



Allen-Bradley Broadband Communication Interface

(Cat. No. 1771-KRF/B)

User's Manual

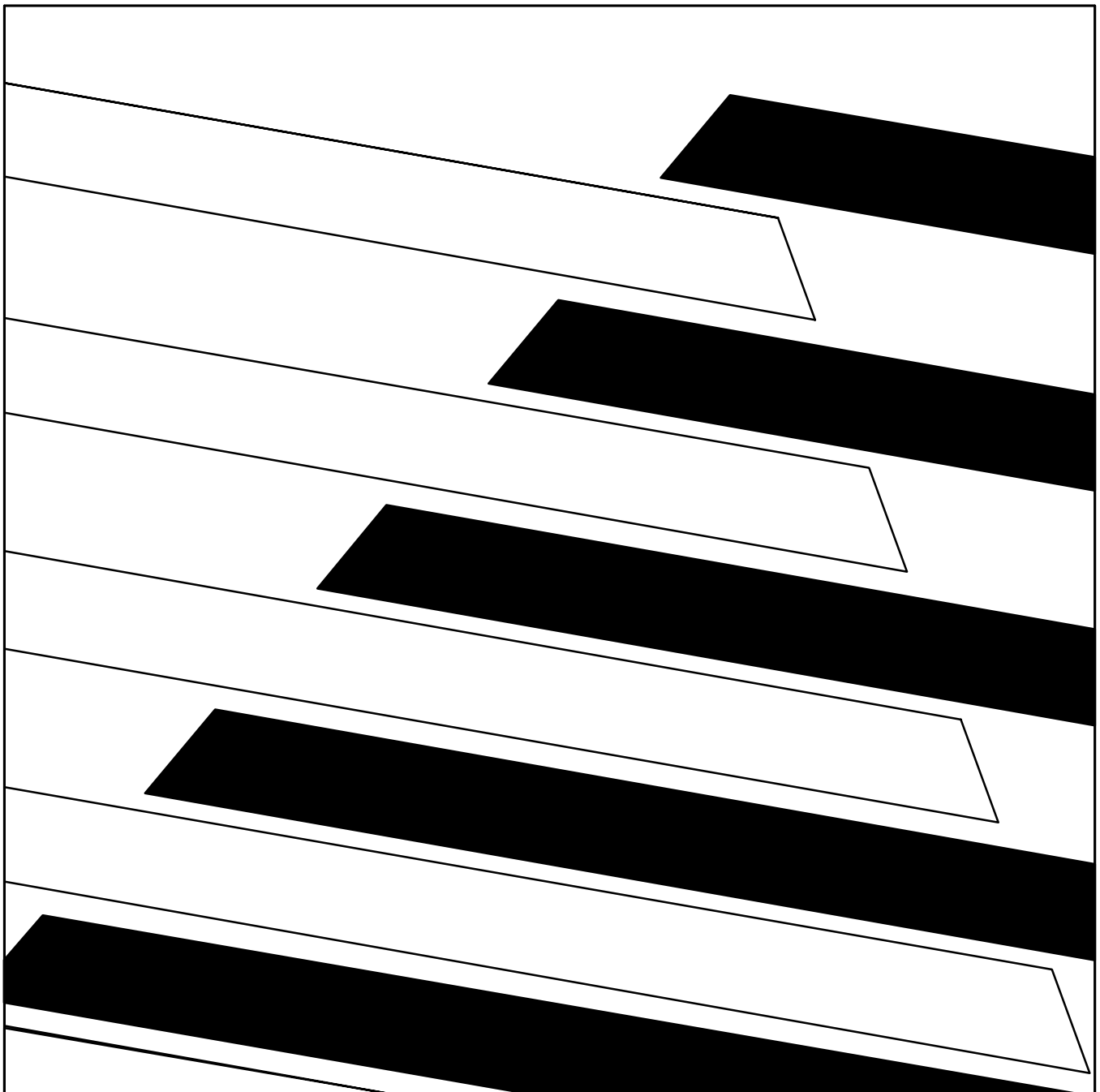


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Preface

The Purpose of this Manual

This manual shows you how to use the 1771-KRF/B Broadband Communications Interface. It provides information on:

- Configuring the DH/DH+ or remote I/O networks using the 1771-KRF/B
- Installing the KRF/B
- Troubleshooting the KRF/B



WARNING: This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with this document, may cause interference with radio communications. It has been tested and complies with the limits for class A computing device pursuant to Subpart J of Part 15 of FCC rules, which provide reasonable protection against such interference when operating in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user will take appropriate measures to correct.

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Audience

You should read this manual before attempting to install the 1771-KRF/B. We assume you are already familiar with the following Allen-Bradley devices:

- Programmable Logic Controllers (PLCs)
- Data Highway and Data Highway Plus networks
- Remote I/O networks
- Data Highway and Data Highway Plus communication device(s) you are using to communicate through the 1771-KRF/B

If you are not, refer to the appropriate documentation before you begin. For a list of related publications, see page III.

Safety Precautions

The following conventions are used in this manual:

This statement	Means this
Important	points out specific areas of concern
CAUTION	damage to equipment could occur
WARNING	personal injury could occur

Vocabulary

In this document we refer to the:

- 1771-KRF/B module as the “KRF” or “KRF module”
- Data Highway and Data Highway Plus networks as “DH/DH+” networks

Related Products

Allen-Bradley offers a wide range of interfaces for DH/DH+ and remote I/O networks, including:

For this Product	Order this Catalog Number
DH/DH+ Asynchronous (RS-232-C or RS-422-A) Interface Module (Desk Top)	1770-KF2
DH PLC-2 Family Communication Adapter Module	1771-KA2
DH RS-232-C Interface Module	1771-KE/KF
DH PLC-3 Communication Adapter Module	1775-KA
DH+ to DH Interface Module	1785-KA
DH+ PLC-2 Family Communication Adapter Module	1785-KA3
DH+ RS-232-C Interface Module (Rack Mount)	1785-KE
PLC-5 Family Programmable Controllers	Series 1785-LT
DH/DH+ PLC-3 Communication Adapter	1775-S5
PLC-2 Scanner	1772-SD2
Remote I/O Adapter Module	1771-ASB

Important: Be certain you have the Series 6600 single channel translator with the correct channel before you begin. You must have this component to operate the 1771-KRF. Refer to table 3.A for a list of available channels.

Related Publications

For more information on DH/DH+ and remote I/O networks and channel translators, refer to these publications:

Title	Publication Number
Data Highway Overview Product Data	1770-2.39
Data Highway Plus Overview Product Data	1785-2.6
Channel Translators Product Data	6600-2.4
Data Highway Cable Assembly and Installation Manual	1770-6.2.1
Remote I/O Adapter Module Product Data	1771-2.48
PLC-5 Family Processor Assembly and Installation Manual	1785-6.6.1
PLC-3 Family Controller Programming Reference Manual	1775-6.4.1
Mini-PLC-2/02, -2/16, -2/17 Processor User's Manual	1772-6.5.8
Remote I/O Adapter Installation Data	1771-2.162

These publications are available from Allen-Bradley. Contact your local Allen-Bradley sales office for more information.

Product Overview

Chapter Objectives

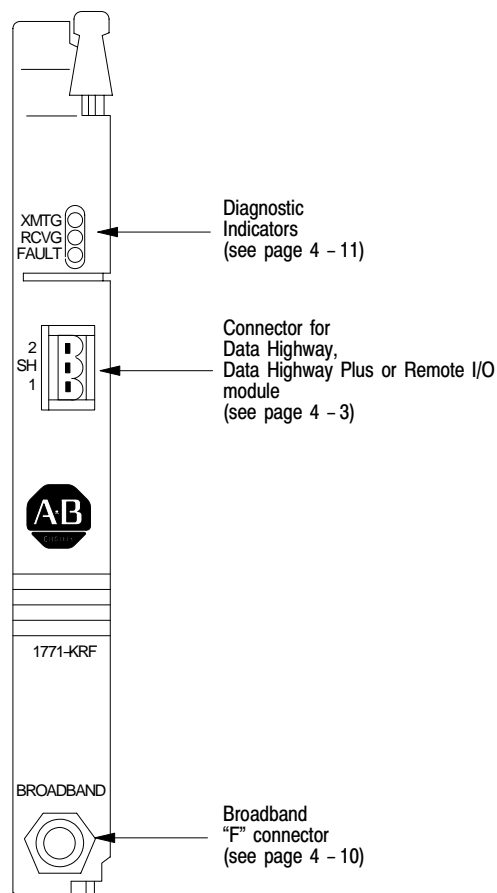
In this chapter, you will read about:

- what the 1771-KRF is
- how the KRF operates on broadband
- compatible devices

What is the 1771-KRF?

