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Find the *Rockwell / Allen-Bradley 1784KR PC DH-485* at our website: *Click HERE*

Installation Data ID

Allen–Bradley
PC DH-485 Interface Module
(Cat. No. 1784-KR)

To the Installer

This document shows you how to install the 1784-KR module. Do not attempt to install the module until you have read this document. It contains the following sections:

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What the 1784-KR Module Does

The 1784-KR module provides an interface that allows IBM XT/AT compatible computers to communicate over the Allen-Bradley DH-485 communication network. This includes communication to the Allen-Bradley family of SLC-500 programmable controllers.

The 1784-KR is a half-slot module that resides in any available expansion slot in an IBM XT (except slot J8) or AT compatible computer.

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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 communication. It has been tested and complies with the limits for Class A computing devices 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, which you must 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.

The 1784-KR module lets you:

- Connect to multiple SLC-500 programmable controllers via the DH-485 network
- Connect to a single SLC-500 via a point-to-point cable link
- Select memory address, I/O address, and interrupt level (You can use this module with other option boards installed in your computer.)
- Perform online programming of the SLC-500 family of programmable controllers (Use the 1784-PA2E Advanced Programming Software).
- Access data from stations on the DH-485 network, including the SLC-500 (This requires the 6001-F2E DH-485 Standard Driver Software.)

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How the 1784-KR Module Operates

The 1784-KR module provides a communication interface for IBM XT/AT compatible computers to connect to the DH-485 network. The module is an intelligent card that supports the DH-485 protocol required to act as a node on DH-485, freeing the host PC from this task.

The 1784-KR module is one of three components required to communicate on the DH-485 network. Depending on your application, you need:

- the 1784-KR module
- the appropriate cable (refer to “Connecting the Communication Cable to the 1784-KR” for details)
- the correct software package for your application (for example, the 1747-PA2E Advanced Programming Software or the 6001-F2E DH-485 Standard Driver Software)

If you are using the 1784-KR with the 1747-PA2E Advanced Programming Software (APS), you also need to install host driver software that interfaces the 1784-KR to the APS. (See the enclosed document “PC DH-485 Interface Module Release Notes,” publication 1784-2.23-RN1, for details).

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The 1784-KR module is memory address-, I/O address-, and interrupt level- selectable on the IBM XT/AT bus. Line drivers provide the proper signal level for the DH-485 network. You connect to the network via a 6-position terminal block header (Phoenix MSTBA-1.5/6-G-AU) on the module. This attaches to the corresponding terminal block plug (Phoenix MSTB-1.5/6-ST-AU) on the DH-485 network.

To protect the PC, the 1784-KR module's DH-485 port provides 500Vdc voltage isolation between the communication cable and the PC. As a result, you do not need an isolated link coupler to connect the 1784-KR module to the DH-485 network.

Important: If you use other boards with the 1784-KR, conflicts in expansion slot bus addresses or interrupt levels may result if board addresses are incorrectly set. This can cause intermittent communication problems. See the next section for more information on setting the memory address, I/O address, and interrupt level on the 1784-KR module.

Installing the 1784-KR Module

You can install the 1784-KR module in any Allen-Bradley industrial terminal or IBM XT/AT compatible computer. For a list of compatible computers, see the "Specifications" section in this document.



CAUTION: Electrostatic discharge can degrade performance or damage this module. To protect the module from electrostatic damage:

- Touch a grounded object to discharge any built-up static charge before handling the module
- Do **not** touch the backplane connector or connector pins
- When setting the addresses via the selector switches, do **not** touch other circuit components inside the module. If available, use a static-safe workstation (Use the disposable wrist band ground strap shipped with the 1784-KR.)
- When the module is not in use, place it in a static shield bag

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Follow the instructions below when installing the module in Allen-Bradley industrial terminals and/or IBM XT/AT computers:

1. Turn the computer OFF and remove the ac power cord.

2. Remove all covers necessary to gain access to your computer's expansion slots.

3. Remove the screw holding the option-retaining bracket at the desired slot and remove the bracket.

4. Set the selectable memory address, I/O address, and interrupt level with the switch assembly on the module. Figure 1 shows the location of the switch assembly:

