Hardware Configuration

Preface

Purpose of this Document

This document provides you with reference information to configure your hardware with Rockwell Software (RS) products. This document may be used as reference guide and/or troubleshooting guide.

Supplemental Publications

We suggest that you accompany this document with other Allen-Bradley (A-B) publications that have been published for the hardware you have purchased. See Chapter 1 for a Publication Reference chart that provides publication numbers and titles of additional documentation. In addition, we suggest that you consult the Rockwell Software documentation provided with your software.

For additional reading, refer to the following A-B publications:

- SD499   Allen-Bradley Publications Index
- B112   Allen-Bradley Automation Systems
- ICCG-1.2   Control, Communication, and Information Reference Guide

Please contact Allen-Bradley for more information.

Intended Audience

We assume you are familiar with:

- the Allen-Bradley products in your system.
- your IBM-compatible personal computer (PC).
- the MS-DOS, Windows 3.*x*, Windows for Workgroups 3.*x*, Windows 95, or Windows NT operating environments.

Document Conventions

The conventions used throughout this document for the user interface comply with those recommended by Microsoft. If you are not familiar with the Microsoft Windows user interface, we recommend that you read the documentation supplied with the operating system you are using before attempting to use this software.

There are also several abbreviations used in this document.

A-B	Allen-Bradley
BNC	A connector for coaxial cable.
DH	Data Highway
IRQ	Interrupt Request
PC	Personal Computer
RS	Rockwell Software
SW-1	The letters SW will be accompanied by a number. This signifies a switch assembly.

SW-2
Base Memory
Address

```
  1     2
┌───┬───┐
│   │   │
│   │   │
│▄▄▄│▄▄▄│
└───┴───┘
```
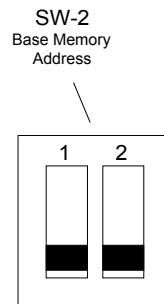
Feedback

Please use the feedback form packaged with your software to report errors or let us know what information you would like to see added in future editions of this document.

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Before using this document

To use this document effectively, please read the following sections and familiarize yourself with the terminology used throughout this document.

After becoming familiar with the basic terminology, you will be ready to configure your hardware with Rockwell Software products.

This chapter explains:

- Operating systems
- Communication links
- Communication cards and modules
- Memory management software

At the end of the chapter, there is a Publication Reference chart that lists the publications for the communication card or modules in this document. Consult these publications for further information on your hardware.

What operating system am I using?

There are five operating systems that are referenced in this document.

- MS-DOS
- Windows 3.*x*
- Windows for Workgroups 3.*x*
- Windows 95
- Windows NT

What communication network am I using?

There are seven local area networks (LANs) that are used to transfer data that are referenced in this document.

LAN	Description
Data Highway (DH)	An Allen-Bradley floating-master baseband local area network.
Data Highway Plus (DH+)	An Allen-Bradley token-passing baseband local area network.
Data Highway II (DHII)	An Allen-Bradley token-passing carrier-band local area network.
Data Highway 485 (DH485)	An Allen-Bradley token-passing baseband link for a local area network based on the RS-485 standard.
ControlNet	An Allen-Bradley open control network that uses the producer/consumer model to combine the functionality of an I/O network and a peer-to-peer network.
DeviceNet	An open communication network designed to provide an interface through a single cable from a PLC processor directly to devices such as sensors, pushbuttons, and drives.
Ethernet	A local area network with a baseband communication rate of 10Mbits/second.

What communication card or module am I using?

In this document, there is hardware configuration information on the following modules and cards.

Modules	Description
1770-KF2B	Provides an interface from a RS-232C or RS-422A device to a Data Highway (DH) or a Data Highway Plus (DH+) network.
1770-KF3	Allows the host computer on an RS-232C link to communicate with SLC processors on a DH485 network.
1770-KFC	Connects devices network that cannot communicate directly on the link to a ControlNet network.
1770-KFD	Allows connection from an IBM-compliant laptop, desktop, or notebook computer to a DeviceNet network.
1785-KE	Provides an interface between RS-232C devices to a Data Highway Plus (DH+) network.
Cards	**Description**
1784-KL	Provides an interface from a PC bus to a Data Highway Plus (DH+) network.
1784-KT	Provides an interface from a PC bus directly to a PLC-5, PLC-3, or PLC-2 processor, or over a Data Highway Plus (DH+) network to a PLC-5 processor.
1784-KT2	Allows an IBM/PS2 personal computer workstation to communicate directly to a PLC-5, PLC-3, or PLC-2 processor, or over a Data Highway Plus (DH+) network to any processor.
1784-KTC/ KTCX	Allows a 16-bit ISA or a 32-bit EISA-compatible computer to communicate on a ControlNet network.
1784-KTX/ KTXD/KTS	Allows the ISA/EISA PC bus to communicate with PLC or SLC processors via a DH, DH485, or remote I/O network.
1784-PCMK	Provides a PCMCIA communication interface between an IBM compliant notebook computer and PLC and SLC processors.
5136-SD (Rev 1 and 2)	Communicates from a PC bus to a Data Highway (DH) or Data Highway (DH+) network.
5136-SD-MCA	Communicates to a Data Highway (DH) or a Data Highway Plus (DH+) network. (Direct-Link Interface card)

What is memory management software?

This discussion of memory management software and memory exclusion is directed towards the MS-DOS, Windows 3.*x*, Windows for Workgroups 3.*x*, and Windows 95 operating systems. Please be aware that you do not need this software with Windows NT.

Memory management software optimizes the use of memory in your computer. If your computer has expanded memory (EMS) or extended memory (XMS) installed, you will be using memory management software. Memory management software programs supervise the use of extended memory so that applications do not try to use the same memory simultaneously.

Configure the memory manager to exclude (not use) memory addresses required by your interface hardware. Determine the specific range of memory addresses used in order to prevent memory conflicts.

MS-DOS

Microsoft supplies three files that manage memory usage in your computer with MS-DOS.

- EMM386.EXE
- HIMEM.SYS
- SMARTDRV.SYS

EMM386.EXE

EMM386.EXE is a type of extended memory manager program provided with MS-DOS. In the CONFIG.SYS file, the command line that loads EMM386.EXE can be modified to avoid conflicts with DH485 and DH+ compatible cards.

1. Use the exclude statement with EMM386.EXE to specify which address to avoid. The command line below avoids an A-B 1784-KT communication card with a memory address of D800.

   DEVICE=C:\DOS\EMM386.EXE EXCLUDE=D800-DBFF

2. Use the MEMMAKER utility to assist you in allocating memory if you are not using 386MAX or QEMM. MEMMAKER makes more conventional memory available by loading some device drivers and memory-resident programs into the upper memory area.

TIP	MEMMAKER can be too aggressive and cause communications problems. Apply this utility with caution.

HIMEM.SYS

The MS-DOS operating system includes the extended memory manager program HIMEM.SYS. HIMEM.SYS is necessary for EMM386.EXE to function.

SMARTDRV.SYS

The SMARTDRV.SYS is a disk-caching program designed to decrease the amount of time the operating system takes to read data from the hard drive. The SMARTDrive program needs the HIMEM.SYS extended memory manager. Consult your MS-DOS documentation for more details.

Windows 95

How to exclude memory areas in the SYSTEM.INI file

TIP	Regardless of whether you are using memory management software (a memory manager that is loaded in CONFIG.SYS), add an exclude statement to the SYSTEM.INI file.

IMPORTANT	Be sure to make a backup copy of the SYSTEM.INI file before editing it. SYSTEM.INI is a Windows initialization file that contains settings that you can use to customize Windows for your system's hardware.

Using Notepad or another text editor, add a statement to your Windows SYSTEM.INI file to exclude the memory range required by your specific communication interface card. SYSTEM.INI is located in the \WINDOWS subdirectory.

1. Add the exclude statement anywhere in the [386 Enh] section. The exclude statement below avoids conflict with the 1784-KT communication interface card at an address of D800.

    emmexclude=D800-DBFF

2. After adding this line to the SYSTEM.INI file, exit and restart Windows. This is necessary for the changes to take effect.

386MAX

386MAX is a type of memory management software produced by Qualitas, Inc. Use 386MAX to avoid conflicts with the following communication interface cards:

Allen-Bradley

- 1784-KL
- 1784-KT
- 1784-KT2
- 1784-KTX/KTXD/KTS
- 1784-PCMK
- 1784-KTC/KTCX

S-S Technologies, Inc.
- 5136-SD (Revisions 1 and 2)
- 5136-SD-MCA

How to avoid conflicts with the Allen-Bradley communication interface cards

386MAX includes a program named MAXIMIZE.EXE. This program examines your computer and makes sure that there will not be any memory conflicts with your existing hardware. If you use MAXIMIZE.EXE to configure 386MAX, there should be no conflicts with A-B communication interface cards. See the 386MAX documentation for more details.

How to avoid conflicts with S-S Technologies, Inc. communication interface cards

The CONFIG.SYS file launches a 386MAX reference initialization file named 386MAX.PRO stored in the 386MAX subdirectory. The 386MAX.PRO file can be modified to prevent memory conflicts with S-S Technologies communication interface cards. Add a RAM=statement in the 386MAX.PRO file to specify the memory addresses to avoid. See the following example to prevent memory conflicts with a 5136-SD with a memory address of D800.

RAM=D800-DBFF

When making a change to your system configuration and installing 386MAX, run MAXIMIZE.EXE to optimize your memory management. Consult the 386MAX documentation for details.

QEMM

QEMM is a type of memory management software produced by Quarterdeck, Inc. Use QEMM to avoid conflicts with the following communication interface cards:

Allen-Bradley

- 1784-KL
- 1784-KT
- 1784-KT2
- 1784-KTX/KTXD/KTS
- 1784-PCMK
- 1784-KTC/KTCX

S-S Technologies, Inc.

- 5136-SD (Revisions 1 and 2)
- 5136-SD-MCA

The command line in your CONFIG.SYS file that launches QEMM may be modified to prevent memory conflicts with these communication interface cards.

Use the EXCLUDE qualifier in the DEVICE= statement that launches QEMM to specify which address to avoid. The following statement is designed to prevent memory conflicts with an A-B 1784-KT with a memory address of D800.

DEVICE=C:\QEMM\QEMM\QEMM.SYS X=D800-DBFF

When using Rockwell Software products with QEMM, disable QEMM Stealth Mode. Consult the QEMM documentation for details. Whenever you make a change to the system configuration and QEMM is installed, run QEMM's OPTIMIZE.EXE to optimize your memory management. Consult the QEMM documentation for details.

Publication reference

Allen-Bradley	Publication Title	Publication Numbers
Modules		
1770-KF2B	DH/DH+ Asynchronous RS-232 or RS-422 Interface Module User Manual	1770-6.5.13
1770-KF3	DH485 Communication Module User Manual	1770-6.5.18
1770-KFC	ControlNet Communication Interface Module User Manual	1770-6.5.20
1770-KFD	1770-KFD Communication Protocol Reference Manual	1770-6.5.22
1785-KE	1785-KE Data Highway Communications Interface Module User Manual	1785-6.5.2
Cards		
1784-KL	Data Highway Plus Local Area Network Product Data	1785-2.6
1784-KT	Communication Interface Module Installation Data	1784-2.31
1784-KT2	Communication Interface Module Installation Data	1784-6.5.16
1784-KTX/KTXD/KTS	1784 Communication Interface Card User Manual	1784-6.5.22
1784-PCMK	PCMK Communication Card User Manual	1784-6.5.19
1784-KTC/KTCX	ControlNet Communication Interface Card Installation Instructions	1784-5.20
S-S Technologies		
Cards		
5136-SD (Rev 1 and 2)	5136-SD User's Guide	SDMS.DOC
5136-SD-MCA	5136-SD-MCA Direct Link Interface User's Guide	MCMAN.DOC

2 Hardware configuration

This chapter provides basic configuration instructions for communication cards and modules manufactured by either Allen-Bradley or S-S Technologies. There is a Communication Links chart in this chapter for product comparison.

If you have any additional questions on your hardware, we suggest that you contact the hardware manufacturer. If you have additional questions on configuring your hardware for Rockwell Software products, please contact Rockwell Software technical support.

How to use this chapter

1. Determine the type of communication interface card or module that you are configuring.

2. Refer to the appropriate section of this chapter.

If you need additional information on your hardware, refer to the documentation from the manufacturer. The Allen-Bradley and S-S Technologies publication numbers are included in each section of this chapter and in Chapter 1 of this document.

TIP	You may not have all the communication interface cards or modules listed in this chapter. It is only necessary that you follow the instructions for the type of communication interface card or module that will be used in your system.

TIP	Not all software supports all hardware. If you foresee or encounter an incompatibility problem, refer to your hardware and software documentation for the solution or contact Rockwell Software technical support.

Communication networks

	Product Catalog Number	Communication Networks						
		Data Highway (DH)	Data Highway (DH+)	Data Highway II (DHII)	Data Highway 485 (DH485)	ControlNet	DeviceNet	Ethernet
Allen-Bradley	**Modules**							
	1770-KF2B	X	X					
	1770-KF3				X			
	1770-KFC					X		
	1770-KFD						X	
	1785-KE		X					
	Cards							
	1784-KL		X					
	1784-KT		X					
	1784-KT2		X					
	1784-KTC 1784-KTCX					X X		
	1784-KTX 1784-KTXD 1784-KTS (RIO)		X X		X X			
	1784-PCMK		X		X			
S-S Technologies	**Cards**							
	5136-SD (Rev 1)	X	X					
	5136-SD (Rev 2)	X	X					
	5136-SD-MCA	X	X					

How to configure Allen-Bradley modules

This section provides information on how to configure Allen-Bradley modules.

1770-KF2 (Series B)

This module provides an interface from an RS-232C or RS-422A device to the Data Highway or the Data Highway (DH+). On the bottom of the module, there are eight switch assemblies. Each of the switch assemblies may contain up to five switches.

For more information on the 1770-KF2B, please refer to *DH/DH+ Asynchronous RS-232 or RS-422 Interface Module User Manual*, publication 1770-6.5.13.

