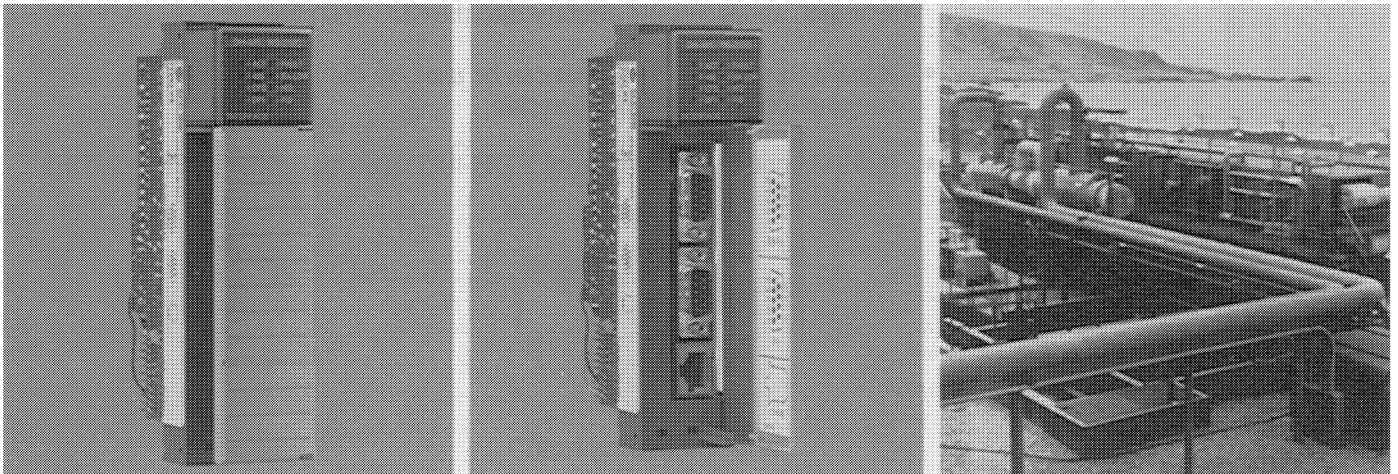




## DH-485/RS-232C Interface Module

(Catalog Number 1747-KE)

### Product Data



**Gain direct access to your SLC 500's CPU memory through an RS-232C link that lets you examine ladder programs, monitor program operation, and make program changes from a local or remote site.** Residing in the SLC 500™ I/O chassis, the DH-485/RS-232C Interface Module, Catalog Number 1747-KE, is a communications interface module that acts as a bridge between DH-485 networks and RS-232 devices using DF1 protocol.

**Ideally suited for SCADA/RTU applications where point-to-point communication is required, the module provides a low cost RS-232C/modem interface.** By providing a modem connection into your DH-485 network, it makes collecting data and troubleshooting installations over telephone lines possible.

**The interface module has a DH485 port that can be linked to the DH-485 network through a 1747-AIC Link Coupler.** It has a DF1 port that accommodates RS-232/423, RS-422, and RS-485 communications from 300 to 19,200 baud and a separate serial port for configuring.

