



Programming Messages In a ControlLogix™ System

Purpose of This Document

This document helps you to establish communications between Logix5000™ controllers and other Logix5000 controllers, PLC-5® controllers, and workstations. It contains procedures for transferring data between those devices in situations where produced and consumed tags are either not supported or not desired.

Additionally, this document provides step-by-step guidance on how to use ControlLogix communication modules to route messages between PLC-5 controllers on different ControlNet™ or DH+™ networks (i.e., remote networks).

When to Use This Document

Use this document when you want to send a message between the following devices:

- Logix5000 Controller to a Logix5000 Controller
- Logix5000 Controller to a Workstation
- Logix5000 Controller to a PLC-5 Controller
- PLC-5 Controller to a Logix5000 Controller
- PLC-5 Controller to a Remote PLC-5 Controller

Software Required

The procedures in the document require the following software:

- programming software that is appropriate for the controllers that will send the messages
- RSLinx™ software
- for a message to a workstation, RSLinx activation file
- ControlLogix Gateway software, for the following messages:
 - PLC-5 controller to a Logix5000 controller over a DH+ network
 - PLC-5 controller to a PLC-5 controller on a remote DH+ network

Allen-Bradley PLCs

Important User Information

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

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

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

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

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

Attention statements help you to:

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

IMPORTANT	Identifies information that is critical for successful application and understanding of the product.
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Logix5000 Controller to a Logix5000 Controller

To send a message from a Logix5000 controller to another Logix5000 controller:

1. Open the RSLogix 5000 project that will send the message.
2. To control the execution of the message, create a controller-scoped tag and select the MESSAGE data type.
3. In the controller organizer, I/O Configuration folder, add the following module (s):

If you are sending the message over this network:	Then add the:
backplane (i.e., both controllers are in the same chassis)	controller that receives the message
Ethernet	1756-ENET module that is in the local chassis (i.e., the chassis that is sending the message)
ControlNet	A. 1756-CNB module that is in the local chassis (i.e., the chassis that is sending the message) B. 1756-CNB module that is in the remote chassis (i.e., the chassis that is receiving the message) C. controller that is receiving the message (Add the controller to the 1756-CNB module from Step B.)
DH+	1756-DHRIO module that is in the local chassis (i.e., the chassis that is sending the message)

4. Enter the logic for the message.

The following example depicts a message that is sent when a specific condition is met.

EXAMPLE

Message logic

When count_send is on, sends count_msg



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5. In the MSG instruction, click  .

The Message Configuration dialog box opens.

6. On the Configuration tab, specify the following parameters:

For this item:	Type or select:
Message Type	CIP Data Table Read or CIP Data Table Write
Source Tag	controller-scoped tag containing the data to be transferred
Number Of Elements	number of array elements to transfer
Destination Tag	controller-scoped tag to which the data will be transferred

7. Click the **Communication** tab.

8. Click **Browse ...**

The Module Browser dialog box opens.

9. On what type of network is the controller that receives the message?

If:	Then:
backplane	Select the controller that receives the message and click OK .
Ethernet	<p>A. Select the 1756-ENET module (from Step 3.) and click OK.</p> <p>B. In the Path text box, add: , 2, <ip address> where: <ip address> is the IP address of the other controller.</p> <p>For example, a completed entry might be: washer_chassis, 2, 130.130.128.4</p>
ControlNet	Select the controller that receives the message and click OK .
DH+	<p>A. Select the 1756-DHRIO module (from Step 3.) and click OK.</p> <p>B. In the Path text box, add: , <path> where: <path> is the path to the other controller.</p> <p>Refer to "Appendix A: Constructing a Communication Path" on page 27.</p>

10. Select a cache option for the connection:

If the message is:	Then:
continuous	Select the Cache Connection check box.
not continuous	Clear the Cache Connection check box.

11. Click **OK.**

Logix5000 Controller to a PLC-5 Controller

While Logix5000 controllers and PLC-5 controllers use 32 bits to store floating point values, each type of controller handles integers differently:

- Logix5000 controllers execute more efficiently and use less memory when working with 32-bit integers (DINTs).
- PLC-5 controllers require 16-bit integers (INTs).

Because of the differences between the controllers, follow these guidelines when developing projects for Logix5000 controllers:

- for integers, use the DINT data type whenever possible
- before sending DINTs to a PLC-5 controller, convert the DINTs to INTs
- when receiving INTs, convert them to DINTs before using them in your application

This application solution uses the following method to convert integers that are transferred in a message:

- when sending integers:
 - an FAL instruction moves the values into a temporary INT tag or array (buffer)
 - the MSG instruction sends the INT buffer
- when receiving integers:
 - the MSG instruction stores the values in a temporary INT tag or array (buffer)
 - an FAL instruction moves the values from the INT buffer to the tag or array that is used in the application

To send a message to a PLC-5 controller:

1. Determine if you need to configure routing tables for 1756-DHRIO modules:

If you are sending the message over this network:	And the controller at the destination is:	Then:
Ethernet	—————→	You do not need routing tables.
ControlNet	—————→	
DH+	local (i.e., both controllers are on the same DH+ network)	You do not need routing tables.
	remote (i.e., the controllers are on different DH+ networks)	For each 1756-DHRIO module along the path to the destination, configure a routing table. Refer to "Appendix B: Configuring a 1756-DHRIO Module" on page 30.