Figure 1
1784-KR Module Switch Assembly Location

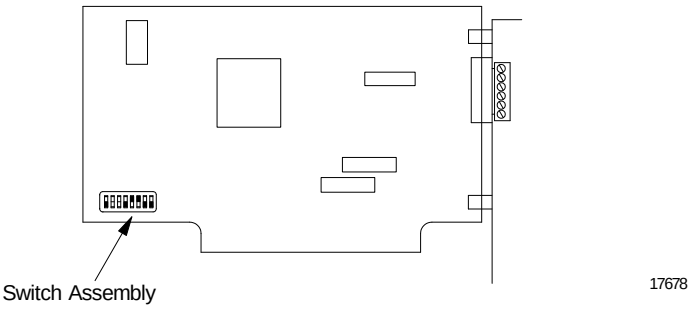
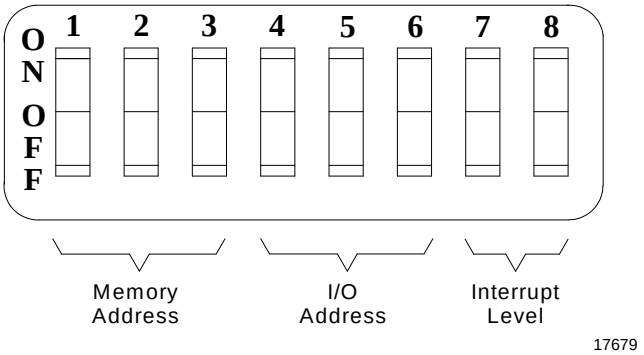


Figure 2 shows the switch assembly and the switches used to select each option:

Figure 2
Switch Assembly and Option Switches



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Important: The default memory address, I/O address, and interrupt level settings for the 1784-KR module are as follows:

- Physical Memory Address: `C0000H-C7FFFH`
- I/O Address: `300H-307H`
- Interrupt Level: `IRQ 2/9`

If you set these options to values other than the default values, an environment string must be entered. For example, if the 1784-KR card is installed with these switch settings:

- Physical Memory Address: `d0000`
- I/O Address: `360`
- Interrupt Level: `IRQ3`

then enter the following at the DOS prompt:

```
Set AB_OAKLAND=md000,b360,i3
```

before running any software on the 1784-KR, where:

- `m` must precede the base-memory segment address in HEX
- `b` must precede the I/O address in HEX
- `i` must precede the interupt level

Values can be entered in any order. Only the non-default values need to be entered.

Important: If you are using a personal computer with an EGA monitor, do not use the default memory address setting (C0000H-C7FFFH). Set the memory address to some other (non-default) value.

Table A on the next page shows the switch settings for the memory address, I/O address, and interrupt level switch settings:

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Table A
Physical Memory Address, I/O Address, and Interrupt Level Switch Settings

	Switch Position		
Physical Memory Address	**1**	**2**	**3**
C0000H-C7FFFH	OFF	OFF	OFF
C0000H-C7FFFH	OFF	OFF	ON
C8000H-CFFFFH	OFF	ON	OFF
C8000H-CFFFFH	OFF	ON	ON
D0000H-D7FFFH	ON	OFF	OFF
D8000H-DFFFFH	ON	OFF	ON
E0000H-E7FFFH	ON	ON	OFF
E8000H-EFFFFH	ON	ON	ON

	Switch Position		
I/O Address	**4**	**5**	**6**
2A8H-2AFH	OFF	OFF	ON
2B8H-2BFH	OFF	ON	OFF
2E8H-2EFH	OFF	ON	ON
300H-307H	OFF	OFF	OFF
320H-327H	ON	OFF	OFF
360H-367H	ON	ON	OFF
320H-327H	ON	OFF	ON
360H-367H	ON	ON	ON

	Switch Position	
Interrupt Level	**7**	**8**
IRQ2/9	OFF	OFF
IRQ3	ON	OFF
IRQ4	OFF	ON
IRQ5	ON	ON

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5. With a hand on each end of the board, firmly seat the board into the XT/AT bus connector.

6. Install the retaining screw into the option-retaining bracket and tighten.

7. Install the covers removed in step 2.

8. Connect the 1784-KR module to the network (See the next section, “Evaluating 1784-KR Module Connection Options” before you connect the module).

