comes up correctly, go to step 10.

10. Turn off power to the computer.

11. Replace CPU cover.

**What to Do Next**

Chapter 4 tells you how to connect the KTx card to various networks and devices.
Install the Card Inside the Computer
Connect the Interface Card

You can connect the KTx card to these networks and devices:

- **DH+ networks**
  - classic PLC-5 processors
  - enhanced PLC-5 processors
  - SLC 5/04 processors
  - ControlLogix DH+/RIO

- **DH-485 networks**
  - selected SLC 500 processors
  - remote I/O networks acting as a scanner

---

**1784-KTX Connections**

- **Remote I/O**
  - 3. Clear
  - 2. Shield/Drain
  - 1. Blue

- **DH+**
  - 3. Blue
  - 2. Shield/Drain
  - 1. Clear

Use the PLC-2 or PLC-3 direct-connect cable (1784-CP15 and 1784-CP16 respectively)

1. Earth Ground
2. Shield/Drain
3. Signal Ground
4. Channel B
5. Channel A
6. Termination Resistance
1784-KTS Connections

1784-KTXD Connections

Remote I/O
- 3. Clear
- 2. Shield/Drain
- 1. Blue

DH+
- 3. Blue
- 2. Shield/Drain
- 1. Clear

Remote I/O
- 3. Clear
- 2. Shield/Drain
- 1. Blue

Remote I/O
- 3. Clear
- 2. Shield/Drain
- 1. Blue

1. Earth Ground
2. Shield/Drain
3. Signal Ground
4. Channel B
5. Channel A
6. Termination Resistance
Before You Begin

Before you make the connections, be certain that you have the correct cables. This table lists the cables for various programmable controllers and processors:

<table>
<thead>
<tr>
<th>For:</th>
<th>Use cable with catalog number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-5/10, -5/12, -5/15, -5/25, -5/VME (6008-LTV) and PLC-5/250 classic programmable controllers</td>
<td>1784-CP12</td>
</tr>
<tr>
<td>SLC 500 processors</td>
<td>1784-CP14</td>
</tr>
<tr>
<td>PLC-2 direct connect</td>
<td>1784-CP15</td>
</tr>
<tr>
<td>PLC-3 direct connect</td>
<td>1784-CP16</td>
</tr>
<tr>
<td>DH-485</td>
<td>BELDEN #9842 (1) (2)</td>
</tr>
<tr>
<td>remote I/O / DH+</td>
<td>1770-CD (1) (3)</td>
</tr>
</tbody>
</table>

(1) Cables used for construction of custom cables
(2) Mating Connector: A-B PN 94199-06 or Phoenix Order No. 1849406
(3) Mating Connector: A-B PN 941999-03 or Phoenix Order No. 1849396

For additional cable information, see these Allen-Bradley publications:

<table>
<thead>
<tr>
<th>Publication:</th>
<th>Number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1784-CP12 Cable Packing Data</td>
<td>1784-2.41</td>
</tr>
<tr>
<td>1784-CP13 Cable Packing Data</td>
<td>1784-2.44</td>
</tr>
<tr>
<td>1784-CP14 Cable Packing Data</td>
<td>1784-2.45</td>
</tr>
<tr>
<td>1784-CP15 Cable Packing Data</td>
<td>1784-2.43</td>
</tr>
<tr>
<td>1784-CP16 Cable Packing Data</td>
<td>1784-2.42</td>
</tr>
</tbody>
</table>
Connect the 1784-KTx Card to DH+ Devices
In your application, you may need to use the KTx card to communicate with a single device or multiple DH+ devices via a DH+ network. This section shows you how to connect to a classic or an enhanced PLC-5 processor.

Connect the Card to a Classic PLC-5 Processor
To connect the 1784-KTX or-KTXD card to a classic PLC-5 processor, follow these steps:

1. Turn off power to the computer.

   Important: If you disconnect the ac power from the computer you lose the chassis ground. Electrostatic damage (ESD) protection is lost.

2. Connect the 3-pin Phoenix end of the CP12 cable to the KTx card.
3. Connect the 9-pin D-shell end directly to the 9-pin D-shell connector on the front of the classic PLC-5 processor.