2. Open the RSLogix 5000 project that will send the message.
3. In the controller organizer, I/O Configuration folder, add the following module (s):

If you are sending the message over this network:	Then add the:
Ethernet	1756-ENET module that is in the same chassis as the Logix5000 controller (i.e., local chassis)
ControlNet	A. 1756-CNB module that is in the same chassis as the Logix5000 controller (i.e., local chassis)
	B. PLC-5C controller (Add the controller to the 1756-CNB module from Step A.)
DH+	1756-DHRIO module that is in the same chassis as the Logix5000 controller (i.e., local chassis)

4. If you are transferring values that are *not* floating point values, create an INT buffer for the values:
 - a. Create a controller-scoped tag and select the INT data type. If you are sending or receiving a block of values, specify the number of values as the array subscript of the tag (e.g., int_buffer[10] for a block of 10 INTs).
 - b. For the FAL instruction that will move values into or out of the INT buffer, create a CONTROL tag.
5. To control the execution of the message, create a controller-scoped tag and select the MESSAGE data type.
6. Using one of the following examples, enter the logic for the message:
 - writing or reading floating point values, on page 9
 - writing integers, on page 10
 - reading integers, on page 10

EXAMPLE

Writing or reading floating point values to or from a PLC-5 controller

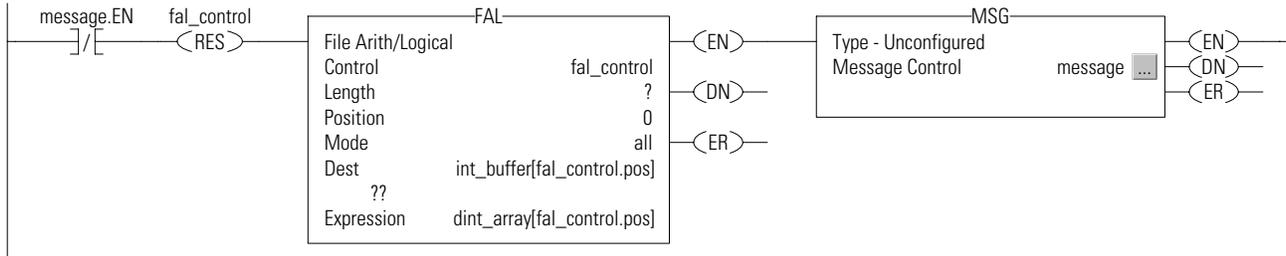
Continuously transfers floating point values



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EXAMPLE Writing integer values to a PLC-5 controller

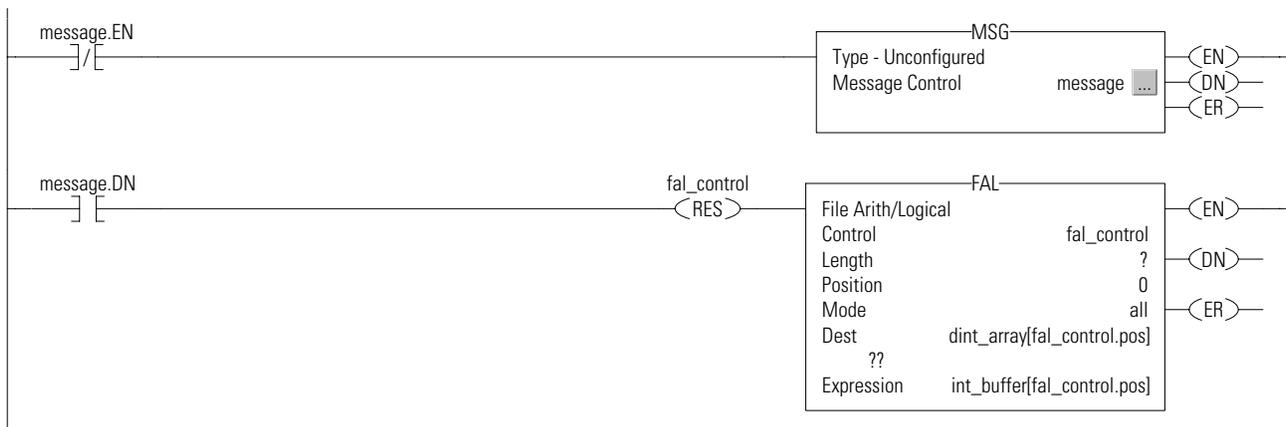
Continuously moves the values in dint_array to int_buffer. This converts the values to 16-bit integers (INTs). Then the message instruction sends int_buffer to the controller that receives the message.



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EXAMPLE Reading integer values from a PLC-5 controller

Continuously reads 16-bit integer values (INTs) from a controller and stores them in int_buffer. Then the FAL instruction moves the values to dint_array. This converts the values to 32-bit integers (DINTs), for use in the project.



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7. In the MSG instruction, click  .

The Message Configuration dialog box opens.

8. On the Configuration tab, specify the following parameters:

For this item:	Type or select:
Message Type	PLC5 Typed Read or PLC5 Typed Write
Source Tag/Element	controller-scoped tag or address of the first element containing the data to be transferred If you are writing values and created an INT buffer for the values, specify the INT buffer.
Number Of Elements	number of array elements to transfer
Destination Tag/Element	controller-scoped tag or address to which the data will be transferred If you are reading values and created an INT buffer for the values, specify the INT buffer.

9. Click the **Communication** tab.

10. Click **Browse ...**

The Module Browser dialog box opens.