IMPORTANT	The 1770-KF2B reads the status of the communications option switches only at power-up. Make the selections with the power OFF.
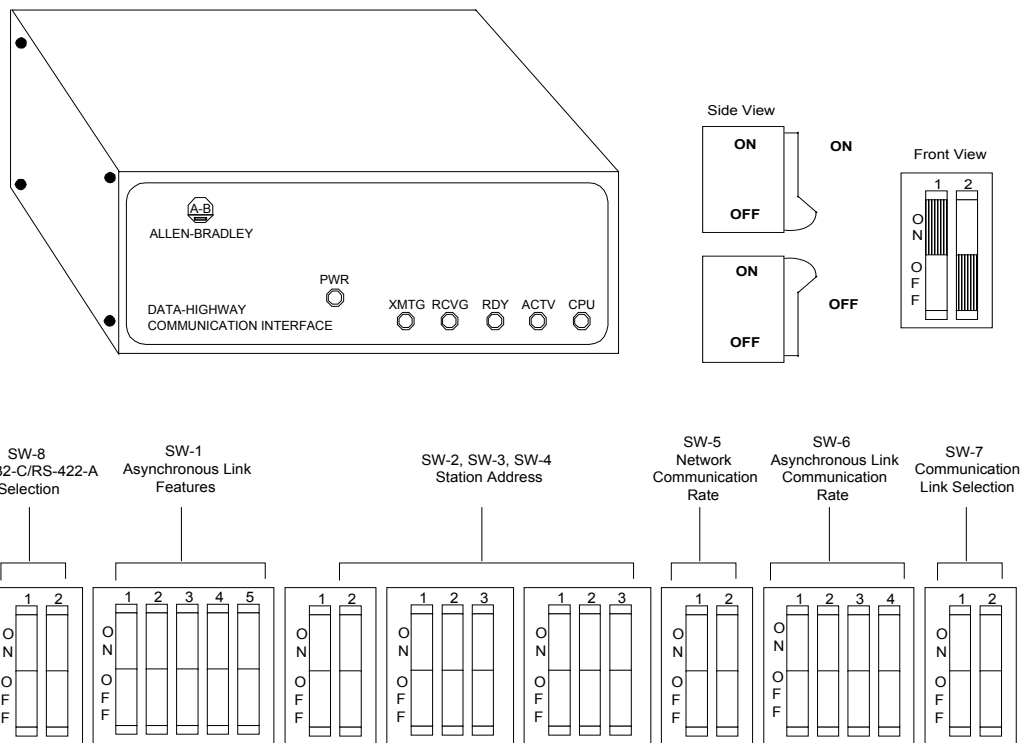
SW-1 (Asynchronous Link Features)

Protocol	Error checking	Parity	Embedded Response	Switch				
				1	2	3	4	5
Full duplex	BCC	None	No	OFF	OFF	n/a	n/a	OFF
Full duplex	BCC	Even	No	ON	OFF			OFF
Full duplex	BCC	None	Yes	OFF	ON			OFF
Full duplex	BCC	Even	Yes	ON	ON			OFF
Half duplex	BCC	None	No	OFF	OFF			ON
Half duplex	BCC	Even	No	ON	OFF			ON
Full duplex	CRC	None	Yes	OFF	ON			ON
Half duplex	CRC	None	No	ON	ON			ON

SW-1 Switch 3 (Duplicates)

Messages	Switch 3
Detect and ignore duplicates	ON
Accept all regardless of duplication	OFF

SW-1 Switch 4 (Handshaking)

Handshaking	Switch 4
Use handshaking signals	ON
Ignore handshaking signals	OFF

SW-2 (Station Address)

First Digit		
Digit	Switch 1	Switch 2
0	OFF	OFF
1	OFF	ON
2	ON	OFF
3	ON	ON

SW-3, SW-4 (Station Address)

Second and Third Digits			
Digit	Switch 1	Switch 2	Switch 3
0	OFF	OFF	OFF
1	OFF	OFF	ON
2	OFF	ON	OFF
3	OFF	ON	ON
4	ON	OFF	OFF
5	ON	OFF	ON
6	ON	ON	OFF
7	ON	ON	ON

SW-5 (Network Communication Rate)

Switch 1	Switch 2	Communication rate
ON	ON	57,600 bits per second

SW-6 (Asynchronous Link Communication Rate)

Bits per second	Switch 1	Switch 2	Switch 3
110	OFF	OFF	OFF
300	ON	OFF	OFF
600	OFF	ON	OFF
1200	ON	ON	OFF
2400	OFF	OFF	ON
4800	ON	OFF	ON
9600	OFF	ON	ON

SW-6 Switch 4 (Diagnostic Command)

Status	Switch 4
Execute	ON
Pass	OFF

SW-7 (Communication Link Selection)

Network	Switch 1	Switch 2
Data Highway (DH)	OFF	OFF
Data Highway Plus (DH+) or Peer Communication Link (PCL)	ON	OFF

SW-8 (RS-232C/RS-422A)

Communication interface	Switch 1	Switch 2
RS-232C	OFF	ON
RS-422A	ON	OFF

1770-KF3

This module is an interface between a host computer on an RS-232C link and SLC processors on a Data Highway 485 (DH485) network. On the bottom of the module, there is a pushbutton display that is used to configure the module's communication parameters.

For more information on the 1770-KF3, please refer to *DH485 Communication Module User Manual*, publication 1770-6.5.18.
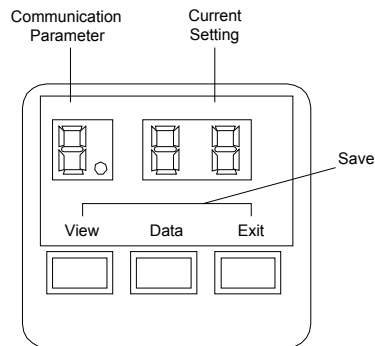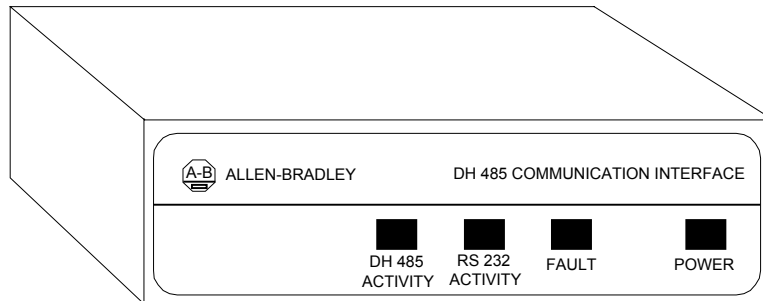
Communication Parameters (Factory Defaults)

DH485 Parameters

Parameter Number	Parameter	Factory Default
0	DH485 Node Address	00
1	DH485 Baud Rate	96 (9600 baud)
2	Diagnostic Command Execution	01 (the KF3 executes the commands)
3	RS-232C Baud Rate	96 (9600 baud)
4	RS-232C Parity	00 (none)
5	DF1 Device Category	00 (full duplex)

RS-232C Parameters

Parameter Number	Parameter	Factory Default
6	Error Detection	00 (BCC)
7	Flow Control	00 (Disabled)
8	Duplicate Message Detection	01 (Enabled)
9	Sub-menu Parameters	N/A
A	Series and Revision	N/A

Advanced Communication Parameters

Parameter Number	Parameter	Factory Default
0	Maximum Token Holder	31
1	Token Hold Factor	01
2	Number of Retries	02
3	DF1 ACK Timeout	10 (1.0 second timeout)
4	CTS to Transmit Delay	00 (no delay)
5	End of Message to RTS Off	00 (no delay)
6	Master Station Address	10 (octal)
7	Group Number	00

1770-KFC

This module provides an interface from RS-232C devices to the ControlNet network. On the bottom of the module, there is a push button display that is used to configure the communication parameters.

For more information on the 1770-KFC, please refer to *ControlNet Communication Interface Module User Manual*, publication 1770-6.5.20.

Status LEDs

Fuse

Parallel Port

RS-232C Port

Reset Switch

Network Access Port

ControlNet Port A BNC Connector

ControlNet Port B BNC Connector

Power Connector

Communication Parameter

Current Setting

Save

View   Data   Exit
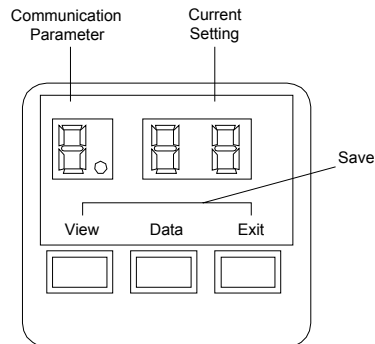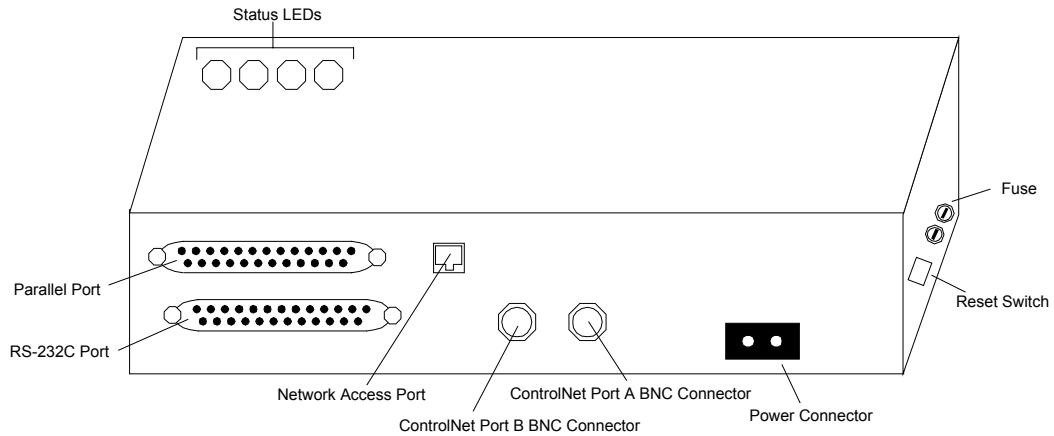
Communication Parameters (Factory Defaults)

Basic Communication Parameters

Parameter Number	Parameter	Factory Default
0	Network address	02
1	DF1 port	00
2	Baud Rate	96
3	Parity	00
4	Full/Half Duplex	00
5	Parallel Port Transfer	01
6	Error detection	00
7	DF1 Station address	00
8	Diagnostic Command Execution	00
A	Sub-menu	N/A
F	Series/Revision	N/A

Advanced Communication Parameters

Parameter Number	Parameter	Factory Default
0	Number of Retries	02
1	Duplicate message detection	01
2	DF1 ACK Time-out	10
3	Modem Handshaking	00
4	CTS to transmit delay	No delay (00)
5	End of message to RTS off	No delay (00)

1770-KFD

This module provides an interface from RS-232 devices to the DeviceNet network. This module is configured through your software.

For more information on the 1770-KFD, please refer to *1770-KFD Communication Protocol Reference Manual*, publication 1770-6.5.22.
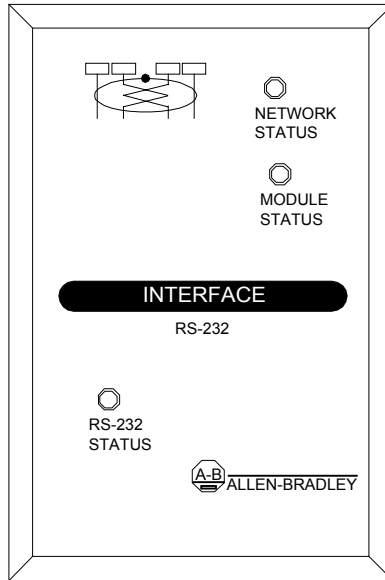
Network Status Indicator

Color	Status
Off	Offline
Flashing green	Online
Solid red	Link failed (critical fault)
Solid green	Online, communicating

Module Status Indicator

Color	Status
Off	No power
Solid green	Device OK
Flashing green	Not configured
Solid red	Critical fault
Flashing red	Non-critical fault

RS-232 Indicator

Color	Status
Off	No activity, link OK
Flickering green	Activity, link OK
Solid red	Link failed (critical fault)
Flashing red	Link failed (non-critical fault)

1785-KE (Series B)

This module provides an interface between RS-232C devices to a Data Highway Plus (DH+) network. On the side of the module, there are four switch assemblies. Each of the switch assemblies may contain up to eight switches. There is also a switch guide printed on the side of the module.

For more information on the 1785-KE, please refer to *1785-KE Data Highway Communications Interface Module User Manual*, publication 1785-6.5.2.
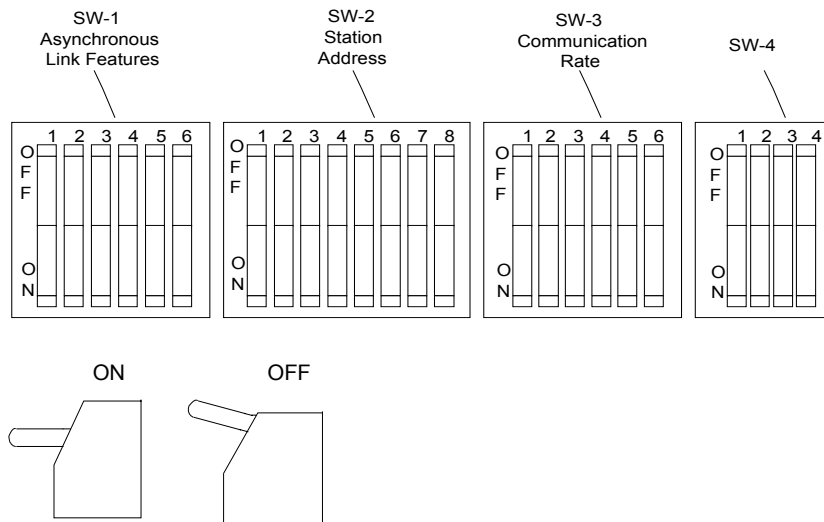
SW-1 (Asynchronous Link Features)

Protocol	Error Checking	Parity	Embedded Response	Switch		
				1	2	3
Full duplex	BCC	None	No	OFF	OFF	OFF
Full duplex	BCC	Even	No	ON	OFF	OFF
Full duplex	BCC	None	Yes	OFF	ON	OFF
Full duplex	BCC	Even	Yes	ON	ON	OFF
Full duplex	BCC	None	No	OFF	OFF	ON
Half duplex	BCC	Even	No	OFF	ON	ON
Full duplex	CRC	None	Yes	OFF	ON	ON
Half duplex	CRC	None	No	ON	ON	ON

SW-1 Switch 4 (Duplicate)

Messages	Switch 4
Detect and ignore duplicates	ON
Accept all regardless of duplication	OFF