4. Restore power to the computer.
Connect the Card to an Enhanced PLC-5 Processor

To connect the 1784-KTX or -KTXD card to an enhanced PLC-5 processor, use a 1784-CP12 cable and a 1784-CP7 adapter. Follow these steps:

1. Connect the 3-pin Phoenix end of the CP12 cable to the KTx card.

2. Connect the 9-pin D-shell connector to the CP7 adapter.

3. Connect the adapter to the connector on the front of the enhanced PLC-5 processor.

For additional information about the 1784-CP7 adapter, refer to publication 1784-2.29, the CP7 Adapter Installation Data.
Terminate the Last Node
You must terminate both ends of your DH+ network. If the KT\textsuperscript{x} is the last physical node on your network, you must set the switch on the CP12 to terminate the link as shown below.

![Termination Diagram]

**Connect the Card to a Data Highway Plus Network**
To connect the 1784-KTX or -KTXD card to a Data Highway Plus network, use Allen-Bradley 1770-CD or approved cable to construct custom cable.

**Important:** You must terminate the last physical node of the network with a resistor of appropriate value.

**Evaluate 1784-KTx Card Connection Options**
In your application, you may need to use the 1784-KTx card to communicate with:

- multiple DH-485 stations (for example, SLC 5/0x programmable controllers) via the DH-485 network (page 4-8)
- a single SLC 500 via a point-to-point DH-485 link (page 4-9)

Figure 4.1 and Figure 4.2 illustrate these applications.
Connect the Card via a DH-485 Network

Figure 4.1 shows an example of a network consisting of three SLC 500 controllers and one programming station. This configuration requires the 1784-KTX or -KTXD card and three link couplers:

- An SLC 500 CPU is connected to each of the link couplers (1747-AIC) with a 1747-C11 cable.

- The 1784-KTX or -KTXD card is connected to the network at one of the link couplers, as shown in Figure 4.1.

- The communication cable consists of three segments of cable daisy-chained at each link coupler.

Figure 4.1 Communicate to multiple SLC 500s via the DH-485 network
Connect the Card to an SLC 500 Processor

Figure 4.2 shows an example of a point-to-point link consisting of an SLC 500 processor and a programming station. This configuration requires the 1784-KTX or -KTXD card and an SLC 500 processor. The SLC 500 CPU is connected directly to the 1784-KTX or -KTXD card with a 1784-CP14 cable, as shown.

To connect an SLC family processor to the KTx card, you:

1. Connect the termination resistor end of the CP14 cable to the KTx card.
2. Connect the RJ-45 connector directly to the phone-jack connector on the front of the SLC processor.
Terminate the Last Node

You must terminate both ends of your DH+ network. If the KT$x$ is the last node on your network, you must set the switch on the CP14 to terminate the link as shown below.

Refer to publication 1770-6.2.2, Data Highway/Data Highway Plus/Data Highway II/Data Highway-485 Cable Installation Manual, for additional information about cable issues.

**What to Do Next**

If you have read each chapter, completed the worksheets, run diagnostics, and still have questions, please call Rockwell Automation Technical Support at 440.646.5800.
Run the 1784-KTx Card Diagnostics for Windows NT

Read this chapter to learn how to operate the 1784-KTx card on Windows NT. Read the following before you install your 1784-KTx card.

**Important:** The 1784-KTS card will not run the dual-port test. It will attempt to run and fail.

The Windows NT diagnostics support the 1784-KTX, -KTXD, and -KTS cards at all addresses. It also supports the 1784-PKTX, -PKTXD, and -PKTS cards but only if the cards jumper is set to memory addresses below 1 megabyte.
Install the Diagnostics

Be aware of the following important points before installing the Windows NT diagnostics for 1784-KTx card.

**Important:** Before you can install the diagnostics for the 1784-KTx card, you must be logged in as an administrator of the machine or have administrator privileges. Being an administrator gives you permission to install or make changes to the machine software. If you try to install the driver without being an administrator, you will get error messages and the diagnostics will not install.

- We recommend running Windows NT 4.0 with Service Pack 3 or later, but it is not required.

Follow the procedure below to install the 1784-KTx diagnostics for Windows NT.

1. Start the install process with your machine off.

2. Install the 1784-KTx card into your computer by following the card installation instructions in Chapter 3.
3. Turn your machine on and logon as an administrator.

**Important:** Remember, in order for the installation process to run correctly, you must have (administrator) privileges to install the software.