11. On what type of network is the PLC-5?

If:	Then:
Ethernet	A. Select the 1756-ENET module in the local chassis (from Step 3.) and click OK . B. In the Path text box, add: , 2, <ip address> where: <ip address> is the IP address of PLC-5E controller. For example, a completed entry might be: washer_chassis, 2, 130.130.128.4
ControlNet	Select the PLC-5C controller and click OK .
DH+	Select the 1756-DHRIO module in the local chassis (from Step 3.) and click OK .

12. Specify the following additional parameters:

For a PLC-5 controller on a:	For this item:	Type or select:
Ethernet network	Communication Method	CIP
ControlNet network		(Disregard the Cache Connection check box. A CIP message to a PLC-5 controller does not use a connection.)
local DH+ network	Communication Method	DH+
	Channel	for the 1756-DHRIO module, the channel that is connected to the DH+ network
	Source Link	0
	Destination Link	0
	Destination Node	in octal, the DH+ node address of the PLC-5 controller
remote DH+ network	Communication Method	DH+
	Channel	for the 1756-DHRIO module, the channel that is connected to the DH+ network
	Source Link	the link ID of the ControlLogix backplane (local chassis)
	Destination Link	the link ID of the DH+ network where the PLC-5 controller resides
	Destination Node	in octal, the DH+ node address of the PLC-5 controller

13. Click **OK**.

Logix5000 Controller to a Workstation

To send a message from a Logix5000 controller to a DDE topic in RSLinx:

1. Start RSLinx software.
2. From the Communications menu, select **Configure Client Applications**.

The Configure Client Applications dialog box opens.

3. Click the **Virtual Link ID** tab.
4. Do you want to use the same Virtual Link ID for each workstation in your system? (Node or IP addresses are sufficient to distinguish between workstations.)

If:	Then:
Yes	A. Record the Virtual Link ID number, which you will use in subsequent steps. B. Click OK .
No	A. Enter a unique Virtual Link ID for the workstation. B. Click OK . C. Close the RSLinx software. (If you configured RSLinx software to start as a service, you must also stop the service.) D. Re-open the RSLinx software.

5. From the DDE/OPC menu, select **Topic Configuration ...**

The DDE/OPC Configuration window opens.

6. In the bottom left corner of the window, click **New**.
7. In the Topic List text box, type a name for the topic and press **[Enter]**.
8. On the Data Collection tab, specify the following parameters:

For this item:	Type, select, or clear:
Processor Type	PLC-5 .
Data Collection Mode	A. Clear the Polled Messages check box. B. Select the Unsolicited Messages check box.

9. On the Advanced Communication tab, specify the following parameters:

For this item:	Type or select:
Communication Driver	driver for the network across which you will send the message
Station	slot number of the controller that is sending the message
Local or Remote Addressing	Remote

The Remote Routing Configuration dialog box opens.

10. In the Remote Routing Configuration dialog box, specify the following parameters:

For this parameter:	Type or select:
Bridge Device	1785-KA5 Bridge/5130-KA
Local ID	Virtual Link ID from Step 4.
Local KA5	arbitrary number between 1 and 107 (RSLinx requires an entry but this configuration does <i>not</i> use the entry.)
Remote ID	number that designates the backplane of the ControlLogix chassis (Use a different number for each backplane.)

11. Click **OK**.
12. Click **Done** and confirm the update of the topic.
13. Open the RSLogix 5000 project that will send the message.
14. To control the execution of the message, create a controller tag and select the MESSAGE data type.

15. Enter the logic for the message.

The following example depicts a message that is sent when a specific condition is met.

EXAMPLE

Message logic

When count_send is on, sends count_msg



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16. In the MSG instruction, click .

The Message Configuration dialog box opens.

17. On the Configuration tab, specify the following parameters:

For this item:	Type or select:	Notes:
Message Type	PLC-5 Typed Read or PLC-5 Typed Write	
Source Tag/ Element	controller-scoped tag or first element containing the data to be transferred	If you are reading values, use the address of the data in the application that is on the workstation. Requires a logical address, such as N7:0.
Number Of Elements	number of array or data table elements to transfer	
Destination Tag/ Element	controller-scoped tag or element to which the data will be transferred	If you are writing values, use the address of the data in the application that is on the workstation. Requires a logical address, such as N7:0.

18. Click the **Communication** tab.

19. In the Path text box, specify the communication path:

For a message over a:	Type:
ControlNet network	<path to the workstation>, 1, 0
Ethernet network	<path to the workstation>

For help with constructing a path to the workstation, refer to “Appendix A: Constructing a Communication Path” on page 27.

20. On the Communication tab, specify the following parameters:

For this item:	Type or select:
Communication Method	CIP With Source ID
Source Link	Remote ID from Step 10.
Destination Link	Virtual Link ID from Step 4.
Destination Node	77 (RSLinx reserves node 77 for DDE topics.)

