# Controller Link Data Link Setup Guide

# Contents

# 1 Introduction

This document explains the basic requirements to use the Controller Link data link function.

Data link can be set automatically with the PLC programming software (auto setting). However, in this document only the manual settings are explained.

## 1.1 Features

Data Link is a specialized data transfer function of the FA network, Controller Link. This function enables constant and automatic data exchange among specified nodes (PLC, computer, etc.) of the same network. The data link function is not restricted by communications timing, like conventional messaging (which issues a request command and waits for a response).

Data link can be used for the following types of applications:

- Automatically collecting data into a computer from multiple PLCs.

- Automatically sending instruction data from a computer to PLCs.

- Sharing the same data among multiple PLCs to control I/O devices synchronously.

### Startup Node

The startup node is the node that starts the data link. The data link table needs to be set to this node. The startup node has nothing to do with the polling of the network.

### Polling Node

The polling node is the node that manages and controls the Controller Link network. This node has nothing to do with the startup of the data link.

The polling node provides the basic functions of the network, such as sending the token and checking the network status. There must be one PLC that operates as the polling node in a network. Communication can never be performed without the polling node. Normally, the node that has the smallest node address in the network will be the polling node.

If the polling node has an error, the node with the next smallest node address automatically becomes the polling node.
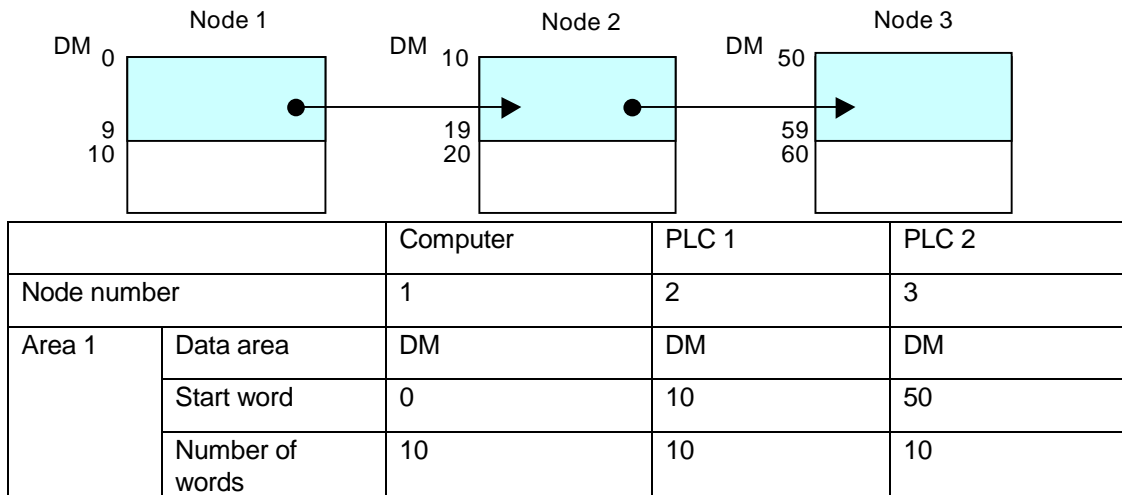
It is possible to switch the polling node to a polled node, which cannot be switched to a polling node. However, it is recommended to leave the polling node as it is, if there are no special circumstances requiring a change.

## 1.2 Design Procedure

### Determining the Data to be Shared

The first step in designing a data link system is determining what data needs to be shared. In doing so, consider the specific data areas and amounts of data (start word and number of words) to be shared for each node in the data link. The block diagram and table shown below might be helpful when designing the data link allocations.

Here, the value of DM 0 in the computer (node 1) is sent to DM 10 in PLC 1 (node 2), and also to DM 50 in PLC 2 (node 3).



|   |   | Computer | PLC 1 | PLC 2 |
|---|---|---|---|---|
| Node number | | 1 | 2 | 3 |
| Area 1 | Data area | DM | DM | DM |
| | Start word | 0 | 10 | 50 |
| | Number of words | 10 | 10 | 10 |

In actual applications, more PLCs and computers will typically participate, and more complicated data allocation will be required. However, it is recommended to draw a configuration diagram and table like that shown above before actually setting the computers and PLCs with the Data Link Setting Utility.

### Data Link Setup

Set up the Data Link tables based on the configuration above. There are various setting utilities available as follows:

- Data Link Setting Utility in FinsGateway

- Controller Link Support Software in Controller Link Support Board

- PLC programming software functionality

# 1.3    Terminology

This section explains the terms commonly used for data link. The terms are explained using the system shown in the figure below:
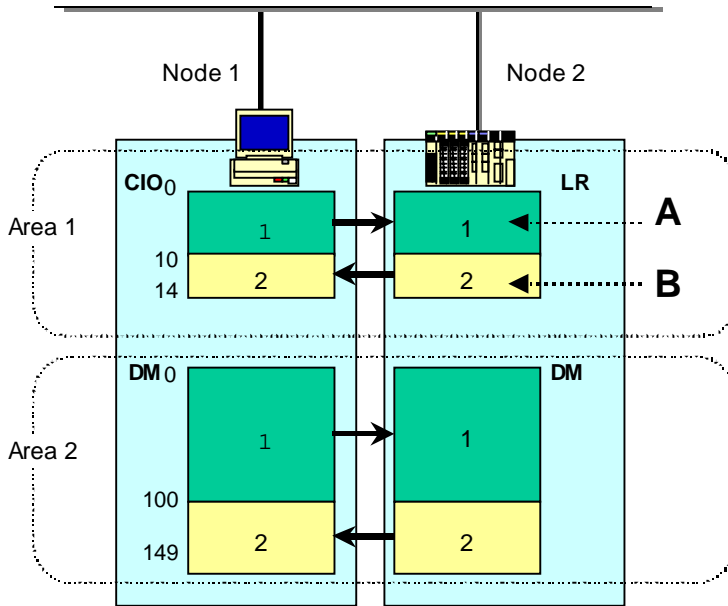


## Node, Node Number

The nodes are indicated by the blue portions [    ]    of the above figure.

Each device, such as a computer or PLC, connected directly to the network is called a node. These nodes are the same as other nodes commonly used in FA networks.

A node number is a number assigned to each node to distinguish the various nodes in the same network.

## Area 1, Area 2

The areas are indicated by the white portions [    ]    of the above figure.

Two areas can be used in a data link system. They are called area 1, and area 2. Area 1 of node 1 in the figure shown above is CIO 0 to 14; area 2 is DM 0 to 149.

## Node Area

The areas for each node are indicated by the green [    ]    and yellow portion [    ]    of the above figure. In this example, section A in node 2 is called the node 1 area (the area to be written by node 1). Section B in node 2 is called the node 2 area (the area to be written by node 2).

# 2 Precautions and Preparations

For more detailed precautions, refer to the Controller Link Unit manual.

The important precautions in setting up a data link system are as follows:

The maximum number of word depends on the PLC as follows:

| Number of **send/receive** words per node (Area 1 and 2, total) | |
| --- | --- |
| CS1 | Max. 12000 words |
| SYSMAC alpha series, CVM1/CV | Max. 8000 words |
| FA computer | Manual setting: 32000 words, maximum<br>Auto-setting: 8000 words, maximum |
| Number of **receive** words per node (Area 1 and 2, total) | |
| Max. 1000 words, maximum | |

- The same data area cannot be specified for both Area 1 and Area 2.

- The area set for each area 1 and area 2, in each node in the data link system must be a single, contiguous section of the same data area.

- For a computer with FinsGateway to participate in a data link system, a memory area called EventMemory will be used. Event Memory is provided by FinsGateway, and has DM and CIO areas. Therefore, specify either DM or CIO to the data link area(s) for the computer.

- To set up a data link system, all the participating nodes must be connected to the network. Connect all the nodes to the network, and establish general network communications in advance.

## Establishing the Network

All the nodes in the network must be correctly wired and operating normally before the Data Link setup.

For details, refer to Section 4 Preparations for Communications, in the Controller Link Unit manual.

## 2.1 Computer Setup

The following summarizes the procedure to connect the computer to the Controller Link system. The details are explained immediately following the summary:

1. Controller Link Support Board setup

The IRQ and shared memory must be set on the Controller Link Support Board before installing it to the computer. If these are not correctly set, FinsGateway will not start.

2. FinsGateway setup

The FinsGateway driver settings are necessary following the Controller Link Support Board settings. Set the same IRQ and shared memory as those set on the Support Board.

### 2.1.1 Setting Up the Controller Link Support Board

Use the following procedure to set up and install the Controller Link Support Board (hereafter called the CLK board) to the computer.

**Note:** Do not install CLK board to the computer until steps 1 to 3 are complete.

## 1. Confirm the Resource Status of the Computer

Empty, or unused numbers, must be specified for the IRQ and memory address. Therefore, confirm the resource status (IRQ and memory address) in step 1; then specify unused areas in steps 2 and 3. For more details, refer to Section 2 Setting, Installing, and Wiring Boards, in the Controller Link Support Board manual.

## Windows2000

From the Start menu, select Programs | Administrative Tools | System Information. Select IRQs from the tree shown on the left.

## Windows95/98

From the Control Panel, click on System | Device Manager | Computer and open Properties.

The currently used IRQ numbers will be displayed in the list. Use a number not displayed in the list for the CLK board:

**Note:**          These screens will differ on Windows 95 and 98.
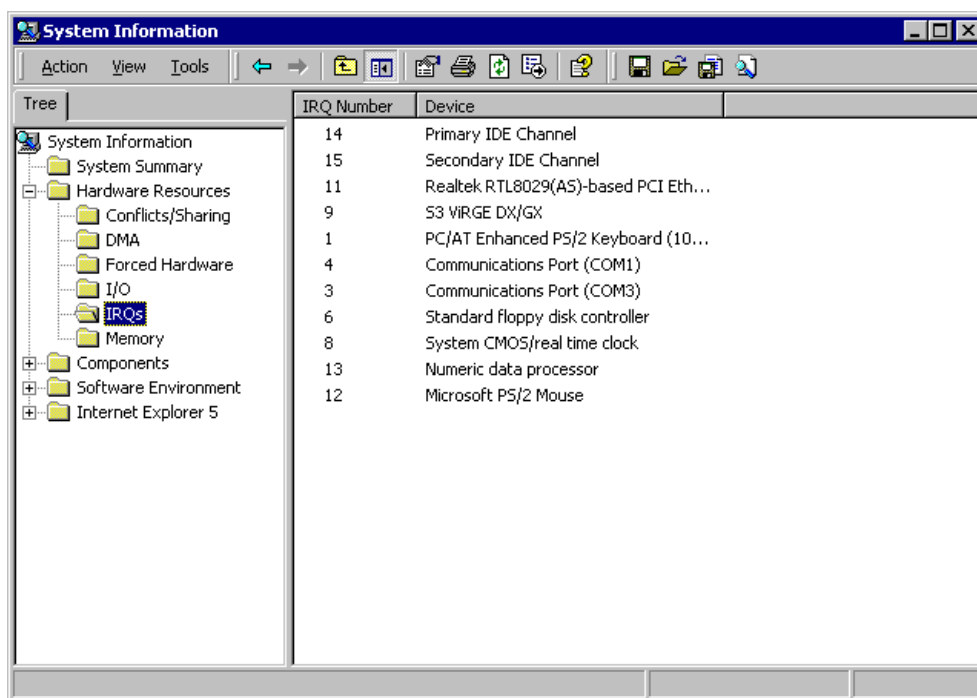


In the above example, 10 is not used, so use 10. If there is no available IRQ, uninstall an unnecessary device occupying an IRQ, or disable one of the used numbers, then allocate that number to the CLK board.

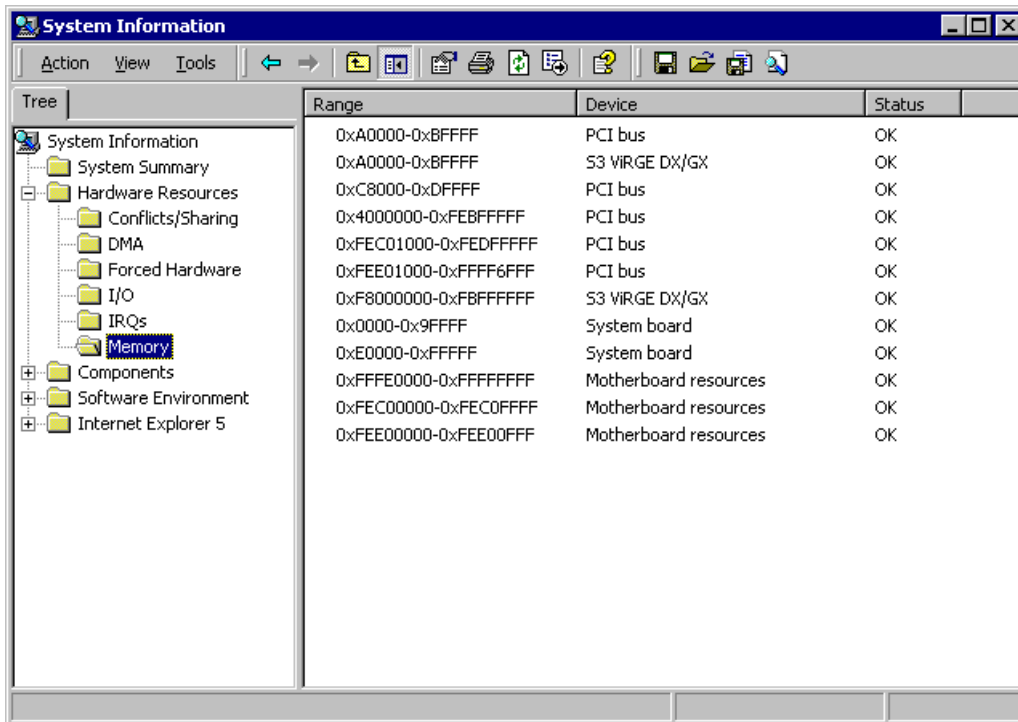Select Memory from the tree on the left. The used memory areas (shared memory) will be displayed. Use a memory area that is not displayed.

| Range | Device | Status |
|---|---|---|
| 0xA0000-0xBFFFF | PCI bus | OK |
| 0xA0000-0xBFFFF | S3 ViRGE DX/GX | OK |
| 0xC8000-0xDFFFF | PCI bus | OK |
| 0x4000000-0xFEBFFFFF | PCI bus | OK |
| 0xFEC01000-0xFEDFFFFF | PCI bus | OK |
| 0xFEE01000-0xFFFF6FFF | PCI bus | OK |
| 0xF8000000-0xFBFFFFFF | S3 ViRGE DX/GX | OK |
| 0x0000-0x9FFFF | System board | OK |
| 0xE0000-0xFFFFF | System board | OK |
| 0xFFFE0000-0xFFFFFFFF | Motherboard resources | OK |
| 0xFEC00000-0xFEC0FFFF | Motherboard resources | OK |
| 0xFEE00000-0xFEE00FFF | Motherboard resources | OK |

System Information

Tree: System Information — System Summary — Hardware Resources — Conflicts/Sharing — DMA — Forced Hardware — I/O — IRQs — Memory — Components — Software Environment — Internet Explorer 5

Action   View   Tools

The shared memory addresses available for the CLK board are the following 16 patterns:

| | | | |
|---|---|---|---|
| C0000 - C1FFF | C2000 - C3FFF | C4000 - C5FFF | C6000 - C7FFF |
| C8000 - C9FFF | CA000 - CBFFF | CC000 - CDFFF | CE000 - CFFFF |
| D0000 - D1FFF | D2000 - D3FFF | D4000 - D5FFF | D6000 - D7FFF |
| D8000 - D9FFF | DA000 - DBFFF | DC000 - DDFFF | DE000 - DFFFF |

Set an area not already displayed in the list for the CLK board. In this example, D8000 – D9FFF is used. If there is no memory available, uninstall an unnecessary device occupying some of the memory, or disable one of the used numbers, then allocate that memory to the CLK board.