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## Benefits

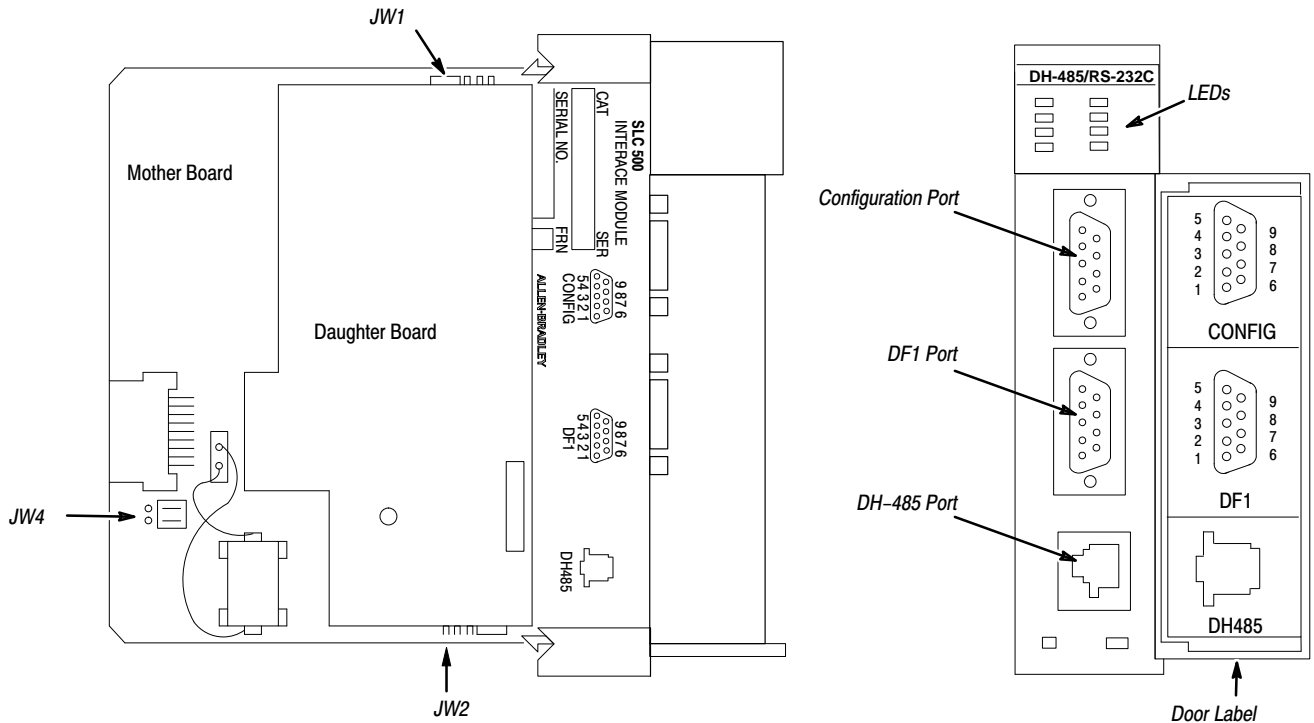
The interface module can enhance your SLC 500 application with the following features:

- It can provide you with local or remote access to examine ladder programs, monitor program operation, and make changes if necessary.
- By providing a modem connection into your DH-485 network, it makes troubleshooting installations over the telephone lines possible.
- It is ideally suited for SCADA/RTU applications where point-to-point communication is required.
- It has a configuration and a DF1 serial port that each accommodates RS-232/423, RS-422, and RS-485 communications.
- It is easily configured using either backplane communication or an ASCII terminal, and it installs directly into the SLC 500 chassis.
- It has a Real Time Clock that can be used by the SLC processor in conjunction with normal operation.
- It allows communication from a DH-485 network device to a single DF1 device.

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## Module Overview

The interface module has a number of features intended to simplify installation and facilitate communications between external DF1 devices and the DH-485 network.



## Communication Ports

There are three communication ports on the front of the module. The location, name, and pin numbers of these ports are listed on the inside of the module door. They are CONFIG, DF1, and DH485.

**CONFIG** - used to configure the module with an ASCII terminal. This serial port accommodates RS-232/423, RS-422, and RS-485 communication interfaces. The CONFIG port is capable of operating at 300, 600, 1200, 2400, 4800, 9600, and 19200 baud. It is electrically isolated to 500V dc.

**DF1** - used to interface the module to a modem or other user devices using DF1 protocol. This serial port accommodates RS-232/423, RS-422, and RS-485 communication interfaces. The DF1 port is capable of operating at 300, 600, 1200, 2400, 4800, 9600, and 19200 baud. It is electrically isolated to 500V dc.

**DH485** - used to interface the module with the DH-485 network. This port is not isolated and cannot directly drive a multi-node DH-485 network. You must use a 1747-AIC link coupler to connect this port to a DH-485 network that includes multiple SLC 500 processors.

The Catalog Number 1747-C10 or Catalog Number 1747-C13 cables can connect the interface module's DH485 port to a 1747-AIC link coupler. The Catalog Number 1747-C13 cable can also connect the module's DH485 port directly to a single SLC™ processor.