4. Insert the installation diskette into the floppy disk drive.

**Important:** We strongly recommend that you exit all Windows programs before running this utility. We cannot guarantee that data will not be lost.

5. Access the Run window by selecting:

The Run dialog box appears.
6. Type the path a:\setup.exe. Substitute a:\ for the drive of your floppy disk, i.e. b:\.

7. Click \OK\.

Please wait until InstallShield is finished.
8. Read the information and decide either to continue or to cancel.

9. Click Next to continue with the install.
You see:

![Software License Agreement](image)

10. To accept agreement and continue, click **Yes**.
You see:

![Image of Information dialog box]

11. Click [Next] if you have administrator permissions.

If you don’t know if you have administrator permissions, click [Next] and see if the install process continues and go to Step 10. If the process does not continue you don’t have administrator permissions, contact your Systems Administrator.
12. Now you have the opportunity to choose the destination of the software.

13. Click Next to accept the default location (recommended). If you would like to change the destination folder, click Browse...
14. After you choose to select the default destination. Select a program folder. The default is displayed. If you choose not to use the default, click on the folder you created or assigned in the previous window.

15. Click **Next** to accept the default.
The install process is very fast. You will see a couple small windows appear and disappear quickly. When the installation process is over you see:

![Image of installation process]

16. **Click Finish** to end the install process.
You see:

**Reboot Now?**

You must reboot your system before this program will run.

- [ ] Yes, I want to restart my computer now.
- [ ] No, I will restart my computer later.

**OK**

17. Decide whether or not you want to reboot now or later and click **OK**.

**Important:** You must reboot before this program will be able to run.
Run the 1784-KTx Diagnostics for Windows NT

This section contains instructions for you to run 1784-KTX, -KTXD, and KTS diagnostics, which check network and host communications, interrupts, and memory access.

Important: The 1784-KTS card will not run the dual-port test. The test will attempt to run and fail.

When Do I Run Diagnostics?
Run KTx diagnostics if:

- you just installed the KTx card
- you want to test if you have set up the KTx card correctly
- you are unable to communicate with the PLC processor
- remote I/O scanner is unable to communicate with adapters

Troubleshooting the KTx Card
If your KTx card is not functioning properly, follow these steps:

1. If you changed the default settings for the KTx card, check and correct the configuration. You may have configured the KTx card at an address already in use by another module.

2. Continue with the instructions in this appendix to run the diagnostics to determine if there are any hardware failures.

3. If you receive a “No KTx cards are detected” error message see page A-17 for error message explanation.

4. If you have followed the directions for correcting errors on page A-17 and still have an error, call Rockwell Automation Customer Support at 440.646.5800.
Follow these instructions to run the KTx diagnostic tool for Windows NT:

1. Select Start.
2. Select Programs.
4. Select KTXDIAG.EXE.
5. Type the number of the card that you need to test.

You see:
6. Decide whether or not you want to load and view the network protocol (network who).
   - Yes displays the protocol.
   - No displays the previous menu.

When you load the protocol, you see:

7. Review the information and if you are connected to a DH+ network and you only see one active node then you will want to check:
   - that the KTx DH+ node is unique (this utility only allows the KTx to be at node 77)
   - that the baud rate is not mismatched (this utility only allows 57.6 kbaud)
   - for bad cable or wiring. Check cable pinouts and press any key to continue.
8. Either exit or continue to test other cards installed.
Error Message
The following error message can occur when you run the diagnostics tool.

No KTx cards are detected

If you receive this message, no cards were found installed in your computer.

Reasons that the diagnostic tool did not detect your card:

• it did not get the resources you assigned to the card
• unavailable base memory address settings

Follow the instructions in Chapter 2 and try the diagnostics again. If you continue to get this error, call Rockwell Automation Customer Support at 440.646.5800.

• incorrect seating in the card slot

Follow the card installation instructions in Chapter 3 and try the diagnostics again. If you continue to get this error, call Rockwell Automation Customer Support at 440.646.5800.
View the readme.txt file

Please view the readme.txt for additional information.

You should probably uninstall this program after you have verified your KTX card's operation.

To uninstall, go to the control panel, select "add/remove programs", and select "KTX Diagnostic".
**Remove the Card’s Diagnostics in Windows NT**

We recommend uninstalling the diagnostics program after you have verified your card’s operation.