## 2. Set the IRQ on the CLK board

Set the interrupt jumper on the CLK board. In this example, 10 is used. Set the jumper to IRQ 10.

This set value will also be needed for the FinsGateway driver settings. Make a note of it for later reference.

For details, refer to Section 2 Setting, Installing, and Wiring Boards, in the Controller Link Support Board manual.

## 3. Set the Memory Address on the CLK Board

Set the memory address with the memory allocation DIP switch on the CLK board.

This set value will also be needed for the FinsGateway driver settings. Make a note of it for later reference.

For details, refer to Section 2 Setting, Installing, and Wiring Boards, in the Controller Link Support Board manual.

## 4. Install the CLK board to the computer

Be sure to shut down the computer completely before installing the CLK board. After installation, turn the power back on.

## 5. Set up the FinsGateway Driver

Select [Start | Programs | FinsGateway | CLK Driver Settings. Click the Driver tab and set the same values as those set to the board IRQ and memory address (shared memory). Leave the other settings at the default values.
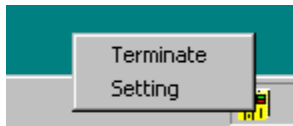
In this example, set 10 to IRQ and D8000 – D9FFF to Shared RAM address.
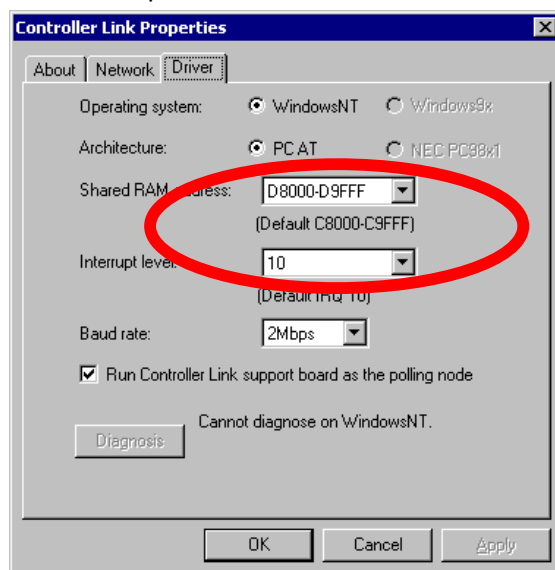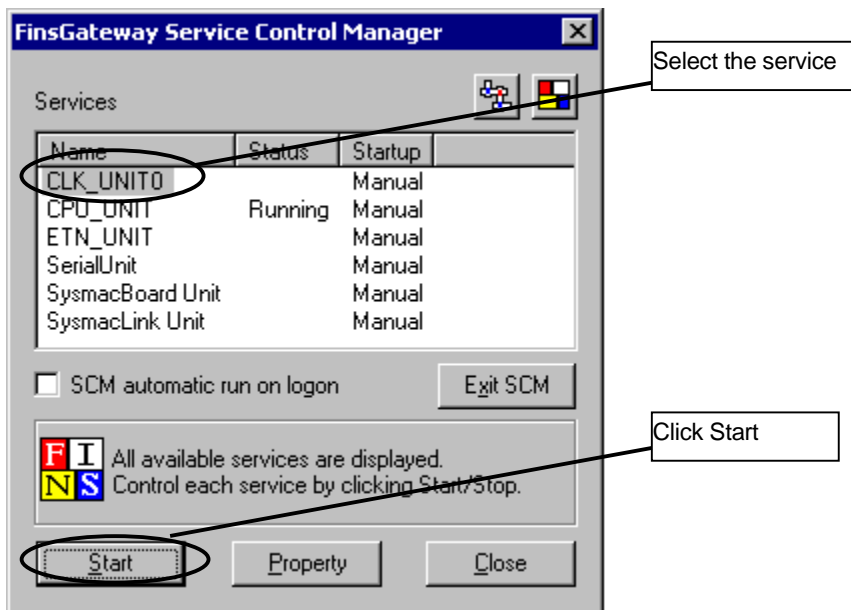
## 2.2 **Starting FinsGateway**

Start the FinsGateway Service Control Manager as follows:

1. From the Start menu, select Programs | FinsGateway | Service Manager.

2. Right-click the icon in the task bar, and select Setting:



3. The following Service Control Manager screen will be displayed:



4. Select CLK_UNIT0 and click Start.



If the status of CLK_UNIT0 does not change to Running, look at the Event Viewer to determine the cause.

In Windows 2000, the Event Viewer can be started from Start | Programs | Administrative Tools | Event Viewer.

In Windows 95 or 98, the Event Viewer can be started from Start | Programs | FinsGateway | Event Viewer.

Next, from the Start menu, select Programs | FinsGateway | FINS network settings. The following screen will be displayed:
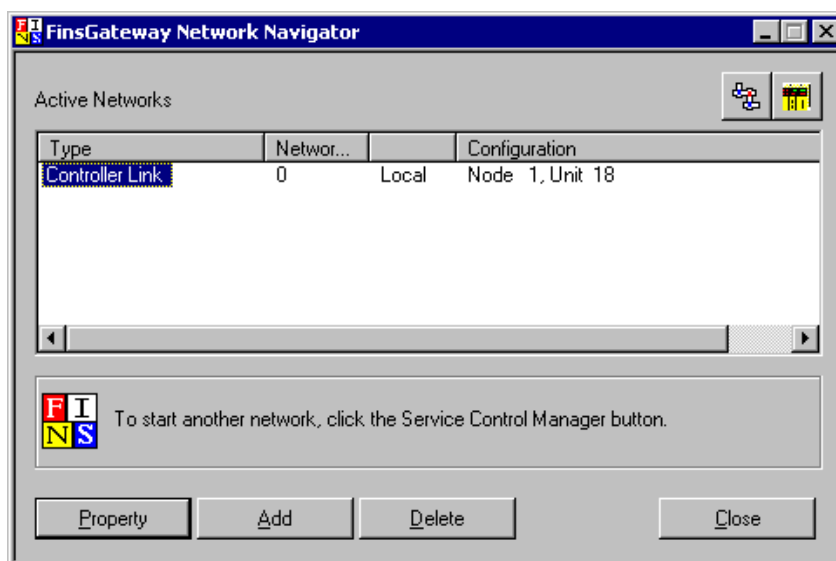


Select Controller Link, and click Property. The Controller Link properties will be displayed as shown below:
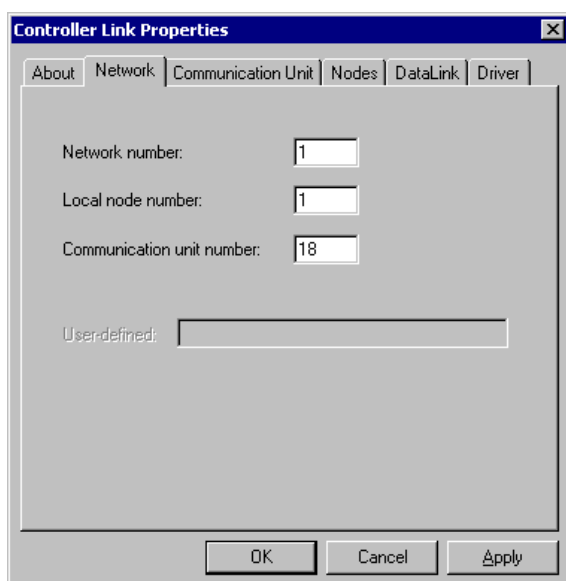


Select the Network tab, and set the Network number. The number must be other than 0 and unique. For SYSMAC LINK and Controller Link, the node number is set with the switch on the Support Board. Leave the other settings at the default values.

### 2.2.1 Set the Status Area

To get the network status with FinsGateway, the following two statuses can be automatically transferred to the FinsGateway EventMemory (DM, CIO).

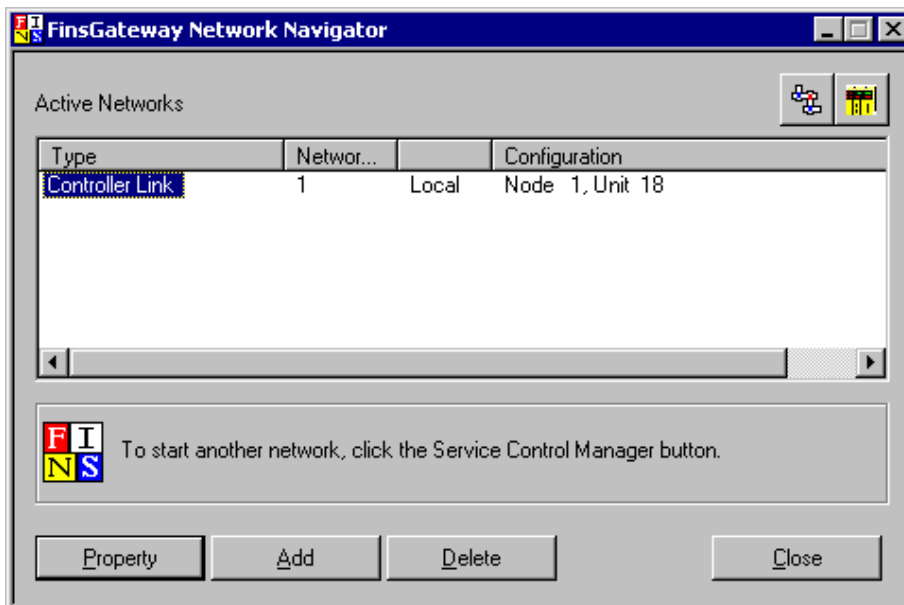- Network participation status

- Data link status

The default setting is not to transfer the status data. To transfer the data, be sure to set areas that are not used in the ladder program or by another application. For more details about the network participation status and data link status, refer also to the Controller Link Unit manual.

Start the FinsGateway Service Manager and the CLK_UNIT.
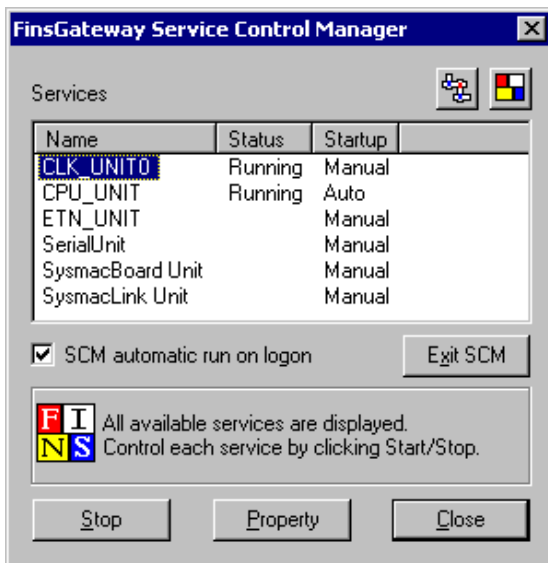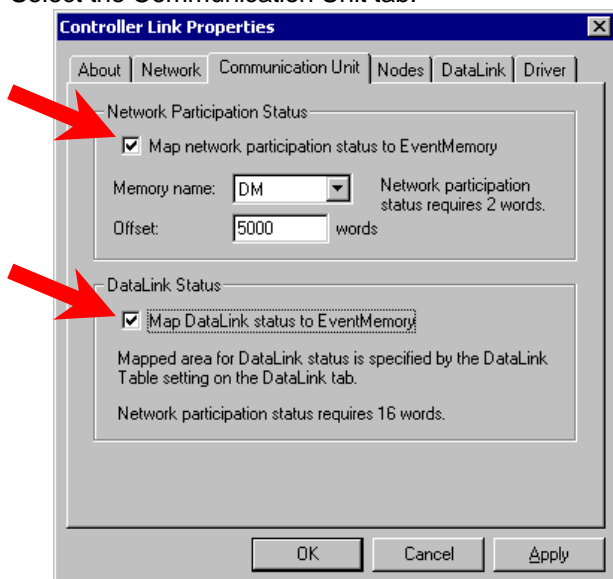


If the CLK_UNIT does not start, follow through the Setting Up the Controller Link Support Board procedure again to solve the problem.

Start the FinsGateway Network Navigator. Select Controller Link and click Property.

Select the Communication Unit tab.



Select the following items:

- Map network participation status to EventMemory

- Map DataLink status to EventMemory

The network participation status occupies two words starting from the memory address set to Offset in the data area specified for the Memory name.

Use Data Link Setting Utility to specify the mapping location of the Data Link status. The location cannot be specified here. This data occupies 16 words starting from the memory address specified in the Status area of the Utility.

**Note:** Be sure to specify an area that is not used in the ladder program or by another application.

# 3  Starting/Stopping Data Link

The data link can be started or stopped at any time. Click Data Link tab in the Controller Link Properties dialog. The data link can be started and stopped by clicking Run Data Link and Stop Data Link.
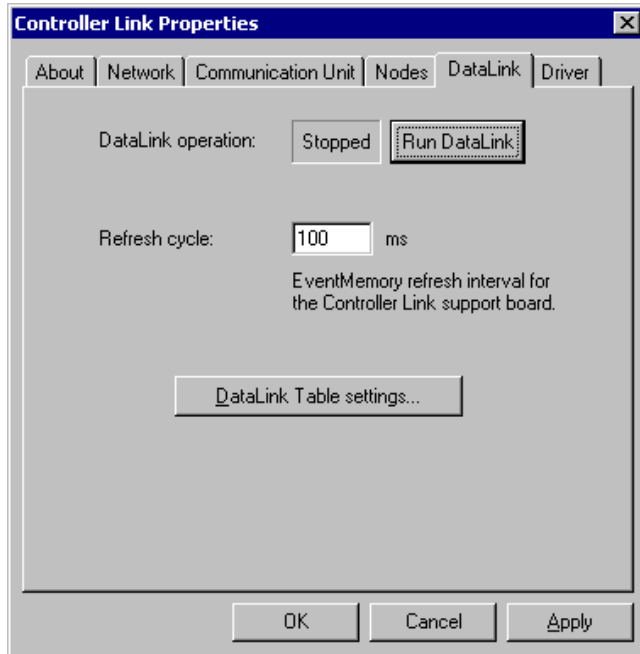


Data Link can be started by any of the following methods:

- Use the Controller Link Support Software

- Turn on the software switch of the PLC

- Apply power to a PLC whose software switch is already on.

For details, refer to the manual for the appropriate product.

# 4        Checking Data Link

This section explains the method to confirm that the data link system is operating normally.

- Confirm that the LNK LED of the Unit(s) and the Support Board(s) are lit.

- Confirm the data link status

- Confirm by reading/writing data

## 4.1      Checking the LNK LED

If the PLC (or computer) is participating in the data link system, the LNK LED of the Unit (or the Support Board) will be lit. Confirm the LEDs of all the PLCs and computers participating in the data link.

If any of them is not lit, it means that node is not participating in the data link. For troubleshooting details, refer to the troubleshooting explanation in the Controller Link Unit manual. Most indicator problems are caused by incorrect Data Link settings.