### **Modem Compatibility**

The module can be connected to most types of dial-up network or direct connect modems.

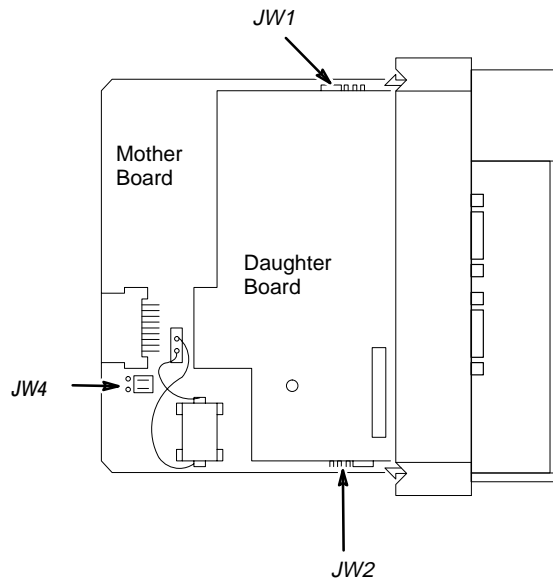
**Important:** Some modems are designed to respond to the DTR signal by answering the phone whether it is ringing or not. Since the module asserts DTR at all times (except during the hang-up sequence), the phone appears to be busy at all times. Do not use the interface module with any type of modem that answers the phone as soon as DTR is asserted.

The type of modems you can use are:

- **Manual** – typically acoustically coupled modems. A person on each end of the phone line establishes the connection. They then insert the handsets into an acoustic coupler to complete the connection.
- **DTE Controlled Answer** – these unattended modems are attached directly to the phone lines. The interface module acts as the Data Terminal Equipment (DTE), which controls the modem via the DTR, DSR, and DCD signals. The module incorporates timeouts and tests to properly operate these types of modems.
- **Auto Answer** – These modems have self-contained timeouts and tests. They can answer and hang up the phone automatically. The module has no means of controlling an auto-dial modem, but it can be used in conjunction with a separate auto-dialer.
- **Direct Connect** – These modems connect to a dedicated, leased phone line and remain active at all times.

## Jumpers

The module has three jumpers that must be set prior to and just after configuring the module. Once set, these jumpers will remain unchanged unless there is a change to the system's communication interface.



**JW1** – allows you to select the type of communication interface for the CONFIG port.

**JW2** – allows you to select the type of communication interface for the DF1 port.

**JW4** – allows you to select the functionality and mode of the interface module. The orientation of the jumper determines the module's functionality. A horizontal orientation gives the module functionality equivalent to a series A module, while a vertical orientation of the jumper accesses the added functionality of a series B module.

The position of the jumper determines the module's mode (Configuration or Run), and thus, which method is used to configure the module (ASCII terminal or backplane communication).

## Configuring Options

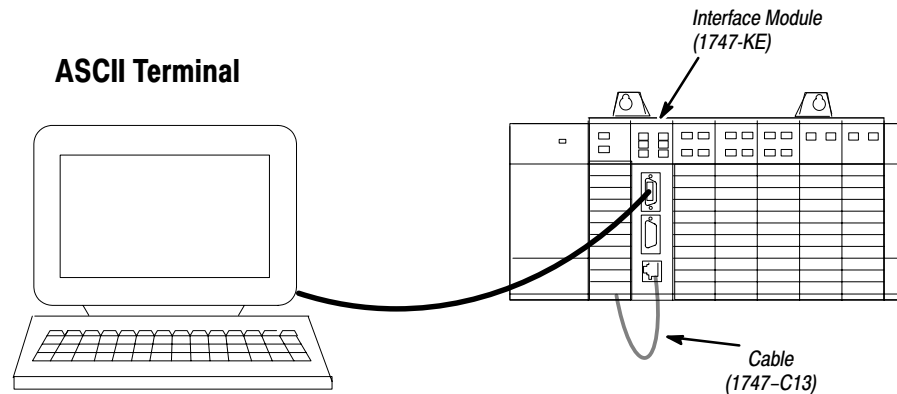
To configure the module, you can either use backplane communication or an ASCII Terminal.