You can access the uninstaller through Windows NT’s Add/Remove programs applet to remove the card’s drivers from your system.

1. Access the Control Panel by selecting Start/Settings/Control Panel, or go to My Computer and double click on Control Panel.

2. Double-click the Add/Remove Programs icon.

3. Click on KTX Diagnostic to select the program.

4. Click **Add/Remove**.
You see:

5. Click [Yes] to remove the diagnostics from your computer.

6. Close the Control Panel.
Run the 1784-KTx Diagnostics for DOS

This appendix contains instructions for you to run 1784-KTX, -KTXD, and KTS diagnostics, which check network and host communications, interrupts, and memory access.

Important: The 1784-KTS card will not run the dual-port test, i.e., it will attempt to run and fail.

When Do I Run Diagnostics?
Run KTx diagnostics if:

• you just installed the KTx card
• you want to test if you have set up the KTx card correctly
• you are unable to communicate with the PLC processor
• remote I/O scanner is unable to communicate with adapters
Troubleshooting the KTx Card

If your KTx card is not functioning properly, follow these steps:

1. If you changed the default settings for the KTx card, check and correct the configuration. You may have configured the KTx card at an address already in use by another module.

2. Continue with the instructions in this chapter to run the diagnostics to determine if there are any hardware failures (see pages A-4 through A-20).
3. If you received any failures, print the log file (see page B-20)


**Install DOS Diagnostics to Your Hard Drive**

Install the diagnostic files with the installation program on the KTx Utility Disk, which came in the box with your KTx card.

1. Insert the utility disk in drive A.

2. Type:

   ```
   a:
   ```

3. Type:

   ```
   install c
   ```

   You see:

   ![MS-DOS Prompt](image)

   **Instructions**

   Use the ↑ ↓ ← → keys to select an item, then press ENTER

4. Select:

   ```
   Install diagnostics to C: . . .
   ```
Important: In some instances, the status bar does not reach 100% even though all of the appropriate files have been copied.

5. Press:

   Enter

   You see the Select Option screen.

6. Select:

   Exit

   You see the DOS prompt.
Access Diagnostics

ATTENTION: You can run diagnostics on only one card or channel (1784-KTXD) at a time. If you run diagnostics using a memory address that is incorrect, the computer may lock up. Be certain to run diagnostics using the correct address setting (see page 2-4 for the memory address(es) your configured).

At the MS-DOS prompt, type:

```
   cd c:\ktxdiag
```

and press Enter.

```
   ktxdiag
```

and press Enter.

<table>
<thead>
<tr>
<th>If you:</th>
<th>Add this to the ktxdiag command:</th>
</tr>
</thead>
<tbody>
<tr>
<td>don’t want to create a KTXDIAG.LOG file</td>
<td>-l</td>
</tr>
<tr>
<td>are using a monochrome monitor</td>
<td>-m</td>
</tr>
<tr>
<td>want to see this list of options</td>
<td>-h</td>
</tr>
<tr>
<td></td>
<td>-?</td>
</tr>
</tbody>
</table>
Run the 1784-KTx Diagnostics for DOS

You see the introductory screen:

```
1784-KTX Diagnostic Utility - Copyright 1994
Allen-Bradley Company
1784-KTX Diagnostic Utility
Copyright 1994
This program has been designed to help you
determine whether or not your Allen-Bradley
Communications Interface Card is functioning properly.
This software is provided "AS IS" and
without any express or implied warranty of
merchandise and fitness
```

Aug 31, 1999 7:11:22 pm

<table>
<thead>
<tr>
<th>Start Diags</th>
<th>Exit</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>F10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>To:</th>
<th>Press this key:</th>
<th>Go to page:</th>
</tr>
</thead>
<tbody>
<tr>
<td>View the diagnostics menu</td>
<td>F1 (Start Diags)</td>
<td>B-6</td>
</tr>
<tr>
<td>Exit the software</td>
<td>F10 (Exit)</td>
<td>-</td>
</tr>
</tbody>
</table>
Start Diagnostics

From the introductory screen (see page B-6), press F1.