## 4.2      Checking the Data Link Status

If any Unit or Support Board is unable to participate in the data link, but there is no apparent problem, check the data link status to find the cause. The status of every node is written to the status area set. For details, refer to the explanation in the Controller Link Unit manual.

## 4.3      Checking the Actual Operation of Data Read/Write

Even though the LNK indicators are lit, the data link may be started with incorrect settings. To check this, perform data read/write. For the following example, suppose a system as shown here:
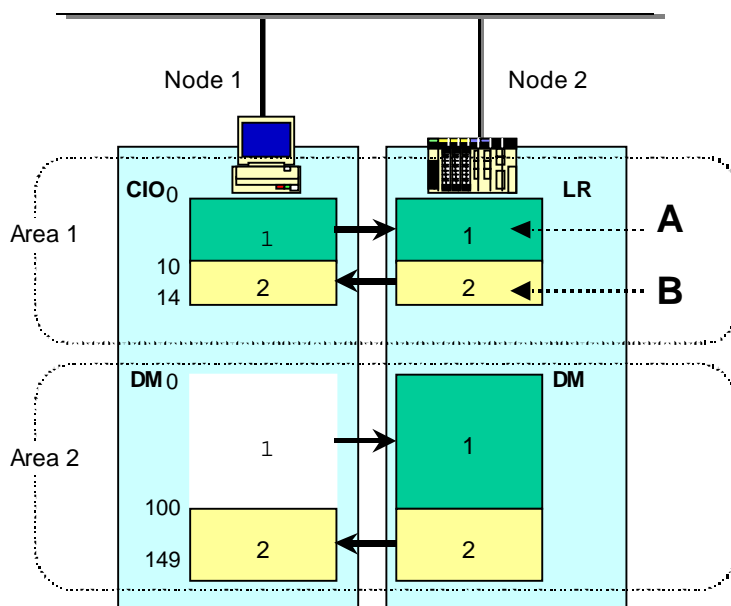
### 4.3.1　Confirm A

Write some data to CIO 0 to 9 in node 1 (computer), and confirm that the written data is copied to LR 0 to 9 in node 2 (PLC).
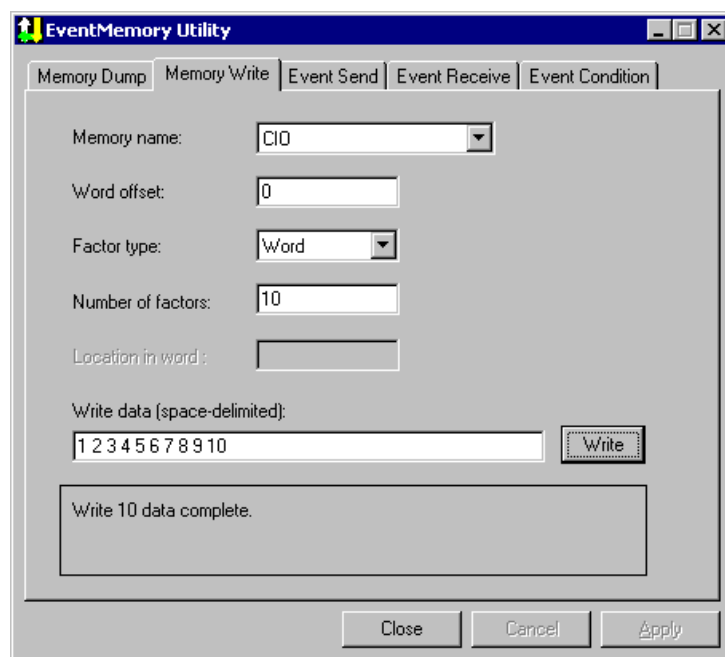
## Writing/Reading Data in the Computer

Use the FinsGateway EventMemory Utility to read and write data in the data link area of the computer (node 1).

To start the EventMemory Utility, select Programs | FinsGateway | EventMemory Utility, from the Start menu. To read data, click Memory Dump tab.

To write data, click Memory Write tab. The fields to be filled in are as follows:

- Memory name:　　　　　Target data area to write, such as CIO or DM

- Word offset:　　　　　　Word offset of the write target

- Factor type:　　　　　　Data type; normally, set Word

- Number of factors:　　　Number of data; in this case, the number of words

- Write data:　　　　　　 Use a space as a delimiter to write multiple words

To write data to CIO 0 to 9 in the computer, set the data as shown below:



### 4.3.2　Confirm B

Write some data to LR 10 to 14 in node 2 (PLC), and confirm that the written data is copied to CIO 10 to 14 in node 1 (computer).

## Writing/Reading Data in the PLC

Use a Programming Console to monitor the LR area, press Shift, *EM/WR/LR twice, and then press Monitor. For details, refer to the PLC Operation Manual.

### 4.3.3　Write and Read Data in Area 2

Write some data to DM 0 to 99 in node 2 (PLC), and confirm that the written data is copied to DM 0 to 99 in node 1 (computer).

# 5    Troubleshooting

This section explains possible errors and corrections.

## Cannot Transfer the Data Link Table

In most cases, failure to transfer the data link table with the Data Link Setting Utility is caused by incorrect settings.

Reconfirm the following settings:

- Data areas: Are the areas specified available for data link?
  For example, only CIO or DM can be set for FinsGateway. For a PLC with EM (Extended DM), the number of banks differs according to the PLC model. Some PLCs have no EM area, at all.

- Number of Words: Do the specified number of words fit within the range available to the PLC/computer?
  The number of words from the offset must all fit within the range of the data area. For example, the C200HX DM area goes up to 6000. Words above that do not exist, and therefore cannot be specified.

- Offset: Are the offset and the number of words consistent?
  Be sure that the number of words starting from the specified offset all fit within the area being written by the source node for that data. For example, if node 1 writes from word 0 to word 29, do not set 25 to Offset and 10 to Words. That setting would result in reading words 25 through 34. However, node 1 is not writing data past word 29.

For details about the data areas available for data link, refer to the manual for the specific PLC, or FinsGateway.

## Error LED of Controller Link Unit is Lit

If ERC or ERH is lit, there is something wrong with the Unit or the Board. Refer to the manual that came with that Unit or Board for troubleshooting details.

## Cannot Start Data Link

If the data link starts, the LNK indicators of all the nodes (PLC Units and computer Boards) participating in the data link will be lit. However, even though the data link is started, some of the LNK indicators may not be lit. Confirm that all the LNK indicators of the participating nodes are lit at data link startup. If the LNK indicator of a node is not lit, it means there is something wrong with that node. Refer to the manual for that product for troubleshooting details.

# 6      Simple Example

In this example, we will set up the following data link configuration:

| | | Computer | PLC |
|---|---|---|---|
| Node number | | 1 | 2 |
| Area 1 | Data area | CIO | LR |
| | Start word | 0 | 0 |
| | No. of words | Node 1: 10 | Node 1: 10 |
| | | Node 2: 5 | Node2: 5 |
| Area 2 | Data area | DM | DM |
| | Start word | 0 | 0 |
| | No. of words | Node 1: 100 | Node 1: 100 |
| | | Node 2: 50 | Node 2: 50 |
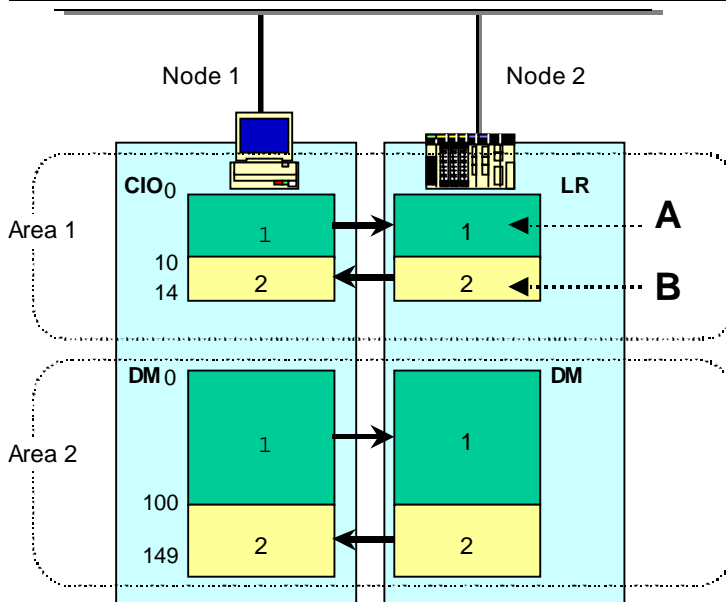


- The data link areas of node 1 are CIO and DM.

- The data link areas of node 2 are LR and DM.

- The data of CIO 0 to 9 in node 1 will be written to LR 0 to 9 in node 2.

- The data of LR 10 to 14 in node 2 will be written to CIO 10 to 14 in node 1.

- The data of DM 0 to 99 in node 1 will be written to DM 0 to 99 in node 2.

- The data of DM 100 to 149 in node 2 will be written to DM 100 to 149 in node 1.

## 6.1      Main Points of This Example

The main points of this example configuration are as follows:

- Two areas are used.
- The number of words differs for each node.

### Using Two Areas

In the above example, two areas are set for the data link between the computer and the PLC. For the computer, the CIO and DM areas are used; for the PLC, the LR and DM areas are used. (The LR area is specific to SYSMAC C-series PLCs. CV-series PLCs do not have this area.) Like this example, a data link system can be set up using two areas. These areas are called Area 1 and Area 2.

### Specifying a Different Number of Words for Each Node

As you can see from the above figure, the number of words in A and B are different. In Area 1 of the computer, the number of write words from the computer (A) is 10 (CIO 0 to 9), while that from the PLC (B) is 5 words (CIO 10 to 14). Like this example, you can freely specify the number of write words for each node.
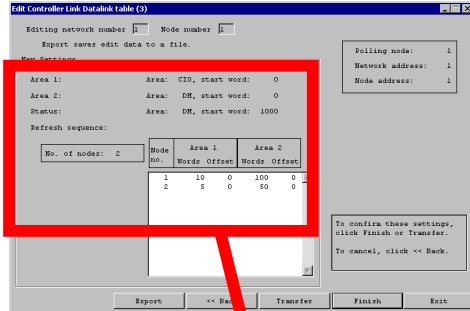
## 6.2      Setting Procedure

The data link settings for the above configuration are explained using the Data Link Setting Utility included with FinsGateway.

The settings are performed and transferred according to the following procedure:

1. Start the Data Link Setting Utility.

2. Set node 1 (computer = local node).

3. Transfer the settings to node 1.

4. Set node 2 (PLC 1).

5. Transfer the settings to node 2.

## 6.3    Completed Setting Tables

With the Data Link Setting utility included in FinsGateway, the data link setting tables for the above example will be as follows:



**Node 1**

| Area 1: | Area: | CIO, start word: | 0 |
|---|---|---|---|
| Area 2: | Area: | DM, start word: | 0 |
| Status: | Area: | DM, start word: | 1000 |

Refresh sequence:

| No. of nodes: 2 | Node no. | Area 1 Words Offset | Area 2 Words Offset |
|---|---|---|---|
| | 1 | 10    0 | 100    0 |
| | 2 | 5    0 | 50    0 |

**Node 2**

| Area 1: | Area: | LR, start word: | 0 |
|---|---|---|---|
| Area 2: | Area: | DM, start word: | 10 |
| Status: | Area: | DM, start word: | 2000 |

Refresh sequence:

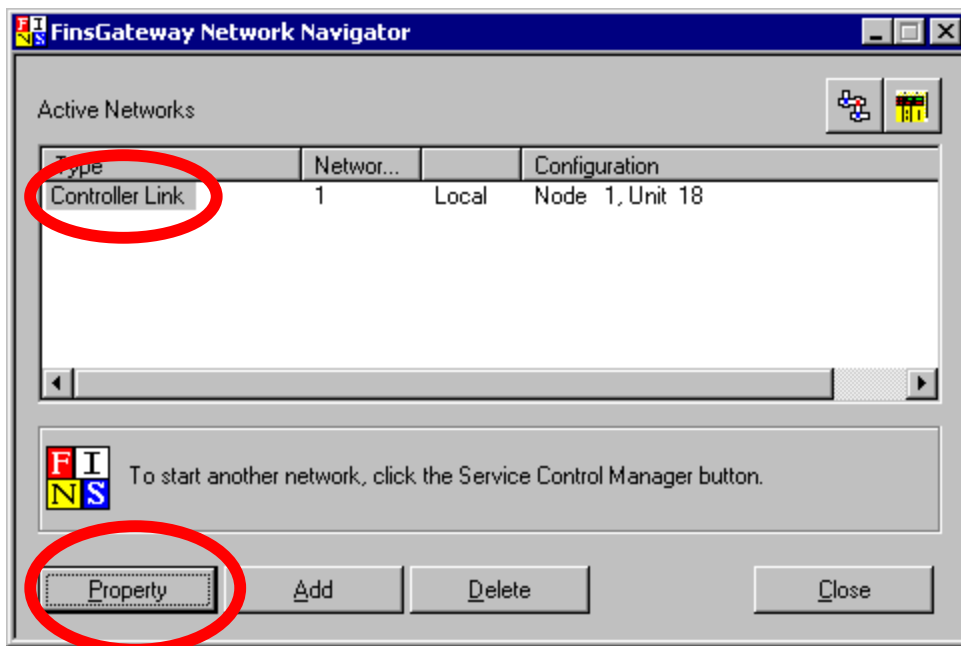| No. of nodes: 2 | Node no. | Area 1 Words Offset | Area 2 Words Offset |
|---|---|---|---|
| | 1 | 10    0 | 100    0 |
| | 2 | 5    0 | 50    0 |

A data link table needs to be created for each node as shown above, and transferred. The procedure to accomplish this is described in the following pages.

## 6.4     Starting the Data Link Setting Utility

Before starting the Data Link Setting Utility, all the nodes to participate in the data link must be connected to the network. Be sure that all the nodes are connected to the network and ready for communications.
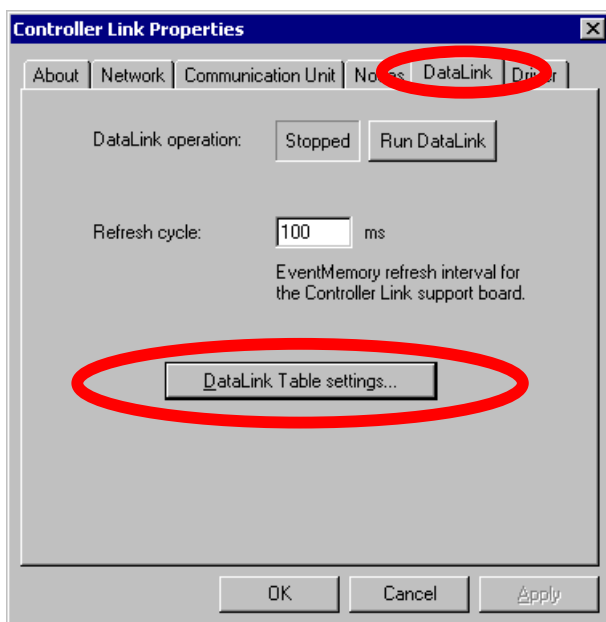
Start the FinsGateway Controller Link Data Link Setting Utility as follows:

From the Start menu, select Programs | FinsGateway | FINS Network Navigator. The following screen will be displayed:



Select Controller Link and click Properties.