### Configuring through the Backplane

The interface module can be configured through backplane communication using any SLC fixed, 5/01™, 5/02™, or 5/03™ processor.

### Configuring with an ASCII Terminal

To communicate with the interface module through an ASCII terminal, connect the terminal to the CONFIG port as shown below:

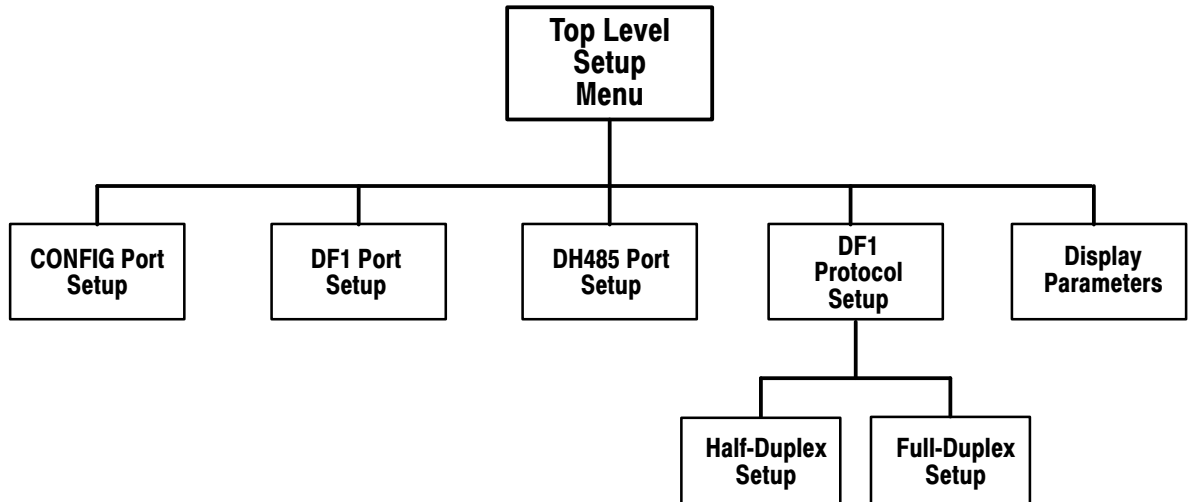


The ASCII terminal can be any industrial terminal, workstation, or personal computer with terminal mode software that communicates in alphanumeric mode.

If a dedicated ASCII terminal such as a DEC VT100 or DEC VT220, is not available, software packages are available to allow a personal computer to emulate an ASCII terminal. Some software examples are:

- The Allen-Bradley 1747-PBASE development software package (designed for the SLC 500 BASIC module).
- PROCOMM® marketed by DataStorm Technologies.
- Windows™ marketed by Microsoft.
- Many others available through companies that make or sell modems.

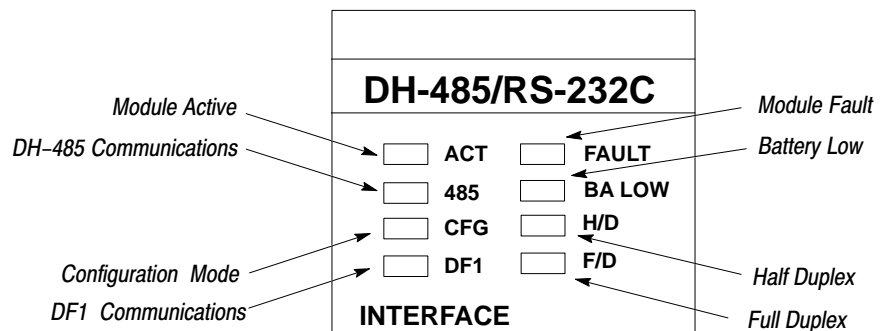
When you power up the module and your ASCII terminal, a Top Level Setup menu will appear. The menu structure is three levels deep, as shown in the following figure.



The sub-menus provide selectable parameters for port setup and DF1 Protocol. Menu selections are saved into the module's RAM which is battery-backed.