SW-1 Switch 5 (Handshaking)

Handshaking	Switch 5
Use handshaking signals	ON
Ignore handshaking signals	OFF

SW-1 Switch 6 (Diagnostics)

Diagnostic Command	Switch 6
Execute	ON
Pass	OFF

SW-2 Switches 1, 2 (Station Address)

Switch 1	Switch 2
ON	ON

SW-2 Switches 3, 4, 5 (Octal Digit 1)(most significant)

To set first digit (octal):	Switch		
	3	4	5
0	ON	ON	ON
1	ON	ON	OFF
2	ON	OFF	ON
3	ON	OFF	OFF
4	OFF	ON	ON
5	OFF	ON	OFF
6	OFF	OFF	ON
7	OFF	OFF	OFF

SW-2 Switches 6, 7, 8 (Octal Digit 2)(least significant)

To set second digit (octal):	Switch		
	6	7	8
0	ON	ON	ON
1	ON	ON	OFF
2	ON	OFF	ON
3	ON	OFF	OFF
4	OFF	ON	ON
5	OFF	ON	OFF
6	OFF	OFF	ON
7	OFF	OFF	OFF

SW-3 Switches 1, 2 (Network Communication Rate)

Switch 1	Switch 2	Communication rate
ON	ON	57, 600 bits per second

SW-3 Switches 3, 4, 5 (Asynchronous Communication Rate)

Bits per second	Switch		
	3	4	5
110	OFF	OFF	OFF
300	ON	OFF	OFF
600	OFF	ON	OFF
1200	ON	ON	OFF
2400	OFF	OFF	ON
4800	ON	OFF	ON
9600	OFF	ON	ON
19200	ON	ON	ON

SW-3 Switch 6

To use the 1785-KE to connect	Switch 6
Computer or other intelligent RS-232C device to a Data Highway Plus network	Local (ON)
Data Highway Plus node (such as a PLC-5) as a slave on a multidrop link, using a modem	Remote (OFF)
Two Data Highway Plus networks over a point-to-point modem link	Remote (OFF)

SW-4

Switch 1	Switch 2	Switch 3	Switch 4
OFF	OFF	OFF	OFF

How to configure Allen-Bradley cards

This section provides information on how to configure Allen-Bradley cards.

1784-KL

This card provides an interface from the Data Highway Plus (DH+) to the A-B T47 programming terminal.

For more information on the 1784-KL, please refer to *Data Highway Plus Local Area Network Product Data*, publication 1785-2.6.

TIP	It is not necessary to configure the 1784-KL card's memory address or interrupt for use with Rockwell Software products. The base address and interrupt are not adjustable and are set as follows:

| Series	Base Address	IRQ
A	E000	None (the card uses Polled Mode)
B	E000	2

IMPORTANT	Exclude memory addresses from E000 to E100 with your memory management software. If you are using Windows, exclude the memory addresses in the SYSTEM.INI file.

1784-KT

This card provides an interface from a PC bus to a Data Highway Plus (DH+) network. The 1784-KT card contains a set of DIP switches and a jumper which must be set before you can use the 1784-KT with your Rockwell Software product.

For more information on the 1784-KT card, please refer to *Communication Interface Module Installation Data*, publication 1784-2.31.

Base Address

1	2	3	4	5	6

Factory base address
setting of D400

Interrupt

3
4
5
7

ON

OFF
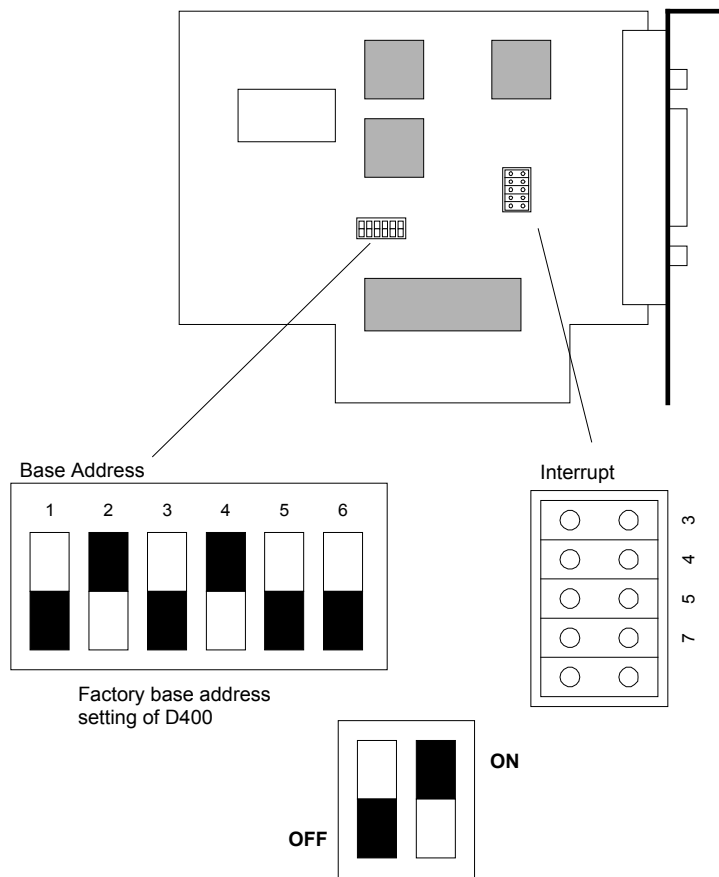
IMPORTANT   Be careful when reading the switches on the 1784-KT card. The side of the switch that is pushed into the switch block is the activated side. (The small red dots on the switches do not denote the switch's position.)

Interrupt

Interrupt	May conflict with
3	COM2
4	COM1
5	LPT2
7	LPT1

Base Address

Address	Switch 1	Switch 2	Switch 3	Switch 4	Switch 5	Switch 6
A000	ON	ON	ON	OFF	ON	OFF
A400	OFF	ON	ON	OFF	ON	OFF
A800	ON	OFF	ON	OFF	ON	OFF
AC00	OFF	OFF	ON	OFF	ON	OFF
B000	ON	ON	OFF	OFF	ON	OFF
B400	OFF	ON	OFF	OFF	ON	ON
B800	ON	OFF	OFF	OFF	ON	OFF
C000	ON	ON	ON	ON	OFF	OFF
C400	OFF	ON	ON	ON	OFF	OFF
C800	ON	OFF	ON	ON	OFF	OFF
CC00	OFF	OFF	ON	ON	OFF	OFF
D000	ON	ON	OFF	ON	OFF	OFF
D400	**OFF**	**ON**	**OFF**	**ON**	**OFF**	**OFF**
D800	ON	OFF	OFF	ON	OFF	OFF

1784-KT2

This module is an IBM/PS2 MicroChannel card that provides an interface from a PC bus to a Data Highway Plus (DH+) network. Use an IBM Reference Diskette to configure this module.

For more information on the 1770-KT2, please refer to *Communication Interface Module Data*, publication 1784.6.5.16.

> **TIP**
> Please refer to your Allen-Bradley documentation for installing and configuring this module.

Supported memory addresses

C000-C3FF

C400-C7FF

C800-CBFF

CC00-CFFF

D000-D3FF

D400-D7FF

D800-DBFF

DC00-DFFF

Supported interrupts

IRQ9

IRQ10

IRQ11

IRQ12

1784-KTC/KTCX

This card provides an interface from a PC bus to the ControlNet network.

The 1784-KTCX is the card pictured in this documentation. There are two series to this card: A and B. The 1784-KTCX series A/B contains two BNC receptacles to connect directly to a ControlNet network. The 1784-KTC series A/B is identical to the KTCX series A/B except that the KTC does not have BNC connectors.

For more information on the 1784-KTC/KTCX, please refer to *ControlNet Communication Interface Card Installation Instructions*, publication 1784-5.20.
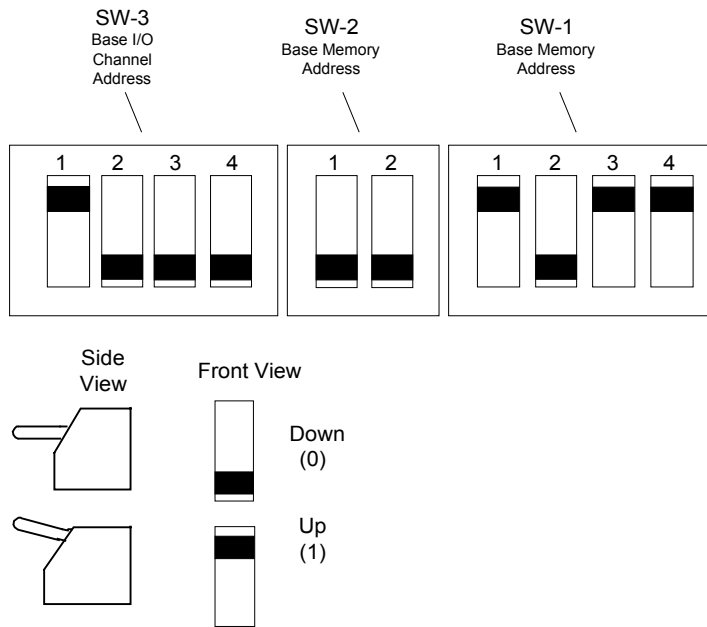
Series A 1784-KTC/KTCX
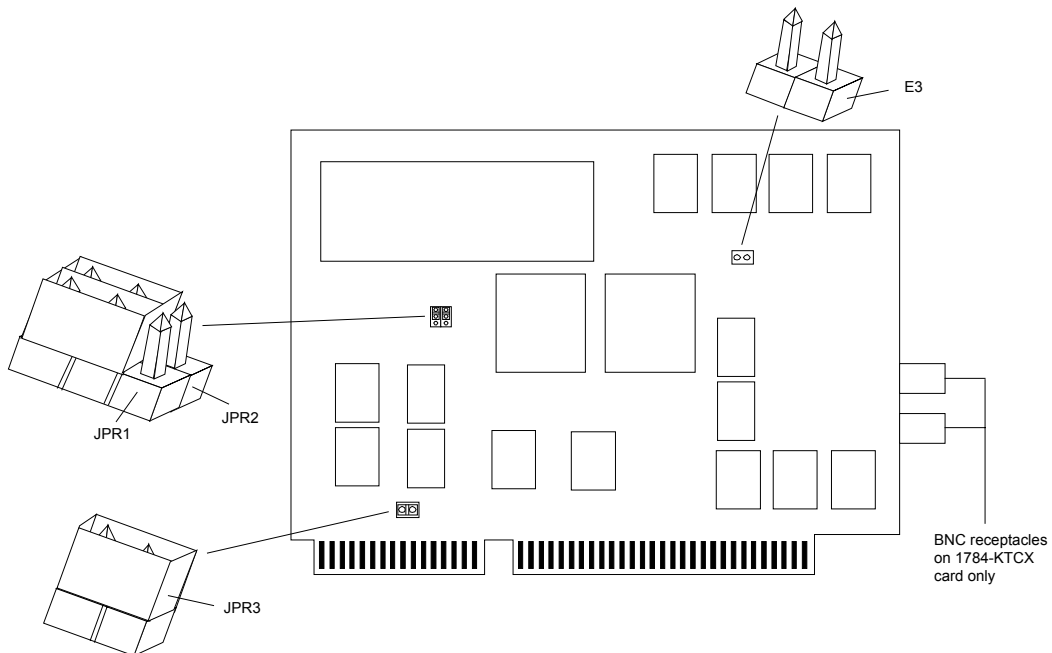
Series B 1784-KTC/KTCX
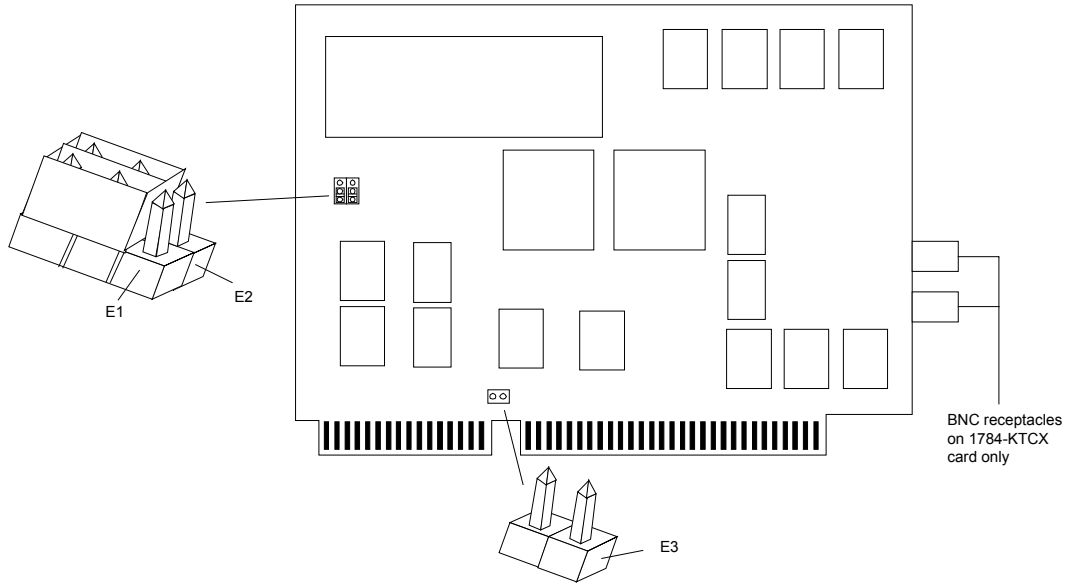
Switch Assemblies (Series A KTC/KTCX and Series B KTC/KTCX)

Base Memory Address for the Series A card

IMPORTANT Do not mix 8-bit and 16-bit cards within a 64K segment boundary. A 1784-KT (series B) card cannot be placed in the same segment range of D000-DFFF or C000-CFFF. The 8-bit card may not work in this setup. The two cards, 1784-KTC (series A) (16-bit) and 1784-KT (series B) (8-bit), can be placed with one in the C000-CFFF range and one in the D000-DFFF range.