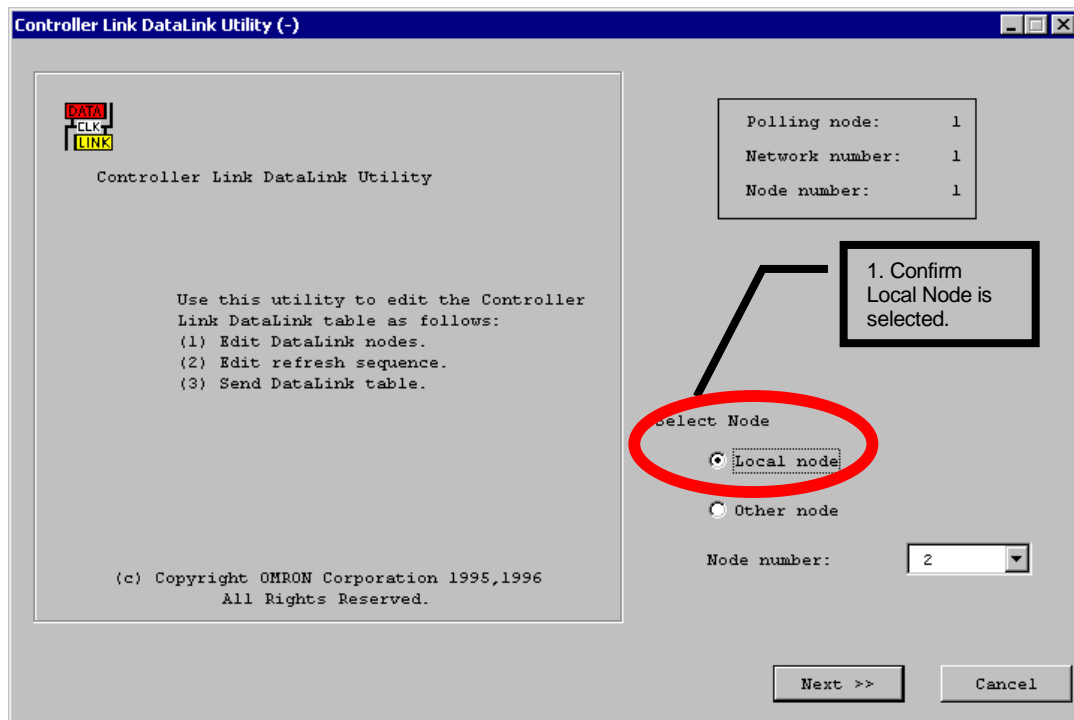The Controller Link Properties dialog will be displayed:



Select the Data Link tab and click Data Link Table settings… This starts the Data Link Setting Utility.

## 6.5    Setting Up Node 1

First, set up the local node (computer = node 1).

Select Local Node.



Click Next >> to proceed to the next screen.

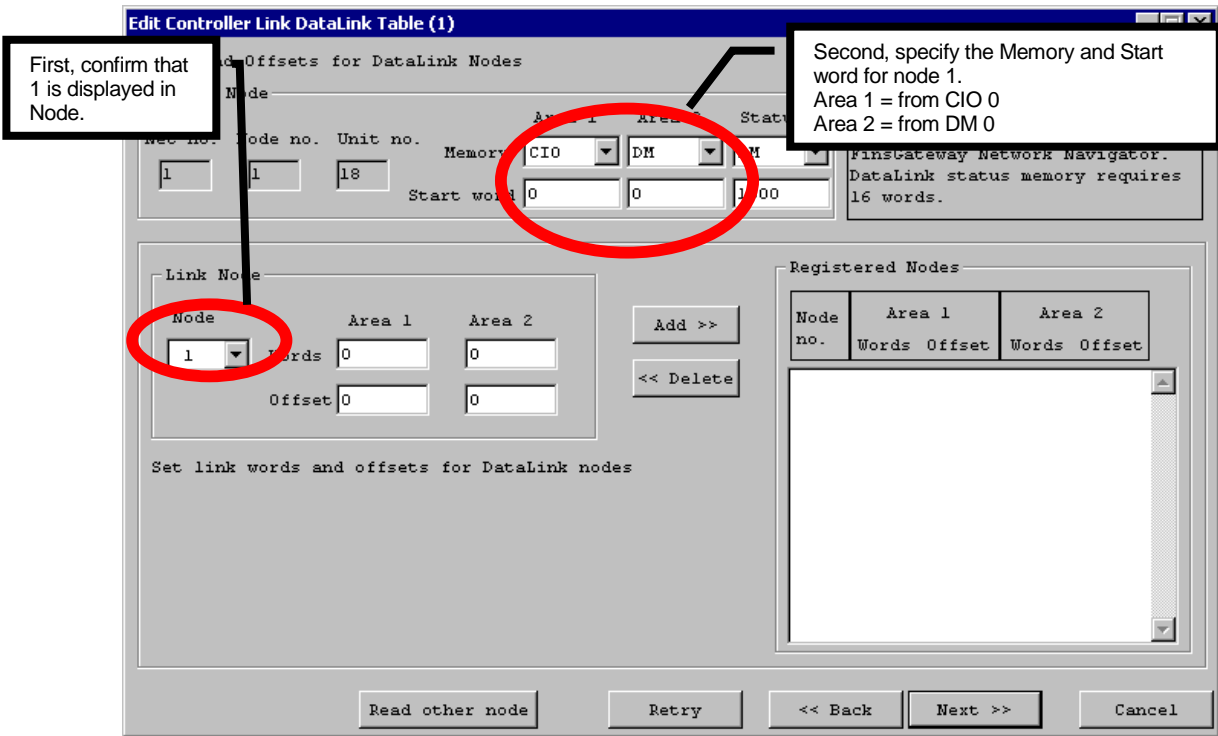## Specify the Data Area and Start Word for Area 1

Specify the data area to use for Area 1.

Set CIO to Memory and 0 to Start word of Area 1.

## Specify the Data Area and Start Word for Area 2

Specify the data area to use for Area 2.

Set DM to Memory and 0 to Start word for Area 2.

## Specify the Data Area and Start Word for the Status Data

The status data area is the area to store the data indicating the data link status. This area occupies 16 words beginning from the start word specified here.

**Note:** Specify an area that is not used in the ladder program or another application.

In this example, specify DM to Memory and 1000 to Start word.
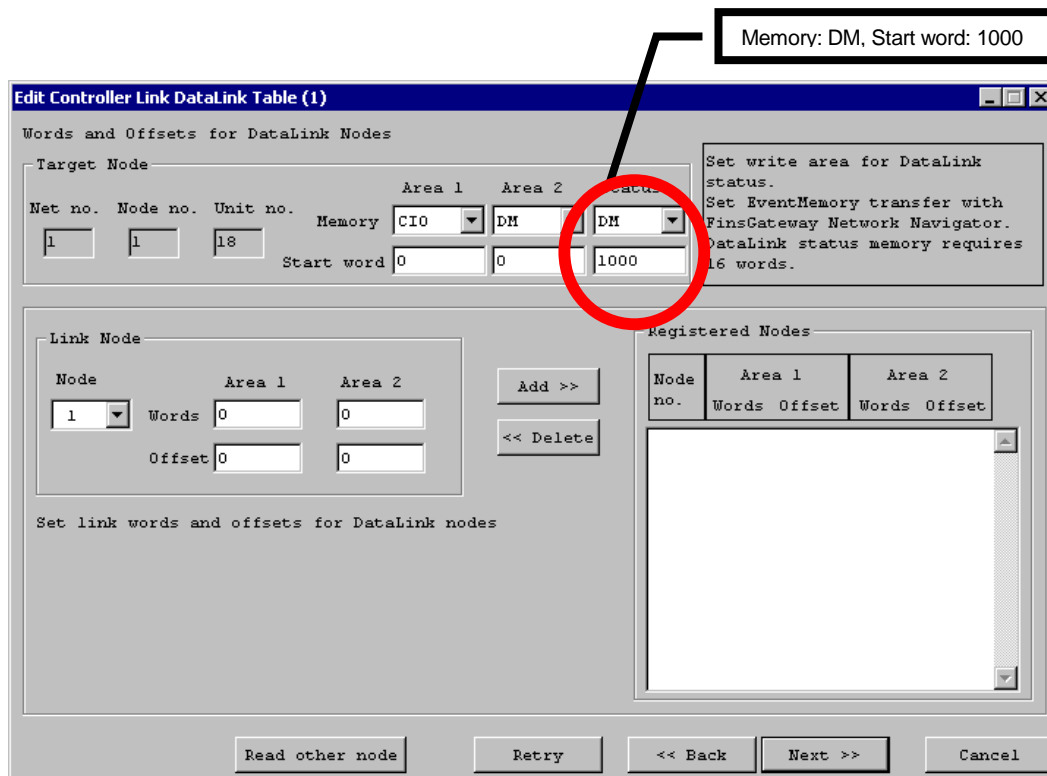
Memory: DM, Start word: 1000

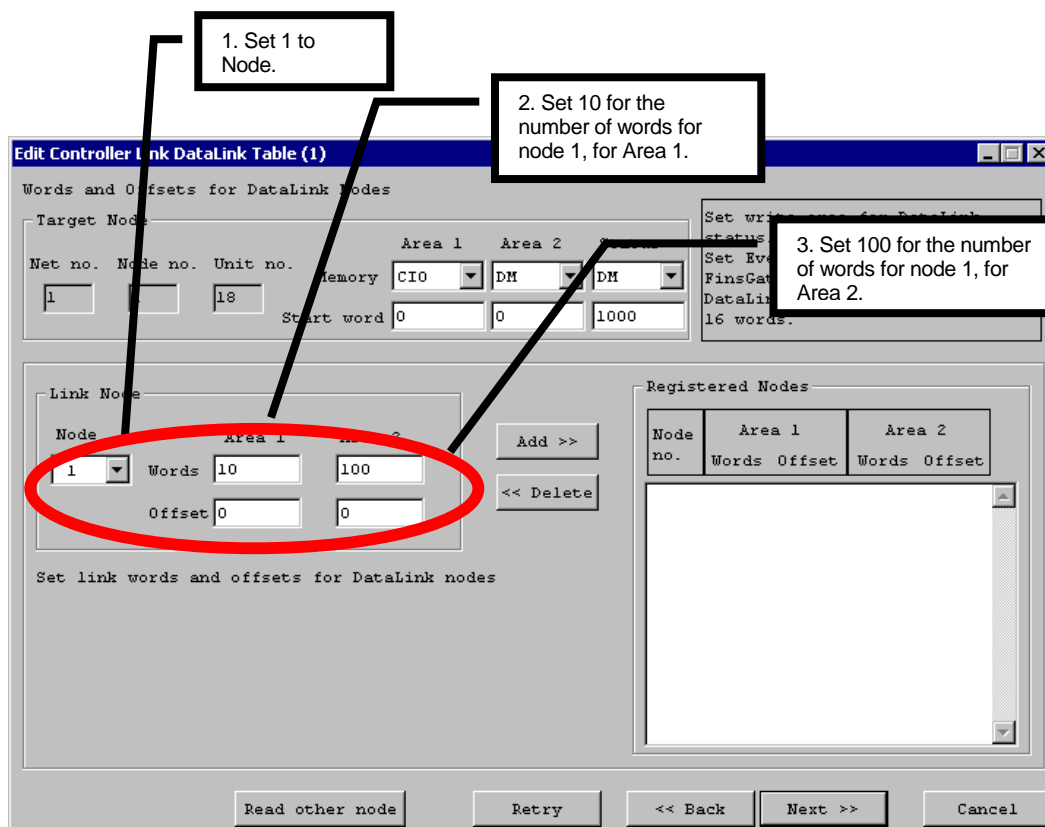## Set the Participating Nodes

### Add Node 1

Specify node number 1 (the local node) to Node.

Set 10 to Words and 0 to the Offset for Area 1.

Set 100 to Words and 0 to the Offset for Area 2.

Click Add >> to add node 1 to the Registered Nodes area.
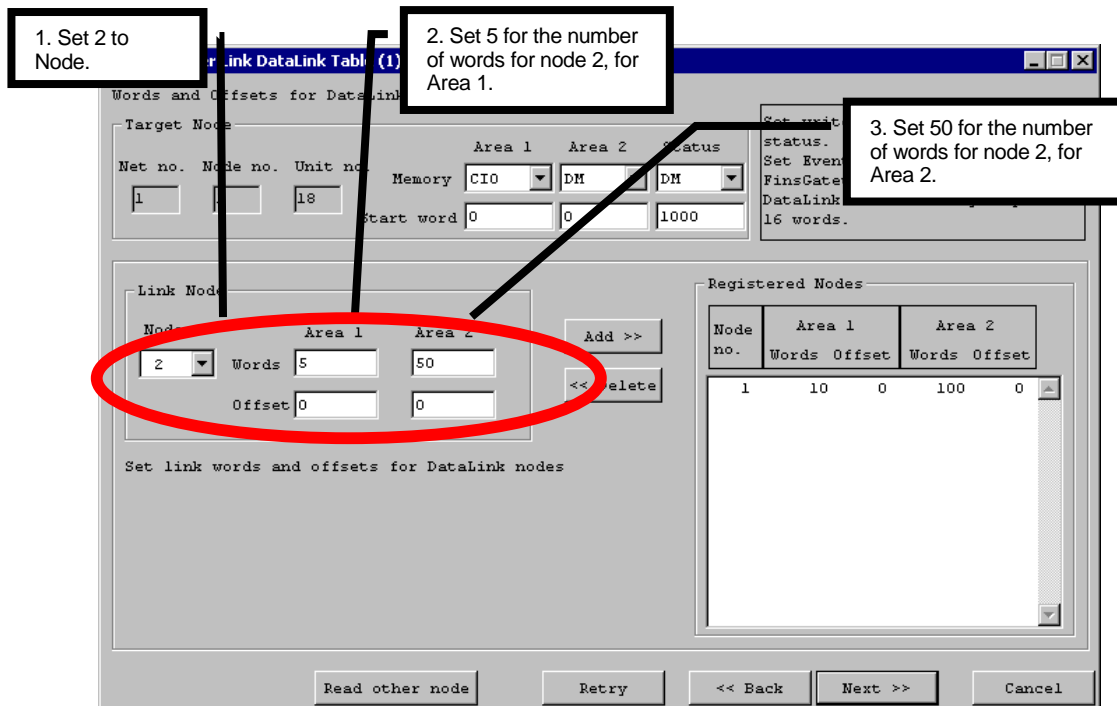
### Add Node 2

Specify node number 2 to Node.

Set 5 to Words and 0 to the Offset for Area 1.

Set 50 to Words and 0 to the Offset for Area 2.