21. Click **OK**.

PLC-5 Controller to a Logix5000 Controller

For a PLC-5 message that is sent to a Logix5000 controller, the configuration of the message depends on the network on which the PLC-5 controller resides:

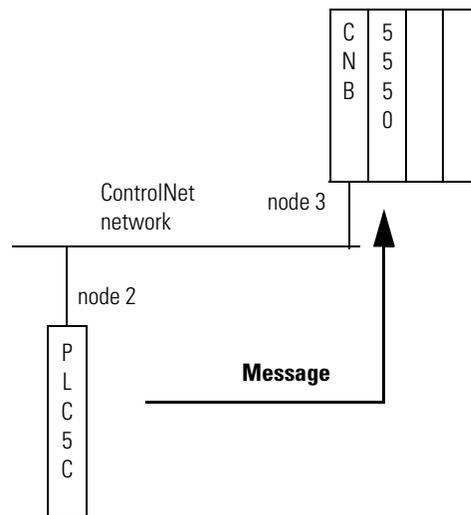
If the PLC-5 controller is on a:	See this section:
ControlNet network	"ControlNet Network" on page 17
DH+ network	"DH+ Network" on page 19

ControlNet Network

The following example depicts a PLC-5C controller that sends a message to a Logix5550™ controller over a ControlNet network.

EXAMPLE

Message from a PLC-5C controller to a Logix5550 controller over a ControlNet network



To send a message from a PLC-5C controller to a Logix5000 controller over a ControlNet network:

1. In the PLC-5 controller that is sending the message, display the set-up screen for the message.

- For the PLC-5 controller that is sending the message (This PLC-5), specify the following parameters:

For this item:	Type or select:
Communication Command	PLC-5 Typed Read or PLC-5 Typed Write
Data Table Address	starting address of the data in the controller that is sending the message
Size in Elements	number of elements to be transferred
Port Number	2

- For the Logix5000 controller that is receiving the message (Target Device), specify the following parameters:

If you are using:	For this item:	Perform this action:
RSLogix 5 software, version 3.x or greater	Data Table Address	Type, in quotation marks [" "], the name of the tag in the Logix5000 controller that is receiving the message (e.g., "count").
	MultiHop	Select Yes .
	MultiHop tab	A. In the first To Address cell in the list, type the ControlNet node number of the 1756-CNB module that is in the same chassis as the Logix5000 controller that is receiving the message. B. In the second To Address cell in the list, type the slot number of the Logix5000 controller that is receiving the message.
any software other than RSLogix 5 software, version 3.x or greater	Data Table Address	Type, in quotation marks [" "], the name of the tag in the Logix5000 controller that is receiving the message (e.g., "count").
	ControlNet Path	Type <i>node slot</i> Where: Is the:
		<i>node</i> ControlNet node number of the 1756-CNB module that is in the same chassis as the Logix5000 controller that is receiving the message
		<i>slot</i> slot number of the Logix5000 controller that is receiving the message

The following example depicts the MultiHop entries or ControlNet Path entry for the example on page 17.

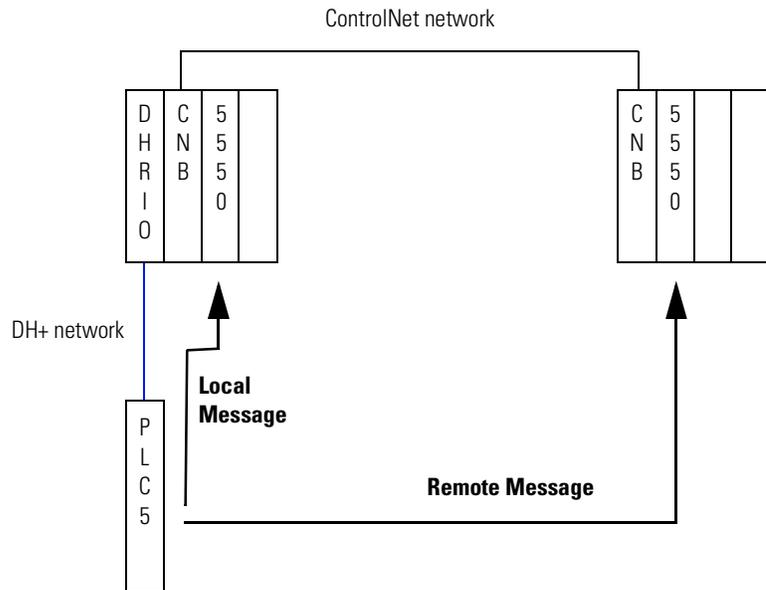
EXAMPLE	MultiHop entries or ControlNet Path entry
	3 1
	where: indicates the:
	3 node number 1756-CNB module
	1 slot number of the Logix5550 controller

DH+ Network

Before programming a message from a PLC-5 controller to a Logix5000 controller over a DH+ network, determine whether the message is local or remote:

If the Logix5000 controller is:	And there is:	Then configure a:
on the same network as the PLC-5 controller	only one Logix5000 controller in the chassis	local message. Refer to "Local DH+ Messages" on page 20
	more than one Logix5000 controller in the chassis	remote message. Refer to "Remote DH+ Messages" on page 21
on a network that is different from the network of the PLC-5 controller	—————▶	remote message. Refer to "Remote DH+ Messages" on page 21

The following diagram depicts a local message and a remote message. The network that links the two ControlLogix chassis can be a ControlNet network (as shown), an Ethernet network, or a different DH+ network.