SW-1 SW-2 Base Memory Address

Base Memory Address	SW-2		SW-1			
	Switch		Switch			
	1	2	1	2	3	4
C000	DOWN	DOWN	DOWN	DOWN	UP	UP
C400	UP	DOWN	DOWN	DOWN	UP	UP
C800	DOWN	UP	DOWN	DOWN	UP	UP
CC00	UP	UP	DOWN	DOWN	UP	UP
D000	DOWN	DOWN	UP	DOWN	UP	UP
D400	UP	DOWN	UP	DOWN	UP	UP
D800	DOWN	UP	UP	DOWN	UP	UP
DC00	UP	UP	UP	DOWN	UP	UP

SW-3 Base I/O Channel Address

Base I/O Channel Address	Switch			
	1	2	3	4
200	DOWN	DOWN	DOWN	DOWN
220	UP	DOWN	DOWN	DOWN
240	DOWN	UP	DOWN	DOWN
260	UP	UP	DOWN	DOWN
280	DOWN	DOWN	UP	DOWN
2A0	UP	DOWN	UP	DOWN
2C0	DOWN	UP	UP	DOWN
2E0	UP	UP	UP	DOWN
300	DOWN	DOWN	DOWN	UP
320	UP	DOWN	DOWN	UP
340	DOWN	UP	DOWN	UP
360	UP	UP	DOWN	UP
380	DOWN	DOWN	UP	UP
3A0	UP	DOWN	UP	UP
3C0	DOWN	UP	UP	UP
3E0	UP	UP	UP	UP

Series A Jumper Explanations
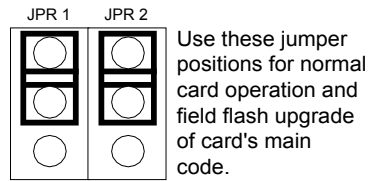
JPR 1   JPR 2

Use these jumper positions for normal card operation and field flash upgrade of card's main code.

JPR 1   JPR 2

Use these jumper positions for field flash upgrade of card's boot code.

JPR 3

When installed, use this jumper to latch certain address lines that some 286 machines and older may not latch.

E3
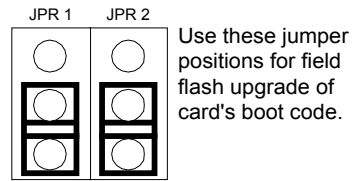
This jumper must be installed during field flash upgrades. This jumper must be uninstalled during normal card operation.
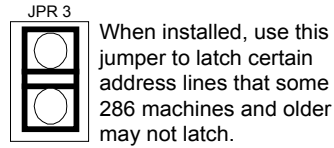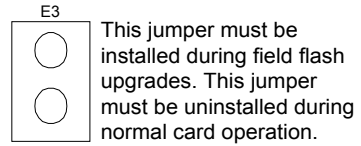
Series B Jumper Explanations

E1   E2

Use these jumper positions for normal card operation and field flash upgrade of card's main code.

E1   E2

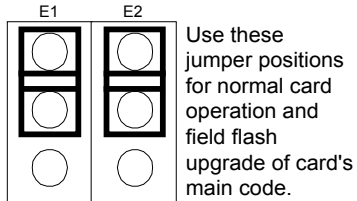Use these jumper positions for field flash upgrade of card's boot code.

E3

When installed, use this jumper to latch certain address lines that some 286 machines and older may not latch.
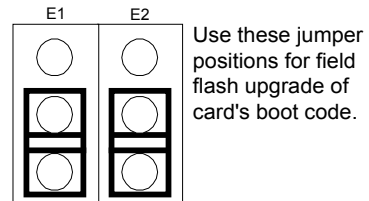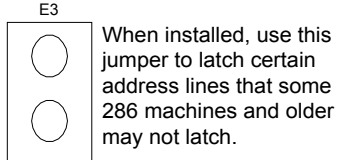
1784-KTX/KTXD/KTS

Use this document to configure the 1784-KTX, the 1784 KTXD, and the 1784-KTS cards.

For more information on these cards, please refer to *1784 Communication Interface Card User Manual*, publication 1784-6.5.22.

Features Supported

Product Catalog Number	Channels	Communicates from a PC bus to these networks	Description
1784-KTX	1	DH+ or DH485	1 set of rotary dials and interrupt jumpers. RJ connector in place of middle 3-pin Phoenix connector.
1784-KTXD	2	DH+ and/or DH485	2 sets of rotary dials and interrupt jumpers.
1784-KTS	1	N/A	A single channel device that acts only as remote scanner.

1784-KTXD
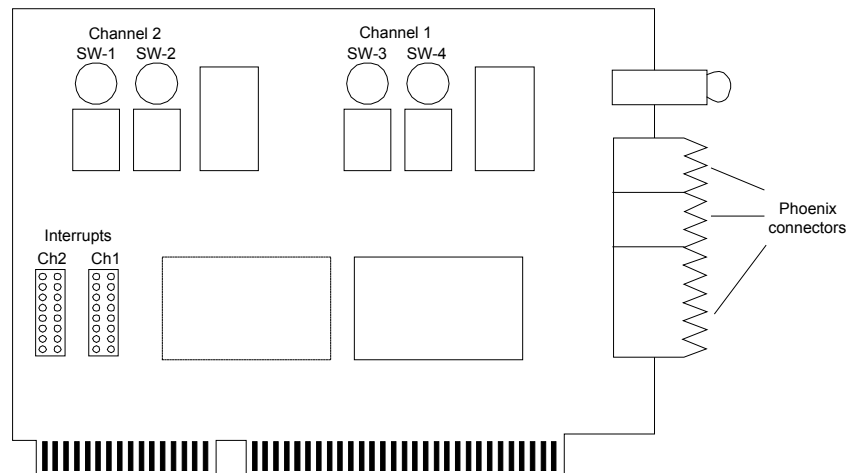
TIP The 1784-KTX is similar in appearance but only has one channel and one RJ connector.

Memory Address

Channel 2

SW-1   SW-2

Channel 1

SW-3   SW-4

Interrupts

No IRQ

IRQ	Ch2	Ch1	IRQ
3			3
4			4
5			5
7			7
9			9
10			10
11			11
12			12
15			15

IRQ 5
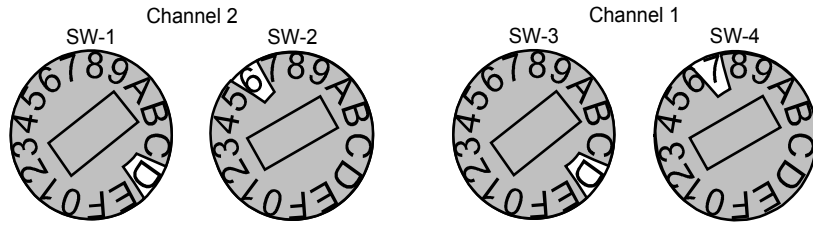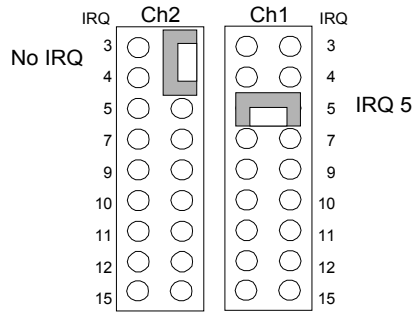
1784-PCMK

This card provides a PCMCIA (Personal Computer Memory Card International Association) communication interface to Data Highway Plus (DH+) and Data Highway 485 (DH485) networks, and the communication port on the front of PLC-2 processors. There are no explicit configuration instructions for this card, as Windows can handle any configuration required.

For more information on the 1784-PCMK, please refer to *PCMK Communication Card User Manual*, publication 1784-6.5.19.

IMPORTANT   Your computer must be PCMCIA 2.1 compliant to support the PCMK card.

EMM386.EXE

Loading EMM386.EXE in the CONFIG.SYS file may interfere with the driver's ability to map the 1784-PCMK into MS-DOS memory. Either remove EMM386.EXE from CONFIG.SYS, or use it with the WIN= option in the command line. Refer to the What is Memory Management Software section in Chapter 1 for more information on EMM386.EXE.

How to configure S-S Technologies cards

This section provides information on how to configure S-S Technologies cards.

5136-SD (Revision 1)

This card provides an interface from a PC bus to a Data Highway (DH) and Data Highway Plus (DH+) network. There are two revisions to this card. Revision 1 has eight switches. Revision 2 has six switches.

For more information on the 5136-SD (Revision 1 and 2), please refer to *5136-SD User's Guide*, publication SDMS.DOC.
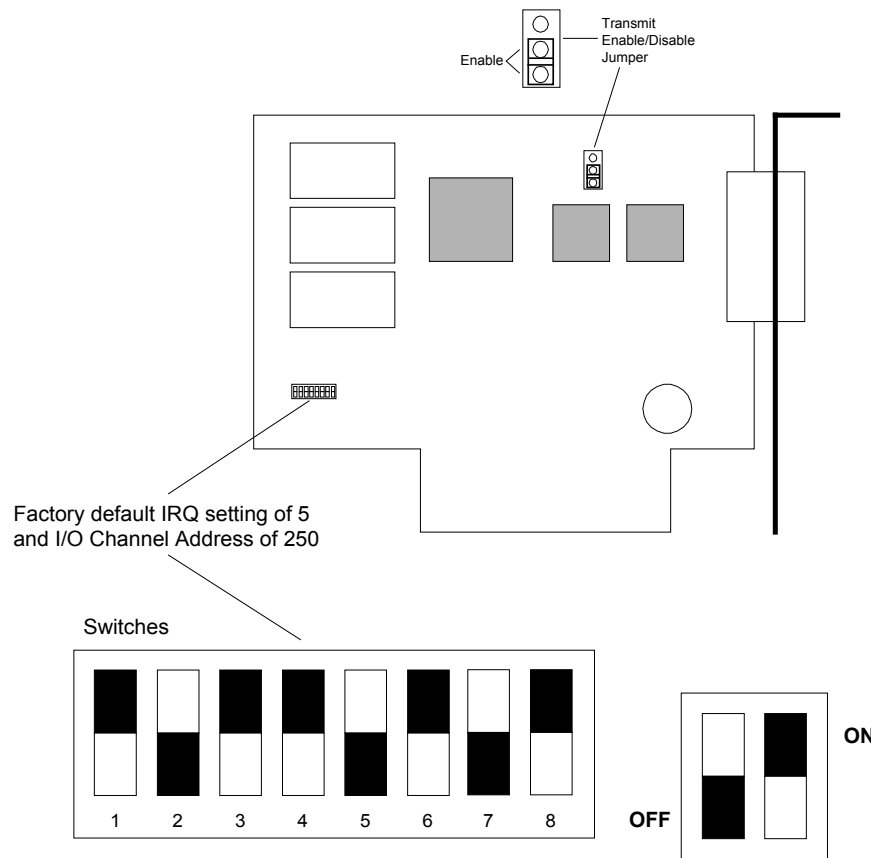
I/O Channel Address

| I/O Channel Address	Switch					Remarks
	4	5	6	7	8	
200	ON	ON	ON	ON	ON	Game port
208	ON	ON	ON	ON	OFF	
210	ON	ON	ON	OFF	ON	
218	ON	ON	ON	OFF	OFF	
220	ON	ON	OFF	ON	ON	
228	ON	ON	OFF	ON	OFF	
230	ON	ON	OFF	OFF	ON	
238	ON	ON	OFF	OFF	OFF	
240	ON	OFF	ON	ON	ON	
248	ON	OFF	ON	ON	OFF	
250	ON	OFF	ON	OFF	ON	Default
258	ON	OFF	ON	OFF	OFF	
260	ON	OFF	OFF	ON	ON	
268	ON	OFF	OFF	ON	OFF	
270	ON	OFF	OFF	OFF	ON	
278	ON	OFF	OFF	OFF	OFF	LPT2
280	OFF	ON	ON	ON	ON	
288	OFF	ON	ON	ON	OFF	
290	OFF	ON	ON	OFF	ON	
298	OFF	ON	ON	OFF	OFF	
2A0	OFF	ON	OFF	ON	ON	
2A8	OFF	ON	OFF	ON	OFF	
2B0	OFF	ON	OFF	OFF	ON	
2B8	OFF	ON	OFF	OFF	OFF	
2C0	OFF	OFF	ON	ON	ON	
2C8	OFF	OFF	ON	ON	OFF	
2D0	OFF	OFF	ON	OFF	ON	
2D8	OFF	OFF	ON	OFF	OFF	
2E0	OFF	OFF	OFF	ON	ON	

I/O Channel Address	Switch					Remarks
	4	5	6	7	8	
2E8	OFF	OFF	OFF	ON	OFF	COM4
2F0	OFF	OFF	OFF	OFF	ON	
2F8	OFF	OFF	OFF	OFF	OFF	COM2

IRQ Setting

IRQ	Switch 1	Switch 2	Switch 3	May conflict with
3	ON	OFF	OFF	COM2
5	OFF	ON	OFF	LPT2
7	OFF	OFF	ON	LPT1
None	OFF	OFF	OFF	Default

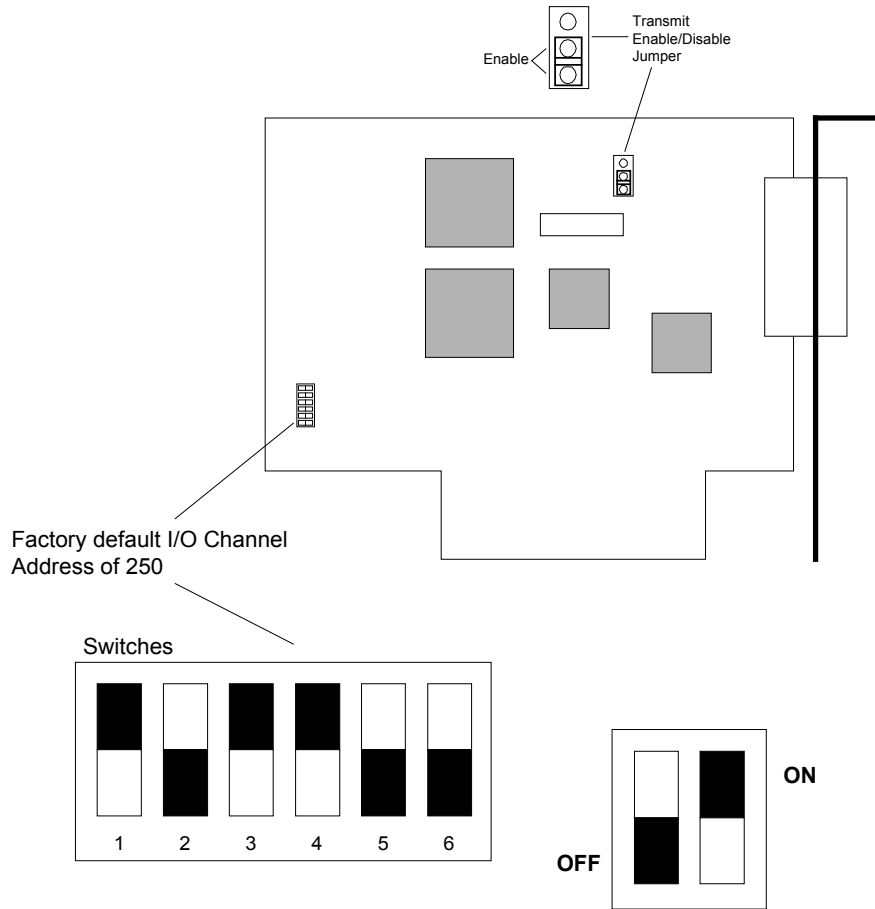**Transmit Enable/Disable Jumper (JB1)**
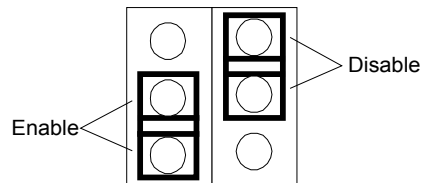
5136-SD (Revision 2)

This card provides an interface from a PC bus to a Data Highway (DH) and Data Highway Plus (DH+) network. There are two revisions to this card. Revision 2 has six switches. Revision 1 has eight switches.