9. Reinstall the ac power cord and turn the computer ON.

10. Install the application software you are using (for example, 1747–PA2E Advance Programming Software or 6001–F2E DH–485 Standard Driver Software). See the application software user’s manual for instructions on installing the software.

Important: If you are using the 1784-KR module with the 1747-PA2E Advanced Programming Software (APS), you also need to install host driver software to interface the 1784-KR to APS. See the “PC DH-485 Interface Module Release Notes,” publication 1784-2.23-RN1, for more information.

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Evaluating 1784-KR Module Connection Options

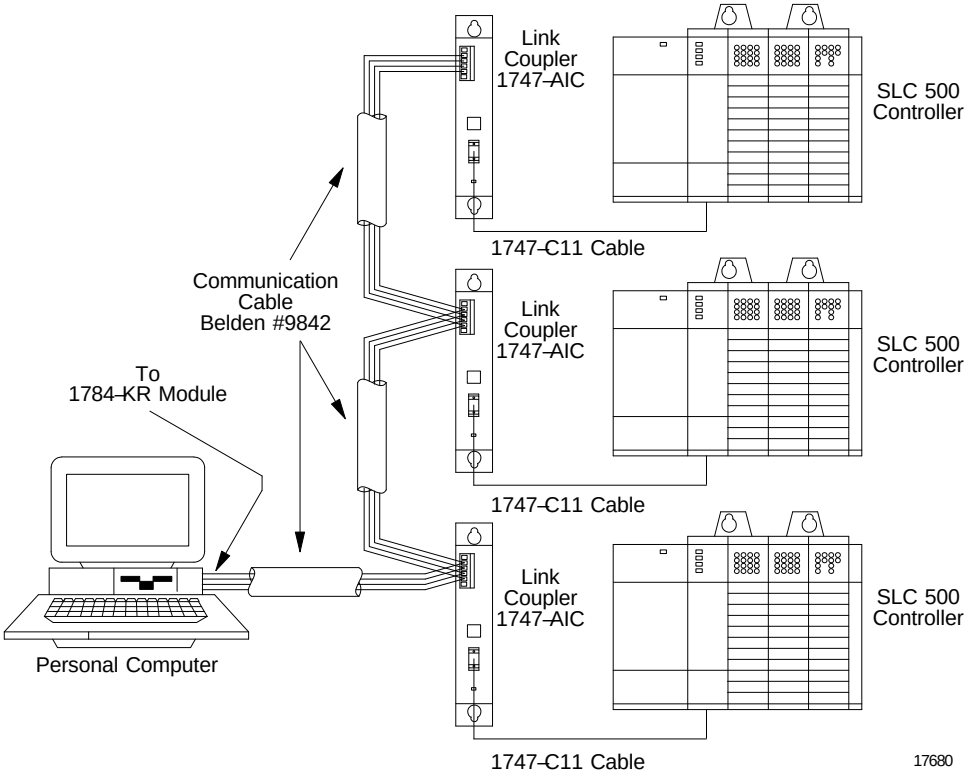
Depending on your application, you may use the 1784-KR module to communicate with multiple DH-485 stations (for example, SLC-500 programmable controllers) via the DH-485 network, or with a single SLC-500 via a point-to-point DH-485 link. These applications are illustrated below:

Connecting the 1784-KR Module via a DH-485 Network

Figure 3 shows an example of a network consisting of three SLC-500 controllers and one programming station. This configuration requires the 1784-KR module and three link couplers:

- An SLC 5/01 CPU is connected to each of the link couplers with a 1747-C11 cable.
- The 1784-KR module is connected to the network at one of the link couplers, as shown.
- The communication cable consists of three segments of cable daisy-chained at each link coupler.