The KRF is a module that lets DH, DH+, and remote I/O stations communicate over a broadband cable system. Figure 1.1 shows the KRF's hardware features:

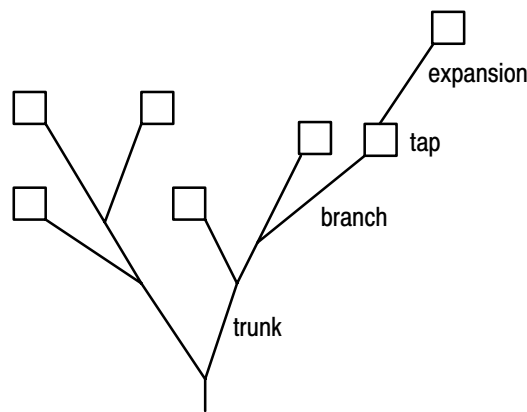
Figure 1.1
1771-KRF hardware features



How the KRF Operates on Broadband

A broadband communication system is an alternative way to connect communication equipment. Numerous separate networks share a single coaxial cable, eliminating separate wires for each network. Broadband cable systems use the same type of cable used in Community Access Television (CATV), which can cover large distances using standard CATV devices. Its high level of noise immunity is well suited to the industrial environment, since communication takes place at RF frequencies well above motor noise, arc welder noise, and AC noise.

Imagine the broadband cable system as a tree-like structure that has several trunks and various branches with taps. When the system is expanded, new devices are tapped in to the branches. Further expansions can be made by adding branches.



Just as CATV provides users with multiple channels on one cable, broadband systems provide multiple data channels using RF technology to divide the bandwidth of the cable into separate frequency bands. In data systems, the frequency space that one CATV channel occupies is often divided into many subchannels that offer separate services. Data communication on CATV systems use channel pairs for two-way communication. Each separate network occupies its own pair of channels or subchannels. A message from a device on the cable is transmitted on an *inbound* channel to a central location called the *headend*. Here, a translator device transfers the message to an *outbound* channel that broadcasts it to all devices that receive the channel. In this way, a data channel replaces a daisy-chained twisted pair cable connection.

The KRF module takes the signals from the DH/DH+ or remote I/O module as input and transmits them on the broadband cable. This allows the DH/DH+ and remote I/O protocol to be transmitted directly over the broadband link, creating a communication link on a broadband cable instead of on the traditional twinaxial baseband cable. The communication rate over the DH/DH+ or remote I/O link is 57.6 or 115.2K baud. The baud rate you use depends on the modules you are using.

The KRF acts as a companion module to each DH/DH+ or remote I/O module on the broadband. You need one KRF for *each* DH/DH+ or remote I/O module that communicates over the broadband. The KRF's industrialized, single-slot, 1771 form factor design lets you install it in any 1771- I/O chassis.

You connect the KRF to the DH/DH+ or remote I/O module with a length (up to 100 ft) of twinaxial baseband cable. Connect the KRF to broadband with a standard broadband drop cable.

The KRF is frequency agile over 18 subchannel pairs, which allows 1-18 DH/DH+ or remote I/O links to operate directly on a single broadband cable system.

The table below shows the possible interfaces for broadband alone and with the KRF module. A single cable system could carry all of these services in addition to closed circuit TV security systems, satellite distribution channels and more to create a total facility communication system.

Table 1.A
Broadband/KRF Possible Interfaces

	Ethernet	Arcnet	MAP	DH	DH+	Remote I/O
Broadband	X	X	X			
Broadband + KRF	X	X	X	X	X	X

Compatible Devices

The following Allen-Bradley devices have been tested and qualified with the 1771-KRF:

Table 1.B
1771-KRF Qualified Modules

Module	Compatible Devices
Data Highway	
	1785-KA (Data Highway port)
	1771-KE/KF
	1771-KA2
	1774-KA
	1770-KF2
	1775-KA
Data Highway Plus	
	PLC-5/12
	PLC-5/15
	PLC-5/25
	1784-KTK1
	1784-KT
	1785-KE
	1770-KF2
	1785-KA3
	1785-KA (Data Highway Plus port)
Remote I/O Scanners	
	1775-S5
	1775-S4B
	1775-S4A
	5150-RS
	1772-SD2
	Series 1784-LT
Remote I/O Adapters	
	1771-ASB
	1771-NA (used in the T-30 terminal and the 2705 Ready Panel)
	Series 1784-LT
	1771-ASC
	1771-DCM

Important: The 1771-KRF has been qualified with the above DH/DH+ and remote I/O modules on a broadband cable system with a radius

(distance from headend to furthest KRF) of four miles. If your application exceeds this distance, contact your local Allen-Bradley representative for assistance.

Allen-Bradley will continue to test additional DH/DH+ and remote I/O interfaces and will update you as testing is completed.

If you have any further questions about devices you wish to interface to the 1771-KRF, contact your local Allen-Bradley representative.

Guidelines for Connecting the 1771-KRF

Chapter Objectives

This chapter contains the following:

- what DH/DH+ networks are
- what a remote I/O network is
- network guidelines
- typical applications using the KRF

Data Highway and Data Highway Plus Networks

Data Highway and Data Highway Plus are local area networks that allow peer-to-peer communication between PLCs, computers, and other intelligent devices:

Data Highway

DH connects up to 64 nodes and has a communication rate of 57.6K baud. It implements peer-to-peer communication through a modified token-passing scheme called *floating master*. In this arrangement, each node has equal access to be master. The nodes bid for temporary mastership based on their need to send information. Fault recovery timeouts are used if mastership token is lost.

Data Highway Plus

DH+ connects up to 64 nodes and has a communication rate of 57.6 or 115.2K baud. It implements peer-to-peer communication with a *token-passing* scheme to rotate link mastership among its nodes. DH+ also uses timeouts to recover from a fault that disables the node that has the token. Use a DH+ link when you want to connect a small number of nodes that communicate frequently on a common link. For example, you would use DH+ to connect a small group of PLC-5s (usually 10 or less) involved in a single integrated process.

Remote I/O Networks

A remote input and output (remote I/O) network is a local area network that supplies PLCs with digital and/or digitally encoded plant floor information.

Remote I/O modules reside at some location other than the chassis that contains the master PLC processor. *Local* I/O modules reside in the same chassis as the master PLC processor. A chassis of remote I/O modules is electrically connected to the devices it controls on the plant floor. Remote and local I/O can consist of digital or digitally encoded analog values.

You can configure PLC processors as *master* devices that scan adapter, or *slave* devices. Slave devices monitor the I/O data and provide information requested by the master PLC processor via block transfer commands. This I/O information is used in the PLC ladder logic program to control a process. The KRF module allows remote I/O information to be transferred onto the broadband cable system, which increases the physical distance between local PLC networks and remote I/O modules.

Network Guidelines

Use the following guidelines when you want to add a DH/DH+ or remote I/O network to your broadband system:

- You need a channel translator (use the Allen-Bradley 6600 channel translator) at the head-end of the broadband cable system
- The 1771-KRF has been tested with a wide variety of DH/DH+ interface modules. Before installing the 1771-KRF, refer to the page 1-4 to verify that it has been tested with the DH/DH+ or remote I/O module you intend to use
- Configure all KRFs that connect devices on a common network or subnetwork for the same channel pair
- The KRF operates on a cable system that meets the requirements of the MAP/TOP or IEEE 802.7 broadband media specification
- To determine the maximum allowable distance for your application from the KRF DH/DH+ or remote I/O module to the headend translator, see page 1-4
- You need one KRF module for each DH/DH+ or remote I/O port you connect to the broadband
- The baseband twinaxial cable between the DH/DH+ or remote I/O port and the KRF should be as short as possible. The maximum length for this cable is 100 ft
- The maximum number of nodes allowed on the DH/DH+ broadband link is 64
- The communication rate over the DH/DH+ or remote I/O link is 57.6 or 115.2K baud. The baud rate you use depends on the modules you connect to and their configurations
- The maximum number of nodes on a remote I/O link depends on the processor type (See the appropriate user's manual for details)

Important: The 1771-KRF acts as a modem to connect individual DH/DH+ or remote I/O stations to a broadband DH/DH+ or remote I/O network. Do not connect more than one DH/DH+ or remote I/O device to the twinaxial cable of the KRF.