You see the main menu:

```
MGDOS Prompt
1784-KTx Diagnostic Utility - Copyright 1994

1784-KTx DIAGNOSTIC SELECTION
F2 On-Line Configuration
F3 M16 Test
F4 Computer Host Tests
F5 KTx Card Tests
F6 Dual Port Tests
F10 Return to Previous Menu
```

The following instructions take you through running the diagnostic tests individually and viewing the error log file.

7. Use the decision table below.

<table>
<thead>
<tr>
<th>To:</th>
<th>Press this key:</th>
<th>Go to page:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define a KTx Card to Test</td>
<td>F2 (On-line Configuration)</td>
<td>B-8</td>
</tr>
<tr>
<td>Run M16-diagnostics</td>
<td>F3 (M16 Tests)</td>
<td>B-10</td>
</tr>
<tr>
<td>Test the computer's ability to communicate with the KTx card</td>
<td>F4 (Computer Host Tests)</td>
<td>B-11</td>
</tr>
<tr>
<td>Run the KTx card's self-diagnostics</td>
<td>F5 (KTX Card Tests)</td>
<td>B-13</td>
</tr>
<tr>
<td>Test the dual port's ability to communicate</td>
<td>F7 (Dual Port Tests)</td>
<td>B-15</td>
</tr>
<tr>
<td>Exit diagnostics</td>
<td>F10 (Return to Previous Menu)</td>
<td></td>
</tr>
</tbody>
</table>
Define a KTx Card to Test

If you have more than one KTx card installed or you are using a 1784-KTXD card, you need to define which card or which memory address you want to test.

**Important:** If you need to use settings other than the default settings, you must define those settings on this screen.

1. From the main menu (see page B-7), press **F2**.

You see:

![Configuration Screen](image)

2. Change the configuration to match the settings for the KTx card that you want to test.

<table>
<thead>
<tr>
<th>To change the:</th>
<th>Press this key until you see the setting that you need:</th>
</tr>
</thead>
<tbody>
<tr>
<td>memory address</td>
<td><strong>F4</strong> (Set Memory)</td>
</tr>
<tr>
<td>interrupt</td>
<td><strong>F5</strong> (Set Intrpt)</td>
</tr>
<tr>
<td>DH-485 baud</td>
<td><strong>F8</strong> (DH485 Baud)</td>
</tr>
</tbody>
</table>
To save the configuration, press **F9**.

The configuration is saved in the KTXDIAGINI file in the KTXDIAG directory. The next time that you run diagnostics, the diagnostics program look for this file and loads it. If you don’t save your configuration or the diagnostic program can’t find the KTXDIAGINI file, it substitutes the default address and interrupt settings for the KTx card (see page B-5 and page B-8).

4. To return to the introductory screen (see page B-6), press **F10**.
Run M16 Tests

1. From the main menu (see page B-7), press **F3**.

You see:

```
MTX Configuration | RESULT
-----------------|------
8-bit mode       | OFF
Extended M16     | ON

Disable M16 Operational Mode | PRESS
M16 Diagnostics         | PRESS
Enabling M16 Test Mode    | PRESS
```

**Important:** If you are in 8-bit mode, you’ll see only the first two lines; those lines will indicate 8-bit mode ON and Extended M16 OFF. You cannot run M16 tests in 8-bit mode.
Test Your Computer

1. From the main menu (see page B-7), press F4.

You see:

2. Use the decision table below.

<table>
<thead>
<tr>
<th>To:</th>
<th>Press this key:</th>
</tr>
</thead>
<tbody>
<tr>
<td>execute the tests</td>
<td>F1 (Execute Tests)</td>
</tr>
<tr>
<td>return to the main menu (page B-7) without</td>
<td>F10 (Return)</td>
</tr>
<tr>
<td>running the test</td>
<td></td>
</tr>
</tbody>
</table>
If you pressed **F1**, you see:

![Diagnostic Utility Interface](image)

If an error occurs, the diagnostics report a failure and continues with the next test. Errors are recorded in the log file (page B-20).