Local DH+ Messages

To send a message from a PLC-5 controller to a Logix5000 controller that is on the same DH+ network:

1. For the 1756-DHRIO module that is in the same chassis as the Logix5000 controller, configure the channel that is connected to the same DH+ network as the PLC-5 controller to route local messages to the Logix5000 controller. Refer to “Appendix B: Configuring a 1756-DHRIO Module” on page 30
2. In the PLC-5 controller that is sending the message, display the set-up screen for the message.
3. For the PLC-5 controller that is sending the message (This PLC-5), specify the following parameters:

For this item:	Type or select:
Communication Command	PLC-5 Typed Read or PLC-5 Typed Write
Data Table Address	starting address of the data in the controller that is sending the message
Size in Elements	number of element to be transferred
Port Number	port through which the message will exit

4. For the Logix5000 controller that is receiving the message (Target Device), specify the following parameters:

For this item:	Type or select:
Data Table Address	in quotation marks [“ ”], the name of the tag in the Logix5000 controller that is receiving the message (e.g., “count”)
Local DH+ Node (Octal)	node number of the 1756-DHRIO module that is in the same chassis as the Logix5000 controller
Local/Remote	Local

Remote DH+ Messages

To send a message from a PLC-5 controller to either:

- a Logix5000 controller that is on a different network
 - a Logix5000 controller when more than one Logix5000 controller is in the chassis
1. For each 1756-DHRIO module that will route the message from one network to another, configure a routing table. Refer to “Appendix B: Configuring a 1756-DHRIO Module” on page 30
 2. In the PLC-5 controller that is sending the message, display the set-up screen for the message.
 3. For the PLC-5 controller that is sending the message (This PLC-5), specify the following parameters:

For this item:	Type or select:
Communication Command	PLC-5 Typed Read or PLC-5 Typed Write
Data Table Address	starting address of the data in the controller that is sending the message
Size in Elements	number of element to be transferred
Port Number	port through which the message will exit

4. For the Logix5000 controller that is receiving the message (Target Device), specify the following parameters:

For this item:	Type or select:
Data Table Address	in quotation marks [“ ”], the name of the tag in the Logix5000 controller that is receiving the message (e.g., “count”)
Local DH+ Node (Octal)	node number of the 1756-DHRIO module that is on the same DH+ network as the PLC-5 controller
Local/Remote	Remote
Remote Link Type	Data Highway
Remote Station Address	slot number of the Logix5000 controller, converted to octal
Remote Bridge Link ID	link ID of the backplane in which the Logix5000 controller resides

PLC-5 Controller to a Remote PLC-5 Controller

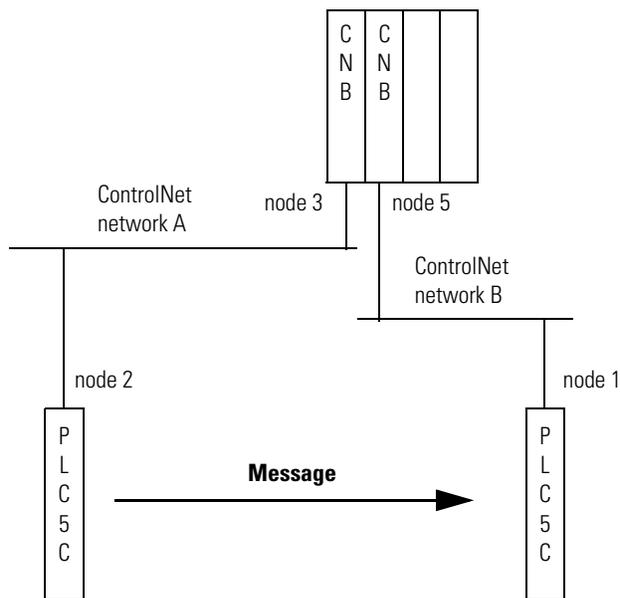
You can use ControlLogix communication modules to route a message between PLC-5 controllers that are on different networks (i.e., a remote message):

For PLC-5 controllers on:	See this section:
different ControlNet networks	"Remote ControlNet Message" on page 22
different DH+ networks	"Remote DH+ Message" on page 25

Remote ControlNet Message

The following example depicts a ControlLogix chassis with two 1756-CNB modules that route a message from a ControlNet network to a different ControlNet network.

EXAMPLE Message from a PLC-5C on a ControlNet network to a PLC-5C on a different ControlNet network



To send a message from a PLC-5C controller to a PLC-5C controller on a different ControlNet network:

1. In the PLC-5 controller that is sending the message, display the set-up screen for the message.
2. For the PLC-5 controller that is sending the message (This PLC-5), specify the following parameters:

For this item:	Type or select:
Communication Command	PLC-5 Typed Read or PLC-5 Typed Write
Data Table Address	starting address of the data in the controller that is sending the message
Size in Elements	number of element to be transferred
Port Number	port through which the message will exit

3. For the PLC-5 controller that is receiving the message (Target Device), specify the following parameters:

If you are using:	For this item:	Perform this action:
RSLogix 5 software, version 3.x or greater	Data Table Address	Type the starting address of the data in the controller that is receiving the message.
	MultiHop	Select Yes .
	MultiHop tab	<p>A. In the first To Address cell in the list, type the ControlNet node number of the 1756-CNB module that is on the same ControlNet network as the controller that is sending the message.</p> <p>B. In the second To Address cell in the list, type the slot number of the 1756-CNB module that is on the same ControlNet network as the controller that is receiving the message.</p> <p>C. Press [Insert]. The list displays a new entry.</p> <p>D. In the From Device cell of the new entry, select 1756-CNB.</p> <p>E. In the To Address cell of the new entry, type the ControlNet node number of the controller that is receiving the message.</p>
any software other than RSLogix 5 software, version 3.x or greater	Data Table Address	Type the starting address of the data in the controller that is receiving the message.
	ControlNet Path	Type <i>node_a slot node_b</i>
		Where: Is the:
		<i>node_a</i> ControlNet node number of the 1756-CNB module that is on the same ControlNet network as the controller that is sending the message
		<i>slot</i> slot number of the 1756-CNB module that is on the same ControlNet network as the controller that is receiving the message
	<i>node_b</i> ControlNet node number of the controller that is receiving the message	

The following example depicts the MultiHop entries or ControlNet Path entry for the example on page 22.

