


User Manual

 **Allen-Bradley**

ControlLogix Data Highway Plus-Remote I/O Communication Interface Module

Catalog Numbers 1756-DHRIO, 1756-DHRIOXT



 Allen-Bradley • Rockwell Software

**Rockwell
Automation**

Connecting a ControlLogix Controller to Remote I/O

What This Chapter Contains

This chapter describes how to use the 1756-DHRIO and 1756-DHRIOXT modules in remote I/O scanner mode to connect a ControlLogix controller to remote I/O.

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IMPORTANT

In these examples, only channel B is configured as a remote I/O scanner. You can configure the channels as remote I/O scanners simultaneously if necessary.

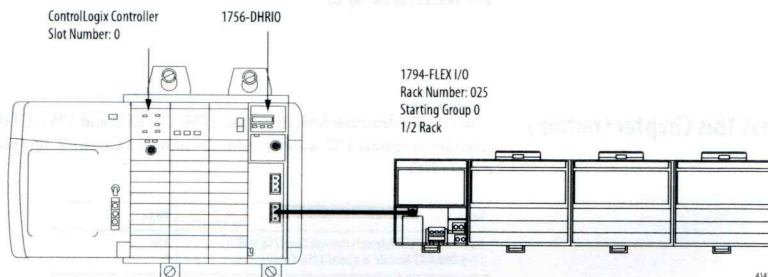
If only one channel is configured as a remote I/O scanner, we recommend you use channel B. If you configure channel A as a remote I/O scanner, you cannot use the programming terminal on the front of the 1756-DHRIO and 1756-DHRIOXT modules for DH+ access.

Also, throughout this chapter, we show sample configuration dialog boxes with each example. Configuration information is dependent on your application needs.

Scan Remote FLEX Adapters through One 1756-DHRIO or 1756-DHRIOXT Module in a Local 1756-Chassis

In this application, a ControlLogix controller controls remote I/O modules through a 1756-DHRIO or 1756-DHRIOXT module in the local chassis.

The following figure illustrates the steps you follow to use this application.

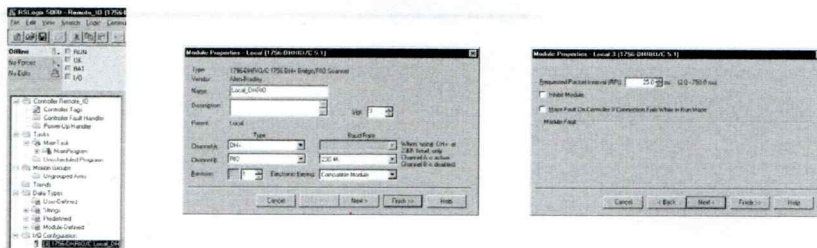


Configure the Module Switches

In this application, channel B on the 1756-DHRIO or 1756-DHRIOXT module must be set for RIO. Channel A can be used for remote I/O or DH+, regardless of the usage assigned to channel B.

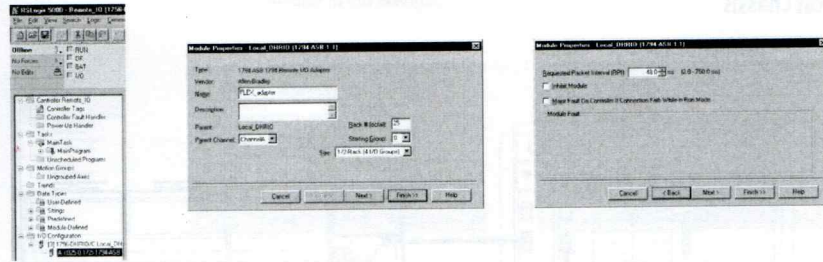
Configure the Module

Use the Studio 5000 environment to configure the 1756-DHRIO or 1756-DHRIOXT module. The following figure shows some sample configuration dialog boxes for the 1756-DHRIO or 1756-DHRIOXT module in this example.