<table>
<thead>
<tr>
<th>Diagnostic</th>
<th>Description</th>
<th>If this test fails:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual Port</td>
<td>Tests the computer's ability to read to and write from dual-port memory.</td>
<td>• RAM memory may be corrupted&lt;br&gt;• KTx card may have a problem (run the KTx card test)</td>
</tr>
<tr>
<td>Reset Test</td>
<td>Tests the computer's ability to reset the KTx card&lt;br&gt;After reset, verifies the status of the KTx card</td>
<td>• KTx card may have a problem (run the KTx card test)</td>
</tr>
<tr>
<td>Interrupt</td>
<td>Tests the interrupt capability from the KTx card to the computer</td>
<td>• There may be a conflict in the interrupt assignments</td>
</tr>
</tbody>
</table>

3. Press **F10** to return to the main menu (page B-7).
Test the KTx Card

1. From the main menu (page B-7), press **F5**.

You see:

![Test the KTx Card](image)

2. To execute the tests, press **F1**.

To return to the main menu (page B-7) without running the test, press **F10**.

If you pressed **F1**, you see:

![Test the KTx Card](image)
If an error occurs, the diagnostics report a failure and continues with the next test. Errors are recorded in a log file (see page A-20).

<table>
<thead>
<tr>
<th>Diagnostic</th>
<th>Description</th>
<th>If the test fails:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory</td>
<td>Tests the KT_x card's ability to read from and write to its internal memory chips</td>
<td>The KT_x card's RAM may have a problem</td>
</tr>
<tr>
<td>Timer Operation</td>
<td>Tests the accuracy and capabilities of the counter-timer chips</td>
<td>KT_x card may not have reset completely</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Turn power off to the computer.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Remove the card and reinsert.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Turn power on to the computer.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Run this test again.</td>
</tr>
<tr>
<td>Serial Port Operation</td>
<td>Tests the interrupts and loopback capabilities of the serial I/O chip</td>
<td>• There may be a hardware problem with the KT_x card.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The wrong set of KT_x*.BIN files are running.</td>
</tr>
</tbody>
</table>
Test the Dual Port

1. From the main menu (page B-7), press F7.

You see:

![MS-DOS Prompt with 1784-KTx Diagnostic Utility window]

2. Use the decision table below.

<table>
<thead>
<tr>
<th>To load this protocol to the KTx card:</th>
<th>Press this key:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DH+ (page B-17)</td>
<td>F3 Download DH+</td>
</tr>
<tr>
<td>DH 485 (page B-17)</td>
<td>F4 Download DH 485</td>
</tr>
<tr>
<td>return to the main menu (page B-7)</td>
<td>F10 Return</td>
</tr>
</tbody>
</table>

If you press:          | You see the message:           |
------------------------|---------------------------------|
F3 Download DH+        | DH+ Loading Test . . . LOADED   |
F4 Download DH 485     | DH-485 Loading Test . . . LOADED|
Then you see:

For DH+

For DH-485
3. Use the decision table below for both protocols.

<table>
<thead>
<tr>
<th>To:</th>
<th>Press this key:</th>
</tr>
</thead>
<tbody>
<tr>
<td>enable the KTx card on a DH+ or DH-485 link (page B-17)</td>
<td>F4 Enable</td>
</tr>
<tr>
<td>disable the KTx card from a DH+ or DH-485 link (disables the card from the network but protocol is not removed from the card)</td>
<td>F5 Disable</td>
</tr>
<tr>
<td>display the KTx card on DH+ or DH-485 link</td>
<td>F6 Display</td>
</tr>
<tr>
<td>clear the memory location of the KTx card</td>
<td>F7 Clear</td>
</tr>
<tr>
<td>• disables card from the DH+ or DH-485 link</td>
<td></td>
</tr>
<tr>
<td>• clears the DH+ or DH-485 protocol from the card</td>
<td></td>
</tr>
<tr>
<td>return to the main menu (page B-7)</td>
<td>F10 Return</td>
</tr>
</tbody>
</table>

4. Press F4 to enable the card.

If everything is operating successfully, you see the message:

- DH+ Enabling Test . . . . . ENABLED for DH+
- DH485 Enabling Test . . . . . ENABLED for DH-485

5. Press F6 to view the card’s information.

For DH+
For DH-485

![MS-DOS Prompt]

**1784-KTx Diagnostic Utility - Copyright 1994**

- **1784-KTx node address is**: ...........
- **1784-KTx node ID**: ...............
- **Link state is**: ................
- **Module state is**: ...............
- **Protocol software is**: ...........
- **Error rate is**: ...............
- **Ktx (HOST side)**: ...............
- **Ktx node name is**: .......... ...