Figure 3
Communicating to Multiple SLC-500s via the DH-485 Network

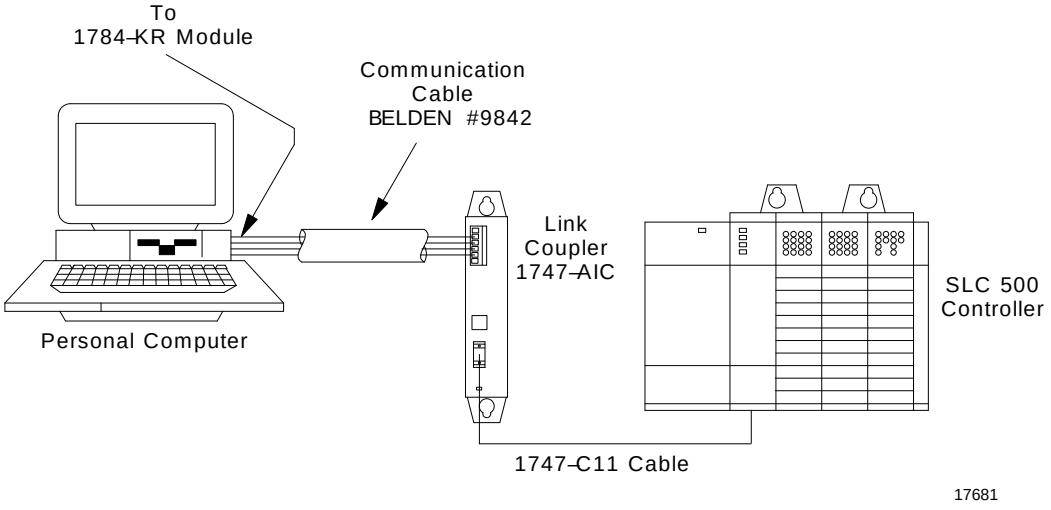


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Connecting the 1784-KR Module via a Point-to-Point DH-485 Link

Figure 4 shows an example of a point-to-point link consisting of an SLC-500 controller and a programming station. This configuration requires the 1784-KR module and one link coupler. The SLC 500 CPU is connected to the link coupler with a 1747-C11 cable. The 1784-KR module is directly connected to the link coupler, as shown.

Figure 4
Communicating to a Single SLC-500 using a Point-to-Point DH-485 Link



What the DH-485 Network Does

The DH-485 network passes information between devices on the plant floor. The network monitors process parameters, device parameters, device status, process status, and application programs to support data acquisition, data monitoring, program upload/download, and supervisory control. The DH-485 network offers:

- Interconnection of up to 32 devices
- Multi-master capability
- Token-passing access control
- The ability to add or remove nodes without disrupting the network
- Maximum length of 4,000 ft.

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Installing and Connecting the DH-485 Cable

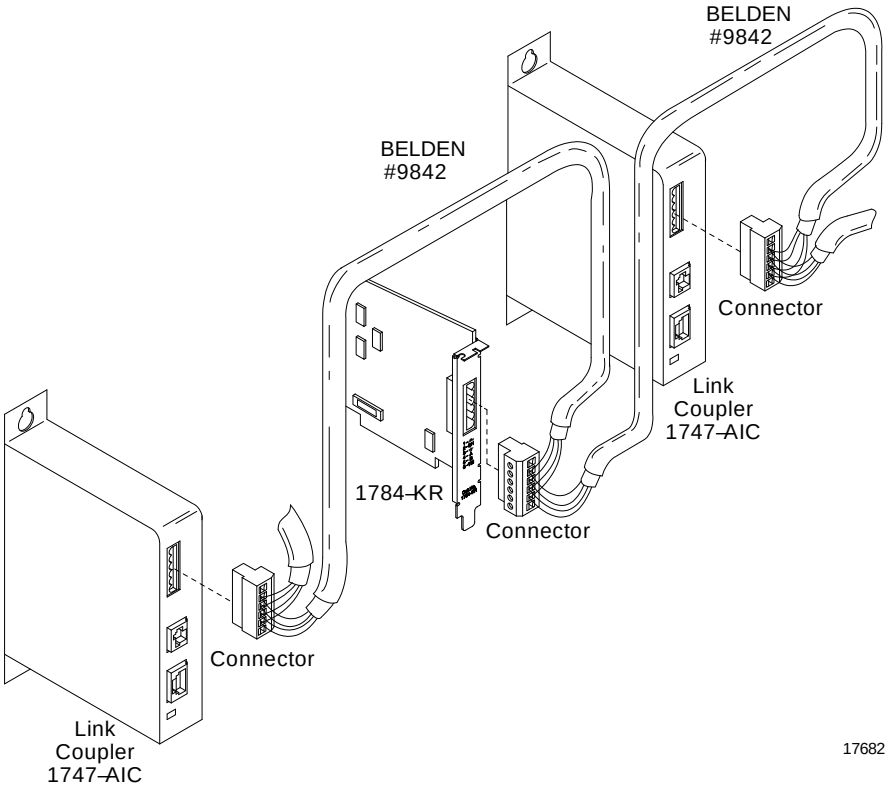
We recommend that you use BELDEN #9842 cable. It is jacketed and shielded with two twisted wire pairs and a drain wire: one pair provides a balanced signal line and one wire of the other pair serves as a common reference line between all nodes on the link. The shield reduces the effect of electromagnetic noise from the industrial environment on the link communications. The next section tells you how to install the cable.