Configure the FLEX Adapter

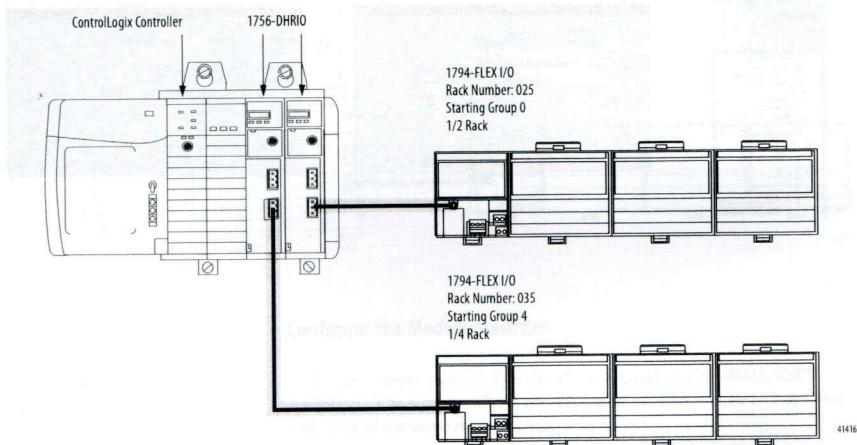
Use the Studio 5000 environment to configure the FLEX adapter. The following figure shows some sample configuration dialog boxes for the FLEX adapter in this example.



Scan Remote FLEX Adapters through Multiple 1756-DHRIO or 1756-DHRIOXT Modules in a Local Chassis

In this application, a ControlLogix controller scans multiple FLEX remote I/O adapters through multiple 1756-DHRIO or 1756-DHRIOXT modules in the local chassis.

The following figure illustrates the steps you must use in this example.

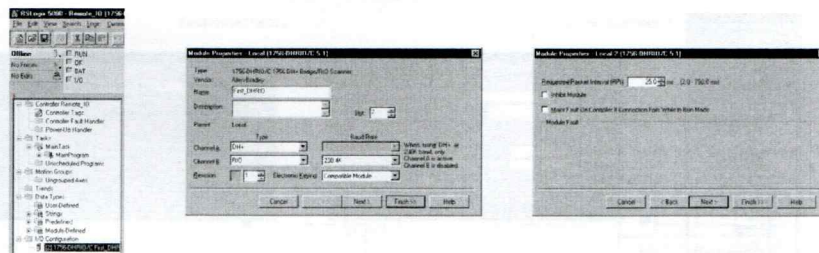


Configure the Module Switches

In this application, channel B on the 1756-DHRIO and 1756-DHRIOXT module must be set for RIO. Channel A can be used for remote I/O or DH+, regardless of the usage assigned to channel B.

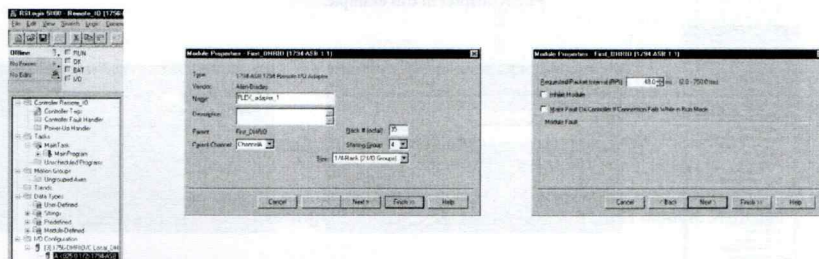
Configure the First Module

Use the Studio 5000 environment to configure the 1756-DHRIO or 1756-DHRIOXT module. The following figure shows some sample configuration dialog boxes for the first 1756-DHRIO or 1756-DHRIOXT module in this example.



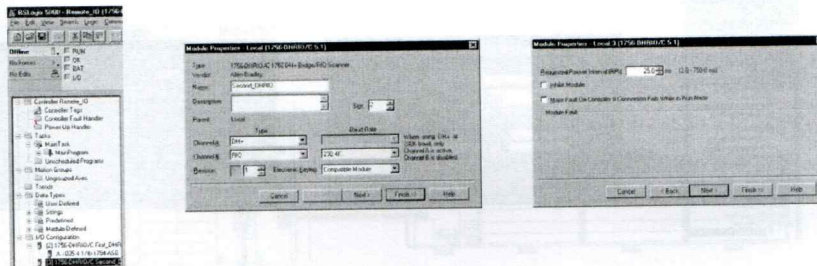
Configure the First FLEX Adapter

Use the Studio 5000 environment to configure the first FLEX adapter. The following figure shows some sample configuration dialog boxes for the first FLEX adapter in this example.