**Number of active nodes**

[00..15] : ....................................

Aug 21, 1999  KTX Address: C800 Interrupt: NONE  7:19:45 pm
Important: The address of the KT\textsubscript{x} card for this test is fixed at 77 octal. If other nodes use this address, you will see duplicate nodes on the network.

<table>
<thead>
<tr>
<th>This field:</th>
<th>Indicates:</th>
</tr>
</thead>
<tbody>
<tr>
<td>KT\textsubscript{x} node address is</td>
<td>the node address of the KT\textsubscript{x} card</td>
</tr>
<tr>
<td>KT\textsubscript{x} DH+ or DH-485 node is</td>
<td>if the node is unique or a duplicate</td>
</tr>
<tr>
<td>Link State is</td>
<td>if the DH+ or DH-485 link is on line or off line or unknown</td>
</tr>
<tr>
<td>card state is</td>
<td>if the KT\textsubscript{x} card is enabled or disabled</td>
</tr>
<tr>
<td>KT\textsubscript{x} is (KT\textsubscript{x} side)</td>
<td>if the communication from the card to the computer is functional or not functional</td>
</tr>
<tr>
<td>Protocol Software is</td>
<td>if the protocol software is:</td>
</tr>
<tr>
<td></td>
<td>• DH+ or unknown</td>
</tr>
<tr>
<td></td>
<td>• DH-485 or unknown</td>
</tr>
<tr>
<td>Baud rate is</td>
<td>the communication rate is:</td>
</tr>
<tr>
<td></td>
<td>• for DH+: 57.6 bps or unknown</td>
</tr>
<tr>
<td></td>
<td>• for DH-485: 300, 600, 1200, 2400, 4800, 9600, 19200, or unknown</td>
</tr>
<tr>
<td>KT\textsubscript{x} is (host side)</td>
<td>the communication from the computer to the card is active or stopped</td>
</tr>
<tr>
<td>KT\textsubscript{x} node name is</td>
<td>the name you assigned to the computer in your application or the default name 1784KT\textsubscript{x}</td>
</tr>
<tr>
<td>Number of active nodes</td>
<td>the number of active nodes and shows a map of the nodes on the DH+ or DH-485 link if the card is communicating on the DH+ or DH-485 link</td>
</tr>
<tr>
<td>(untitled)</td>
<td>active nodes on network displayed as ‘mini-who’</td>
</tr>
</tbody>
</table>

This test reports the current status of DH+ or DH-485 communications. The test results are recorded in the log file. Use this information to help you troubleshoot. If you encounter any difficulty, review your error log.
Print the Log File

If you did not add \-1\ to the ktxdiag command (see page B-5) when accessing diagnostics, your diagnostic test session was recorded in a log file that helps Allen-Bradley Automation Group Technical Support diagnose your difficulty.

1. To view the log file, at the MS-DOS prompt, type:

```plaintext
cd c:\ktxdiag
```

and press ENTER.

```plaintext
type ktxdiag.log | more
```

and press ENTER.

2. Use MS-DOS commands or a text editor to print a copy of the log file.

3. Call Rockwell Automation Technical Support at: 440.646.5800 and request a customer log number and the name of a technical support specialist. Include this information on the fax cover letter along with the log print-out. Fax everything to the number indicated on the print-out.
Use the KTx Card with 6200 Software

You can use the KTx card with Allen-Bradley PLC-2™, PLC-3™, PLC-5™, and PLC-5/250 programmable controllers using 6200 software.

KTx Card and 6200 Software for PLC-5 and PLC-5/250 Programmable Controllers

Current versions of Allen-Bradley 6200 software for PLC-5 and PLC-5/250 programmable controllers have built-in support for the KTx card. If your version does not support the KTx card, you must upgrade to the latest version of 6200 software before attempting to connect.

KTX Card and 6200 Software for PLC-2 Direct-connect and PLC-3 Direct-connect

Important: You can use only the 1784-KTX card for PLC-2 and PLC-3 direct-connect. The 1784-KTS and 1784-KTXD do not support direct connection to a PLC-2 or PLC-3 processor.

To use the KTX card for direct-connect operation to a PLC-2 or PLC-3 programmable controller, follow these steps:

Important: The screen prints presented here may not contain the same part and release number as your KTx Utility software.

