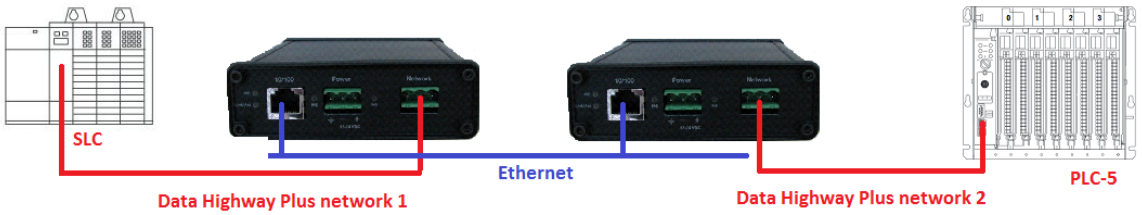
Application Note

Using Two AN-X2-DHP Modules to Bridge Between Two Data Highway Plus Networks

This application note describes how to use AN-X modules to bridge between two Data Highway Plus networks, using the routing function on the AN-X2-DHP.

Routing requires version 4.7 or above of the AN-X2-DHP firmware.

An AN-X2-DHP emulates a 4 slot ControlLogix rack with a 1756-ENET in slot 0 and a 1756-DHRIO in slot 1. The emulated 1756-DHRIO has only channel A, since the AN-X has only one Data Highway Plus channel.



In this example, the first AN-X is at node address 37 octal on Data Highway Plus 1 and the second AN-X is at node address 14 on Data Highway Plus 2.

	Data Highway Plus 1	Data Highway Plus 2
AN-X DH+ address	37 octal	14 octal
AN-X IP address	192.168.1.12	192.168.1.14
Local link ID	121	122
SLC address	01 octal	
PLC-5 address		00 octal

To send remote messages between Data Highway Plus networks:

1. Configure the AN-X routers
2. Create remote messages

AN-X Router Configurations

To bridge between Data Highway Plus networks, the router configuration for each AN-X must contain, at minimum:

- a local Link ID
- a path definition to route messages to the other network

Path definitions to the other network are of the form:

```
Linkid Eth IPaddress Slot 1 DHA
```

where the LinkID is the Local Link ID of the AN-X on the other Data Highway Plus network and the IPaddress is the address of the AN-X on the other Data Highway Plus network.

On Data Highway Plus 1, the AN-X will be assigned local Link ID 121.

On Data Highway Plus 2, the AN-X will be assigned local Link ID 122.

The router configuration file for the AN-X on Data Highway Plus 1 will then look like this:

```
LocalLinkID 121
122 Eth 192.168.1.14 Slot 1 DHA
```

The router configuration file for the AN-X on Data Highway Plus 2 will then look like this:

```
LocalLinkID 122
121 Eth 192.168.1.12 Slot 1 DHA
```

SLC Remote Messages

The SLC on Data Highway Plus 1 will be sending remote messages to the PLC-5 on Data Highway Plus 2.

The Data Highway Plus channel on the SLC must be configured to accept replies to remote messages from the AN-X.

1. In the Project tree, right click on *Controller/Channel Configuration* and select *Open*. Select the *General* tab.
2. In the Channel 1 area, enter the AN-X Local Link ID in the Passthru Link ID (dec) box.
3. Click OK

To send a message to the PLC-5 to read 10 integers from address N7:0:

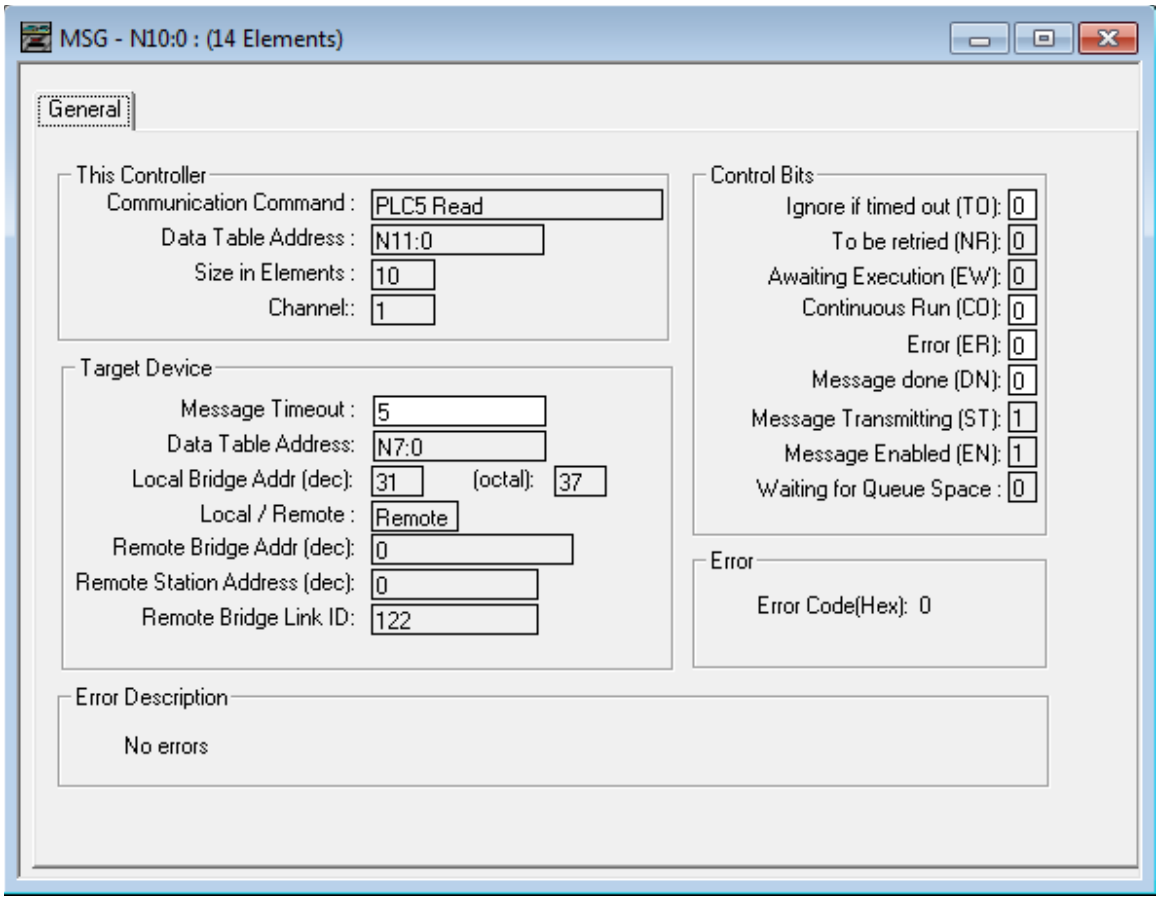
1. Add a MSG instruction to the SLC program. You must be offline.
2. Set Read/Write to the appropriate value, in this case Read.
3. Set the Target Device to the correct type, in this case, PLC5.
4. Set Local/Remote to Remote.
5. Assign an address for the Control Block.
6. Double click on Setup Screen to configure the message.

In the *This Controller* area:

1. Select an appropriate Communication Command.
2. Set the Data Table Address on the SLC for the data we are sending or receiving.
3. Set the Size in Elements. In this example, we are reading 10 integers.
4. Set the Port Number to match the Data Highway Plus channel on the SLC.

In the *Target Device* area:

1. Set an appropriate timeout or accept the default.
2. Enter the Data Table Address in the destination device. In this example, the data starts at N7:0.
3. Set the Local Bridge Address to match the Data Highway Plus address of the AN-X that is routing the message, in this case, 37 octal or 31 decimal.
4. Set the Remote Bridge Address to 0.
5. Set the Remote Station address to be the Data Highway Plus address of the destination device. This is necessary only if the AN-X is routing the message to another Data Highway Plus network. In the example, it is 0, the address of the PLC-5 on the other Data Highway Plus network.
6. Set the Remote Bridge Link ID to be the Link ID of the routing table entry in the AN-X. In this case, Link ID 122 provides the path to Data Highway Plus 2.


MSG - N10:0 : (14 Elements)
General
This Controller
Communication Command : PLC5 Read
Data Table Address : N11:0
Size in Elements : 10
Channel:: 1
Target Device
Message Timeout : 5
Data Table Address: N7:0
Local Bridge Addr (dec): 31 (octal): 37
Local / Remote : Remote
Remote Bridge Addr (dec): 0
Remote Station Address (dec): 0
Remote Bridge Link ID: 122
Control Bits
Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 1
Message Enabled (EN): 1
Waiting for Queue Space : 0
Error
Error Code(Hex): 0
Error Description
No errors

PLC-5 Remote Messages

The PLC-5 on Data Highway Plus 2 will be sending remote messages to the SLC on Data Highway Plus 1.