Typical Applications

This section contains four typical applications for the KRF involving:

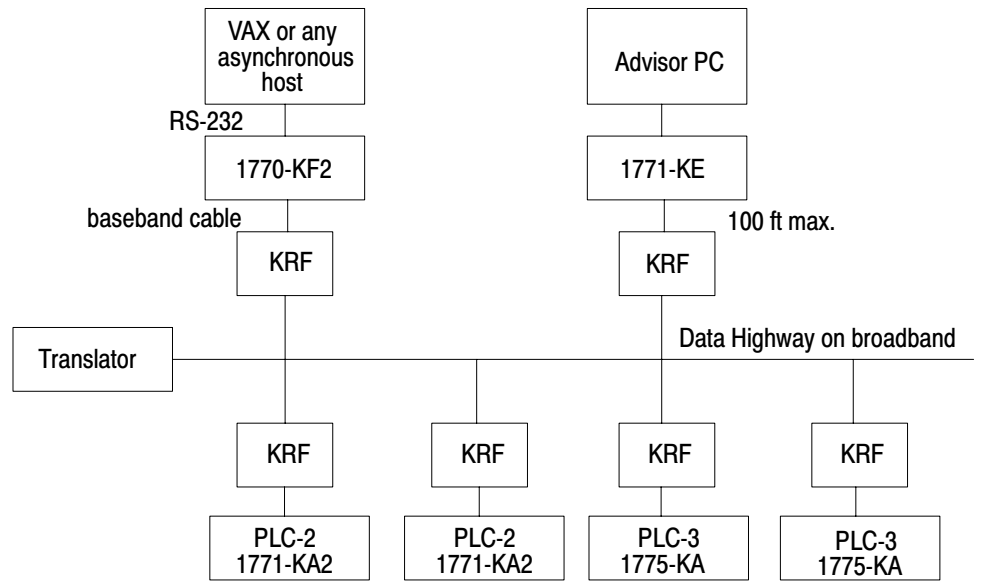
- a single DH broadband link
- a single DH+ broadband link
- a DH broadband backbone linking DH+ twinaxial baseband subnetworks
- a single remote I/O broadband link

It shows you how these networks are configured and explains the benefits of each.

Data Highway on Broadband Configuration

Broadband cable and modems replace daisy-chained twinaxial media and offer a greater distance between nodes, as well as multiple networks coexisting on one cable. Figure 2.1 shows a typical DH on broadband link configuration where KRFs create a single DH broadband link.

Figure 2.1
Typical DH on broadband configuration



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Table 2.A contains more information about figure 2.1:

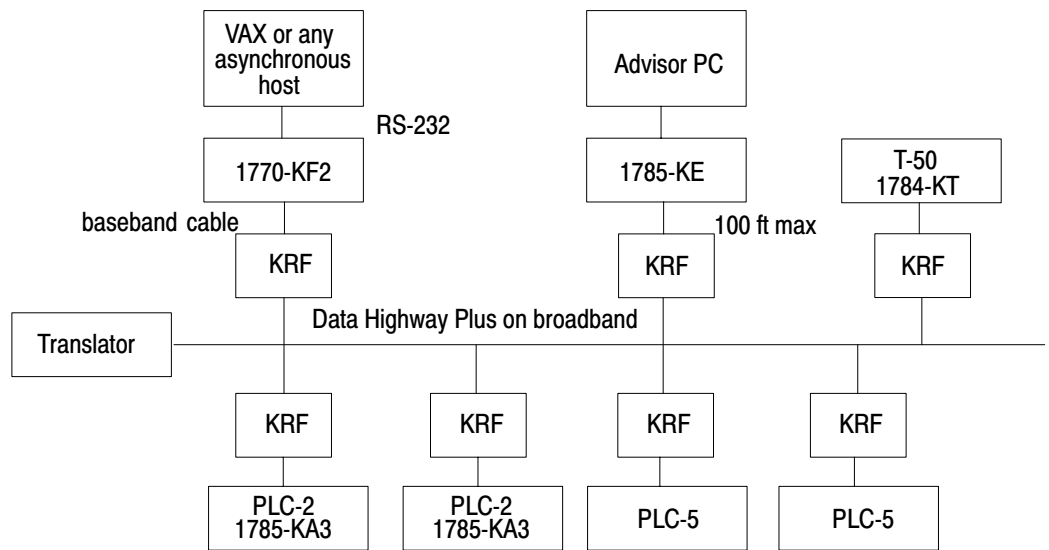
Table 2.A
Configuring a single DH link on the broadband network

These Devices	Connect this to the Data Highway Broadband Cable Link
KRFs + 1771-KA2 Communication Adapter Modules	PLC-2s
KRFs + 1775-KA Communication Adapter Modules	PLC-3s
KRFs + 1771-KE/KF DH/RS-232 Communication Controller Modules	host computers
KRFs + 1770-KF2 DH/RS-232 Communication Interface Module	host computers

Data Highway Plus on Broadband Configuration

Broadband cable and modems now replace daisy-chained twinaxial media and offer a greater distance between nodes as well as multiple networks coexisting on one cable. Figure 2.2 shows a typical DH+ on broadband configuration where KRFs create a single DH+ link.

Figure 2.2
DH+ on broadband configuration



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Table 2.B explains the configuration in figure 2.2:

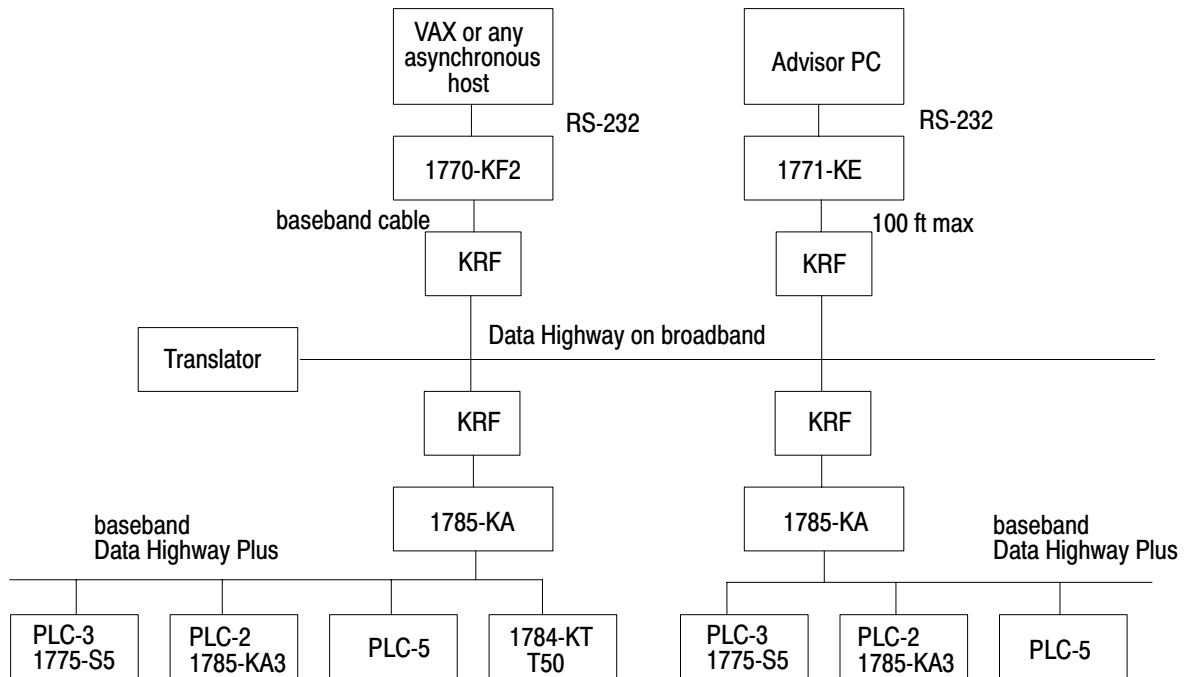
Table 2.B
Configuring a single DH+ link on the broadband network

These Devices	Connect this to the DH+ Broadband Link
KRFs + 1784-KT Communication Adapter Modules	T-50s, T/35s, IBM AT/XT and compatible computers
KRFs + 1785-KA3 Communication Adapter Modules	PLC-2s
KRFs + built-in DH+ port of the PLC-5	PLC-5s
KRFs + 1785-KE DH/RS-232 Communication Controller Modules	host computers
KRFs + 1770-KF2 DH/RS-232 Communication Interface Module	host computers

Data Highway Broadband Backbone/Data Highway Plus Subnet Configuration

Broadband cable and modems now replace daisy-chained twinaxial media and offer a greater distance between nodes as well as multiple networks coexisting on one cable. The 1785-KA is typically used to link DH+ baseband subnetworks over a DH backbone. This lets you increase the number of DH+ nodes that can share information without lowering throughput within subnetworks. Figure 2.3 shows the DH backbone/DH+ subnet configuration where KRFs create a DH broadband backbone.