EXAMPLE

MultiHop entries or ControlNet Path entry

3 1 1

where: indicates the:

3 node number of the 1756-CNB module on ControlNet network A

1 slot number of the 1756-CNB module on ControlNet network B

1 node number of the PLC-5C controller that is receiving the message

Remote DH+ Message

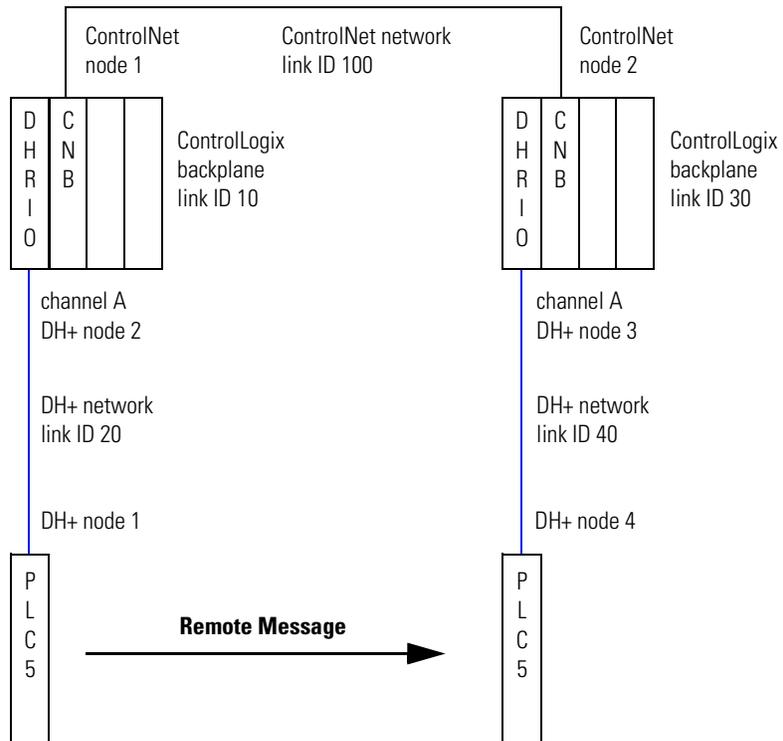
You can use ControlLogix chassis and a common ControlNet or Ethernet network to link different DH+ networks. Because you cannot designate a path over a DH+ network, routing tables are used to provide a description of the route that the message should take:

- A unique link ID number designates each network and each ControlLogix backplane (chassis) in the system.
- A routing table, configured for each 1756-DHRIO module in the systems, stores the link IDs.
- Each 1756-DHRIO module uses its routing table to route messages across the system.

In the following example, two ControlLogix chassis link different DH+ networks together via a ControlNet network.

EXAMPLE

Message from a PLC-5 controller on a DH+ network to a PLC-5 controller on a different DH+ network



To send a message from a PLC-5 controller to a PLC-5 controller on a different DH+ network:

1. For each 1756-DHRIO module that will route the message from one network to another, configure a routing table. Refer to “Appendix B: Configuring a 1756-DHRIO Module” on page 30
2. In the PLC-5 controller that is sending the message, display the set-up screen for the message.
3. For the PLC-5 controller that is sending the message (This PLC-5), specify the following parameters:

For this item:	Type or select:
Communication Command	PLC-5 Typed Read or PLC-5 Typed Write
Data Table Address	starting address of the data in the controller that is sending the message
Size in Elements	number of element to be transferred
Port Number	port through which the message will exit

4. For the PLC-5 controller that is receiving the message (Target Device), specify the following parameters:

For this item:	Type or select:
Data Table Address	starting address of the data in the controller that is receiving the message
Local DH+ Node (Octal)	node number of the 1756-DHRIO module that is on the same DH+ network as the controller that is sending the message
Local/Remote	Remote
Remote Link Type	Data Highway
Remote Station Address	node number of the controller that is receiving the message
Remote Bridge Link ID	link ID of the DH+ network to which the controller that is receiving the message is connected

Appendix A: Constructing a Communication Path

When you configure a message in a Logix5000 project, you typically have to designate a communication path for the message.

- The path identifies the route that the message will take from the controller to the destination device (controller, module, or workstation).
- A path requires pairs of numbers:
 - The first number in the pair identifies the port from which the message exits.
 - The second number in the pair designates the network address of the next device
- When you enter a path, separate each number with a comma [,].
- A path may require several pairs of numbers.