Installing the DH-485 Communication Cable

The communication cable consists of a number of cable daisy-chained segments. The total length of the combined cable segments must not exceed 4,000 ft.

Cut the cable segments long enough to route from one DH-485 node to the next, allowing sufficient slack to prevent strain on the connector. Figure 5 below shows cable connections on a DH-485 link.

Figure 5
Connecting to a DH-485 Link



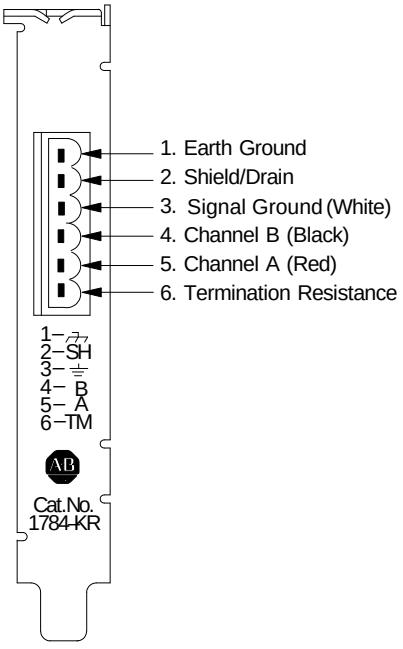
The next section tells you how to connect the communication cable to the 1784-KR module.

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Connecting the Communication Cable to the 1784-KR

Follow the instructions below to connect the communication cable to the 1784-KR module. Figure 6 shows the pinouts for the 1784-KR module terminal block:

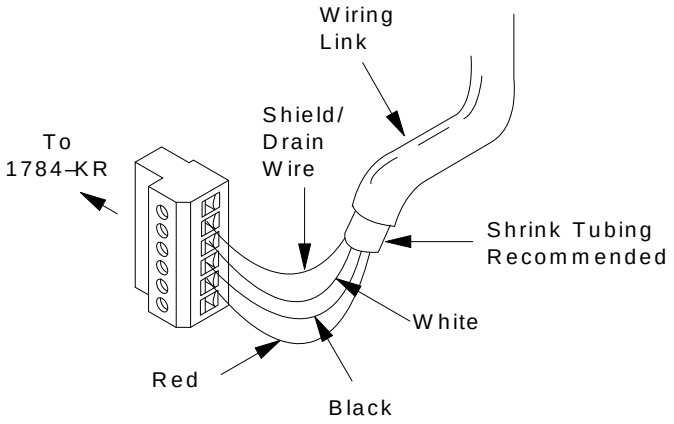
Figure 6
1784-KR Module Pinouts



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1. Build a cable to attach the terminal block of the 1784-KR module to the DH-485. The figure below shows the connection for a point-to-point DH-485 application.

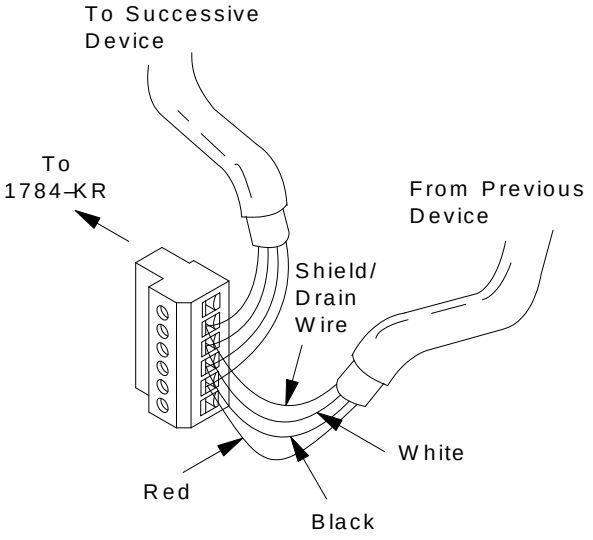
Figure 7
Connection for a Point-to-Point DH-485 Application



Single Cable Connection 17684

The following figure shows a corresponding connection for attaching the 1784-KR module to a DH-485 network.