Figure 2.3
DH broadband/DH+ subnet configuration



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Configure the network as follows:

- Data Highway Plus twinaxial baseband subnetworks are linked to the broadband backbone via KRFs attached to the Data Highway port of the 1785-KA DH/DH+ Communication Adapter modules
- KRFs are used with 1770-KF2 and 1771-KE DH/RS-232 Communication Controller modules to connect host computers to the Data Highway broadband backbone

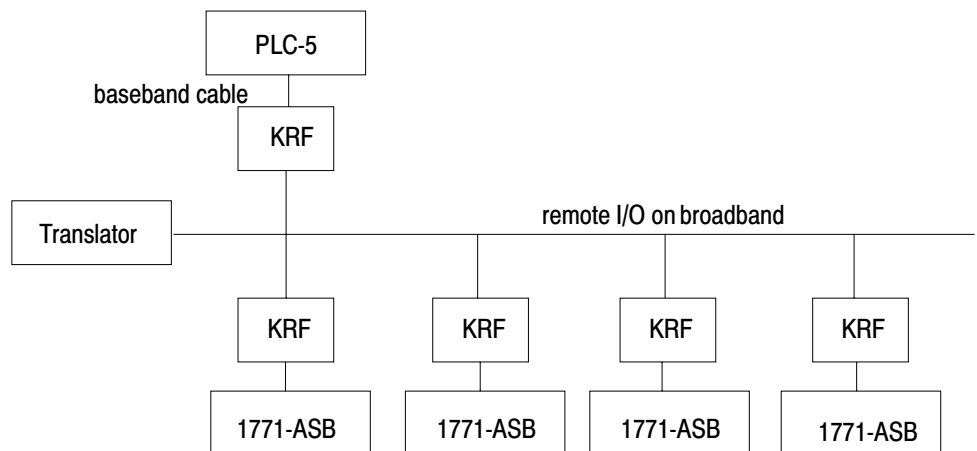
We recommend this configuration to optimize overall system performance by minimizing the number of nodes on each of the DH+ subnetworks. This configuration also optimizes overall system performance by isolating local traffic to the individual DH+ subnetworks. The DH protocol is used on the broadband backbone.

See the 1785-KA DH/DH+ Communication Adapter Module manual (publication 1785-6.5.1) for more details on this application. The manual contains examples of DH baseband applications that are valid for corresponding DH on broadband applications using the KRF.

Remote I/O Broadband Link Configuration

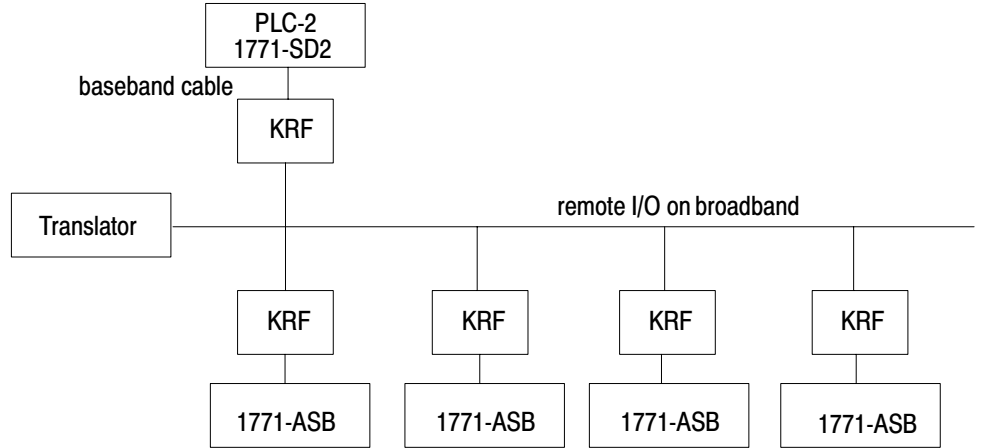
In this application, the KRF and standard remote I/O modules create a single remote I/O link that resides directly on the broadband. The block transfer read and write scanning of remote I/O is sent over the broadband. Figures 2.4, 2.5, and 2.6 show possible remote I/O broadband link configurations for PLC-5, PLC-3, and PLC-2 programmable controllers. Table 2.C on page 2-9 tells you what scanner or adapter you need to configure the network in each example.

Figure 2.4
Remote I/O on broadband link using the PLC-5 Programmable Controller



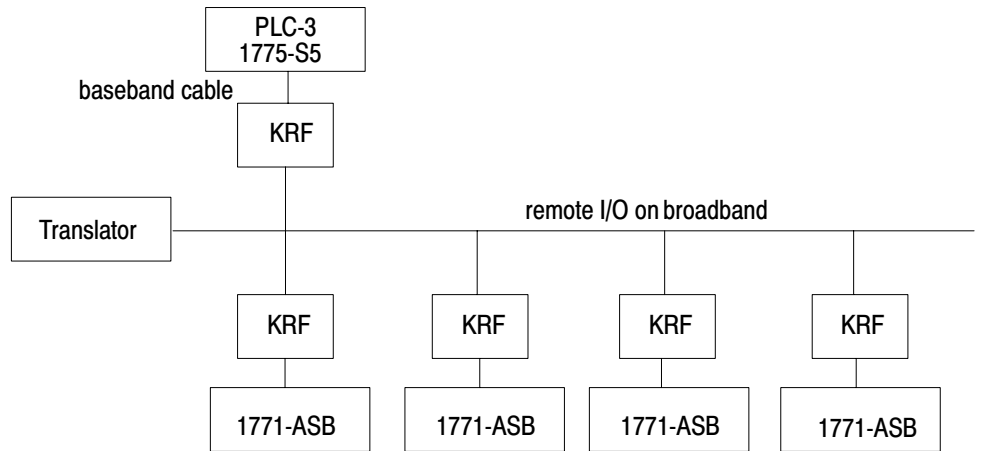
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Figure 2.5
Remote I/O on broadband link using the PLC-2 Programmable Controller



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Figure 2.6
Remote I/O broadband link using the PLC-3 Programmable Controller



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Table 2.C lists the devices you use to connect each programmable controller to the remote I/O broadband link.

Table 2.C
1771-KRF Configurations for PLC-5, PLC-3, and PLC-2 Programmable Controllers

Use these devices	To connect these devices to the remote I/O broadband link
1771-KRF and built-in remote I/O port of the PLC-5	PLC-5
1771-KRF and 1771-ASB adapter	I/O chassis
1771-KRF and 1772-SD2 scanner	PLC-2
1771-KRF and 1775-S5 scanner	PLC-3

Selecting Channels and Setting Switches

Chapter Objectives

In this chapter, you read about:

- available channels for the KRF
- setting the option switches on the KRF

Available Channels for 1771-KRF Module

The KRF module is frequency agile, which means you can change the operating subchannel as your application requires. The KRF operates on these standard CATV channel pairs:

- T12/L
- T13/M
- T14/N

Table 3.A shows the frequencies for each channel pair:

Table 3.A
KRF channel pair frequencies

Channel Pair	Transmit (MHz)	Receive (MHz)
T12 to L	35.75 to 41.75	228 to 234
T13 to M	41.75 to 47.75	234 to 240
T14 to N	47.75 to 53.75	240 to 246

The KRF operates on one of 18 750 KHz subchannels within three 6 MHz channels. Table 3.B shows the six subchannels available within each channel:

Table 3.B
KRF subchannels

For this Channel Pair	Use these Subchannels	And this Allen-Bradley Translator
T12 to L	1, 2, 3, 4, 5, 6	6600-XLL
T13 to M	9, 10, 11, 12, 13, 14	6600-XLM
T14 to N	17, 18, 19, 20, 21, 22	6600-XLN

Use the dipswitch settings in the next section to configure the subchannel you choose.