To send a message to the SLC to read 20 integers from file N7:0:

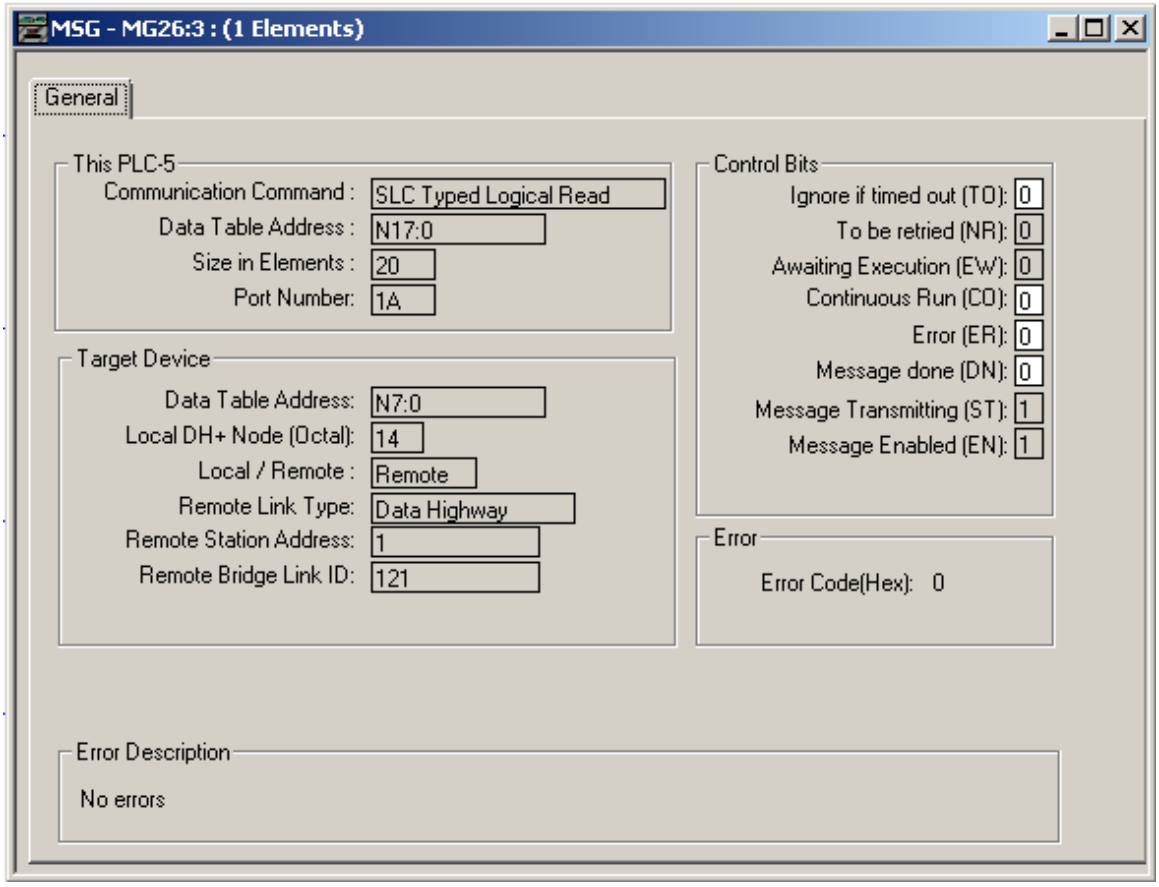
1. Add a MSG instruction to the PLC-5 program.
2. Set Read/Write to the appropriate value.
3. Set the Target Device to the correct type, in this case, PLC5.
4. Set Local/Remote to Remote.
5. Assign an address for the Control Block
6. Double click on Setup Screen to configure the message.

In the *This Controller* area:

1. Select an appropriate Communication Command, in this case SLC Typed Logical Read.
2. Set the Data Table Address on the PLC-5 for the data we are sending or receiving. In this example, the data will be stored at N17:0
3. Set the Size in Elements. In this example, we are reading 20 integers.
4. Set the Port Number to match the Data Highway Plus channel on the PLC-5, in this case, port 1A

In the *Target Device* area:

1. Enter the Data Table Address in the destination device. In this example, the data is found at address N7:0.
2. Set the Local DH+ Node to match the Data Highway Plus address of the AN-X that is routing the message. In this example, the AN-X is at Data Highway Plus address 14 octal.
3. Set Local/Remote to Remote.
4. Set the Remote Link Type to Data Highway.
5. Set the Remote Station address to be the Data Highway Plus address of the destination device. This is necessary only if the AN-X is routing the message to a device on another Data Highway Plus network. In this example, set the address to 1, the address of the SLC.
6. Set the Remote Bridge Link ID to be the Link ID of the routing table entry in the AN-X. In this case, Link ID 121 is the path to Data Highway Plus 1.


MSG - MG26:3 : (1 Elements)
General
This PLC-5
Communication Command : SLC Typed Logical Read
Data Table Address : N17:0
Size in Elements : 20
Port Number: 1A
Target Device
Data Table Address: N7:0
Local DH+ Node (Octal): 14
Local / Remote : Remote
Remote Link Type: Data Highway
Remote Station Address: 1
Remote Bridge Link ID: 121
Control Bits
Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 1
Message Enabled (EN): 1
Error
Error Code(Hex): 0
Error Description
No errors