For more information on the 5136-SD (Revision 1 and 2), please refer to *5136-SD User's Guide*, publication SDMS.DOC.

I/O Channel Address

I/O Channel Address	Switch						Remarks
	1	**2**	**3**	**4**	**5**	**6**	
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	
260	ON	ON	OFF	OFF	ON	ON	
268	ON	ON	OFF	OFF	ON	OFF	
270	ON	ON	OFF	OFF	OFF	ON	
278	ON	ON	OFF	OFF	OFF	OFF	LPT2
280	ON	OFF	ON	ON	ON	ON	
288	ON	OFF	ON	ON	ON	OFF	
290	ON	OFF	ON	ON	OFF	ON	
298	ON	OFF	ON	ON	OFF	OFF	
2A0	ON	OFF	ON	OFF	ON	ON	
2A8	ON	OFF	ON	OFF	ON	OFF	
2B0	ON	OFF	ON	OFF	OFF	ON	
2B8	ON	OFF	ON	OFF	OFF	OFF	
2C0	ON	OFF	OFF	ON	ON	ON	
2C8	ON	OFF	OFF	ON	ON	OFF	
2D0	ON	OFF	OFF	ON	OFF	ON	
2D8	ON	OFF	OFF	ON	OFF	OFF	
2E0	ON	OFF	OFF	OFF	ON	ON	
2E8	ON	OFF	OFF	OFF	ON	OFF	COM4

I/O Channel Address	Switch						Remarks
	1	2	3	4	5	6	
2F0	ON	OFF	OFF	OFF	OFF	ON	
2F8	ON	OFF	OFF	OFF	OFF	OFF	COM2
600	OFF	ON	ON	ON	ON	ON	Game port
608	OFF	ON	ON	ON	ON	OFF	
610	OFF	ON	ON	ON	OFF	ON	
618	OFF	ON	ON	ON	OFF	OFF	
620	OFF	ON	ON	OFF	ON	ON	
628	OFF	ON	ON	OFF	ON	OFF	
630	OFF	ON	ON	OFF	OFF	ON	
638	OFF	ON	ON	OFF	OFF	OFF	
640	OFF	ON	OFF	ON	ON	ON	
648	OFF	ON	OFF	ON	ON	OFF	
650	OFF	ON	OFF	ON	OFF	ON	
658	OFF	ON	OFF	ON	OFF	OFF	
660	OFF	ON	OFF	OFF	ON	ON	
668	OFF	ON	OFF	OFF	ON	OFF	
670	OFF	ON	OFF	OFF	OFF	ON	
678	OFF	ON	OFF	OFF	OFF	OFF	LPT2
680	OFF	OFF	ON	ON	ON	ON	
688	OFF	OFF	ON	ON	ON	OFF	
690	OFF	OFF	ON	ON	OFF	ON	
698	OFF	OFF	ON	ON	OFF	OFF	
6A0	OFF	OFF	ON	OFF	ON	ON	
6A8	OFF	OFF	ON	OFF	ON	OFF	
6B0	OFF	OFF	ON	OFF	OFF	ON	
6B8	OFF	OFF	ON	OFF	OFF	OFF	
6C0	OFF	OFF	OFF	ON	ON	ON	
6C8	OFF	OFF	OFF	ON	ON	OFF	
6D0	OFF	OFF	OFF	ON	OFF	ON	
6D8	OFF	OFF	OFF	ON	OFF	OFF	

I/O Channel Address	Switch						Remarks
	1	2	3	4	5	6	
6E0	OFF	OFF	OFF	OFF	ON	ON	
6E8	OFF	OFF	OFF	OFF	ON	OFF	COM4
6F0	OFF	OFF	OFF	OFF	OFF	ON	
6F8	OFF	OFF	OFF	OFF	OFF	OFF	COM2

Transmit Enable/Disable Jumper (JB2)
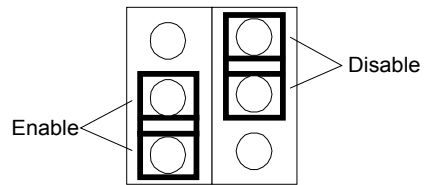
5136-SD-MCA

This card provides an interface from an IBM PS/2 bus to a Data Highway (DH) and Data Highway Plus (DH+) network.

> **TIP** The original cards were labeled 5136-SD-MCA. Revised cards are labeled 5136-SD2-MC (Revision 1). See S-S Technologies' documentation for details.

> **TIP** Installing and configuring the 5136-SD-MCA requires a reference disk that is supplied with the computer. The .ADF files for installing the 5136-SD-MCA are included on the reference disk.

For more information on the 5136-SD-MCA, please refer to *5136-SD-MCA Direct-Link Interface Card User's Guide*, publication MCMAN.DOC.
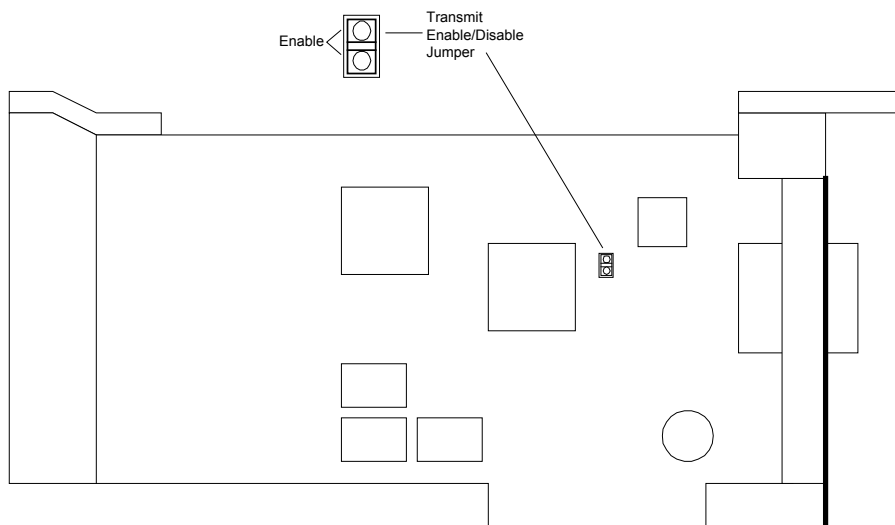
Jumper Settings

Card	Jumper	Setting	Function
Original card	J2	Enable	Enables transmission
Revised card	P6	Enable (left position)	Enables transmission

3 Communication cables

This chapter provides you with basic connection information. In this chapter, there is also a chart to reference the communication cables.

If you have additional questions on your cabling, we suggest that you contact the cable manufacturer. If you have additional questions on cabling your hardware with Rockwell Software products, please contact Rockwell Software technical support.

> **TIP** Some of the products listed in this may be no longer available from Rockwell Software, Inc. Please contact Rockwell Software for details on availability.

How to use this chapter

1. Determine the type of communication devices that you are configuring.

2. Refer to the appropriate section of Chapter 3.

Cables

| Rockwell Software Part Number	Product Description	Allen-Bradley Part Number
9399-C5	Serial Port to 1771-KG, -KE, -KF, or 1785-KE Module	1784-CAK
9399-C6	Serial Port to 1770-SA or 1770-SB Recorder	1784-CAS
9399-C7	Serial Port to 1770 T3 Terminal	
9399-C8	6120 Industrial XT to 1771-KF, -KG, or 1785-KE Module	
9399-C9	6120 Industrial XT to 1770-SA or 1770-SB Recorder	1784-CYS
9399-C10	6120 Industrial XT to 1770 T3 Terminal	
9399-C11	Serial Port to 1770-KF2B or 1770-KF3 Module	
9399-C13	25-Pin Male to 9-Pin Female Adapter	
9399-C13B	9-Pin Male to 25-Pin Female Adapter	
9399-C14	Serial Port to1771-DB Module	
9399-C15	1784-KTK1 or 1770-KF2B to PLC-5 Processor	1784-CP5
9399-C16	Serial Port to PLC-3 Channel 0 or 5	
9399-C17	Rockwell Software L2-101 Interface Card (9399-L2101) to PLC-2 Front Port	1772-TC
9399-C18	1784-KT or 1784-KL to PLC-2 Front Port	1784-CP2
9399-C19	1784-KT or 1784-KL to PLC-5 Processor	1784-CP
9399-C20	1785-KE to PLC-5 Processor (blue hose for DH, DH+, and remote I/O)	
9399-C21	Serial Port to 1774-TC Cable	
9399-C23	1784-KT to PLC-3 Front Port	1784-CP3
9399-C25	Serial Port Adapter for 1774-TD Cable	
9399-C26	8-Pin Mini DIN to 9-Pin Female	1784-CP7
9399-C27	(Obsolete)	
9399-C28	Serial Port to PLC-5 Channel 0	1784-CP10
9399-C29	Serial Port to SLC 500/03 Channel 0	1747-CP3
9399-C30	Serial Port to CVIM/CVIM2	
	RJ-45 8-Pin Connector KTC/KTCX	1786-CP

9399-C5/1784-CAK

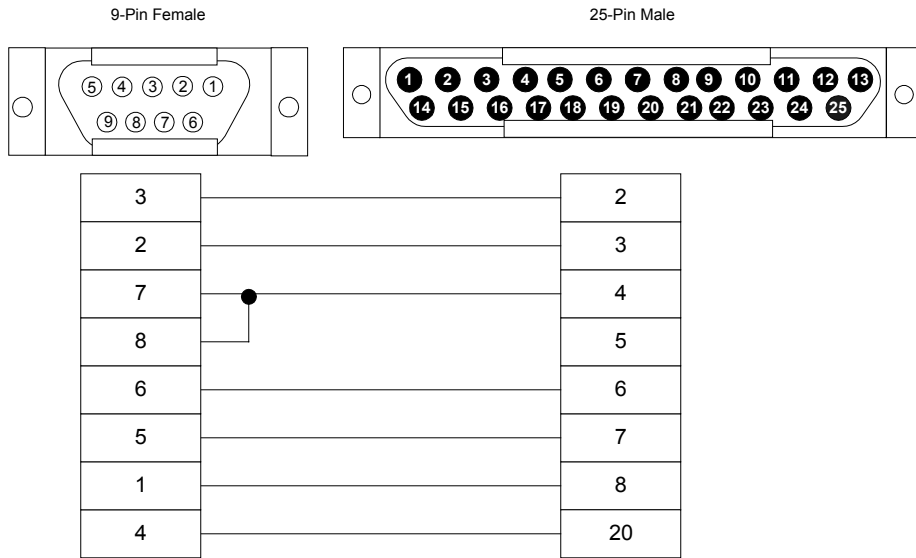This cable connects a T50, 6121, or IBM AT to a 1771-KG, -KE, -KF, or 1785-KE module.

15-Pin Male

9-Pin Female
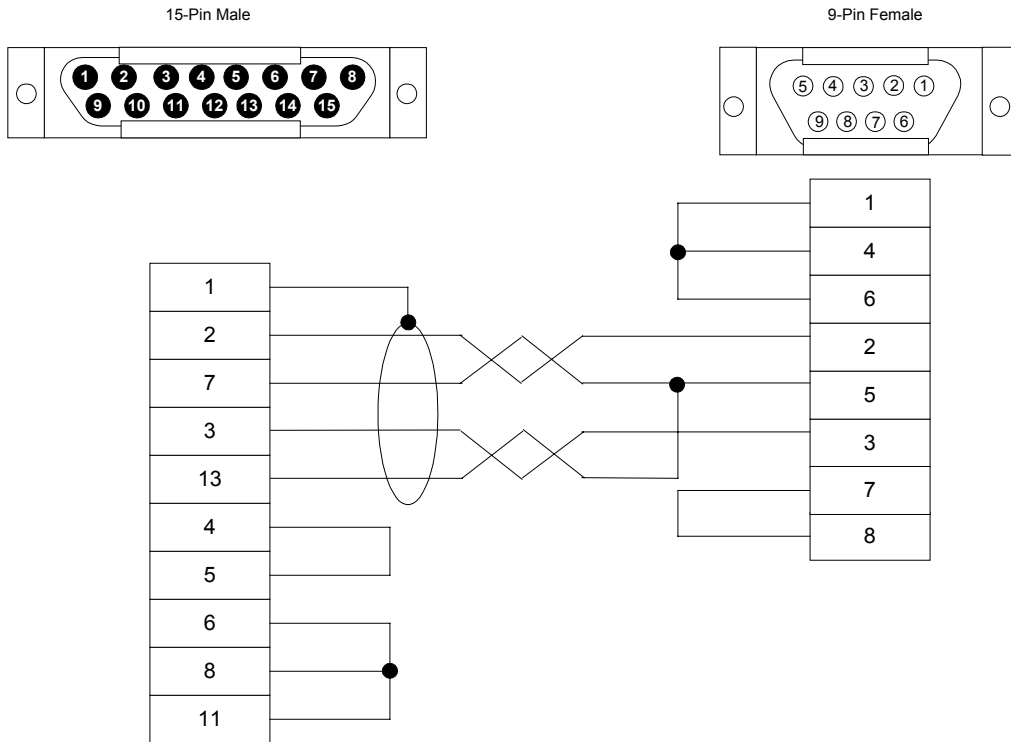
9399-C6/1784-CAS

This cable connects a T50, 6121, or IBM AT to a 1770-SA or 1770-SB recorder.