### Operating and Troubleshooting

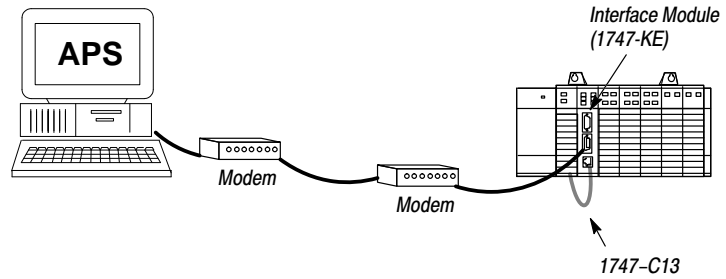
The module has an array of LEDs to provide a quick visual check on module status during operation and assist with any troubleshooting that may be required. One LED displays configuration status, three pertain to communication port status, one indicates a fault condition, one indicates a low battery, and two indicate half- or full-duplex transmission.



## Typical Applications

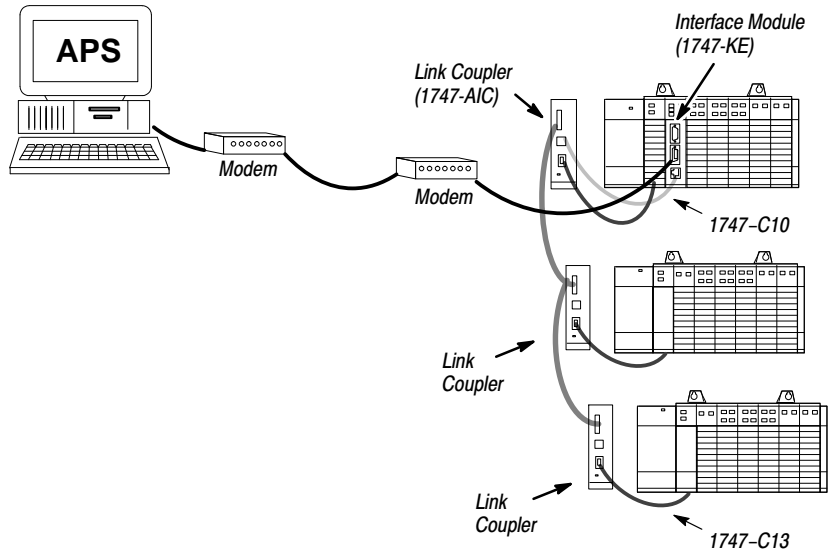
This section illustrates most typical applications for which the module is suited. A number of variations on these configurations is possible.

### Full-Duplex (Point-to-Point)



This configuration allows a connection to a single remote SLC node. The 1747-C13 cable eliminates the need for a 1747-AIC link coupler for connections to one node.