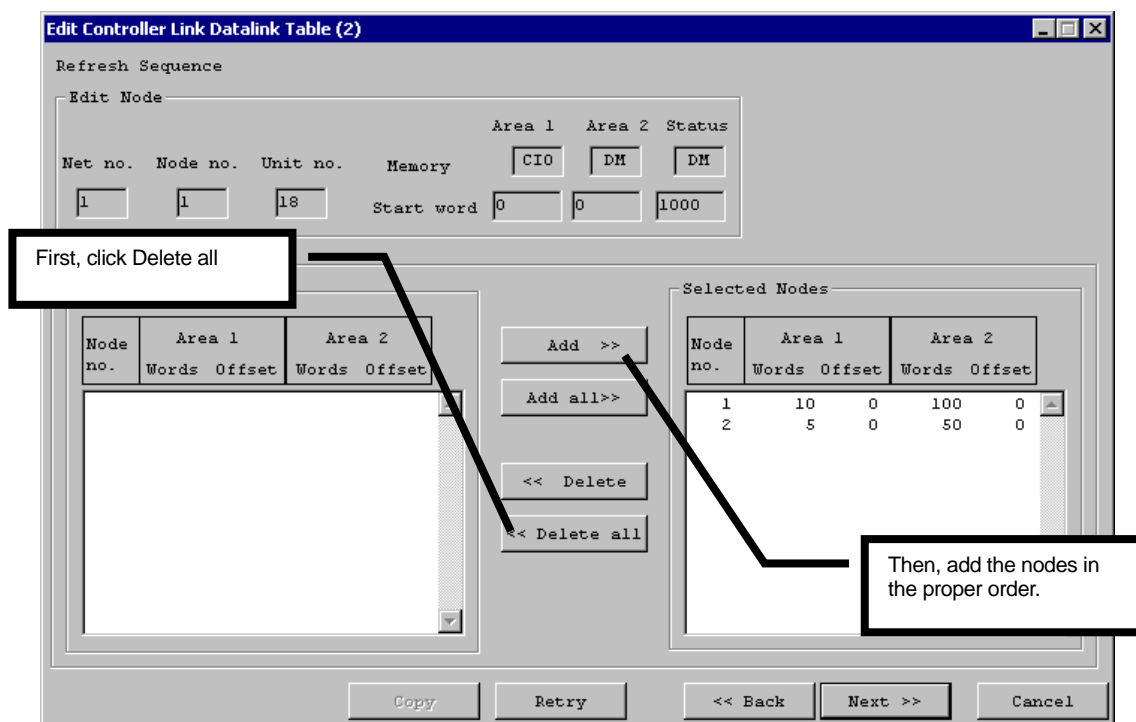Click Add >> to add node 2 to the Registered Nodes area.



This completes the registration of all the participating nodes. Click Next >> to proceed to the next screen.

## Node Order Setup

The refresh order of the data link area for this node can be changed here.

In this example, the order needs to be 1 -> 2 from the top.

If the order is not 1 -> 2 from the top, change it to 1 -> 2.



To change the order, click the << Delete all button once to move all the nodes to the left area of the screen. Select node 1, which is to be first in order. Click Add >> to move node 1 to the right area of the screen.
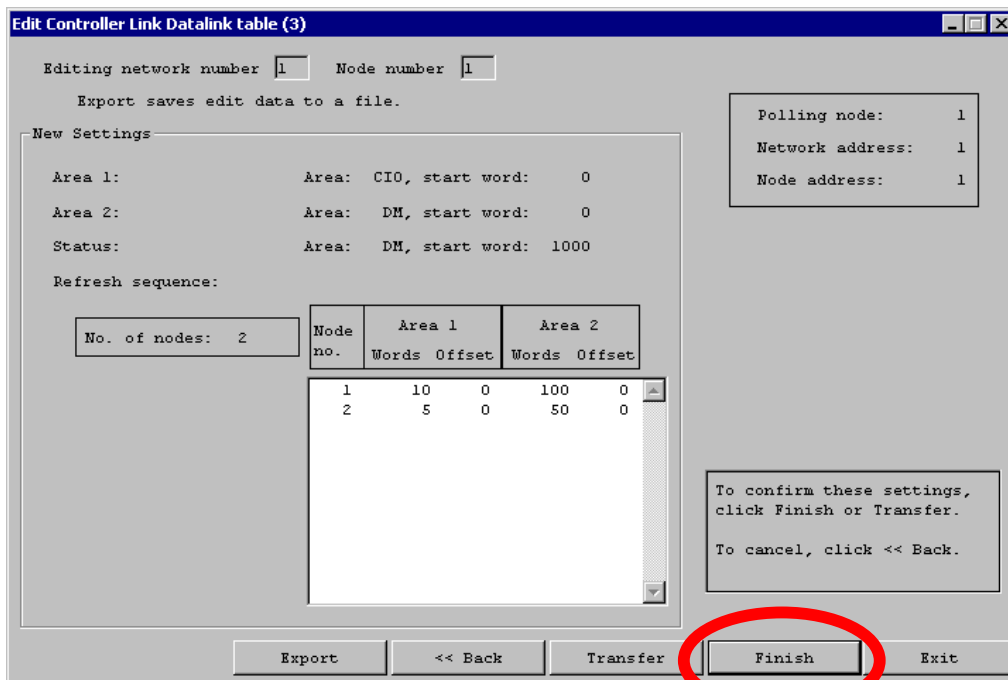
Then, select node 2, and click Add.

The order is now 1 -> 2 from the top in the right area of the screen.

When the node order is correctly set, click Next >> to proceed to the next screen.
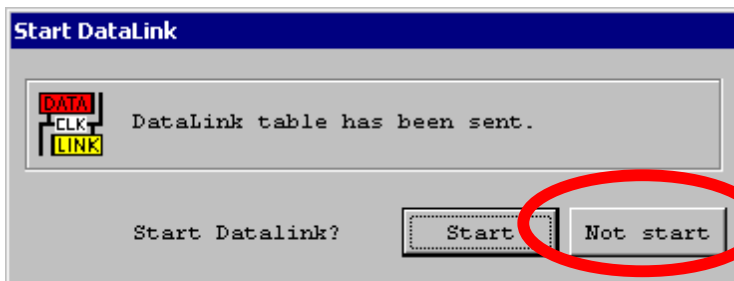
## Confirmation and Transfer

Confirm that the settings are displayed as follows and click Finish. The data link settings are then transferred to node 1 (the local node).

```
Edit Controller Link Datalink table (3)                                    _ □ ✕

   Editing network number  1     Node number  1

      Export saves edit data to a file.
  ─New Settings─────────────────────────────────            ┌──────────────────────┐
                                                            │ Polling node:      1 │
   Area 1:            Area:  CIO, start word:    0          │ Network address:   1 │
                                                            │ Node address:      1 │
   Area 2:            Area:   DM, start word:    0          └──────────────────────┘

   Status:            Area:   DM, start word:  1000

   Refresh sequence:

   ┌──────────────────────┐  ┌──────┬────────────┬────────────┐
   │ No. of nodes:    2   │  │ Node │   Area 1   │   Area 2   │
   └──────────────────────┘  │ no.  │Words Offset│Words Offset│
                             ├──────┴────────────┴────────────┤
                             │   1     10     0    100     0  ▲
                             │   2      5     0     50     0
                             │
                             │                         ┌──────────────────────────┐
                             │                         │ To confirm these settings,│
                             │                         │ click Finish or Transfer. │
                             │                         │                           │
                             │                         │ To cancel, click << Back. │
                             │                       ▼ └──────────────────────────┘

        ┌─────────┐ ┌─────────┐ ┌──────────┐ ┌─────────┐ ┌────────┐
        │ Export  │ │ << Back │ │ Transfer │ │ Finish  │ │  Exit  │
        └─────────┘ └─────────┘ └──────────┘ └─────────┘ └────────┘
```

## Data Link Startup Dialog

The following dialog will be displayed asking whether to start the data link:

```
Start DataLink

┌─────────────────────────────────────────────────┐
│ DATA                                            │
│ CLK   DataLink table has been sent.             │
│ LINK                                            │
└─────────────────────────────────────────────────┘

    Start Datalink?     ┌───────┐  ┌───────────┐
                        │ Start │  │ Not start │
                        └───────┘  └───────────┘
```

Select Not start, because the settings for node 2 have not been done yet.

Click Back enough times to return to the initial screen.

## 6.6      Setting Up Node 2

Select Other node, and specify node 2 from the Node number list.

**Note:**          If node 2 is not correctly connected to the network, it will not be in the list. Be sure that all the
nodes are correctly connected to the network and ready for communications.
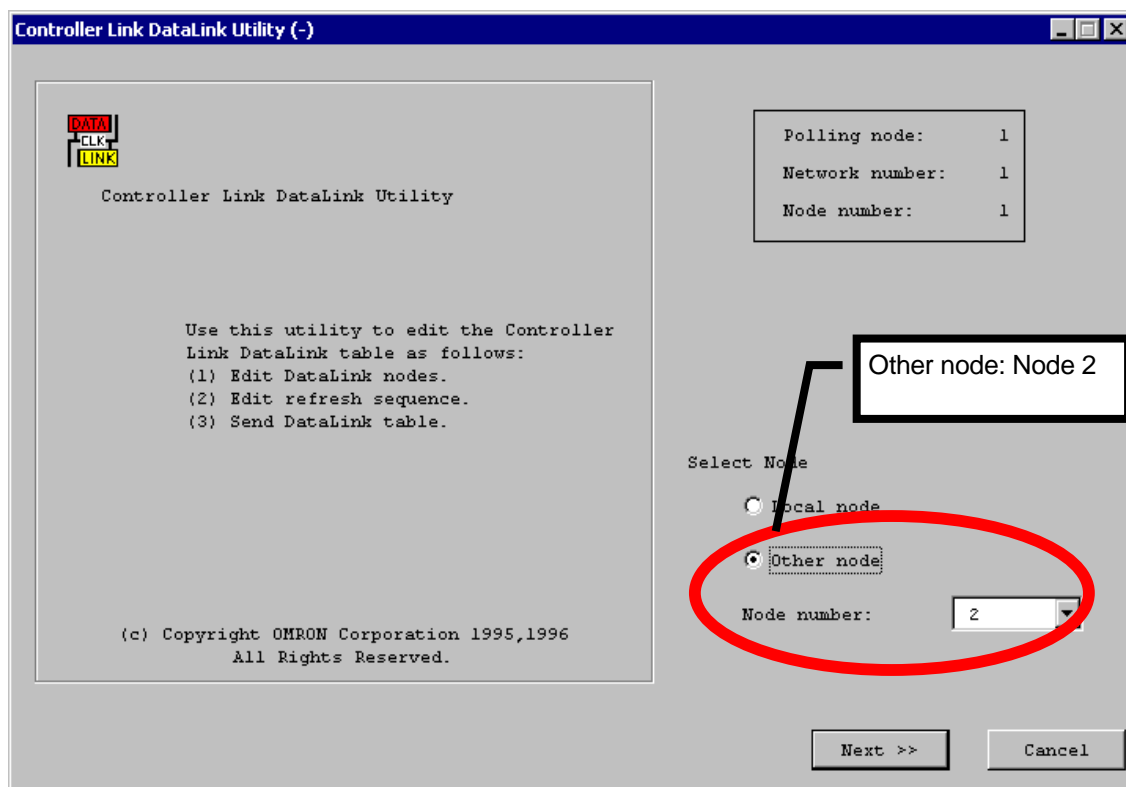


Click Next >> to proceed to the next screen.

## Specify the Data Area and Start Word for Area 1

Set the data area to use for Area 1. Set LR to Memory and 0 to Start word for Area 1.

## Specify the Data Area and Start Word for Area 2

Set the data area to use for Area 2. Set LR to Memory and 0 to Start word for Area 2.

## Specify the Data Area and Start Word for the Status Data

In this example, specify DM to Memory and 2000 to Start word.

## Set the Participating Nodes

### Add Node 1

Specify node number 1 (the local node) to Node.

Set 10 to Words and 0 to the Offset for Area 1.

Set 100 to Words and 0 to the Offset for Area 2.

Click Add >> to add node 1 to the Registered Nodes area.

## Add Node 2

Specify node number 2 to Node.

Set 5 to Words and 0 to the Offset for Area 1.

Set 50 to Words and 0 to the Offset for Area 2.

Click Add >> to add node 2 to the Registered Nodes area.



All the participating nodes have been registered. Click Next >> to proceed to the next screen.

## Node Order Setup

The refresh order of the data link area for this node can be changed here.

In this example, the order needs to be 1 -> 2 from the top. If the order is not 1 -> 2 from the top, change it to 1 -> 2.
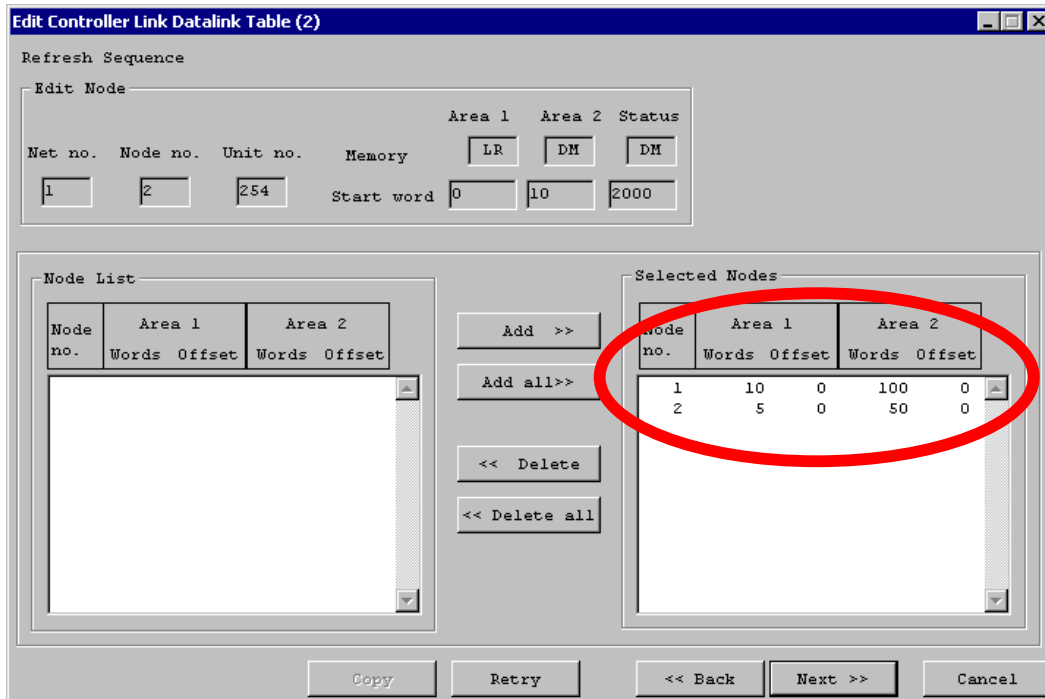


When the node order is correctly set, click Next >> to proceed to the next screen.

## Confirmation and Transfer

Confirm that the settings are correct and click Finish.

```
Edit Controller Link Datalink table (3)                                    _ □ ✕

    Editing network number  1     Node number  2

        Export saves edit data to a file.                   ┌──────────────────────────┐
   ┌─New Settings───────────────────────────────────────┐   │ Polling node:         1  │
   │                                                     │   │ Network address:      1  │
   │   Area 1:              Area:   LR, start word:    0 │   │ Node address:         1  │
   │                                                     │   └──────────────────────────┘
   │   Area 2:              Area:   DM, start word:   10 │
   │
   │   Status:              Area:   DM, start word: 2000
   │
   │   Refresh sequence:
   │                          ┌──────┬──────────────┬──────────────┐
   │   ┌──────────────────┐   │Node  │    Area 1    │    Area 2    │
   │   │ No. of nodes:  2 │   │no.   │ Words Offset │ Words Offset │
   │   └──────────────────┘   ├──────┴──────────────┴──────────────┤
   │                          │    1     10     0     100     0    │
   │                          │    2      5     0      50     0    │   ┌──────────────────────────┐
   │                          │                                    │   │ To confirm these settings,│
   │                          │                                    │   │ click Finish or Transfer. │
   │                          │                                    │   │                           │
   │                          │                                    │   │ To cancel, click << Back. │
   │                          │                                    │   └──────────────────────────┘
   │                          └────────────────────────────────────┘

   ┌──────────┐ ┌──────────┐ ┌──────────┐ ┌──────────┐ ┌──────────┐
   │  Export  │ │  << Back │ │ Transfer │ │  Finish  │ │   Exit   │
   └──────────┘ └──────────┘ └──────────┘ └──────────┘ └──────────┘
```

The data link settings are then transferred to node 2.