Setting the Option Switches

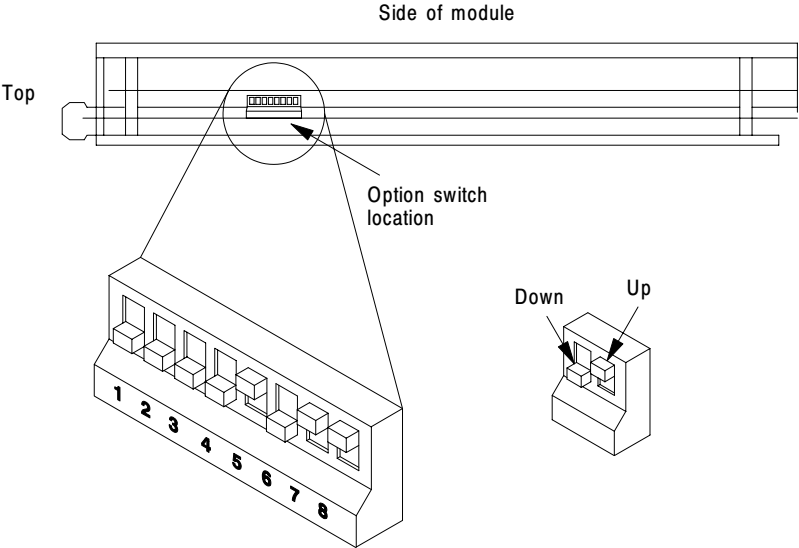
The 1771-KRF has a single switch assembly with eight option switches that let you select one of 18 unique subchannel addresses. To set the option switches:



WARNING: When operating more than one DH/DH+ or remote I/O network over a common broadband system, verify that each DH/DH+ or remote I/O network uses a unique subchannel. When two or more DH/DH+ or remote I/O networks attempt to use the same subchannel, equipment damage or injury may occur due to unpredictable equipment operation and communication errors.

1. Locate the switch assembly on the KRF in figure 3.1.

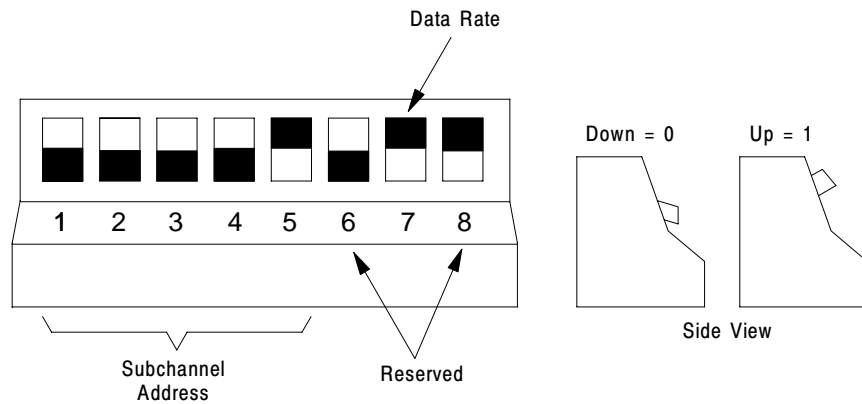
Figure 3.1
KRF option switches



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- Use switches SW-1 through SW-5 to set a unique subchannel address (1-6, 9-14, 17-22) for all KRFs sharing a common link. The figure below shows the KRF switch assembly; Table 3.C shows the switch settings for each subchannel address.

Figure 3.2
KRF switch assembly



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- Set the baud rate using SW-7:

If SW-7 is	The data rate is
Up	57.6K
Down	115.2K

- Switches SW-6 and SW-8 are reserved. Set them as follows:

Set this switch	To this
SW-6	Down
SW-8	Up

Table 3.C
Setting switches for KRF subchannel addresses

Subchannel	SW-1	SW-2	SW-3	SW-4	SW-5
Do not use	DOWN	DOWN	DOWN	DOWN	DOWN
1	DOWN	DOWN	DOWN	DOWN	UP
2	DOWN	DOWN	DOWN	UP	DOWN
3	DOWN	DOWN	DOWN	UP	UP
4	DOWN	DOWN	UP	DOWN	DOWN
5	DOWN	DOWN	UP	DOWN	UP
6	DOWN	DOWN	UP	UP	DOWN
Do not use	DOWN	DOWN	UP	UP	UP
Do not use	DOWN	UP	DOWN	DOWN	DOWN
9	DOWN	UP	DOWN	DOWN	UP
10	DOWN	UP	DOWN	UP	DOWN
11	DOWN	UP	DOWN	UP	UP
12	DOWN	UP	UP	DOWN	DOWN
13	DOWN	UP	UP	DOWN	UP
14	DOWN	UP	UP	UP	DOWN
Do not use	DOWN	UP	UP	UP	UP
Do not use	UP	DOWN	DOWN	DOWN	DOWN
17	UP	DOWN	DOWN	DOWN	UP
18	UP	DOWN	DOWN	UP	DOWN
19	UP	DOWN	DOWN	UP	UP
20	UP	DOWN	UP	DOWN	DOWN
21	UP	DOWN	UP	DOWN	UP
22	UP	DOWN	UP	UP	DOWN
Do not use	UP	DOWN	UP	UP	UP

Important: Settings for SW-1 through SW-5 *not* specified in the table above are not used.

Table 3.D shows the channel allocation for the 18 subchannels available on the KRF.

Table 3.D
Available frequencies and channel pairs for KRF subchannels

Subchannel	TX Frequency	RX Frequency	CATV Channel Pair
Do not use	36.125	228.375	T12/L
1	36.875	229.125	T12/L
2	37.625	229.875	T12/L
3	38.375	230.625	T12/L
4	39.125	231.375	T12/L
5	39.875	232.125	T12/L
6	40.625	232.875	T12/L
Do not use	41.375	233.625	T12/L
Do not use	41.125	234.375	T13/M
9	42.875	235.125	T13/M
10	43.625	235.875	T13/M
11	44.375	236.625	T13/M
12	45.125	237.375	T13/M
13	45.875	238.125	T13/M
14	46.625	238.875	T13/M
Do not use	47.375	239.625	T13/M
Do not use	48.125	240.375	T14/N
17	48.875	241.125	T14/N
18	49.625	241.875	T14/N
19	50.375	242.625	T14/N
20	51.125	243.375	T14/N
21	58.875	244.125	T14/N
22	52.625	244.875	T14/N
Do not use	53.375	245.625	T14/N

Important: The 1771-KRF and Allen-Bradley 6608 19.2 KB Frequency Agile Modems can be installed on the same 6-MHz channel (L, M, or N)

using the same channel translator. However, you must leave a 100 KHz (.1 MHz) guardband between the subchannel(s) you select for the 1771-KRF and the subchannel(s) you select for the 6608 modems. See Appendix B “Using the 1771-KRF with 6608 Modems” for details.

Installing and Connecting the 1771-KRF

Chapter Objectives

In this chapter, you learn how to:

- mount the KRF
- connect the KRF to a DH, DH+, or remote I/O module
- connect the KRF to the broadband network
- power up the KRF
- troubleshoot the KRF

Mounting the KRF

To mount the KRF in an Allen-Bradley 1771 I/O chassis, follow the instructions below:

1. Perform a power down of the I/O chassis and its controlling PLC (refer to your PLC User's Manual for more information).



WARNING: Remove power from the I/O chassis backplane before removing or installing an I/O module. Failure to remove power from the backplane could cause injury or equipment damage due to possible unexpected operation.

2. Slide the KRF into one of the slots in the I/O chassis and secure the latch on top of the module.

The next section tells you how to connect the KRF to DH/DH+ or remote I/O modules.