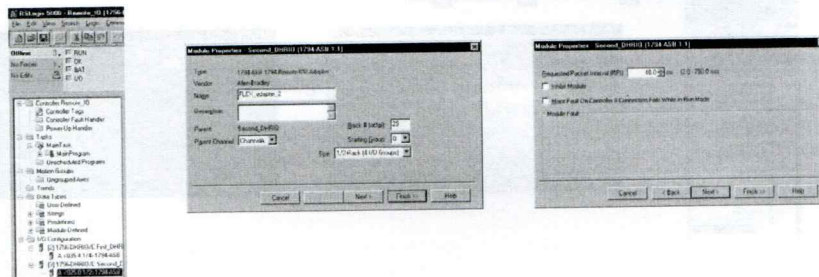
Configure the Second Module

Use the Studio 5000 environment to configure the second 1756-DHRIO or 1756-DHRIOXT module. The following figure shows some sample configuration dialog boxes for the second 1756-DHRIO or 1756-DHRIOXT module in this example.



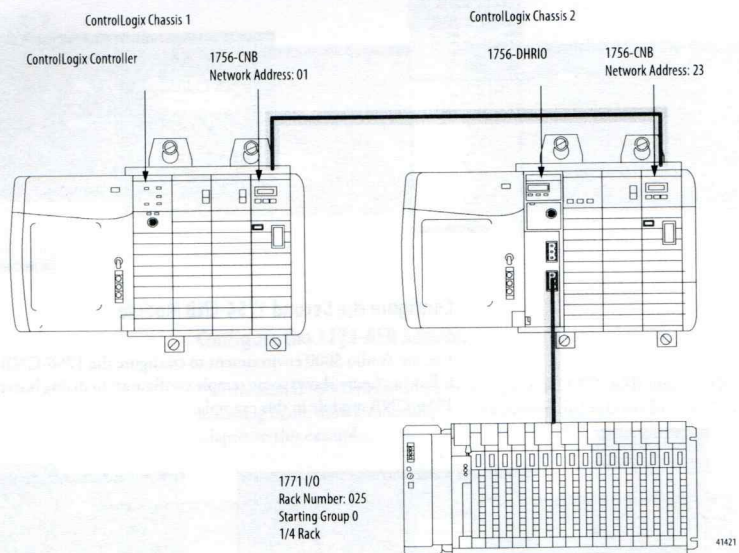
Configure the Second FLEX Adapter

Use the Studio 5000 environment to configure the second FLEX adapter. The following figure shows some sample configuration dialog boxes for the second FLEX adapter in this example.



Scan 1771 Remote I/O Adapters through a 1756-DHRIO or 1756-DHRIOXT Module in a Remote Chassis

In this application, a ControlLogix controller scans remote FLEX I/O modules through a 1756-DHRIO or 1756-DHRIOXT module in a remote chassis over a ControlNet network. The following figure illustrates the steps you follow to use this application.



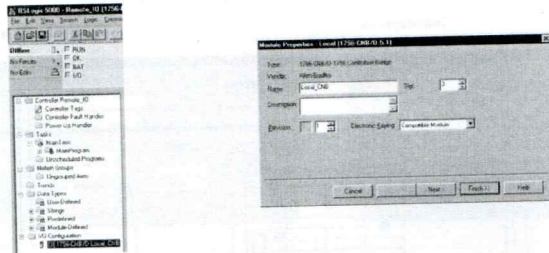
Configure the 1756-DHRIO or 1756-DHRIOXT Module Switches

In this application, channel B on the 1756-DHRIO or 1756-DHRIOXT module must be set for RIO. Channel A can be used for remote I/O or DH+, regardless of the usage assigned to channel B.

Configure the switches on the 1756-CNB modules to the correct node addresses. The 1756-CNB module in system number 1 uses node address 01 and the 1756-CNB module in system number 2 uses node address 23.

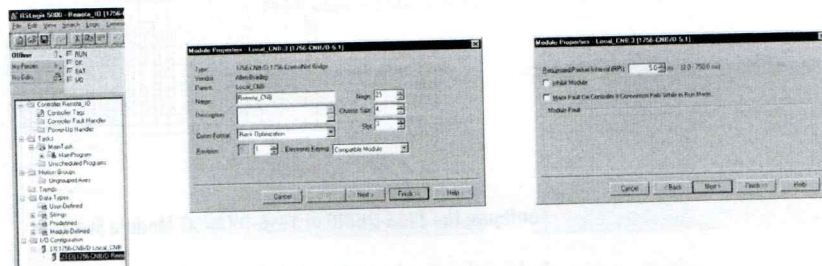
Configure First 1756-CNB Module

Use the Studio 5000 environment to configure the 1756-CNB module. The following figure shows some sample configuration dialog boxes for the first 1756-CNB module in this example.