## Data Link Startup Dialog

The following dialog will be displayed asking whether to start the data link:
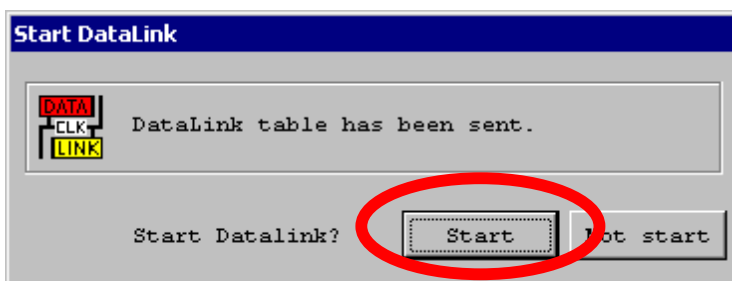


Select Start, because the settings for both nodes are complete.

If the data link is successfully started, the Data Link Setting Utility exits with the following confirmation dialog:
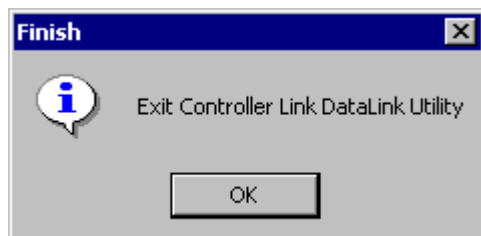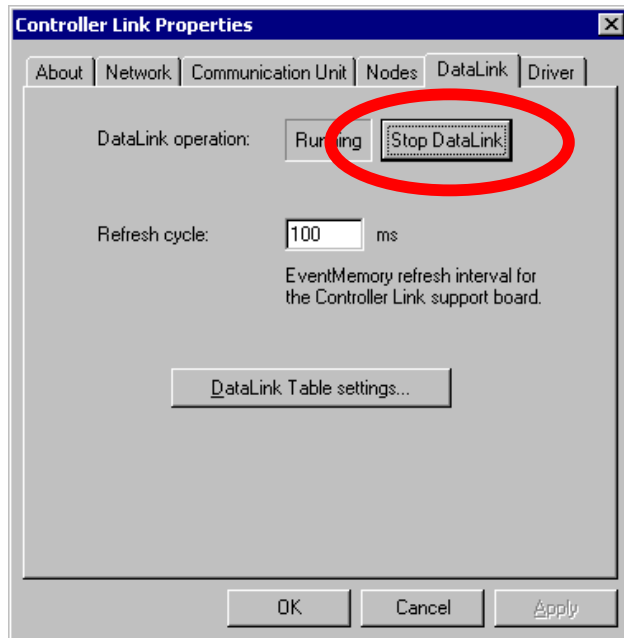


Confirm that the data link is operating properly by referring to the Checking Data Link section of the Controller Link Data Link Setup Guide - Basic.

## 6.7  Starting/Stopping Data Link

The data link can be started or stopped at any time.

Click the Data Link tab in the Controller Link Properties dialog.



Clicking Run Data Link starts the data link, and clicking Stop Data Link stops the data link.

# 7 Application Example

In this example, we will set up the following data link configuration:

|  |  | Computer | PLC (CVM1) | PLC (CVM1) |
|---|---|---|---|---|
| Node number |  | 1 | 2 | 3 |
| Area 1 | Data area | CIO | CIO | CIO |
|  | Start word | 0 | 0 | 100 |
| Area 2 | Data area | DM | DM | DM |
|  | Start word | 0 | 50 | 10 |
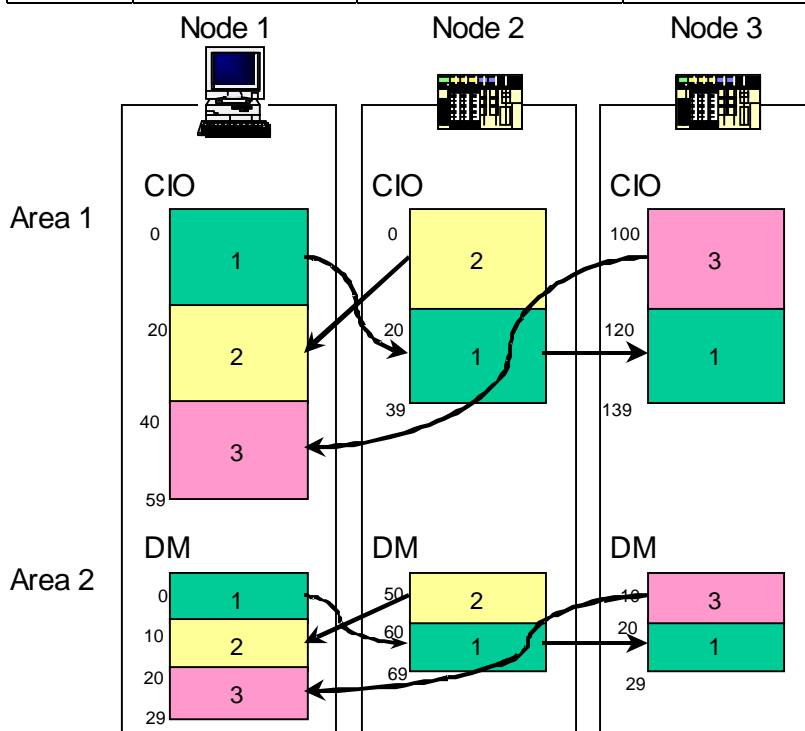


- The data link areas of node 1 are CIO and DM.

- The data link areas of node 2 are CIO and DM.

- The data link areas of node 3 are CIO and DM.

- The data of CIO 0 to 19 in node 1 will be written to CIO 20 to 39 in node 2, and to CIO 120 to 139 in node 3.

- The data of CIO 0 to 19 in node 2 will be written to CIO 20 to 39 in node 1.

- The data of CIO 100 to 119 in node 3 will be written to CIO 40 to 59 in node 1.

- The data of DM 0 to 9 in node 1 will be written to DM 60 to 69 in node 2, and to DM 20 to 29 in node 3.

- The data of DM 50 to 59 in node 2 will be written to DM 10 to 19 in node 1.

- The data of DM 10 to 19 in node 3 will be written to DM 20 to 29 in node 1.

# 7.1    Main Points of This Example

The main points of this example configuration are as follows:

- The node order is changed.
- Not all the nodes receive all the data.

## Changing Node Order

In node 1 (computer), the data link data is placed in the order of 1 -> 2 -> 3 from the top, while in node 2 (PLC), and node 3 (PLC), the data link data is placed in the order of 2 -> 1 and 3 ->1. As you can see from this example, the order of the data can be configured freely.

## Receiving Only Part of the Data

Node 1 (computer) receives all the data from both node 2 and node 3. Node 2 (PLC) and node 3 (PLC) only receive data from node 1. They do not receive data from each other. As you can see from this example, data link can be configured to provide only the necessary data for each node.

# 7.2    Setting Procedure

The data link settings for the above configuration are explained using the Data Link Setting Utility included with FinsGateway.

The settings are performed and transferred according to the following procedure:

1. Start the Data Link Setting Utility.

2. Set node 1 (computer = local node).

3. Transfer the settings to node 1.

4. Set node 2 (PLC 1).

5. Transfer the settings to node 2.

6. Set node 3 (PLC 2).

7. Transfer the settings to node 3.

## 7.3 Completed Setting Tables

With the Data Link Setting utility included in FinsGateway, the data link setting tables for the above example will be as follows:
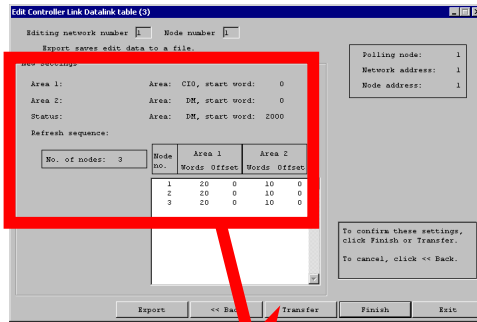


**Node 1**

| | Area: | CIO, start word: | 0 |
|---|---|---|---|
| Area 1: | | | |
| Area 2: | Area: | DM, start word: | 0 |
| Status: | Area: | DM, start word: | 2000 |

Refresh sequence:

| No. of nodes: 3 |
|---|

| Node no. | Area 1 Words | Area 1 Offset | Area 2 Words | Area 2 Offset |
|---|---|---|---|---|
| 1 | 20 | 0 | 10 | 0 |
| 2 | 20 | 0 | 10 | 0 |
| 3 | 20 | 0 | 10 | 0 |

**Node 2**

| | Area: | CIO, start word: | 0 |
|---|---|---|---|
| Area 1: | | | |
| Area 2: | Area: | DM, start word: | 0 |
| Status: | Area: | DM, start word: | 2000 |

Refresh sequence:

| No. of nodes: 2 |
|---|

| Node no. | Area 1 Words | Area 1 Offset | Area 2 Words | Area 2 Offset |
|---|---|---|---|---|
| 2 | 20 | 0 | 10 | 0 |
| 1 | 20 | 0 | 10 | 0 |

**Node 3**

| | Area: | CIO, start word: | 100 |
|---|---|---|---|
| Area 1: | | | |
| Area 2: | Area: | DM, start word: | 10 |
| Status: | Area: | DM, start word: | 2000 |

Refresh sequence:

| No. of nodes: 2 |
|---|

| Node no. | Area 1 Words | Area 1 Offset | Area 2 Words | Area 2 Offset |
|---|---|---|---|---|
| 3 | 20 | 0 | 10 | 0 |
| 1 | 20 | 0 | 10 | 0 |

A data link table needs to be created for each node as shown above, and transferred. The procedure to accomplish this is described in the following pages.

## 7.4    Starting the Data Link Setting Utility

Before starting the Data Link Setting Utility, all the nodes to participate in the data link must be connected to the network. Be sure that all the nodes are connected to the network and ready for communications.

Start the FinsGateway Controller Link Data Link Setting Utility as follows:

From the Start menu, select Programs | FinsGateway | FINS Network Navigator. The following screen will be displayed:



Select Controller Link and click Properties.

The Controller Link Properties dialog will be displayed:



Select the Data Link tab and click Data Link Table settings… This starts the Data Link Setting Utility.

## 7.5 Setting Up Node 1

First, set up the local node (computer = node 1).

Select Local Node.



Click Next >> to proceed to the next screen.

## Specify the Data Area and Start Word for Area 1

Specify the data area to use for Area 1.

Set CIO to Memory and 0 to Start word of Area 1.

## Specify the Data Area and Start Word for Area 2

Specify the data area to use for Area 2.

Set DM to Memory and 0 to Start word for Area 2.

## Specify the Data Area and Start Word for the Status Data

The status data area is the area to store the data indicating the data link status. This area occupies 16 words beginning from the start word specified here.

**Note:** Specify an area that is not used in the ladder program or another application.

In this example, specify DM to Memory and 2000 to Start word.



Memory and Start word of the Node 1 Status area

## Set the Participating Nodes

Specify node number 1 (the local node).

Set 20 to Words and 0 to the Offset for Area 1, and 10 to Words and 0 to the Offset for Area 2.

Click Add >>.

For a more detailed explanation of the offset setting, refer to Advanced Settings.

## Add Each of the Other Participating Nodes

Following node 1, add nodes 2 and 3.

Select node 2.

Set 20 to Words and 0 to the Offset for Area 1, and 10 to Words and 0 to the Offset for Area 2.

Click Add >>.

Then, select node 3.

Set 20 to Words and 0 to the Offset for Area 1, and 10 to Words and 0 to the Offset for Area 2.

Click Add >>.

Confirm that your data link table is set the same as the one shown below:
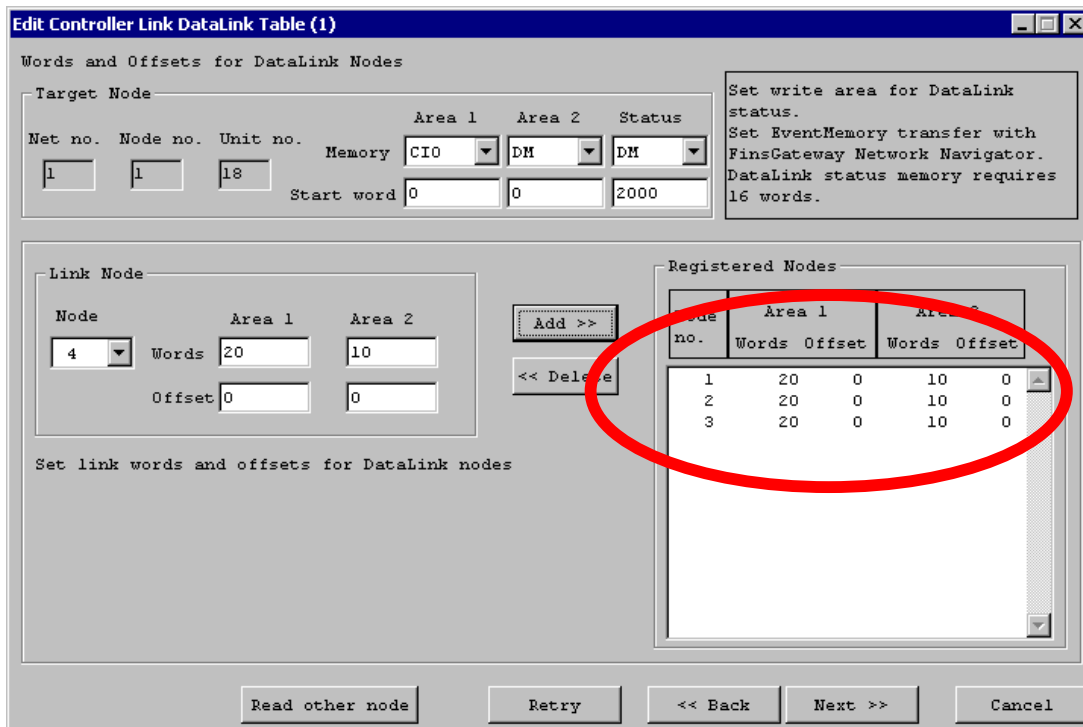
## Node Order Setup

The refresh order of the data link area for this node can be changed here.

In this example, the order needs to be 1 -> 2 -> 3 from the top. If the order is not 1 -> 2 -> 3 from the top, change it to 1 -> 2 -> 3.

To change the order, click << Delete all to move all the nodes to the left area of the screen.

Select node 1, which is to be first in order. Click Add >> to move node 1 to the right area of the screen.

Then, select node 2, and click Add. Last, select node 3, and click Add.