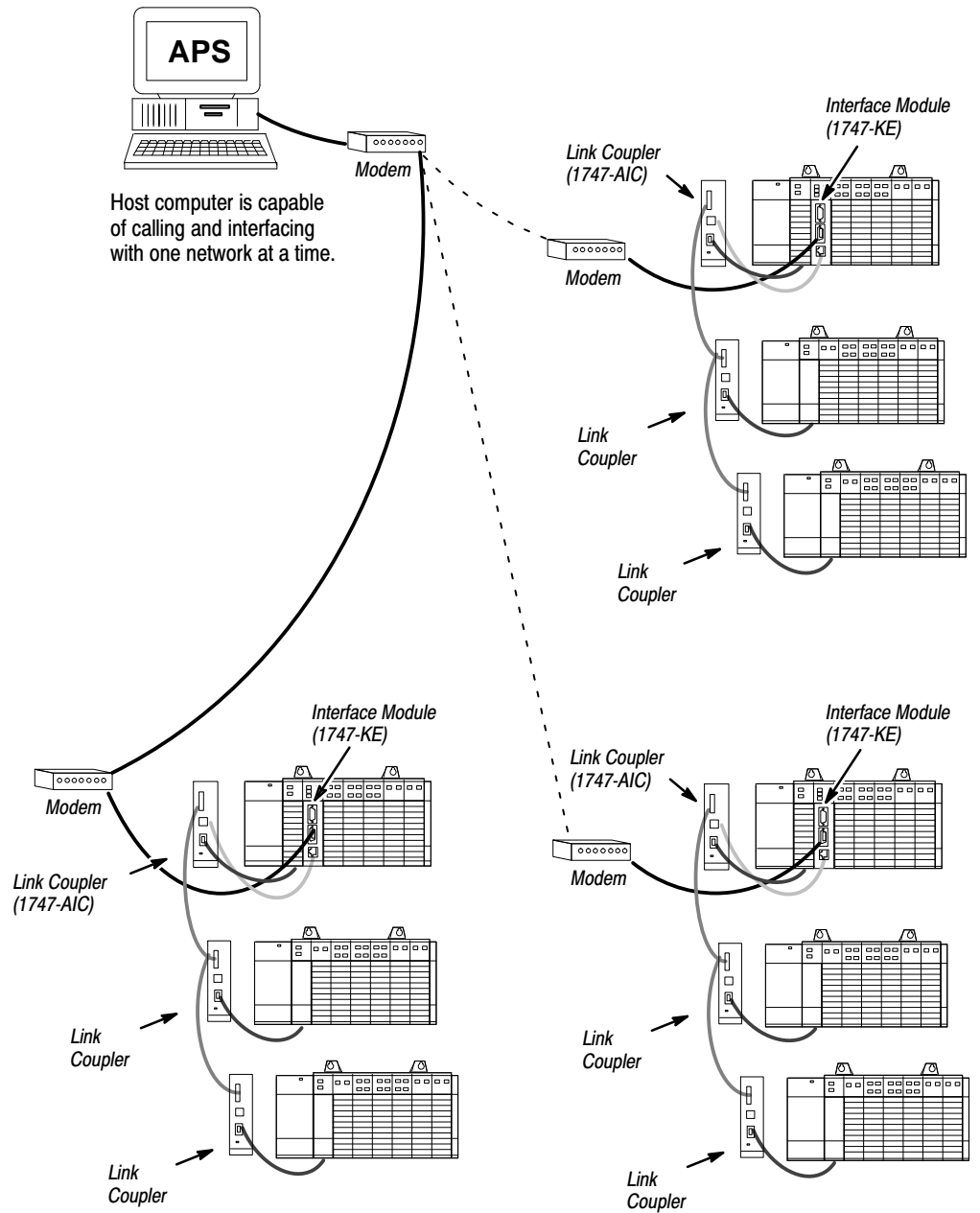
### Full-Duplex (Network, Example 1)



This configuration allows connection to a remote DH-485 network of up to 31 SLC nodes.