1. Set the memory address on the card to one of the following:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CB00:</td>
<td>D300:</td>
<td>DB00:</td>
</tr>
<tr>
<td>CF00:</td>
<td>D700:</td>
<td>DF00:</td>
</tr>
</tbody>
</table>

See Chapter 2 for additional information.
2. Install the card in the computer by following the instructions in Chapter 3.

**Important:** The following procedure to run the installation program is not necessary with later versions of software. If your software lists the KTxxx as an option, the utility is already installed.

3. Run the installation program on the KTxxx Utility Disk, which came in the box with your KTxxx card.
   
   A. Insert the utility disk in drive A.
   
   B. Type: `a:
   
   C. Type: `install c`

4. Select the ‘update’ routine specific to your processor.

   - Update 6200 series for PLC 3 files . . .
   - Update 6200 series for PLC 2 files . . .

```
+-----------------------------+-----------------------------+-----------------------------+
| Contents: KTx Card Utilities Software | Part Number: 99974405 | Release Number: 1.40 |
+-----------------------------+-----------------------------+-----------------------------+
| Status | Complete | 100% | Status | Complete | 100% | Status | Complete | 100% |
| Update 6200 series PLC-3 files... | Update 6200 series PLC-2 files... | Install diagnostics to C:... | Uninstall... | Exit |
+-----------------------------+-----------------------------+-----------------------------+
Use the ↑ ↓ + - keys to select an item, then press ENTER
```

5. Select the ‘update’ routine for the KTxxx files.

For a PLC-3 processor, select:
Update target drive PLC 3 files with 1784 KTX files

You see:

Important: In some instances, the status bar does not reach 100% even though all of the appropriate files have been copied.

For a PLC-2 processor, select:
Update target drive PLC 2 files with 1784 KTX files

You see:

6. Exit the installation program.
7. Connect the appropriate cable from the card to the port on the programmable controller:

- 1784-CP15 for PLC-2
- 1784-CP16 for PLC-3

8. Start 6200 software for the PLC-2 or PLC-3 programmable controller running on the computer.

9. Go to on-line configuration and set the current device to:

- “1784-KT (Direct Con.)” for PLC-2 programmable controllers
- “1784-KT (BCL)” for PLC-3 programmable controllers

10. Set the address on the on-line configuration screen to the following bit patterns, corresponding to the selections on the KTx card:

<table>
<thead>
<tr>
<th>Address Pattern</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>010011 (CB00:)</td>
<td></td>
</tr>
<tr>
<td>001011 (D300:)</td>
<td></td>
</tr>
<tr>
<td>011011 (DB00:)</td>
<td></td>
</tr>
<tr>
<td>110011 (DF00:)</td>
<td></td>
</tr>
<tr>
<td>101011 (D700:)</td>
<td></td>
</tr>
<tr>
<td>111011 (DF00:)</td>
<td></td>
</tr>
</tbody>
</table>

6200 PLC-2 and PLC-3 software supports only these addresses.

11. Save the configuration.

12. Go on line to confirm that everything is set correctly.

During subsequent programming sessions, these steps do not need to be repeated.
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# Allen-Bradley Publication Problem Report

If you find a problem with our documentation, please complete and return this form.

<table>
<thead>
<tr>
<th>Check Problem(s) Type:</th>
<th>Describe Problem(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical Accuracy</td>
<td>text</td>
</tr>
<tr>
<td></td>
<td>illustration</td>
</tr>
<tr>
<td>Completelessness</td>
<td>procedure/definition</td>
</tr>
<tr>
<td></td>
<td>illustration</td>
</tr>
<tr>
<td></td>
<td>guideline</td>
</tr>
<tr>
<td></td>
<td>feature</td>
</tr>
<tr>
<td>Clarity</td>
<td></td>
</tr>
<tr>
<td>Sequence</td>
<td></td>
</tr>
<tr>
<td>Other Comments</td>
<td></td>
</tr>
</tbody>
</table>

What information is missing?

What is unclear?

What is not in the right?

Other Comments
Use back for more

Your Name __________________________ Location/Phone __________________________

Return to: Technical Communications, Allen-Bradley, 1 Allen-Bradley Drive, Mayfield Hts., OH 44124-6118 Phone: 440.646.3176 FAX: 440.646.4320