The nodes are now in the order of 1 -> 2 -> 3.
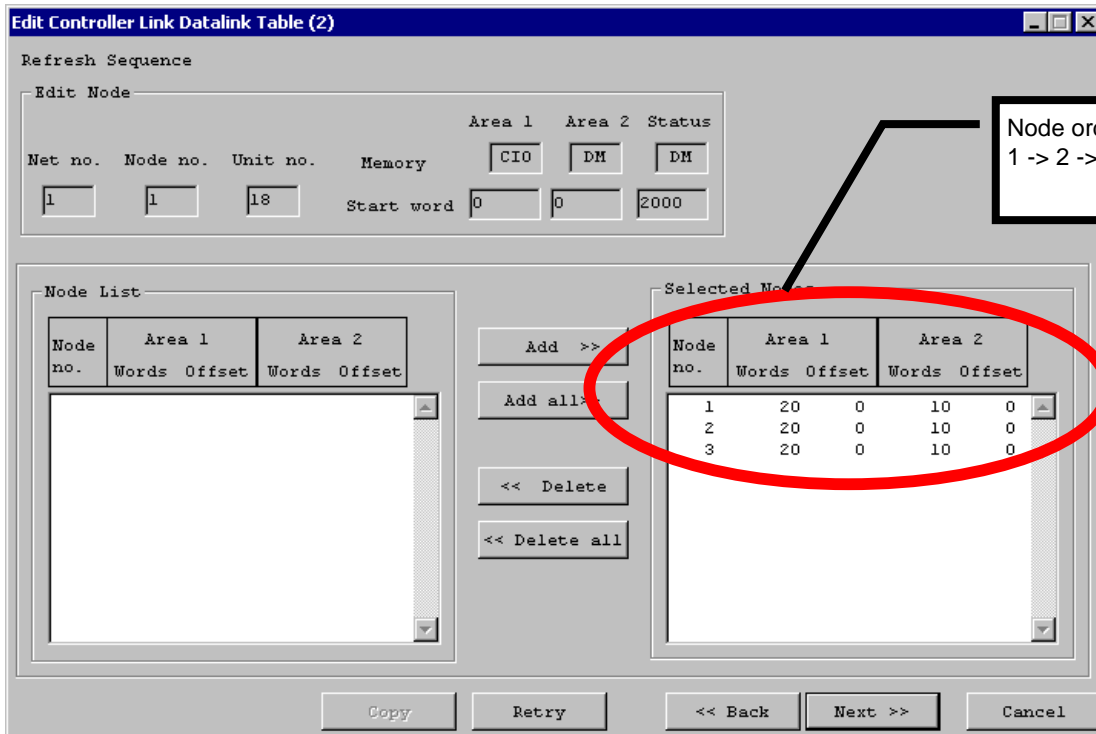


Click Next >> to proceed to the next screen.

## Confirmation and Transfer

Confirm that the settings are displayed as follows and click Finish.

The data link settings are then transferred to node 1 (the local node).

At this point, only the settings for node 1 are complete. The settings for the other nodes still need to be done. If the settings for all nodes are same, click Transfer to set the same settings to all the nodes.



## Data Link Startup Dialog

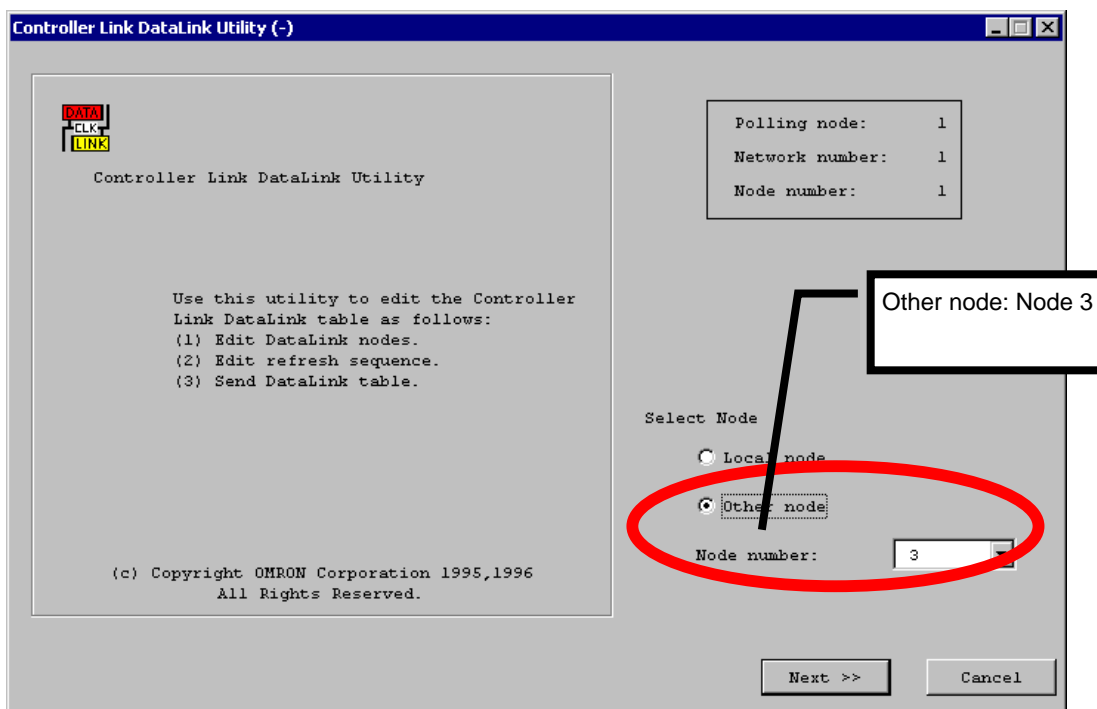The following dialog will be displayed asking whether to start the data link:
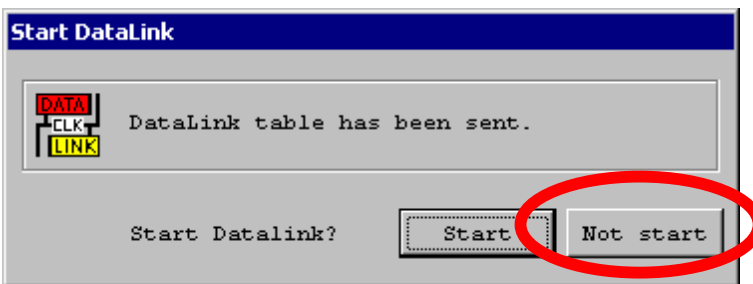


Select Not start, because the settings for nodes 2 and 3 are not done.

Click Back enough times to return to the initial screen.

## 7.6      Setting Up Node 2

Select Other node, and specify node 2 from the Node number list.

**Note:**          If node 2 is not correctly connected to the network, it will not be in the list. Be sure that all the nodes are correctly connected to the network and ready for communications.



Click Next >> to proceed to the next screen.

## Specify the Data Area and Start Word for Areas 1 and 2

Set CIO to Memory and 0 to the Start word of Area 1.

Set DM to Memory and 0 to the Start word of Area 2.

## Specify the Data Area and Start Word for the Status Data

Set DM to Memory and 2000 to the Start word.

## Set the Participating Nodes

Node 2 handles the data of nodes 1 and 2 only. Therefore, nodes 1 and 2 will be added to the table. Node 3 will not be added.

Select node 2.

Set 20 to Words and 0 to the Offset for Area 1, and 10 to Words and 0 to the Offset for Area 2.

Click Add >>.

Now, select node 1.

Set 20 to Words and 0 to the Offset for Area 1, and 10 to Words and 0 to the Offset for Area 2.

Click Add >>.

Confirm that your data link table is set the same as the one shown below:



Click Next >> to proceed to the next screen.

## Node Order Setup

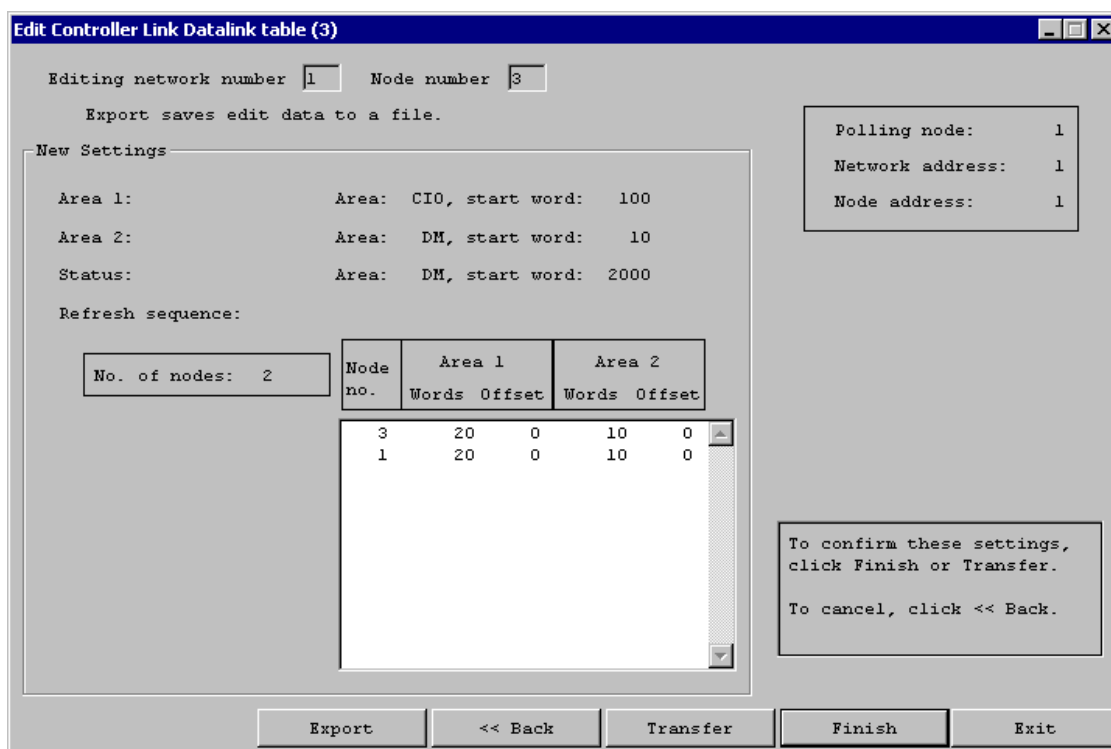The refresh order of the data link area for this node can be changed here.

In this example, the order needs to be 2 -> 1 from the top. If the order is not 2 -> 1 from the top, change it to 2 -> 1.
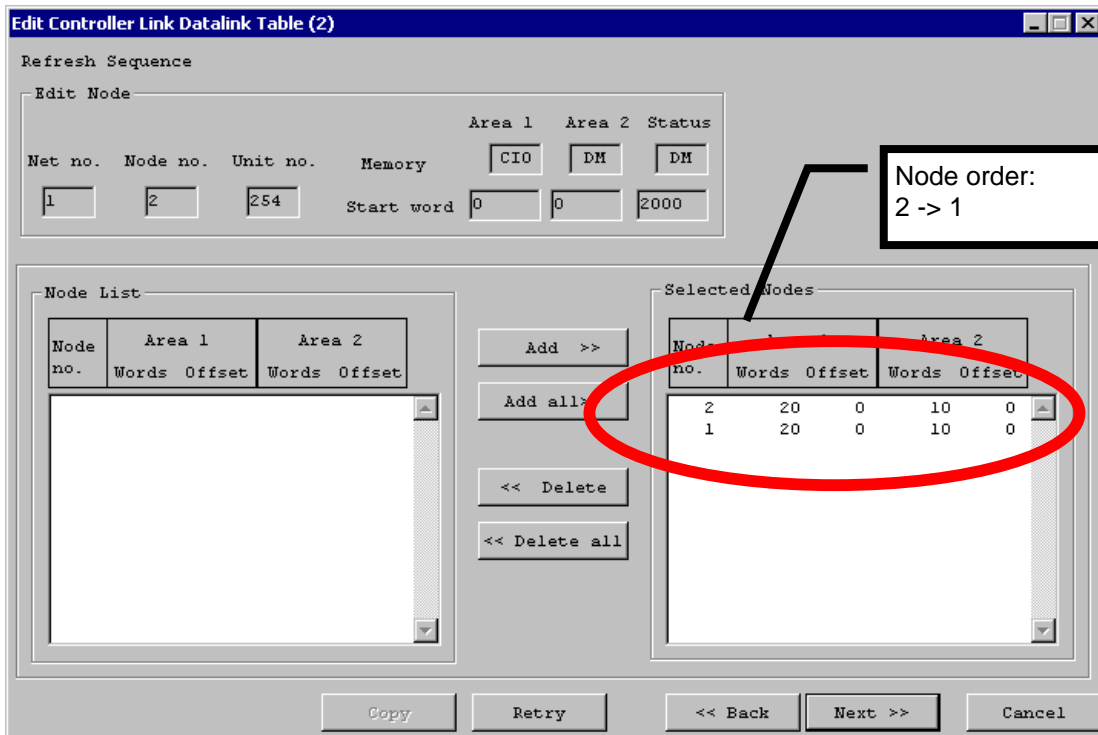


Click Next >> to proceed to the next screen.

## Confirmation and Transfer

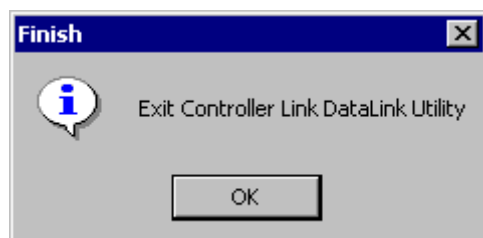Confirm that the settings are displayed as follows and click Finish.

If the settings for all nodes are same, click Transfer to send the settings to all the nodes.
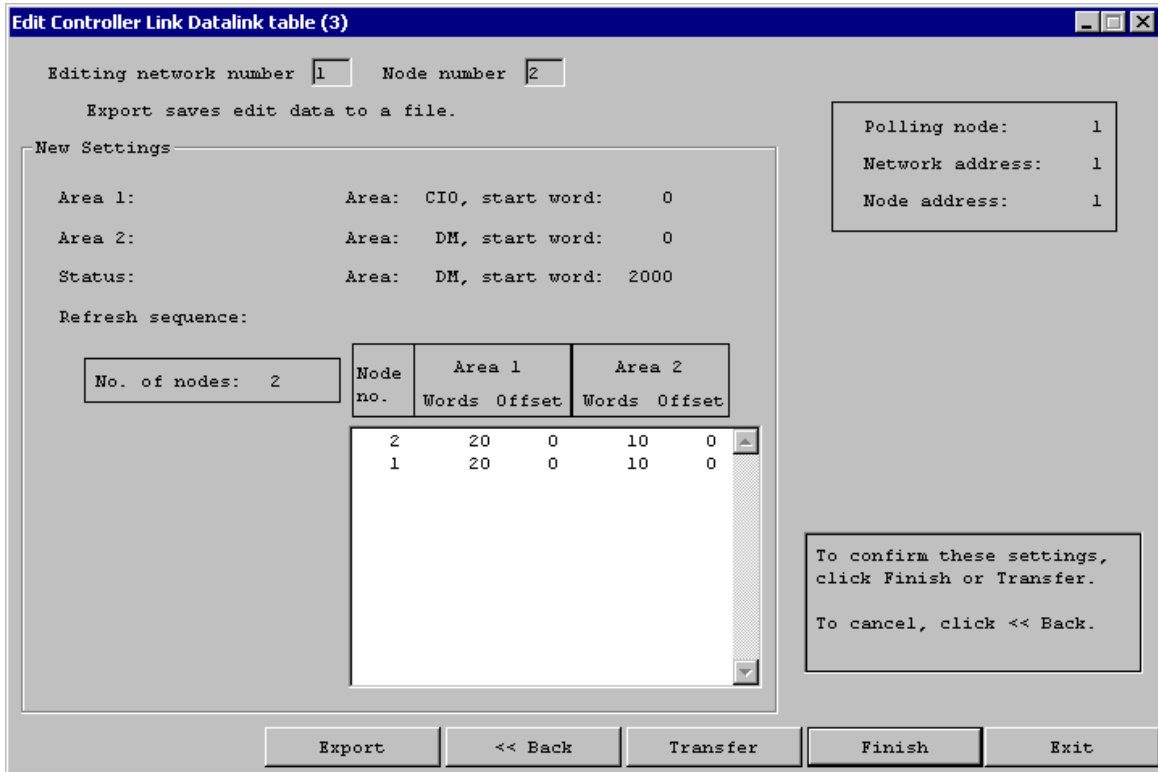


## Data Link Startup Dialog

The following dialog will be displayed asking whether to start the data link:
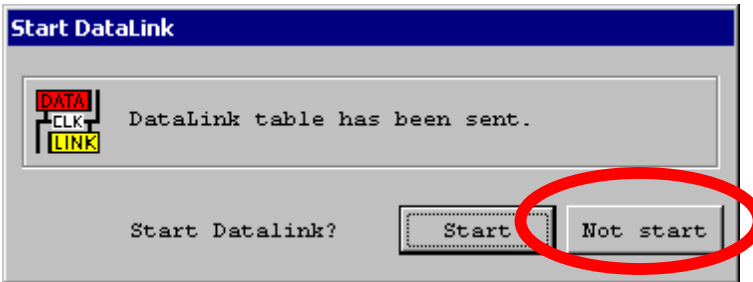


Select Not start, because the setting for the node 3 are not done.