25-Pin Male

9-Pin Female

25-Pin Male	9-Pin Female
1	
2	3
3	2
4	7
5	8
6	6
7	5
8	1
20	4
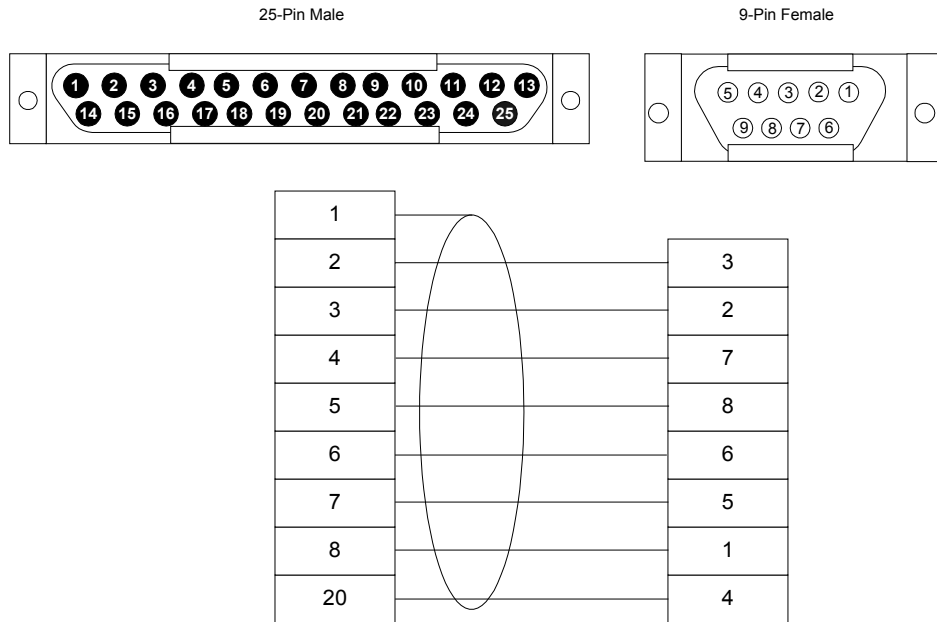
9399-C7

This cable connects an IBM AT to the 1770 T3 terminal.

9-Pin Female		25-Pin Male
3		2
2		3
7		4
8		5
6		6
5		7
1		8
4		20

9399-C8

This cable connects the 6120 Industrial XT to a 1771-KF, -KG, or 1785-KE module.
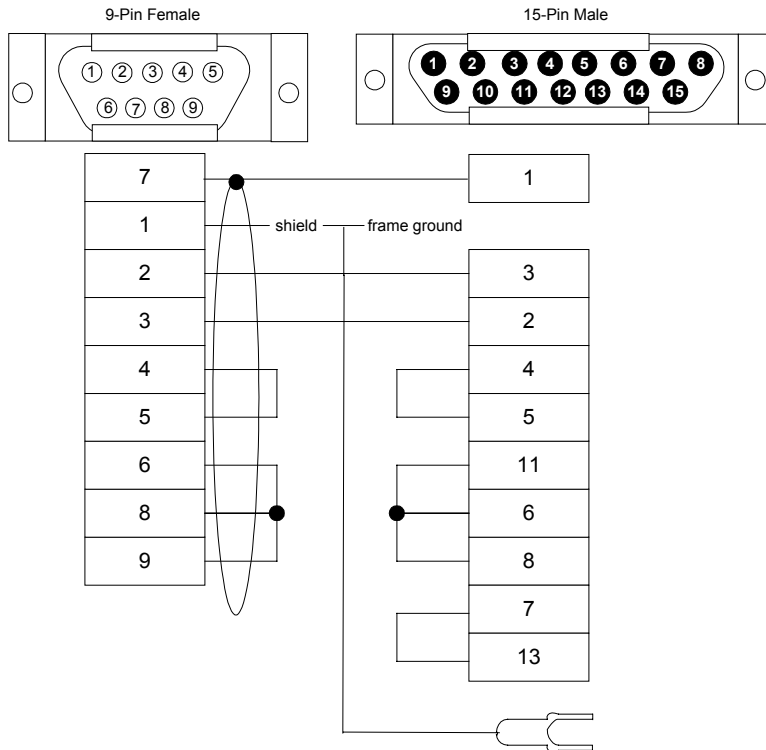
9399-C9/1784-CYS

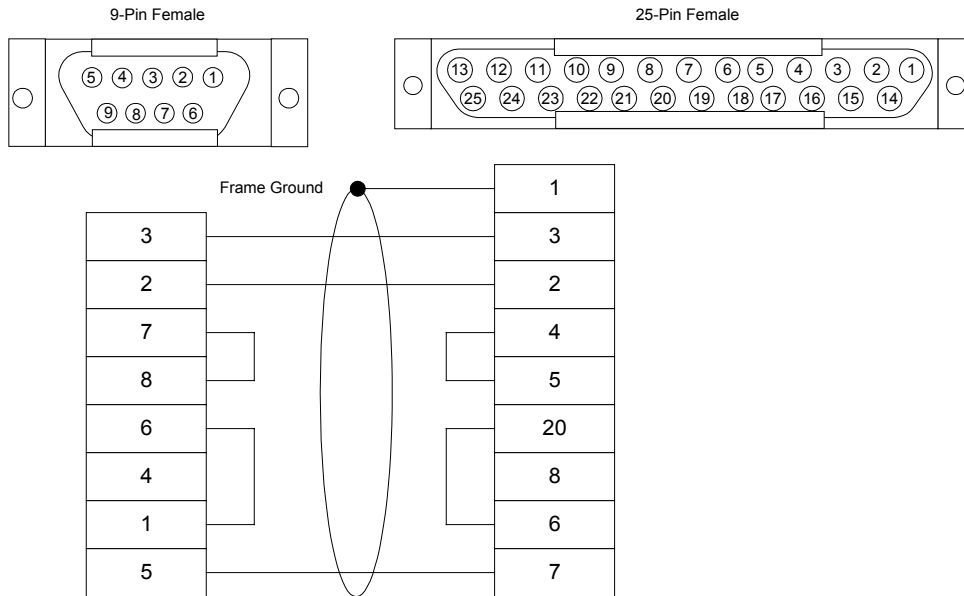This cable connects the 6120 Industrial XT to 1770-SA or 1770-SB recorder.

25-Pin Male

9-Pin Female

| 1 |
| 2 |
| 3 |
| 4 |
| 5 |
| 6 |
| 7 |
| 8 |
| 20 |

| 2 |
| 3 |
| 4 |
| 5 |
| 6 |
| 7 |
| 8 |
| 9 |
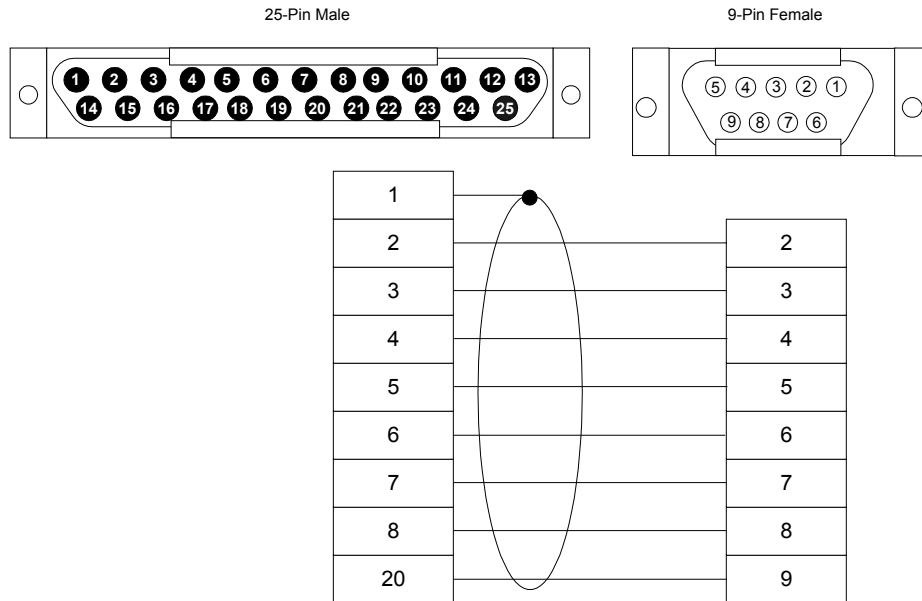
9399-C10

This cable connects a 6120 Industrial XT to a 1770 T3 terminal.

9-Pin Female

⑤ ④ ③ ② ①
⑨ ⑧ ⑦ ⑥

25-Pin Male

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬
⑭ ⑮ ⑯ ⑰ ⑱ ⑲ ⑳ ㉑ ㉒ ㉓ ㉔ ㉕

9-Pin Female		25-Pin Male
1	Frame Ground	
2		2
3		3
4		4
5		5
6		6
7		7
8		8
9		20
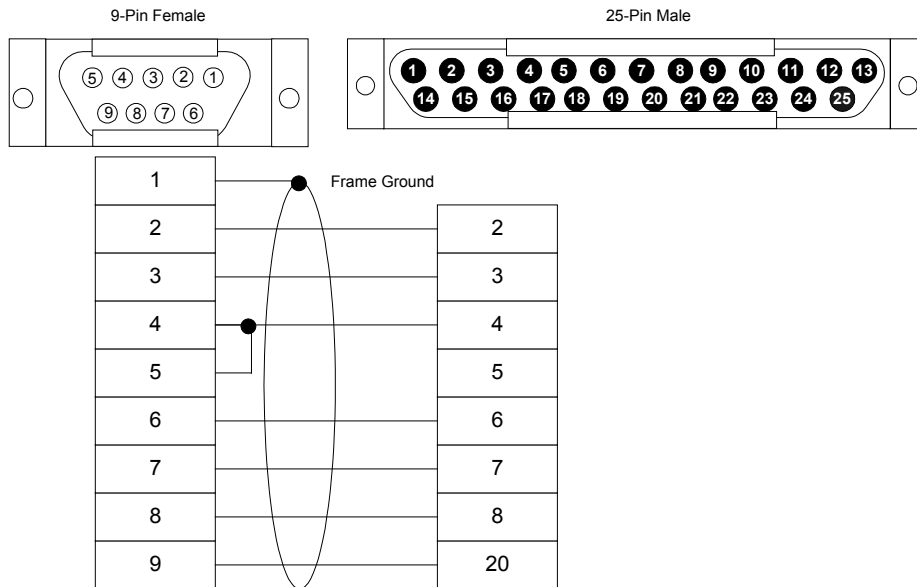
9399-C11

This cable connects a 1770-KF2B or 1770-KF3 module.

```
        9-Pin Female                              25-Pin Female

    ⑤ ④ ③ ② ①              ⑬ ⑫ ⑪ ⑩ ⑨ ⑧ ⑦ ⑥ ⑤ ④ ③ ② ①
      ⑨ ⑧ ⑦ ⑥                ㉕ ㉔ ㉓ ㉒ ㉑ ⑳ ⑲ ⑱ ⑰ ⑯ ⑮ ⑭
```

	Frame Ground	1
3		3
2		2
7		4
8		5
6		20
4		8
1		6
5		7

9399-C13

This cable is a 25-pin male to 9-pin female adapter.

25-Pin Male

9-Pin Female

25-Pin Male	9-Pin Female
2	3
3	2
4	7
5	8
6	6
7	5
8	1
20	4
22	9
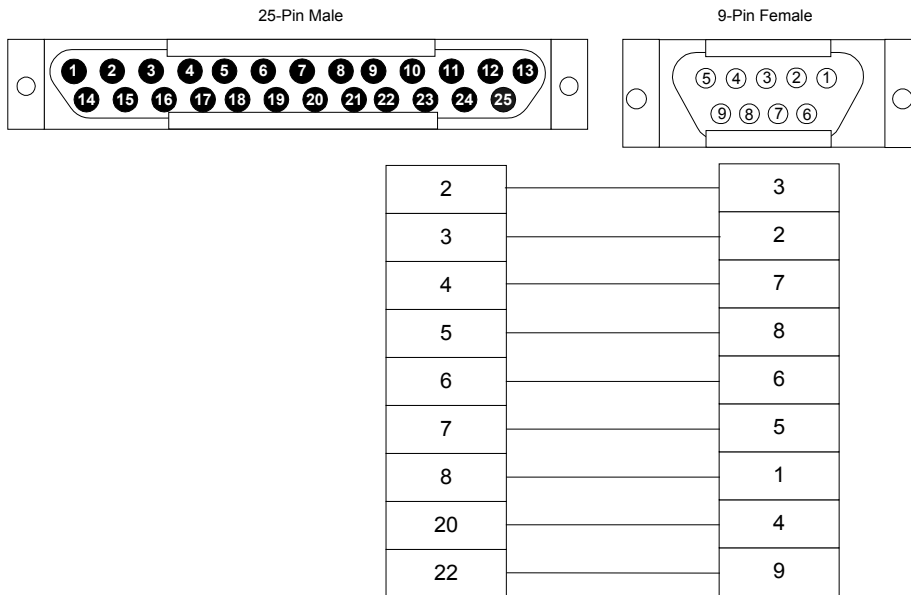
9399-C13B

This cable connects to a 9-pin male to a 25-pin female port or vice versa. This cable allows a cable to be used interchangeably on 9- and 25-pin serial ports.