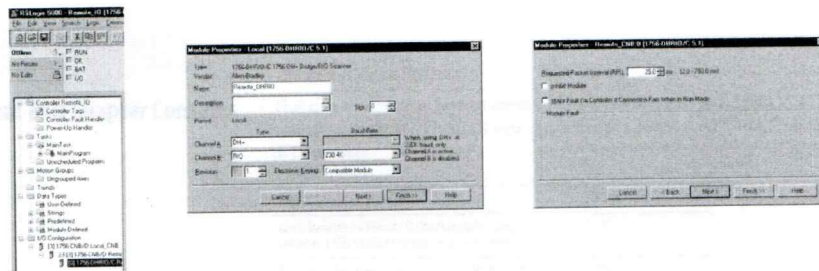
Configure the Second 1756-CNB Module

Use the Studio 5000 environment to configure the 1756-CNB module. The following figure shows some sample configuration dialog boxes for the second 1756-CNB module in this example.



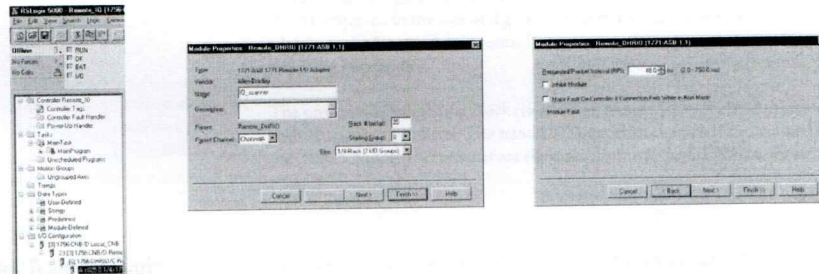
Configure the 1756-DHRIO or 1756-DHRIOXT Module

Use the Studio 5000 environment to configure the 1756-DHRIO or 1756-DHRIOXT module. The following figure shows some sample configuration dialog boxes for the 1756-DHRIO or 1756-DHRIOXT module in this example.



Configure the 1771-ASB Adapter

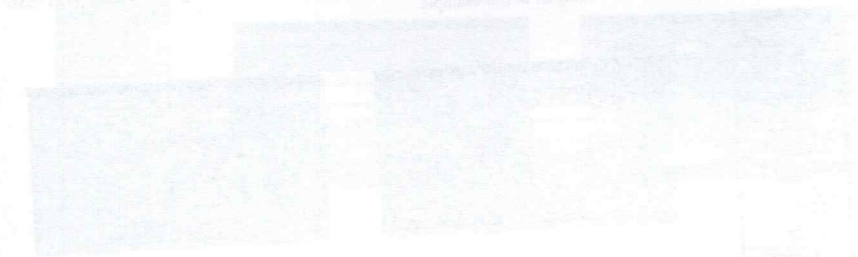
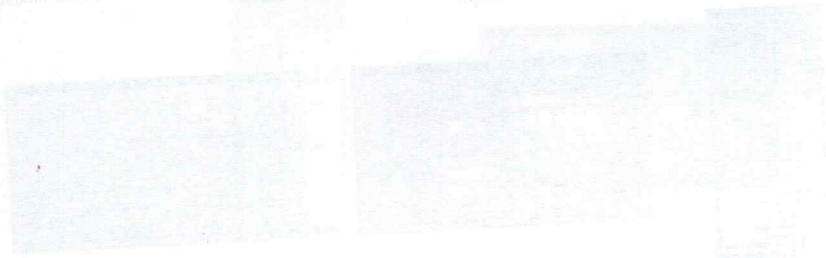
Use the Studio 5000 environment to configure the 1771-ASB adapter. The following figure shows some sample configuration dialog boxes for the 1771-ASB adapter in this example.



Run RSNetWorx Software

You must run RSNetWorx™ software for this application to begin operation. For more information on how to run RSNetWorx software, see the online help for that software.

Notes:



Block Transfers with the 1756-DHRIO or 1756-DHRIOXT Module

What This Chapter Contains

This chapter describes how to use the 1756-DHRIO or 1756-DHRIOXT module to connect a ControlLogix controller to a remote I/O Block Transfer (BT) module.