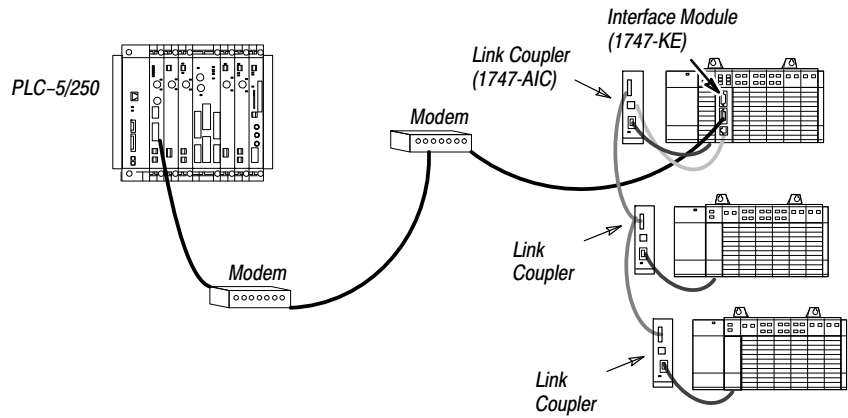


**Full-Duplex (Network, Example 2)**



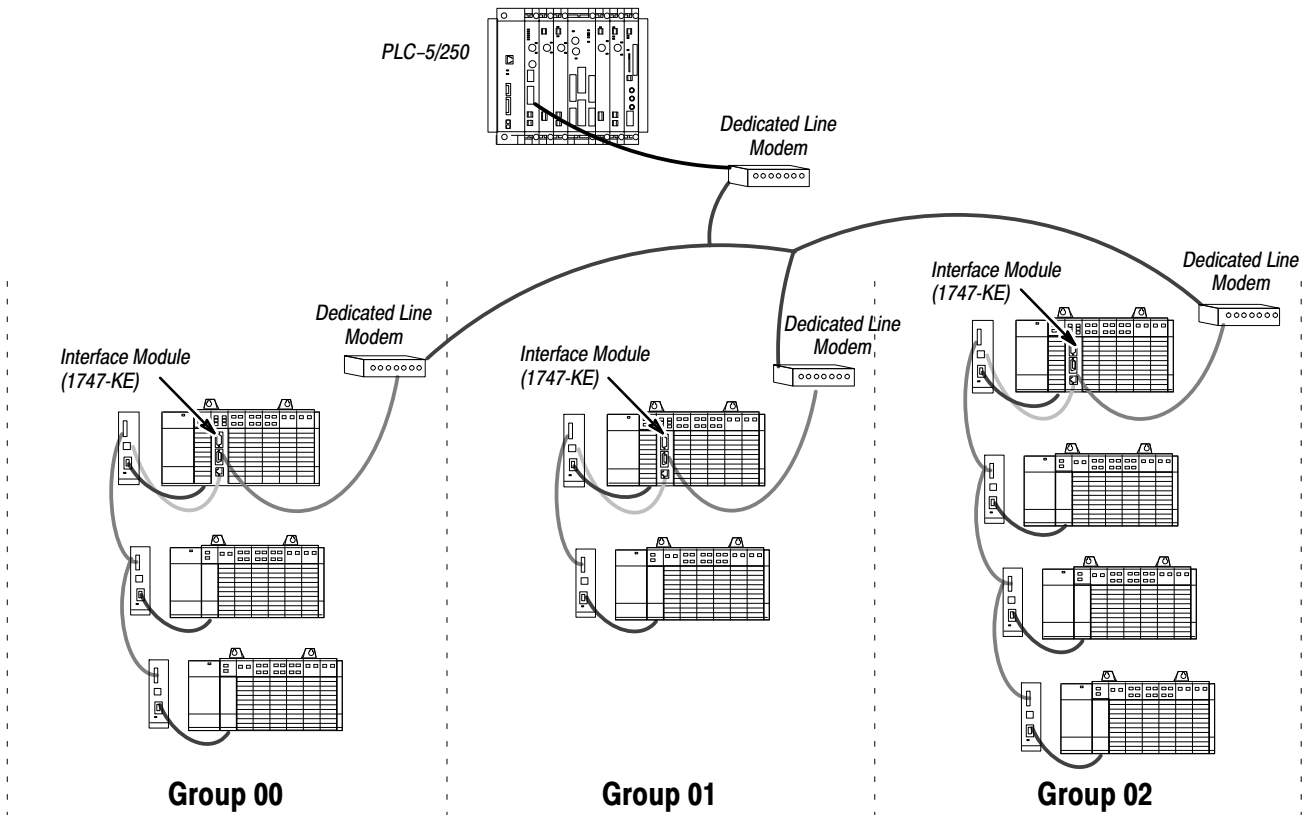
This configuration allows the host to call more than one remote network (one network connected at a time). Each remote network can consist of up to 31 SLC nodes.