9-Pin Male

25-Pin Female

9-Pin Male	25-Pin Female
3	2
2	3
7	4
8	5
6	6
5	7
1	8
4	20
9	22
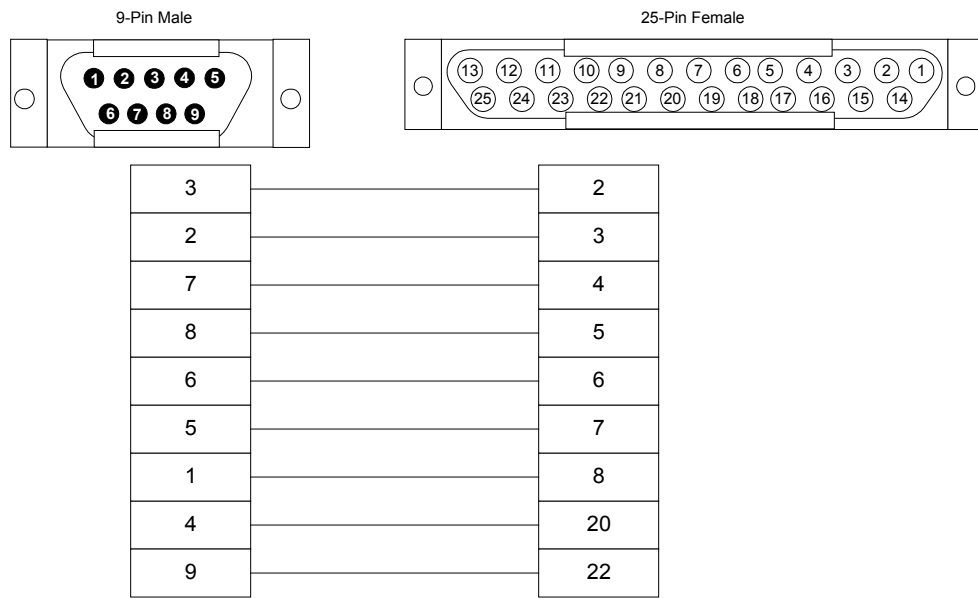
9399-C14

This cable connects the 9-pin serial port to the 25-pin port on the 1771-DB module. This cable comes with an adapter for use with 9- or 25-pin serial ports on the computer.

9-Pin Female

25-Pin Male

| 1 |
| 3 |
| 2 |
| 5 |
| 6 |
| 1 |
| 4 |

Frame Ground

| 3 |
| 2 |
| 7 |
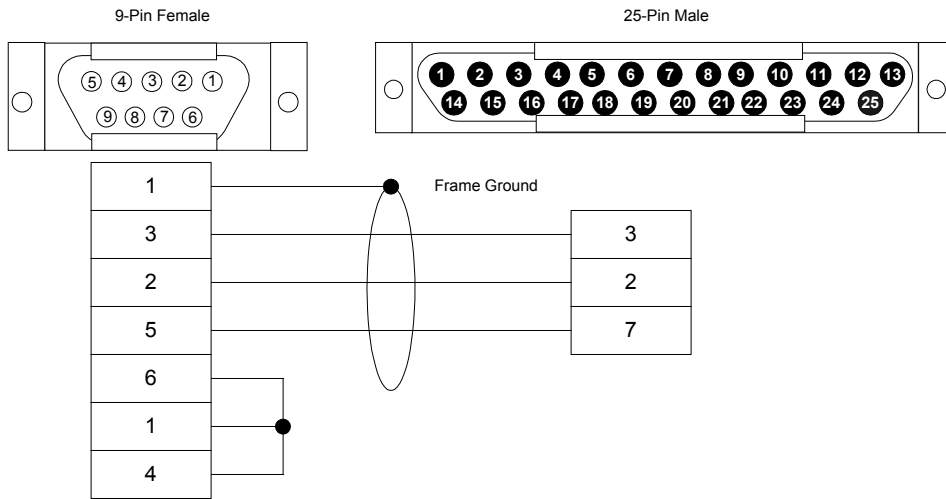
9399-C15/1784-CP5

This cable connects the 1784-KTK1 or 1770-KF2B module to a 9-pin serial port on a PC.
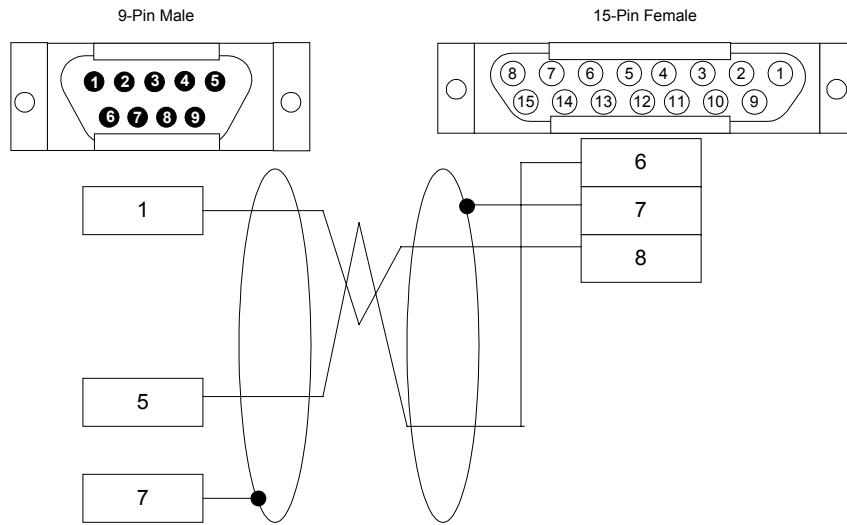
9399-C16

This cable is a serial port that connects the computer's 25-pin serial port to the Channel 0 or Channel 5 on the PLC-3. This cable comes with an adapter for use with 9- or 25-pin serial ports on the computer.

25-Pin Female

25-Pin Male

```
Frame Ground ●──────────  1

         2                  2
         3                  3
         4                  4
         5                  5
         6                  6
         7                  7
         8                  8
        20                 20
```
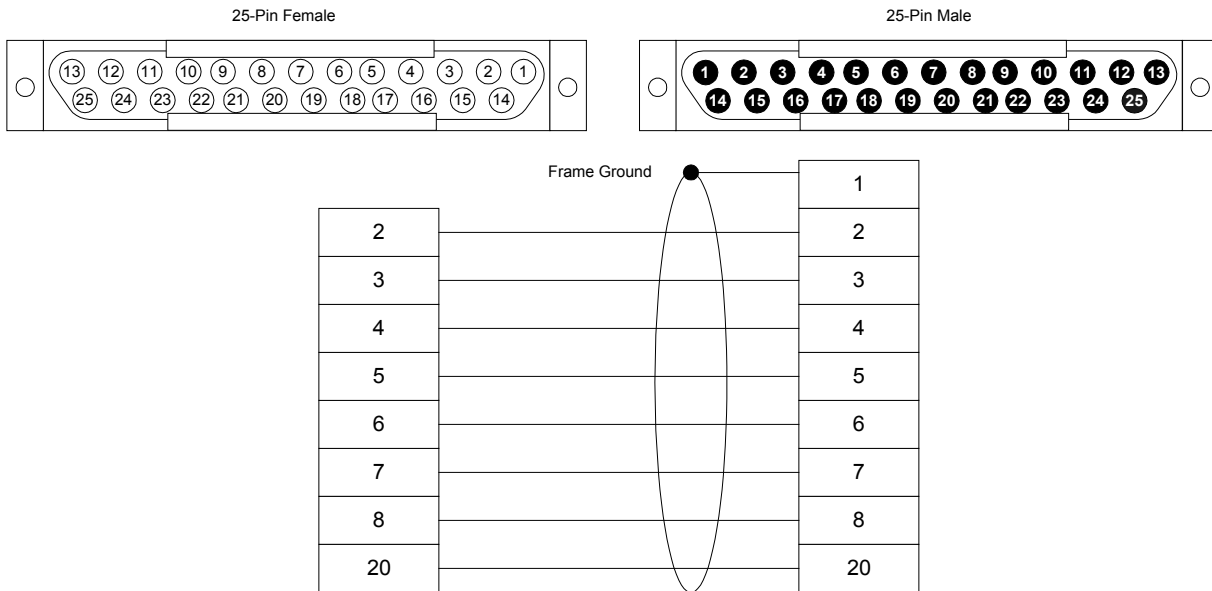
9399-C17/1772-TC

This cable connects the port on the interface card to the communication port on the front of the PLC-2 processor.

15-Pin Male

15-Pin Male

1 2 3 4 5 6 7 8
9 10 11 12 13 14 15

1 2 3 4 5 6 7 8
9 10 11 12 13 14 15

1			1
2			2
3			3
4			4
5			5
6			6
7			7
8			8
			9
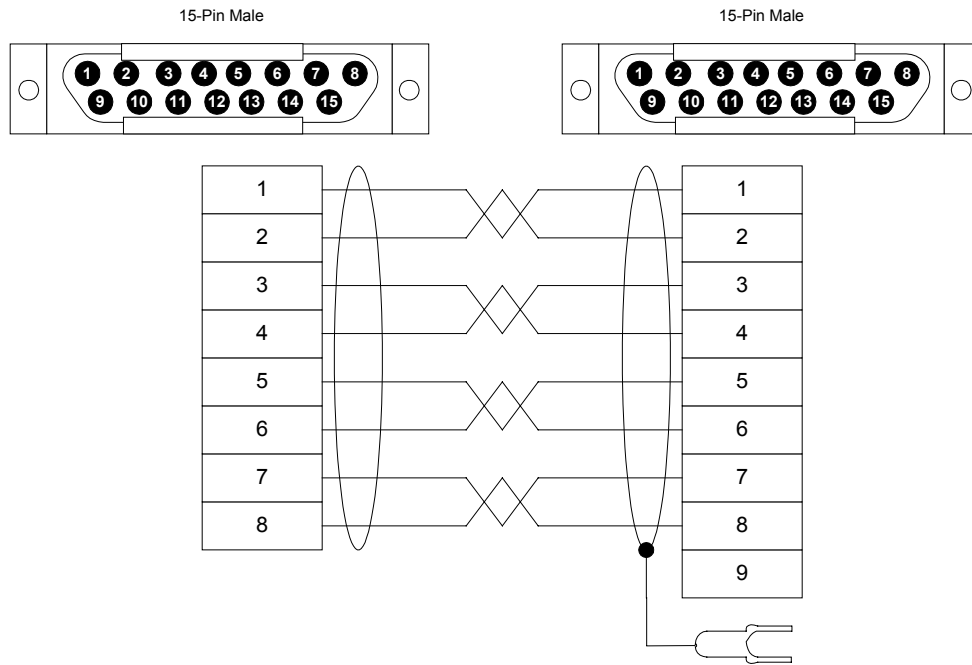
9399-C18/1784-CP2

This cable connects the 1784-KT or 1784-KL to the communication port on the front of the PLC-2 processor.
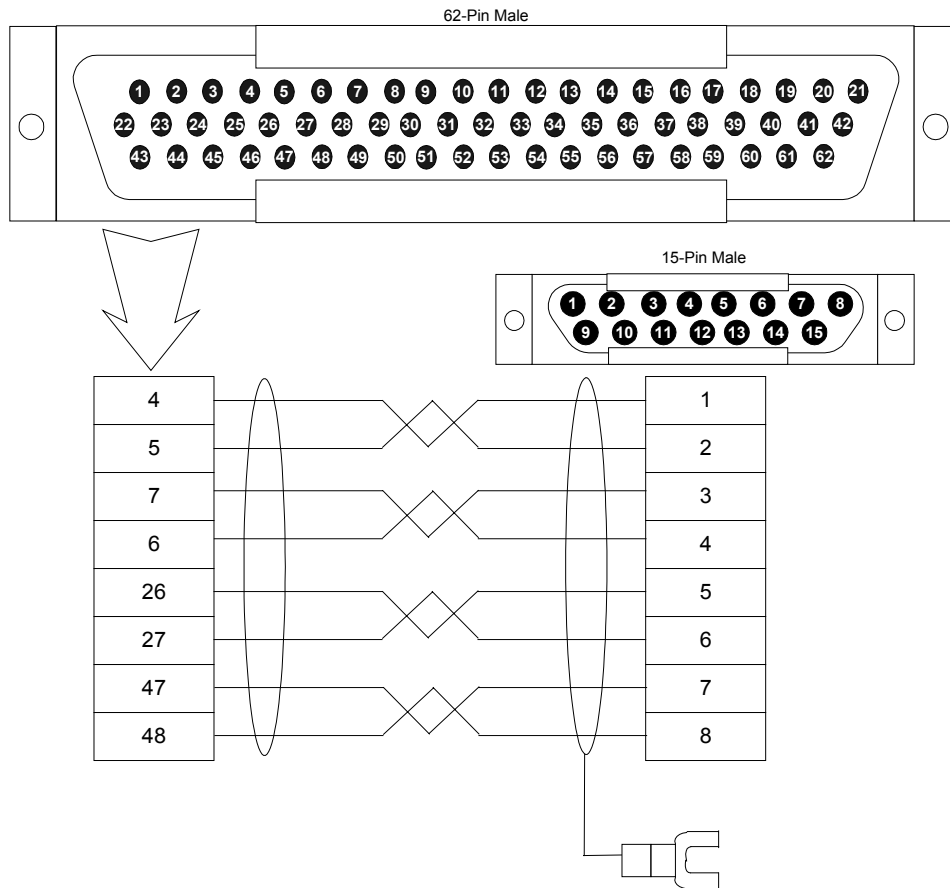
9399-C19/1784-CP

This cable connects the 1784-KT or 1784-KL to Channel 1 on a PLC-5 processor serial port.
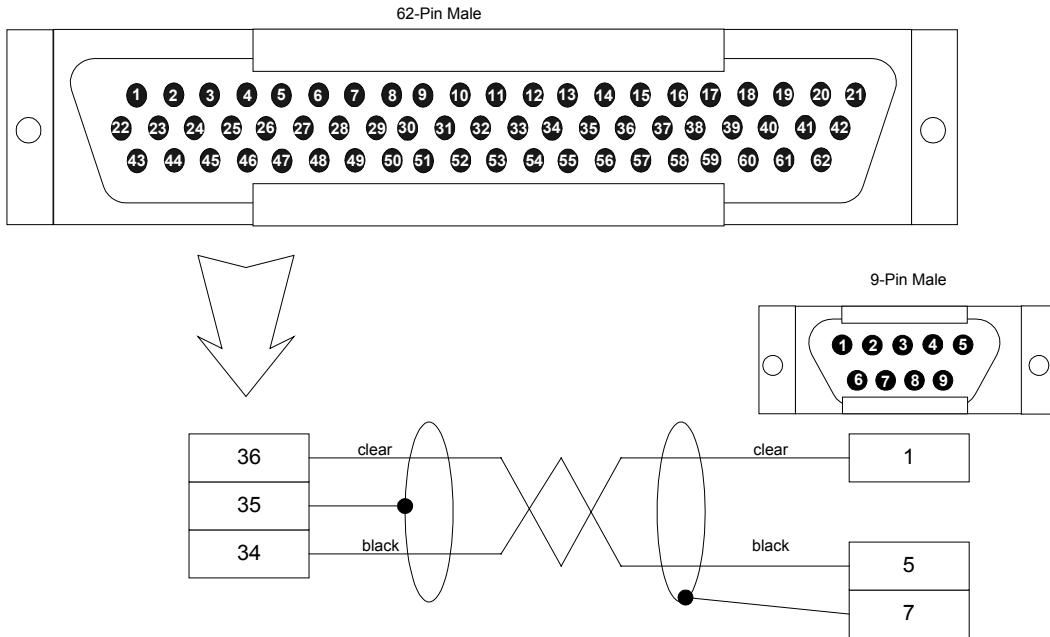
9399-C20

This cable connects the 1785-KE to the PLC-5 processor serial port.