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Block Transfers to Remote 1771-ASB I/O Modules through a 1756-DHRIO or 1756-DHRIOXT Module in a Remote Chassis	150

The 1756-DHRIO and 1756-DHRIOXT modules support sending block transfer (BT) data and discrete I/O to the ControlLogix controller. This data exchange transfers up to 64 words of data to/from a selected I/O module.

The BT data exchange is message-based (that is a message instruction in the Ladder Logic program of the ControlLogix controller must be used to initiate the BT request). In the case of digital I/O modules, simply by entering the adapter in the ControlLogix controller organizer, data is transferred without requiring instructions.

The process for completing block transfers on remote I/O remains consistent with all adapters products. The remote I/O network characteristics defined for the PLC-5 remote I/O scanner are the same for the 1756-DHRIO remote I/O scanner.

Block Transfer Fault Notification

The message timeout for the BT message is fixed at 4.5 seconds. This timeout is a ControlLogix network response timeout associated with the connection established between the 1756-DHRIO or 1756-DHRIOXT module and the ControlLogix controller. The primary timeout for the BT response is remote I/O network based. This timeout occurs in 4 seconds if the I/O module fails to respond to the BT message.

Block Transfer 'Pass-Through' Messages

DH+ 'Block Transfer (BT) Pass-Through' messages are DH+ (PCCC) messages sent to an remote I/O channel, where it causes an remote I/O Block Transfer.

To target a DH+ 'BT Pass-Through' message to an remote I/O channel on a 1756-DHRIO or 1756-DHRIOXT module, the final destination of the DH+ message must be the 1756-DHRIO or 1756-DHRIOXT module with the remote I/O channel.

In the case of Local DH+ Messaging, the bridging 1756-DHRIO or 1756-DHRIOXT module must have its default slot configured to match the location (slot) of the final destination 1756-DHRIO or 1756-DHRIOXT module (module with the remote I/O channel).

In the case of Remote DH+ Messaging, the destination link ID and destination node of the DH+ message must be set to the final destination 1756-DHRIO or 1756-DHRIOXT module (module with the remote I/O channel).

For example, if the target is an remote I/O channel on a 1756-DHRIO or 1756-DHRIOXT module in slot 5 of a ControlLogix chassis and remote DH+ messaging is used, the destination link ID is set to the ControlLogix chassis link ID and the remote destination node is set to 5.

IMPORTANT

To send DH+ 'Pass-Through' messages to a 1756-DHRIO or 1756-DHRIOXT module, the module must be configured with a routing table, as described in Chapter 2, even if the channels are configured for remote I/O.

Block Transfer Examples

IMPORTANT

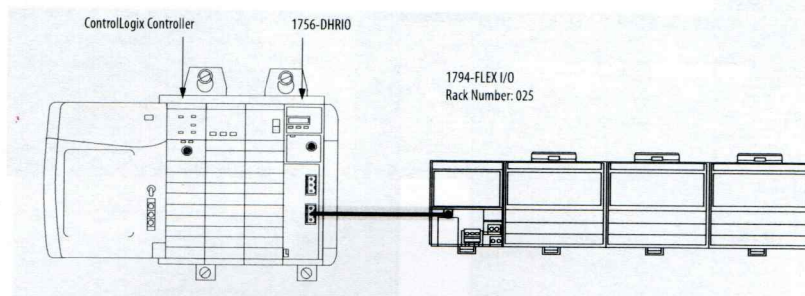
In the examples in this chapter, only channel B is connected to remote I/O. You can connect the channels to remote I/O simultaneously if necessary.

If only one channel is connected to remote I/O, it is recommended that you use channel B. If you connect channel A to remote I/O, you cannot use the programming terminal on the front of the 1756-DHRIO or 1756-DHRIOXT module.

Block Transfers to Remote FLEX I/O Modules through a 1756-DHRIO or 1756-DHRIOXT Module in a Local Chassis

This application enables a ControlLogix controller to initiate block transfers to remote FLEX I/O modules through a 1756-DHRIO or 1756-DHRIOXT module in the local chassis.

The following figure illustrates the steps you must use in this example.