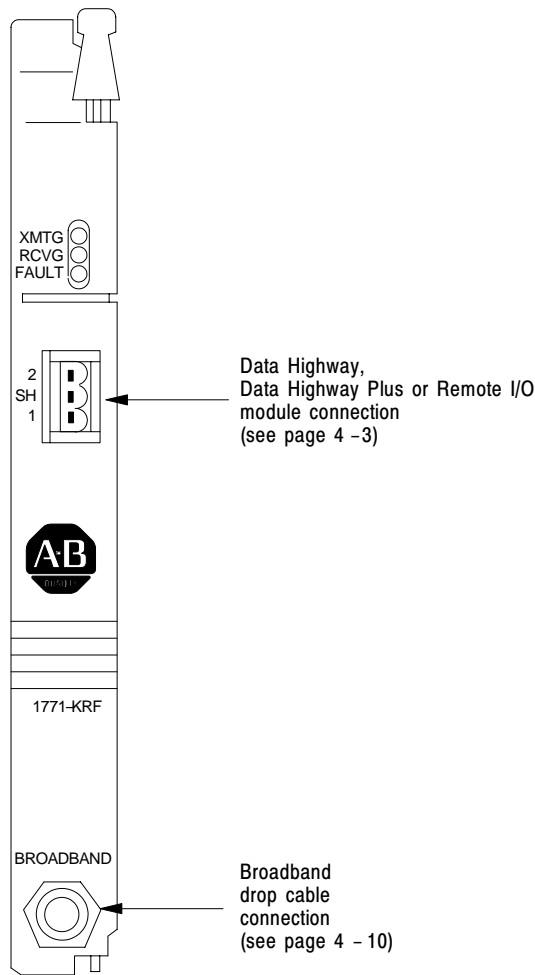
Connecting the KRF to DH/DH+ or Remote I/O Modules

Connect your KRF to:

- the DH/DH+ or remote I/O port of the module you wish to connect to the broadband system
- the drop cable of the broadband cable system you are using for the DH/DH+ or remote I/O broadband link

For more information on these connections, refer to the appropriate user's manual. The figure below shows the connection ports on the front panel of the KRF.

Figure 4.1
1771-KRF connection ports



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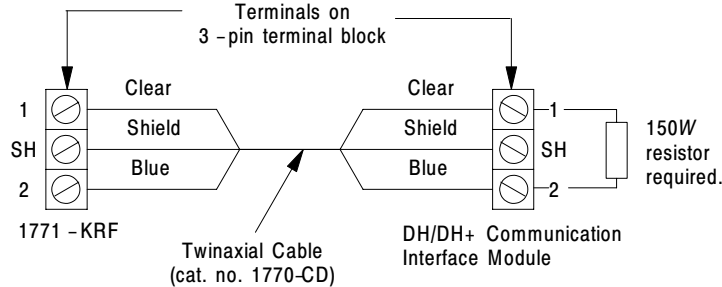
To connect your KRF module to the port of the module you wish to connect to the broadband cable system:

1. Use a short length (as short as possible, 100 ft maximum) of twinaxial cable to run between the 1771-KRF and the module (Typically, the KRF is mounted next to the DH/DH+ or remote I/O module in the 1771 I/O chassis.)
2. Be certain that you terminate the twinaxial cable at the DH/DH+ or remote I/O module with a 150 ohm resistor (if the DH/DH+ or remote I/O module is not already terminated internally). The 1771-KRF module provides a built-in 150 ohm termination resistance so no termination resistor is required at the 1771-KRF.
3. Plug the 3-pin connector of your twinaxial cable into the top connector of the KRF module.

Connecting to a DH/DH+ Module

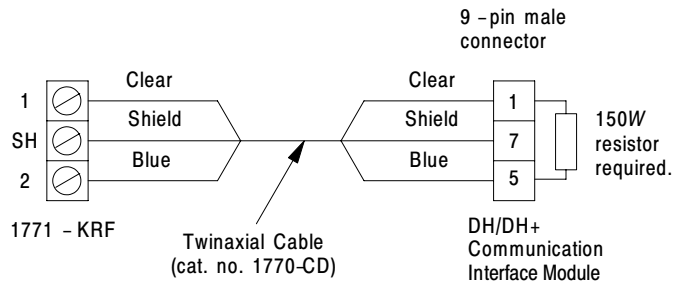
The following figures show how to connect the KRF to a DH/DH+ module using either a 3, 9, 15, or 62-pin connector for the 1784-KT.

Figure 4.2
Connecting to a DH/DH+ module with a 3-pin terminal block



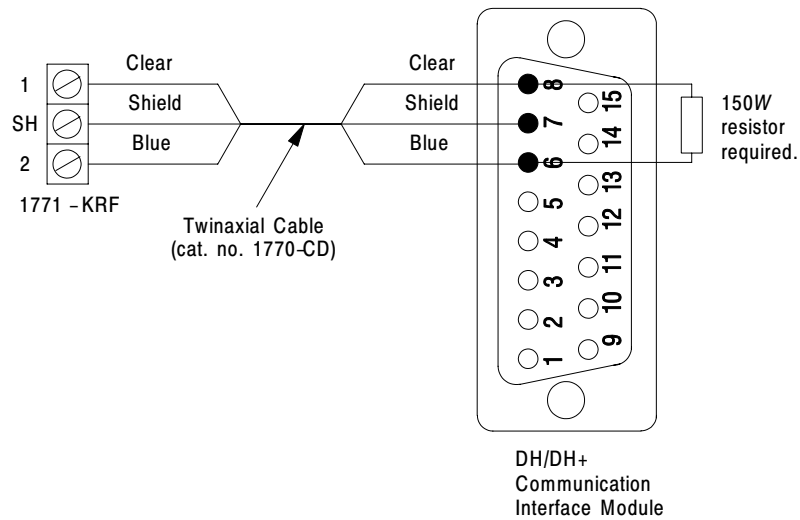
17277

Figure 4.3
Connecting to a DH/DH+ module with a 9-pin connector



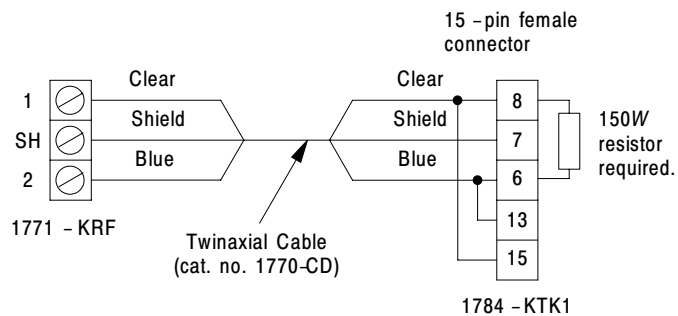
1729

Figure 4.4
Connecting to a DH/DH+ module with a 15-pin connector



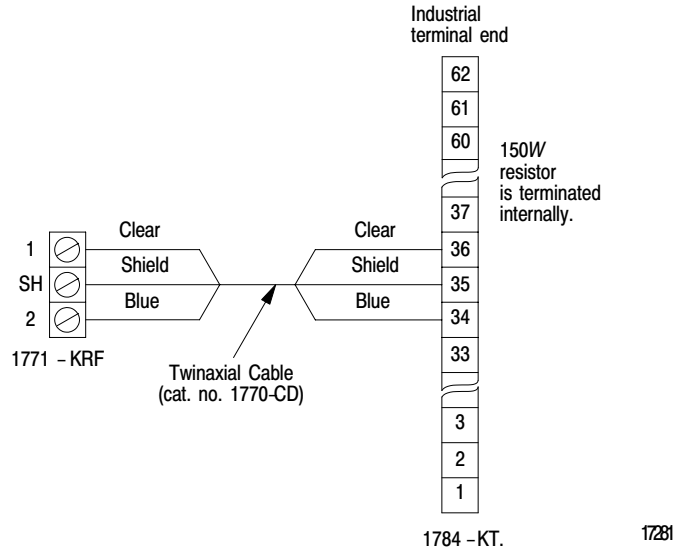
1728

Figure 4.5
Connecting to a 1784-KTK1 with a 15-pin connector



17280

Figure 4.6
Connecting to a 1784-KT with a 62-pin connector



Connecting to the Remote I/O

The following figures show how to connect the KRF to remote I/O devices.