9-Pin Male			9-Pin Male
1			1
7			7
5			5
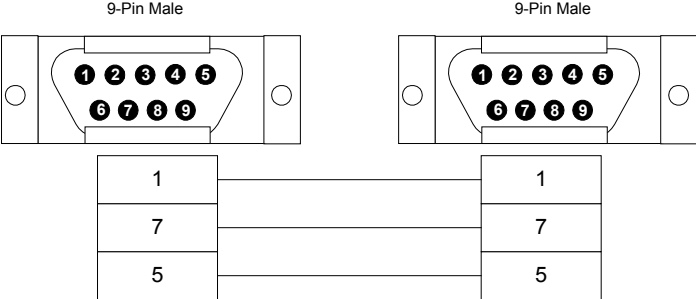
9399-C21

This cable connects a 9-pin serial port to the 1774-TC cable. This cable comes with an adapter for use with 9- or 25-pin serial ports on the computer.
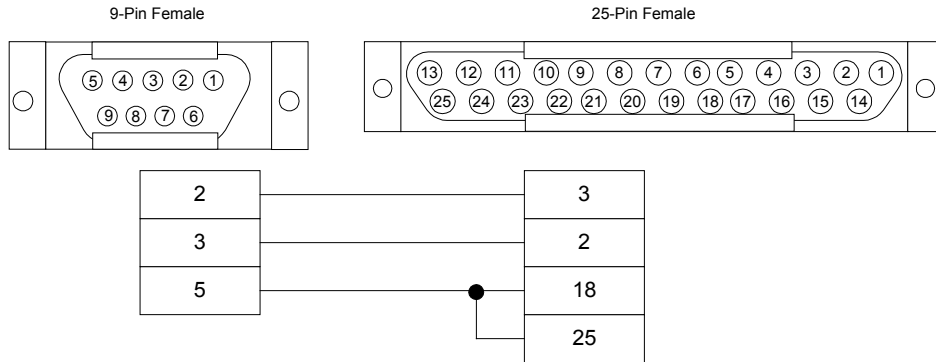
9399-C23/1784-CP3

This cable connects the 1784-KT to the PLC-3 processor serial port.

62-Pin Male

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑱ ⑲ ⑳ ㉑
㉒ ㉓ ㉔ ㉕ ㉖ ㉗ ㉘ ㉙ 30 31 32 33 34 35 36 37 38 39 40 41 42
43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62

25-Pin Male

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬
⑭ ⑮ ⑯ ⑰ ⑱ ⑲ ⑳ ㉑ ㉒ ㉓ ㉔ ㉕

23			3
24			18
2			25
1			14
			1
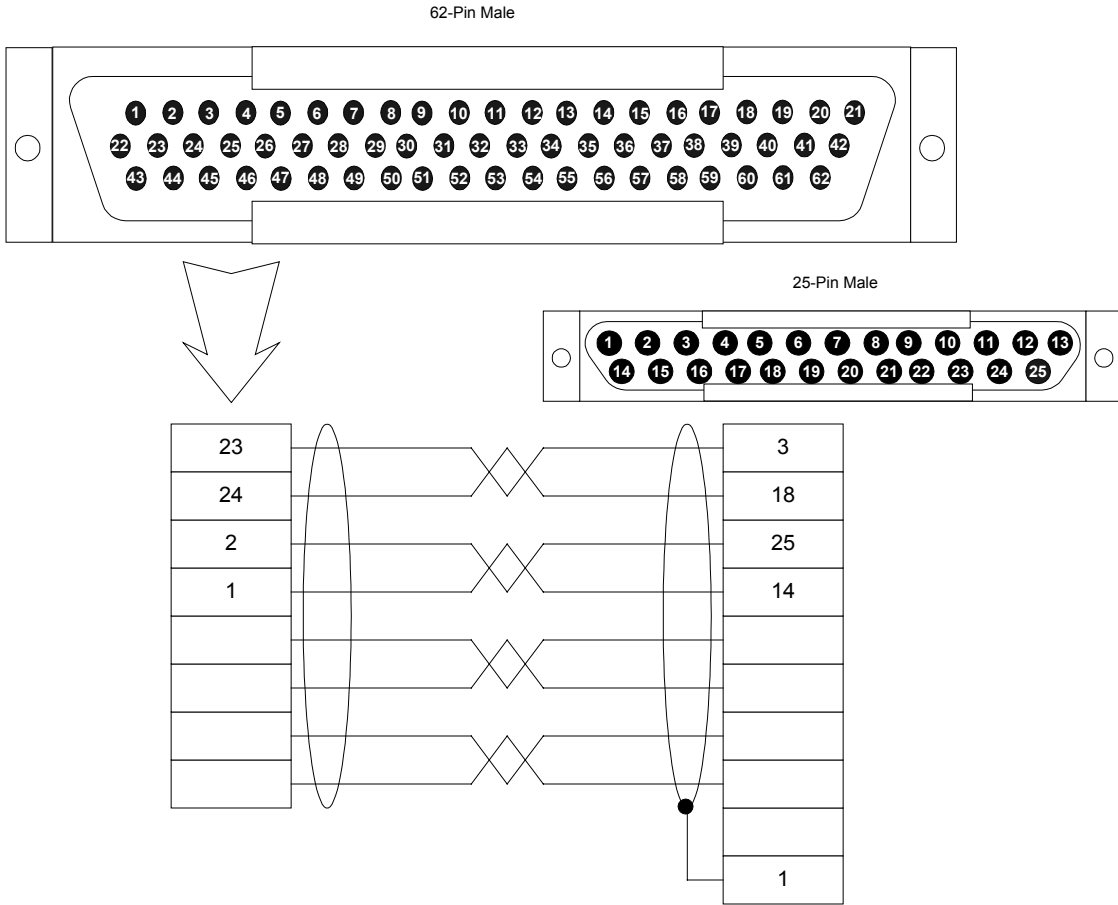
9399-C25

This cable connects the computer's 9-pin serial port to the 1774-TD cable.

25-Pin Female

9-Pin Female

25-Pin	9-Pin
2	2
3	3
7	5
5	1
4	4
6	6
8	8
	7
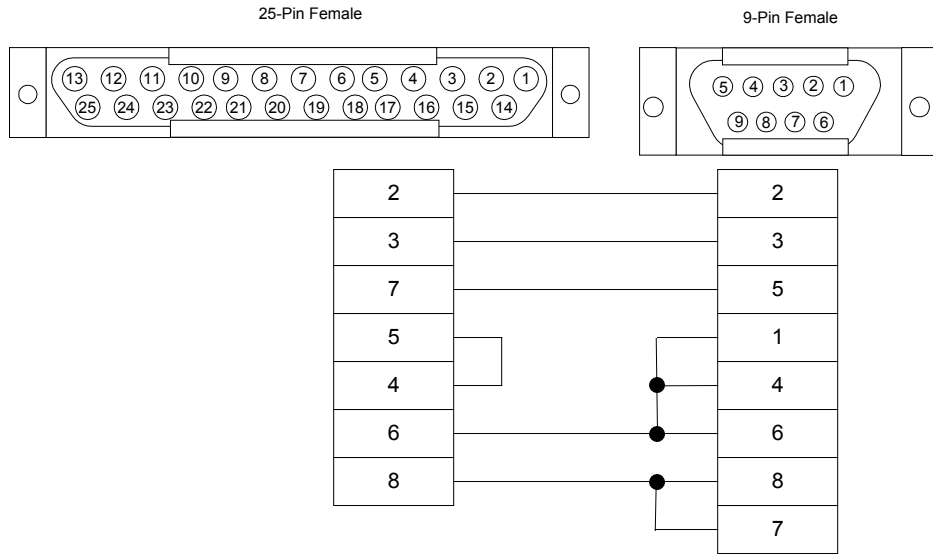
9399-C26/1784-CP7

This cable connects an 8-pin Mini DIN to a 9-pin female.

9-Pin Female

8-Pin Mini-DIN
connector

7	Shield	3
5	Blue	1
1	Clear	6
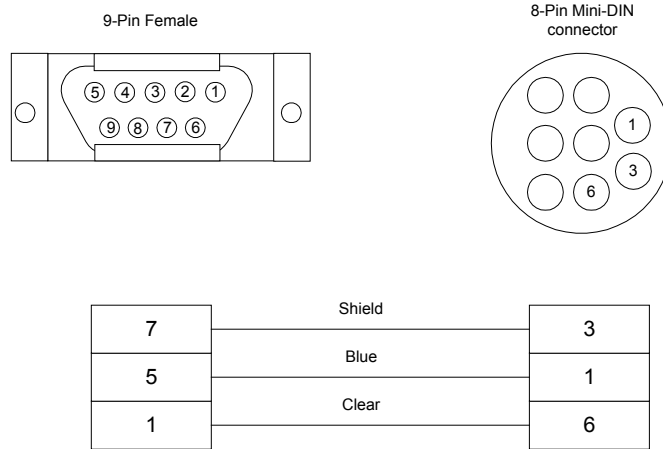
9399-C27 (Obsolete)

The 9399-C27 cable is an obsolete gender changer. It was used in conjunction with the RS 9399-C11 cable to connect the computer serial port to Channel 0 of an Enhanced PLC-5 processor. The combined cable function is now accomplished with the RS 9399-C28 cable.

25-Pin Male

```
1  2  3  4  5  6  7  8  9  10  11  12  13
  14  15  16  17  18  19  20  21  22  23  24  25
```

25-Pin Male

```
1  2  3  4  5  6  7  8  9  10  11  12  13
  14  15  16  17  18  19  20  21  22  23  24  25
```
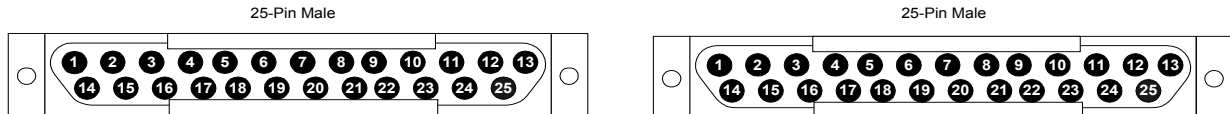
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
20	20
21	21
22	22
23	23
24	24
25	25

9399-C28/1784-CP10

This cable connects the to Channel 0 of an Enhanced PLC-5 processor.

9-Pin Female   25-Pin Male

9-Pin Female		25-Pin Male
3		3
2		2
7		4
8		5
6		20
1		6
4		8
5		7
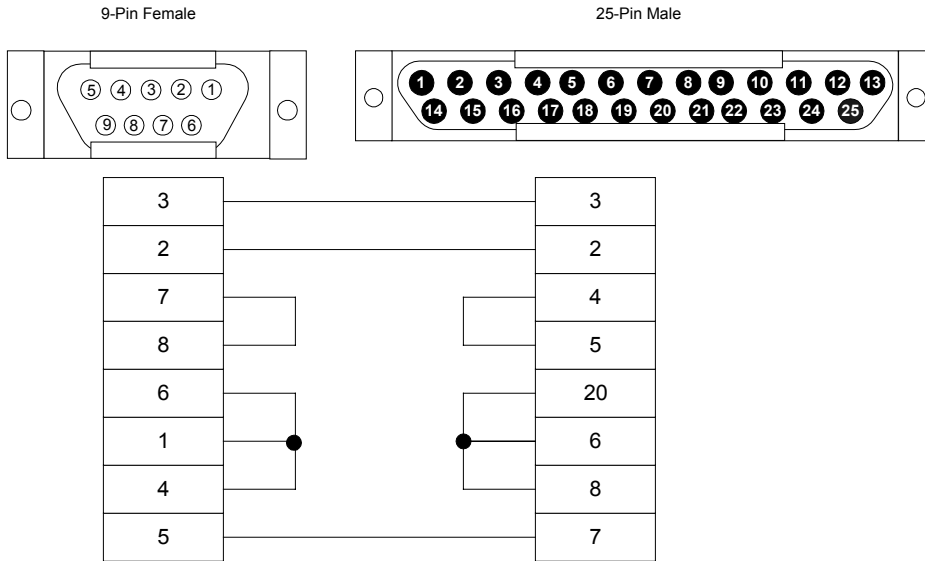
9399-C29/1747-CP3

This cable connects to Channel 0 on a SLC 500/03.

9-Pin Female   9-Pin Female

3		2	
2		3	
4		6	
		1	
6		4	
1			
7		8	
5		5	
8		7	
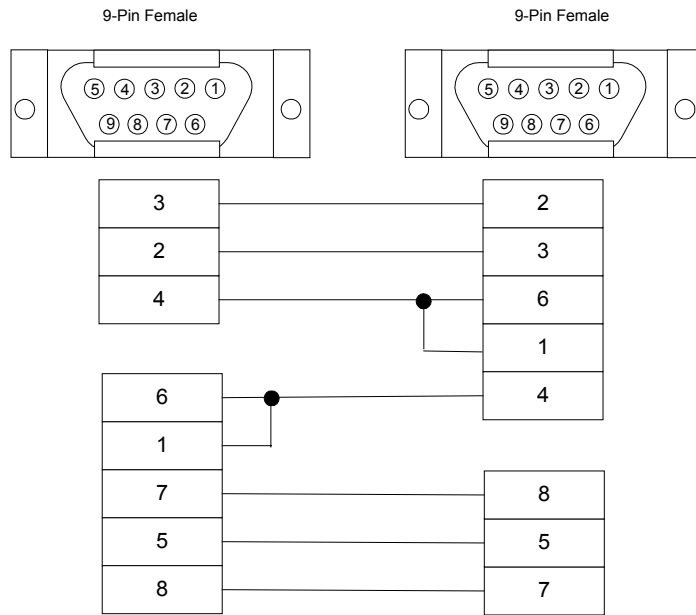
9399-C30

This cable connects to a CVIM/CVIM2. This cable is equivalent to a standard null-modem cable.

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