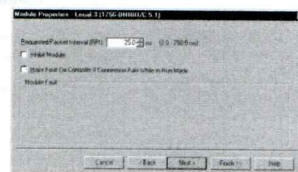
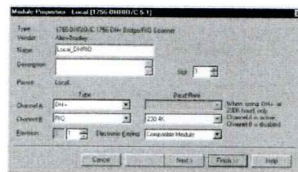
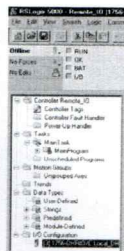


Configure the Module Switches

Channel B on the 1756-DHRIO or 1756-DHRIOXT module must be set for RIO. Channel A can be used for remote I/O or DH+, regardless of the usage assigned to channel B.

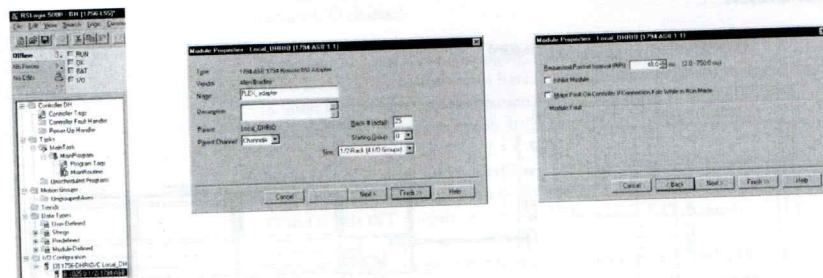
Configure the 1756-DHRIO or 1756-DHRIOXT Module

Use the Studio 5000 environment to configure the 1756-DHRIO or 1756-DHRIOXT module. The following figure shows some sample configuration dialog boxes for the 1756-DHRIO or 1756-DHRIOXT module in this example.



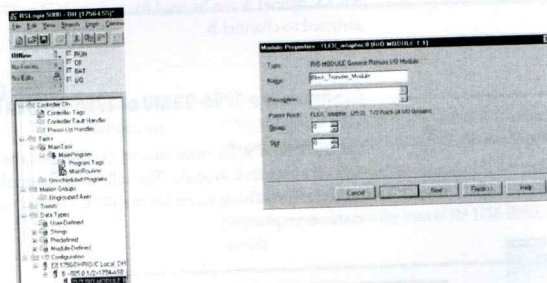
Configure the FLEX Adapter

Use the Studio 5000 environment to configure the FLEX adapter. The following figure shows some sample configuration dialog boxes for the FLEX adapter in this example.



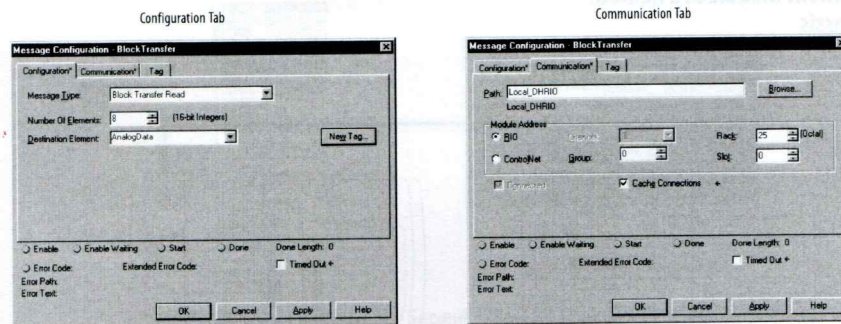
Configure the Block Transfer Module

Use the Studio 5000 environment to configure the Block Transfer module. The following figure shows some sample configuration dialog boxes for the Block Transfer module in this example.