Figure 4.7
Connecting to the 1771-ASB and 1771-ASC remote I/O adapters

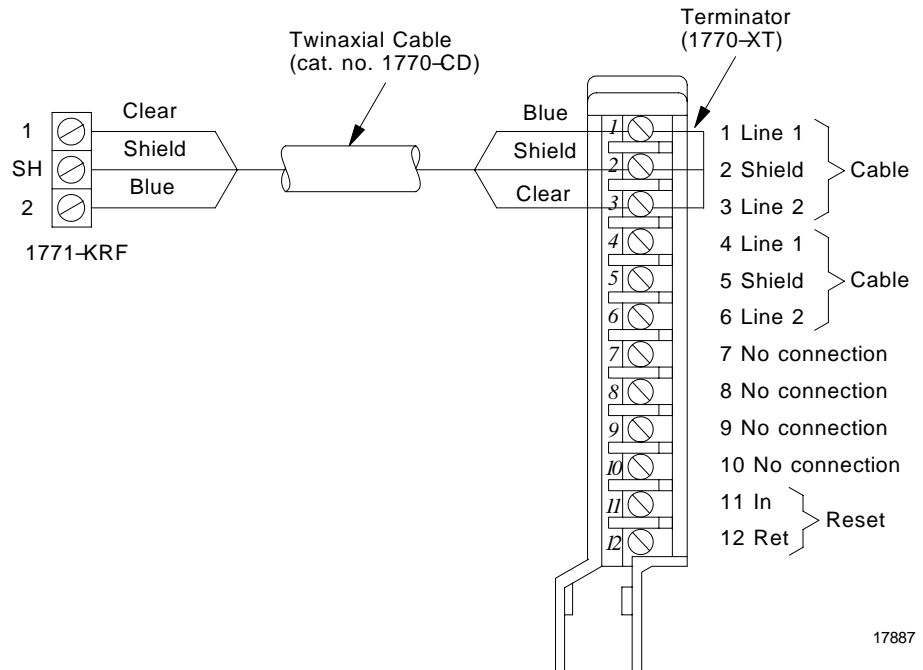


Figure 4.8
Connecting to the PLC-5 I/O channel (Series 1784-LT scanner and 1784-LT adapter)

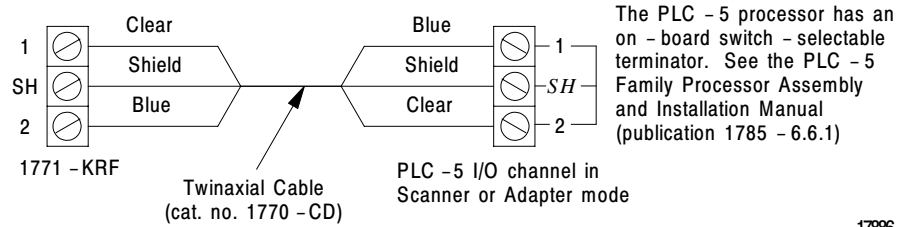


Figure 4.9
Connecting to the 1775-S5, 1775-S4A, and 1775-S4B remote I/O scanners

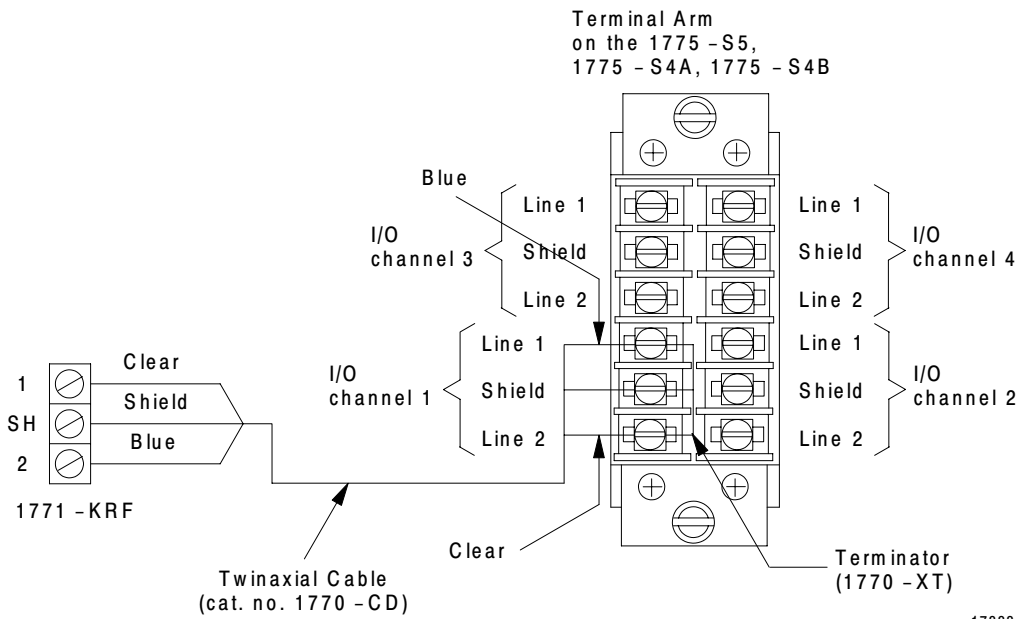


Figure 4.10
Connecting to the 1771-DCM remote I/O adapter

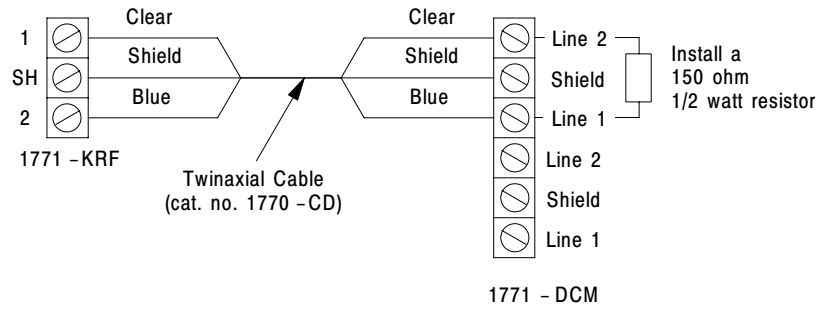


Figure 4.11
Connecting to the 5150-RS remote I/O scanner

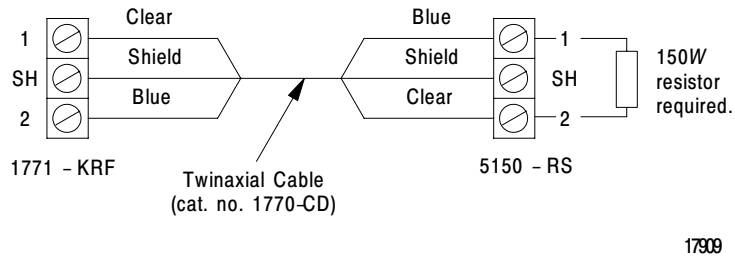
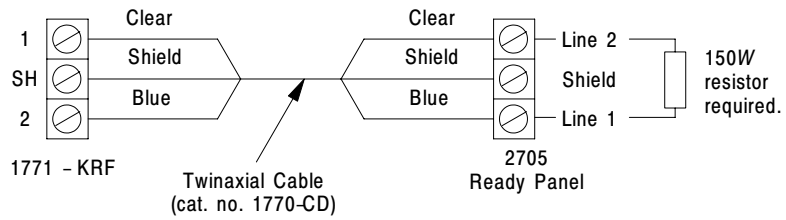
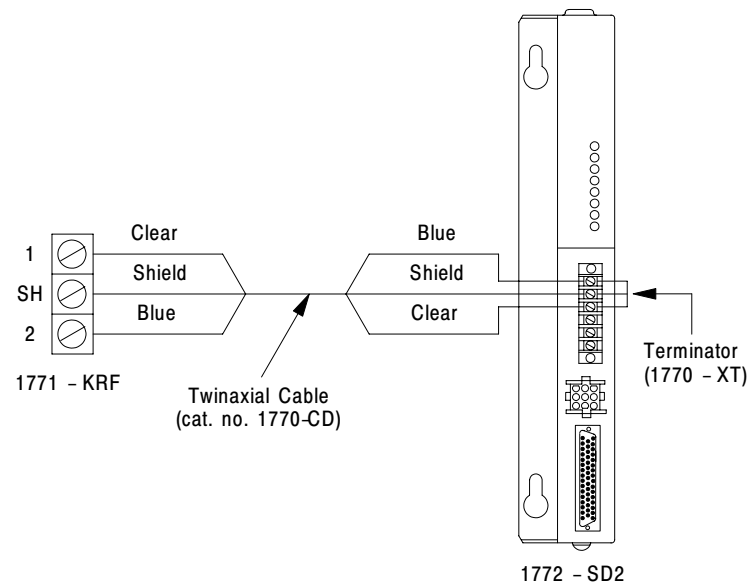


Figure 4.12
Connecting to the 2705 Ready Panel



17910

Figure 4.13
Connecting to the 1772-SD2 remote I/O scanner



17911

For more information on setting up your twinaxial cable link, see the Data Highway Cable Assembly and Installation Manual (publication 1770-6.2.1).