To construct a path, complete the following steps and separate each number with a comma [,]:

1. Specify the port from which the message exits. (For the first number in the path, this is usually a “1,” which designates the backplane port of the Logix5000 controller that is sending the message.):

For this port:	Specify:
backplane port from a 1756 controller or module	1
DF1 port from a 1756-L1 controller	2
ControlNet port from a 1756-CNB module	
Ethernet port from a 1756-ENET module	
DH+ port over channel A from a 1756-DHRIO module	
DH+ port over channel B from a 1756-DHRIO module	3

2. Specify the next hardware device (e.g., controller, module, workstation):

For a device on a:	Specify:
ControlLogix backplane	slot number
DF1 network	station address (0-254)
ControlNet network	node number (1-99 decimal)
DH+ network	8# followed by the node number (1-77 octal) For example, to specify an octal node address of 37, type 8#37
Ethernet network	IP address (four decimal numbers separated by periods)

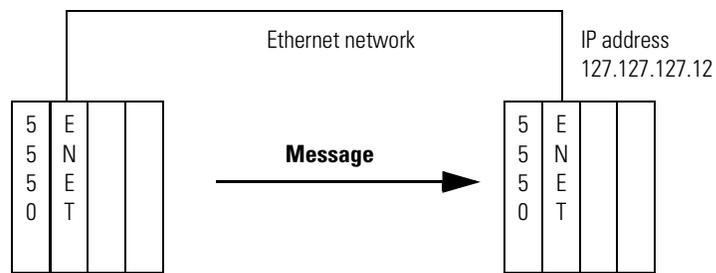
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3. Repeat steps 1. and 2. until you have specified the destination controller, module, or workstation.

The following examples depict communication paths:

- between two Logix5000 controllers over an Ethernet network, on page 28
- between a Logix5000 controller and a workstation over an Ethernet network, on page 29
- between a Logix5000 controller and a workstation over a ControlNet network, on page 29

EXAMPLE Communication path from a Logix5000 controller to a Logix5000 controller over an Ethernet network



1, 1, 2, 127.127.127.12, 1, 0

where:	indicates:
1	backplane port of the controller
1	slot number of the 1756-ENET module
2	Ethernet port of the 1756-ENET module
127.127.127.12	IP address of the 1756-ENET module in the destination chassis
1	backplane port of the 1756-ENET module in the destination chassis
0	slot number of the destination controller

EXAMPLE

Communication path over an Ethernet network to a workstation

1, 1, 2, 130.151.202.34

where:	indicates:
1	backplane port of the controller
1	slot of the Ethernet module
2	Ethernet port of the Ethernet module
130.151.202.34	IP address of the workstation

EXAMPLE

Communication path over a ControlNet network to a workstation

1, 5, 2, 10, 1, 0

where:	indicates:
1	backplane port of the controller
5	slot of the ControlNet bridge module
2	ControlNet port of the ControlNet bridge module
10	ControlNet node number of the workstation
1	workstation port of the 1784-KTCX15 communication card
0	RSLinx (RSLinx is node 0 in the workstation.)

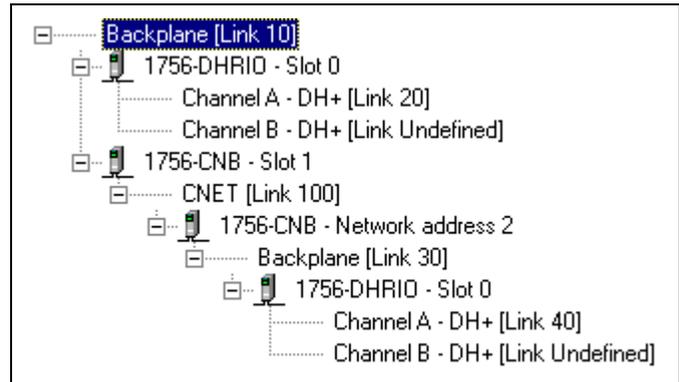
Appendix B: Configuring a 1756-DHRIO Module

You must configure a 1756-DHRIO module before you can use it to route messages.

The following example depicts the routing table for each of the 1756-DHRIO modules that are used in the remote DH+ example on page 25.

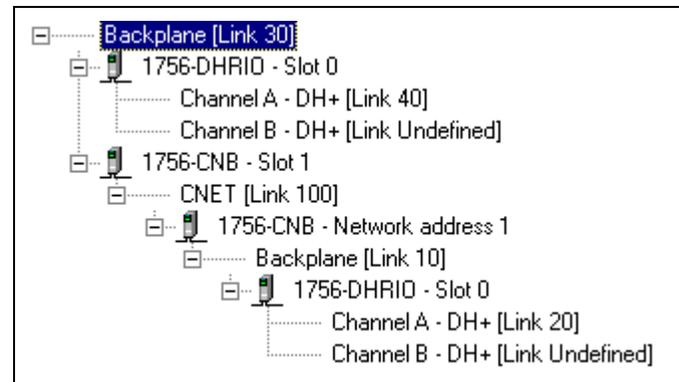
EXAMPLE

Routing table for the left 1756-DHRIO module



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Routing table for the right 1756-DHRIO module



42191

Before you configure a 1756-DHRIO module, perform these actions:

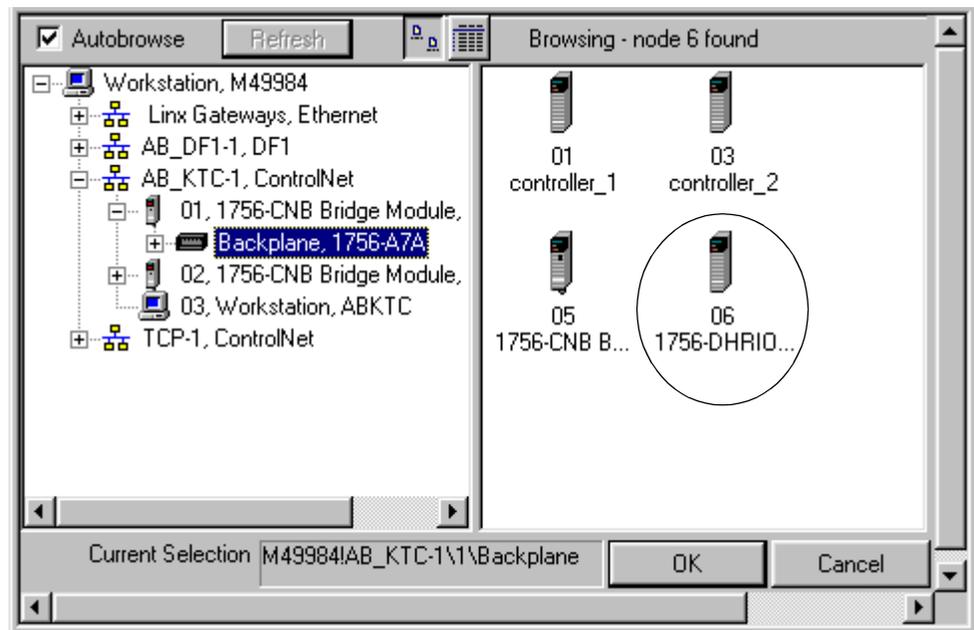
- install and power up the module
- connect the chassis in which the module resides to a communication network (e.g., serial connection to a Logix5550 controller that is in the same chassis as the 1756-DHRIO module)

To configure a 1756-DHRIO module:

1. For each network and each ControlLogix backplane in your system, designate a unique link ID number. Refer to the remote DH+ example on page 25.
2. Start the ControlLogix Gateway software.
3. From the File menu, select **Browse Network ...**

The RSLinx window opens.

4. In the left pane of the RSLinx window, expand the network in which the 1756-DHRIO module resides until it is displayed in the right pane, as depicted in the following example:



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5. In the right pane, select the 1756-DHRIO module.
6. In the bottom right corner of the window, click **OK**.

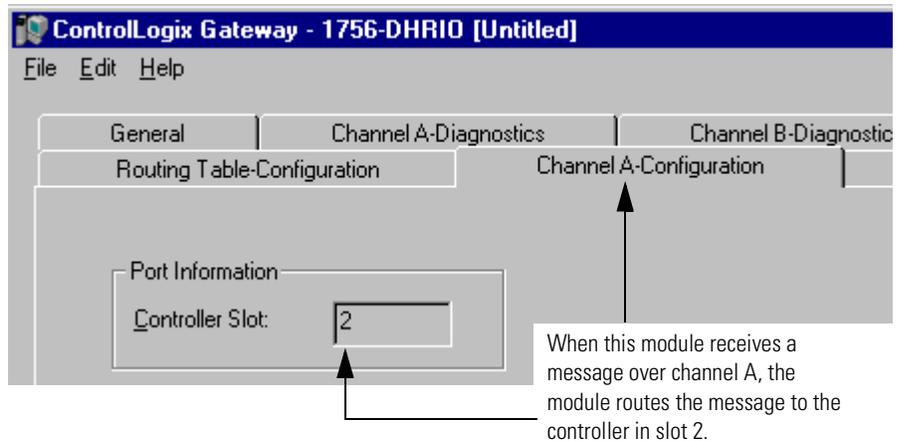
The ControlLogix Gateway 1756-DHRIO dialog box opens.

7. Choose the appropriate option:

To configure a:	Then:
routing table	Click the Routing Table-Configuration tab.
channel to route local messages	<p>A. Click the configuration tab for the channel.</p> <p>B. In the Controller Slot text box, type the slot number of the controller that will receive local messages over this channel.</p> <p>C. Go to Step 13.</p>

In the following example, a 1756-DHRIO module is configured to automatically route any messages that it receives over channel A to the controller in slot two.

EXAMPLE Route a local message



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8. Define the link ID of the backplane in which the 1756-DHRIO module resides:
 - a. Right-click the backplane link at the top of the configuration and select **Edit Module ...**
The Edit Backplane dialog box opens.
 - b. Type the link ID of the backplane and click **OK**.

9. Define the link IDs of the 1756-DHRIO module:
 - a. Right-click the 1756-DHRIO module and select **Edit Module ...**
The Edit Module dialog box opens.
 - b. For each channel, type the link ID of the corresponding network.
 - c. Click **OK**.
10. Add the remaining communication modules in the backplane (chassis) to the routing table:
 - a. Right-click the backplane and select **Add Module ...**
The Select Module dialog box opens.
 - b. Select the type of device and click **OK**.
The Add Module dialog box opens.
 - c. Type or select the slot number of the module.
 - d. Type the link ID(s) of the network(s) to which the module is connected.
 - e. Click **OK**.
11. To each of the networks created in the previous step, add the corresponding communication modules in other ControlLogix chassis:
 - a. Right-click the link ID and select **Add Module ...**
The Select Module dialog box opens.
 - b. Select the type of device and click **OK**.
The Add Module dialog box opens.
 - c. Type the node or IP address of the module.
 - d. Type the link ID(s):

For this module:	Type the link ID(s):
1756-ENET	of the backplane of the module (i.e., the ControlLogix chassis in which the module resides)
1756-CNB	
DH+ Bridge	in the routine table of the added module

- e. Click **OK**.
The routing table displays the module and its associated backplane.
12. Repeat steps 10. and 11. until the routing table depicts the required networks.

13. To download the configuration to the module, click **Apply**.
14. To save a copy of the configuration as a file, from the File menu, select **Save**.

Notes:

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