Figure 8
Attaching the KR Module to a DH-485 Network



Multiple Cable Connection

17684

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Refer to the chart below for the proper wire/connector connections:

For this Wire/Pair:	Connect this Wire:	To this Terminal:
Shield/Drain	Non-jacketed	Terminal 2
Black/White	Black Wire	Cut back- No connection
	White Wire	Terminal 3 (Signal Ground)
Black/Red	Black Wire	Terminal 4 (Channel B)
	Red Wire	Terminal 5 (Channel A)

2. Carefully plug the terminal block into the connector of the 1784-KR module you are connecting to the DH-485. Allow enough slack to prevent stress on the cable.

3. Provide strain relief for the BELDEN #9842 cable after it is installed in the terminal block. This prevents the cable wires from breaking.

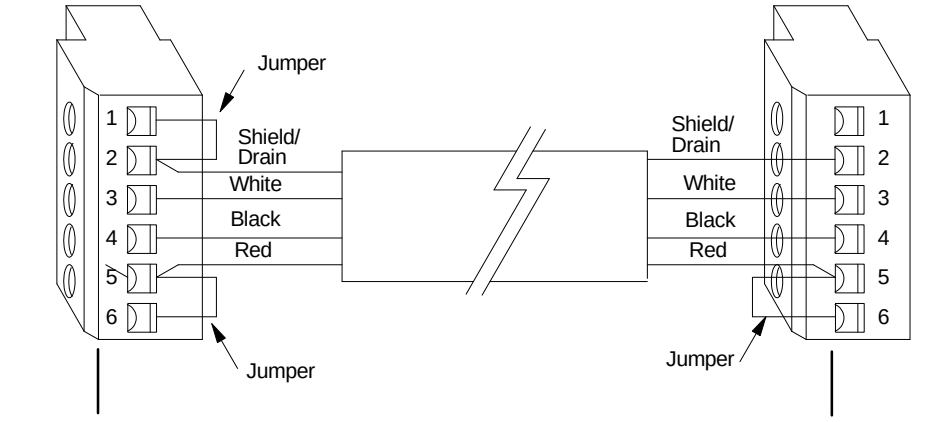
Grounding and Terminating the DH-485 Network

CAUTION: Only one of the nodes at the end of the network must have an earth ground connection for the shield of the communication cable. If the 1784-KR module is at the end of the network, you can do this by jumpering Terminals 1 and 2 of the terminal block.

Terminate the nodes at each end of the network with the appropriate impedence. If the 1784-KR module is at the end of the network, you can terminate it by jumpering Terminals 5 and 6 of the terminal block connector. This connects the termination impedance built into the module. Refer to the illustration on the next page for the proper jumpering (The illustration assumes 1784-KR modules are at both ends of the DH-485 link).

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Figure 9
Jumpering the 1784-KR



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Specifications

1784-KR Module

Module Compatibility

- IBM XT/AT
- Allen-Bradley T50
- Allen-Bradley T35
- Allen-Bradley 6120
- Allen-Bradley 6121
- Allen-Bradley 6122
- Compaq Deskpro 386

(This is a partial list. Contact your nearest Allen-Bradley sales office for the latest listing.)

Module Output Connector

- Six-position terminal block header (Phoenix MSTBA-1.5/6-G-AU)

Outputs

- RS-485

Hardware Interrupt

- IRQ2, IRQ3, IRQ4, IRQ5

Baud Rate

- 300, 1200, 2400, 4800, 9600, 19200 Baud

Maximum Line Length

- 4000 ft

Power Requirements

- +5VDC @ 1.8A

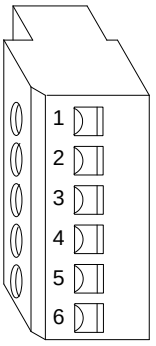
Operating Temperature

- 0.to 60 °C

Humidity

- 5 to 95% noncondensing

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