Connecting the 1771-KRF to the Broadband Cable System

Use a drop cable to connect your KRF to the broadband network. You can order these cables from Allen-Bradley¹:

Cable Length	Catalog Number
50 ft.	6615-DC50
25 ft.	6615-DC25
6 ft.	6615-DC8

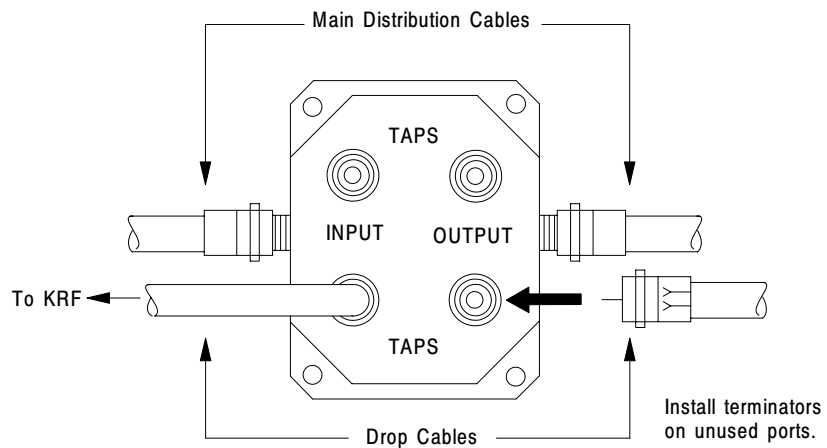
¹You can also order the RG-6 Drop Cable Kit (cat. no. 6615-DCK) to construct your own cables.

Important: If you do not use Allen-Bradley cables, make sure your cables:

- are 75 ohm, RG-6 cables to reduce electrical interference
- have an “F” connector on each end
- do not exceed 100 ft of RG-6 cable

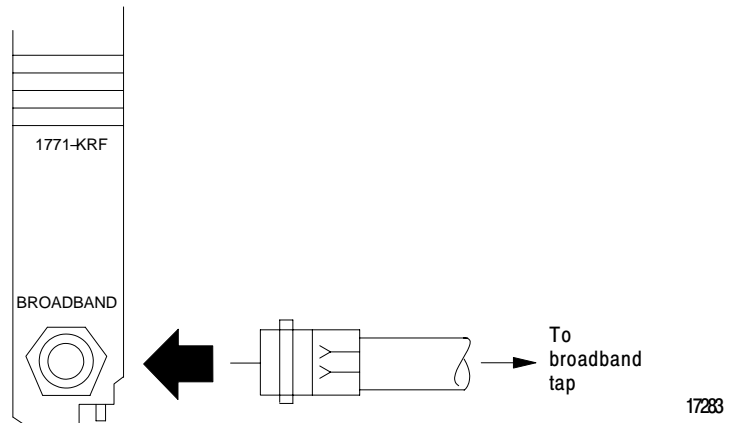
To connect the KRF to the broadband cable system:

1. Power down the KRF.
2. Attach the drop cable to the broadband main distribution cable as shown below:



14187

3. Attach the other end of the drop cable to the broadband interface female “F” connector as shown below:



Important: For best results, tighten the drop cable connection with a wrench until snug. Avoid bending or kinking the drop cable.



CAUTION: Do not attempt to convert a single drop cable into multiple drop cables using extra taps and splitters. A multiple drop cable produces incorrect signal levels and degrades the performance of the entire system.

Powering Up the 1771-KRF

After you have successfully:

- set the switch assemblies on the KRF
- mounted your KRF in a 1771 I/O chassis
- connected the KRF to the DH/DH+ or remote I/O module and your broadband cable system

you can power up the KRF module. Power up the I/O chassis and PLC (if necessary, refer to your PLC user's manual for more information).

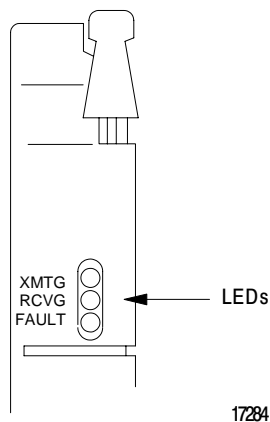
Troubleshooting the Network with the LEDs

The front panel of the KRF has three LED indicators for the following:

- Transmit
- Receive
- Fault

These indicators help you troubleshoot problems with the KRF's installation and operation. Figure 4.14 shows the LEDs:

Figure 4.14
KRF LED Indicators



Use table 4.A to troubleshoot using the LEDs and table 4.B to troubleshoot KRF local problems.

Table 4.A
Troubleshooting with the LEDs

Indicator Label	LED State	Definition of State
XTMG	ON	Data being transmitted from the DH/DH+ or remote I/O module through the KRF to the broadband cable system
	OFF	Data not being transmitted from the DH/DH+ or remote I/O module to the broadband cable system
RCVG	ON	Data being received from the broadband cable system through the KRF to the DH/DH+ or remote I/O module
	OFF	Data not being received by the KRF from the broadband cable system
FAULT	ON	(A) A fault has been detected at power up, possibly caused from missing or incorrect reset signal from I/O chassis power supply ¹
		(B) KRF has attempted to transmit on the broadband cable for more than 500 milliseconds (bus hog) ²
		(C) KRF frequency synthesizer out of lock ²
	OFF	No fault has been detected

¹Allen-Bradley power supplies have a reset signal that is transmitted on the backplane of the I/O chassis. If the module does not receive this signal, it will not power-up correctly. Check to see if there is an I/O adapter module or backplane jumper board (cat. no. 1771-EY) in the far left slot of the chassis.

²If the KRF has detected an error in the broadband circuitry, it will light the Fault LED. The KRF, however, can correct some errors, so a power cycle on the module may bring it back online (If your KRF needs frequent power cycles to bring it back online, the module is probably defective and should be replaced.)

Once you have established that the broadband cable system is operating correctly, you can use the KRF and corresponding DH/DH+ or remote I/O module LEDs to troubleshoot a local problem at the KRF.

Important: Be certain messages are being sent over the DH/DH+ or remote I/O network. Network activity is required for troubleshooting.

Use the following table to troubleshoot local problems at the KRF.

Table 4.B
Troubleshooting KRF Local Problems

If this LED	And this LED	The Problem Is
DH/DH+ or remote I/O module XTMG blinking	KRF XTMG not blinking	-the baseband cable between the module and the KRF is not connected properly, or -there is a fault in the KRF
KRF RCVG not blinking (and there is traffic on the DH/DH+ or remote I/O)	N/A	-the broadband drop cable is not connected properly or -there is a fault in the KRF or -the KRF is on the wrong channel
DH/DH+ or remote I/O module RCVG not blinking	KRF RCVG blinking	-the baseband cable is not connected properly, or -there is a fault in the DH/DH+ or remote I/O module

Specifications

Location	single slot in I/O chassis
Communication Ports	DH/DH+ and remote I/O baseband: 3-screw terminal block Broadband: female type F connector
Communication Rate	57.6 and 115.2K baud
Cabling	DH/DH+ and Remote I/O port: Twinaxial Baseband- Belden 9463 Broadband port: 75 ohm, RG-6 coaxial
Power Requirement	1.5 amps @ 5VDC
Ambient Temperature Rating	32° to 140° F (0 to 60° C) operational -40° to 185° F (-40° to 85° C) storage
Ambient Humidity Rating	5 to 95% non-condensing

Frequency Channels

Channel Pair	Transmit Frequency (MHz)	Receive Frequency (MHz)
T12 to L	35.75 to 41.75	228 to 234
T13 to M	41.75 to 47.75	234 to 240
T14 to N	47.75 to 53.75	240 to 246

Subchannel Spacing	750 KHz
Transmit Level	+45 dBmV (nominal)
Receive Level Range	-13 dBmV to +15 dBmV
Regulatory Compliance	FCC Class A Subpart J of part 15 UL listed when used with listed bulletin 1771 systems Canadian DOC, Class A, RIR, September 1988

Using the 1771-KRF with 6608 Modems

Important: You can install the KRF and Allen-Bradley 6608 19.2KB frequency agile modems on the same 6 MHz channel (L, M or N) using the same channel translator. However, you must leave a 100 KHz (.1 MHz) guardband between the subchannel(s) you select for the KRF and the subchannel(s) you select for the 6608 modems.

The following table shows which 6608 subchannels you can *not* use if you select the given KRF subchannel.

Table B.A
1771-KRF restricted subchannels

If you select this KRF subchannel	Do NOT use this 6608 subchannel
1	13-31 (L)
2	28-46 (L)
3	43-61 (L)
4	58-76 (L)
5	73-91 (L)
6	88-106(L)
9	13-31 (M)
10	28-46 (M)
11	43-61 (M)
12	58-76 (M)
13	73-91 (M)
14	88-106 (M)
17	13-31 (N)
18	28-46 (N)
19	43-61 (N)
20	58-76 (N)
21	73-91 (N)
22	88-106 (N)

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