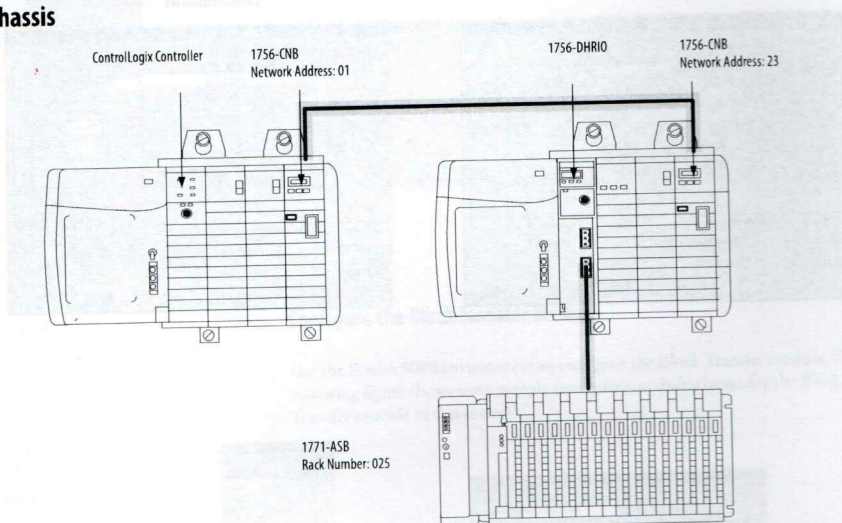
Configure Message Instruction

Use the Studio 5000 environment to configure the block transfer message instructions. The following figure shows the message instruction tabs necessary for this example.



Block Transfers to Remote 1771-ASB I/O Modules through a 1756-DHRIO or 1756-DHRIOXT Module in a Remote Chassis

This application enables a ControlLogix controller to write block transfers to remote 1771-ASB I/O modules through a 1756-DHRIO or 1756-DHRIOXT module in a remote chassis over a ControlNet link. The following diagram illustrates the steps you follow to use this application.



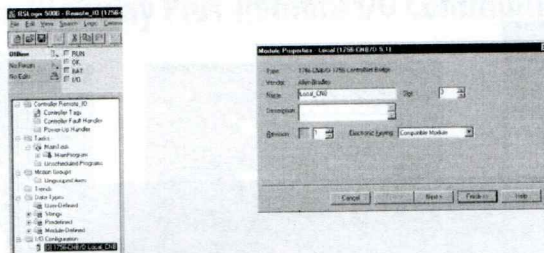
Configure the Module Switches

In this application, channel B on the 1756-DHRIO or 1756-DHRIOXT module must be set for RIO. Channel A can be used for remote I/O or DH+, regardless of the usage assigned to channel B.

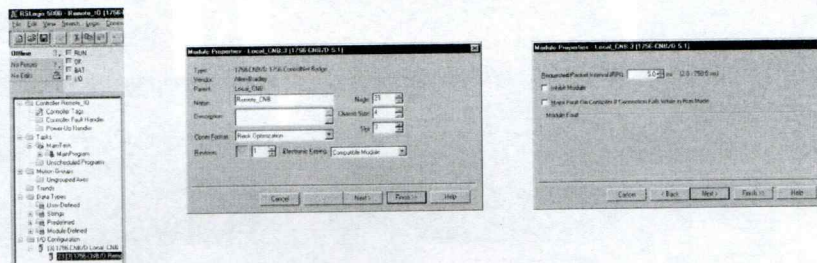
Set the switches on the 1756-CNB modules to the correct network addresses. The 1756-CNB module in system number 1 uses network address 01 and the 1756-CNB module in system number 2 uses network address 23.

Configure the First 1756-CNB Module

Use the Studio 5000 environment to configure the 1756-CNB module. The following figure shows some sample configuration dialog boxes for the first 1756-CNB module in this example.

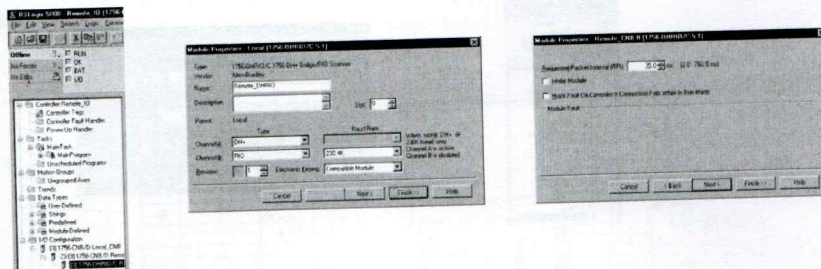
**Configure the Second 1756-CNB Module**

Use the Studio 5000 environment to configure the 1756-CNB module. The following figure shows some sample configuration dialog boxes for the second 1756-CNB module in this example.



Configure the 1756-DHRIO or 1756-DHRIOXT Module

Use the Studio 5000 environment to configure the 1756-DHRIO or 1756-DHRIOXT module. The following figure shows some sample configuration dialog boxes for the 1756-DHRIO or 1756-DHRIOXT module in this example.



Configure the 1771-ASB Adapter

Use the Studio 5000 environment to configure the 1771-ASB adapter. The following figure shows some sample configuration dialog boxes for the 1771-ASB adapter in this example.