**Half-Duplex (Local Mode)**



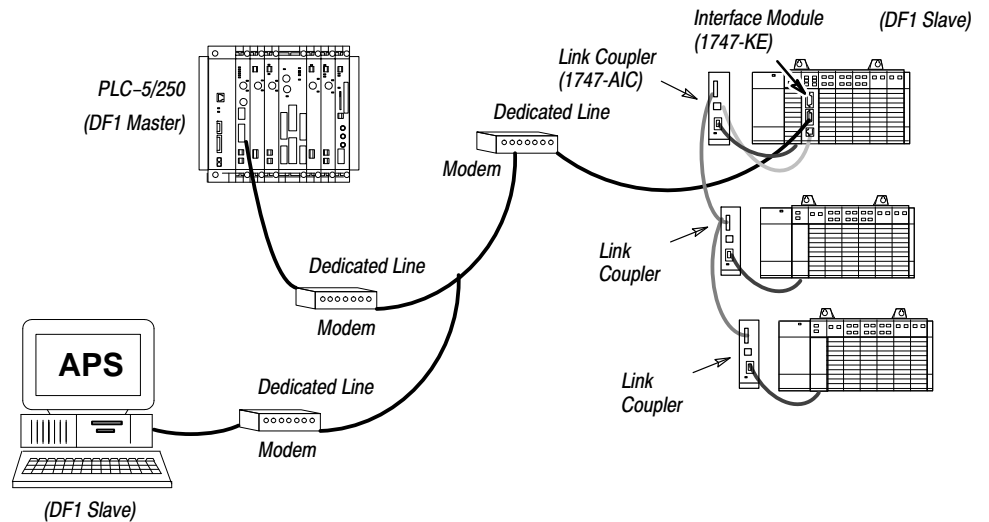
This allows a host (the PLC 5/250™ in this example) to interface to one SLC node in a remote DH-485 network using the half-duplex protocol.

**Half-Duplex (Remote Mode)**



This configuration allows a host connection up to 8 groups of DH-485 networks connecting up to a total of 255 SLC nodes.

### Half-Duplex (Slave-to-Slave Communication)



This allows a DF1 slave device to send a message to another DF1 slave device. In this example, APS can communicate to an SLC node.

## Allen-Bradley Support

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- sales and order support
- product technical training
- warranty support
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## Specifications

Module hardware specifications are listed in the following tables.

### Power Consumption

Voltage	Current Required
5V dc	.150 A
24V dc	.040 A <sup>①②</sup>

<sup>①</sup> If the 1747-AIC Link Coupler is connected to the 1747-KE module with a 1747-C10 cable, then the link coupler draws its power (.085 A @ 24V dc) through the module. Add this to the listed current requirements for the 1747-KE module.

<sup>②</sup> If the 1747-AIC Link Coupler is connected to the 1747-KE module with a 1747-C13 cable, then power for the link coupler comes from either a SLC 500 processor or an external power supply. Refer to the documentation provided with the link coupler. Module current requirements remain as listed.

**Important:** The 1747-KE module requires both 5V dc and 24V dc power from the SLC backplane. The power consumption of the module must be taken into consideration when planning your SLC 500 system. Refer to the documentation supplied with your SLC 500 fixed or modular controller for additional information on power supplies and current requirements.

### Environmental Conditions

Condition	Range
Operating temperature	0° C to 60° C (32° F to 140° F)
Storage temperature	-40° C to 85° C (-40° F to 185° F)
Relative humidity	5% to 95% (non-condensing)
Certification	<ul style="list-style-type: none"> <li>•CSA certified</li> <li>•CSA Class I, Division 2 Groups A, B, C, D certified</li> <li>•UL listed</li> <li>•CE compliant for all applicable directives</li> </ul>

### Port Isolation

Port	Isolation	Isolation Voltage
CONFIG	Backplane to Port	500V dc
DF1	Backplane to Port	500V dc
CONFIG and DF1	CONFIG to DF1	500V dc

**Important:** The DH485 Port is not isolated.

### Real Time Clock/Calendar Accuracy

Specification	Range
Accuracy	±1 minute/month @ 25° C
	+0, -6 minutes/ month @ 60° C

### Maximum Communication Distances

Communication Rate (bps)	Maximum Distance Allowed in meters (feet)			
	RS-232	RS-423	RS-422	RS-485
300	15 (50)	1230 (4000)	1230 (4000)	1230 (4000)
600	15 (50)	920 (3000)	1230 (4000)	1230 (4000)
1200	15 (50)	770 (2500)	1230 (4000)	1230 (4000)
2400	15 (50)	502 (1650)	1230 (4000)	1230 (4000)
4800	15 (50)	245 (800)	1230 (4000)	1230 (4000)
9600	15 (50)	120 (400)	1230 (4000)	1230 (4000)
19200	15 (50)	60 (200)	1230 (4000)	1230 (4000)

**Important:** When communicating in RS-232 mode, use the RS-423 jumper settings.

When communicating in RS-423 mode, use RS-423 or compatible receivers.

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