Click Back enough times to return to the initial screen.

## 7.7 Setting Up Node 3

Select Other node, and specify node 3 from the Node number list.

**Note:** If node 3 is not correctly connected to the network, it will not be in the list. Be sure that all the nodes are correctly connected to the network and ready for communications.



Click Next >> to proceed to the next screen.

## Specify the Data Area and Start Word for Areas 1 and 2

Set CIO to Memory and 0 to the Start word of Area 1.

Set DM to Memory and 0 to the Start word of Area 2.

## Specify the Data Area and Start Word for the Status Data

Set DM to Memory and 2000 to the Start word.

## Set the Participating Nodes

Node 3 handles the data of nodes 1 and 3 only. Therefore, nodes 1 and 3 will be added to the table. Node 2 will not be added.

Select node 3.

Set 20 to Words and 0 to the Offset for Area 1, and 10 to Words and 0 to the Offset for Area 2.

Click Add >>.

Now, select node 1.

Set 20 to Words and 0 to the Offset for Area 1, and 10 to Words and 0 to the Offset for Area 2.

Click Add >>.

Confirm that your data link table is set the same as the one shown below:
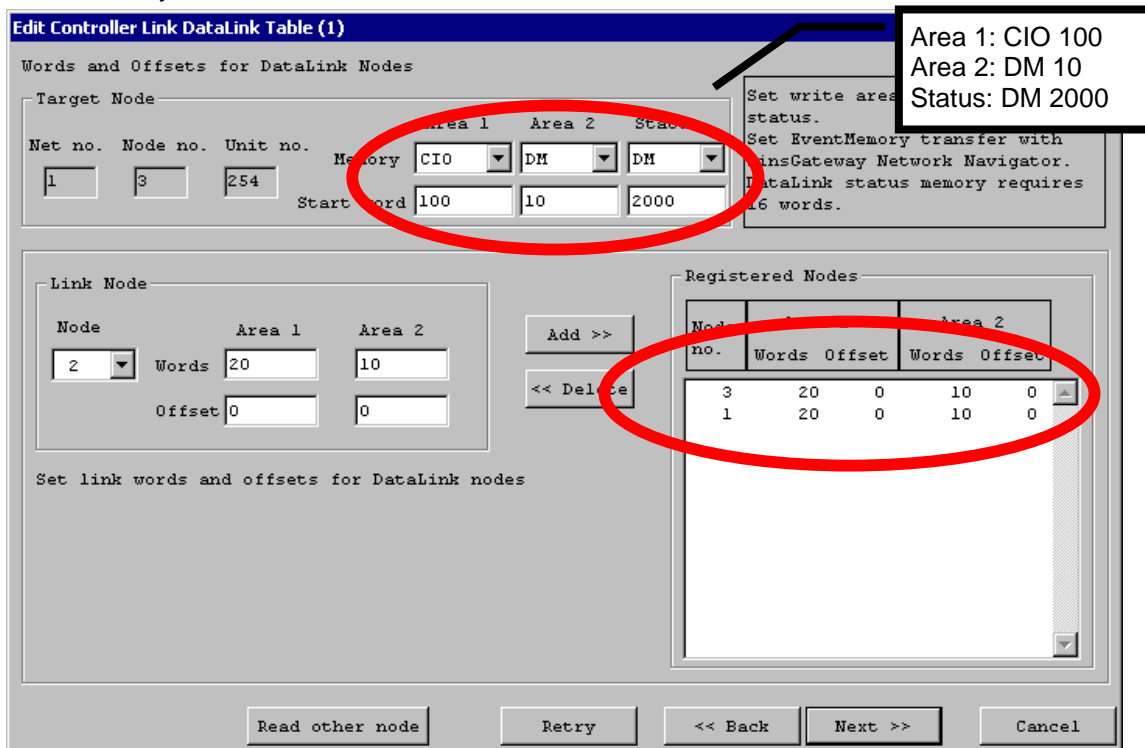


Click Next >> to proceed to the next screen.

## Node Order Setup

The refresh order of the data link area for this node can be changed here.

In this example, the order needs to be 3 -> 1 from the top. If the order is not 3 -> 1 from the top, change it to 3 -> 1.
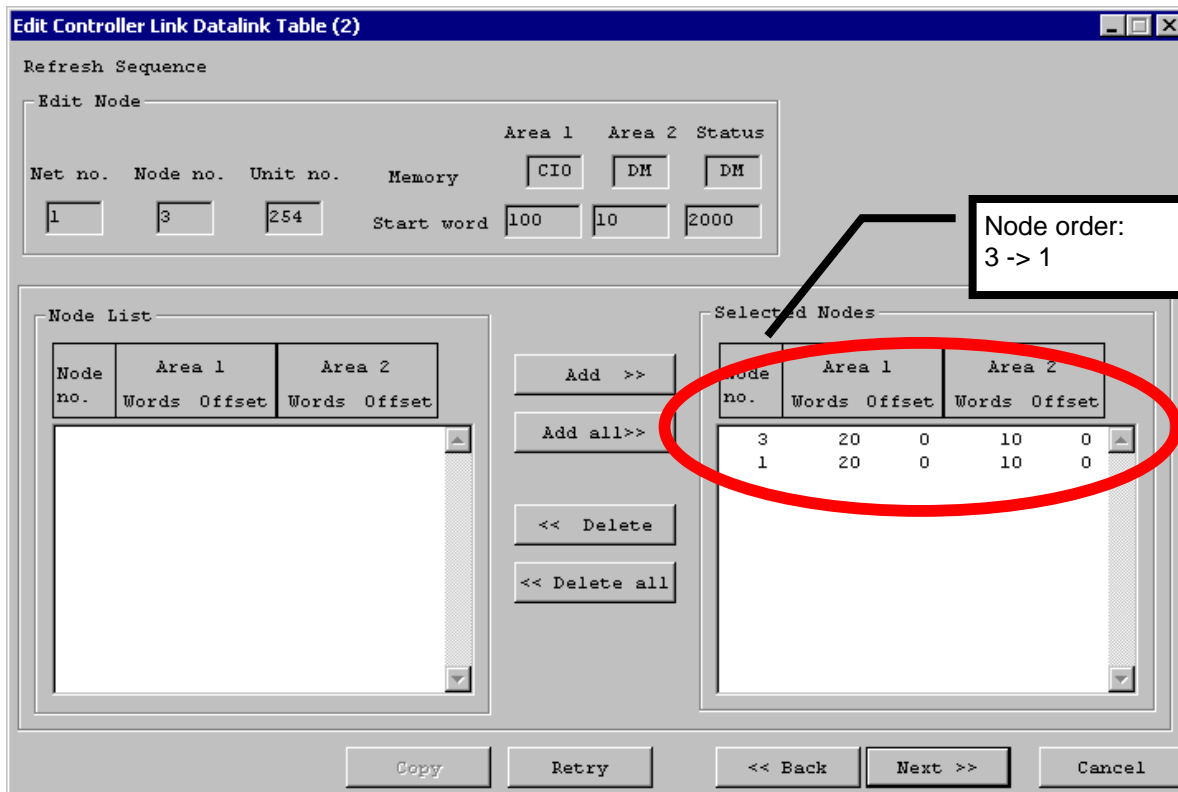


Click Next >> to proceed to the next screen.

## Confirmation and Transfer

Confirm that the settings are displayed as follows and click Finish.



## Data Link Startup Dialog

The following dialog will be displayed asking whether to start the data link:
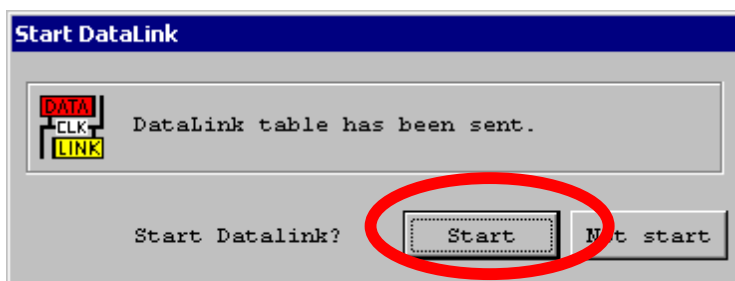


Select Start, because the settings for all the nodes are now complete.

If the data link is successfully started, the Data Link Setting Utility exits with the following confirmation dialog:



Confirm that the data link is operating properly by referring to the Checking Data Link section of the Controller Link Data Link Setup Guide - Basic.

## 7.8    Starting/Stopping Data Link

The data link can be started or stopped at any time.

Click the Data Link tab in the Controller Link Properties dialog.
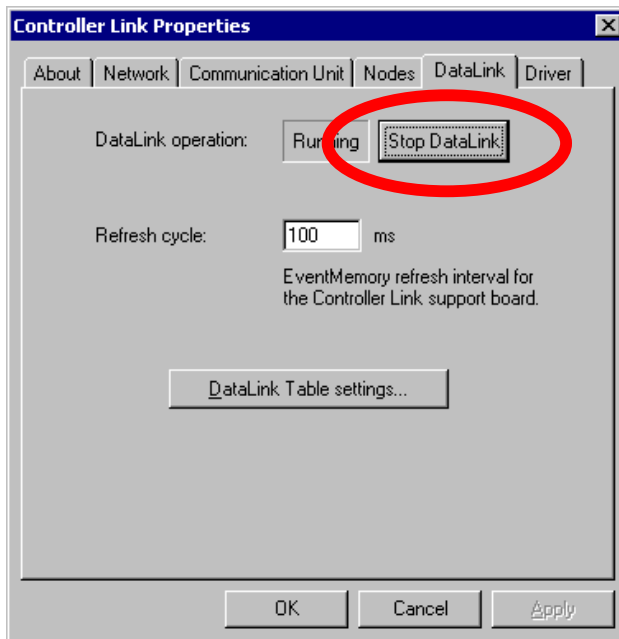


Clicking Run Data Link starts the data link, and clicking Stop Data Link stops the data link.

# 8 Advanced Example

In this example, we will set up the following data link configuration:

| | | Computer | PLC 1 | PLC 2 | PLC 3 |
|---|---|---|---|---|---|
| Node number | | 1 | 2 | 3 | 4 |
| Area 1 | Data area | DM | EM0 (EM bank 0) | EM1 (EM bank 1) | DM |
| | Start word | 0 | 0 | 50 | 100 |
| Area 2 | Data area | None | None | None | None |
| | Start word | None | None | None | None |
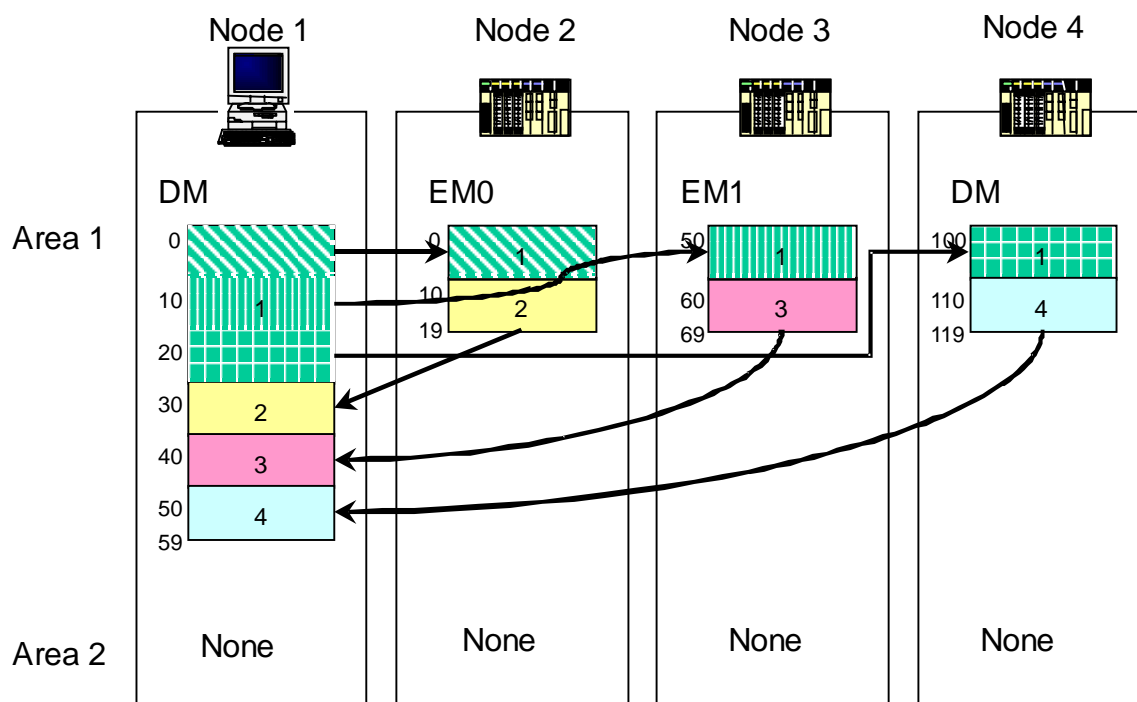


- The data link area of node 1 is DM only.
- The data link area of node 2 is EM0 only.
- The data link area of node 3 is EM1 only.
- The data link area of node 4 is DM only.
- The data of DM 0 to 9 in node 1 will only be written to EM0 0 to 9 in node 2.
- The data of DM 10 to 19 in node 1 will only be written to EM1 50 to 59 in node 3.
- The data of DM 20 to 29 in node 1 will only be written to DM 100 to 109 in node 4.
- The data of EM0 10 to 19 in node 2 will only be written to DM 30 to 39 in node 1.
- The data of EM1 60 to 69 in node 3 will only be written to DM 40 to 49 in node 1.
- The data of DM 110 to 119 in node 4 will only be written to DM 50 to 59 in node 1.

# 8.1    Main Points of This Example

The main points of this example configuration are as follows:

- Only part of the data is received.

- Only one data link area is used.

- EM is used as the data link area for some PLCs.

## Receiving Only Part of the Data

In data link, it is also possible to receive just one part of the data provided by another node.

As shown again in the figure below, node 1 writes 30 words of data starting from DM 0 (A + B + C). However, each PLC receives only one part of that total. In this case, the setting for each PLC will be to receive a set number of words from a set start word. The number of the start word is called the offset. For example, part C is 10 words starting from word 20. The offset is therefore 20.
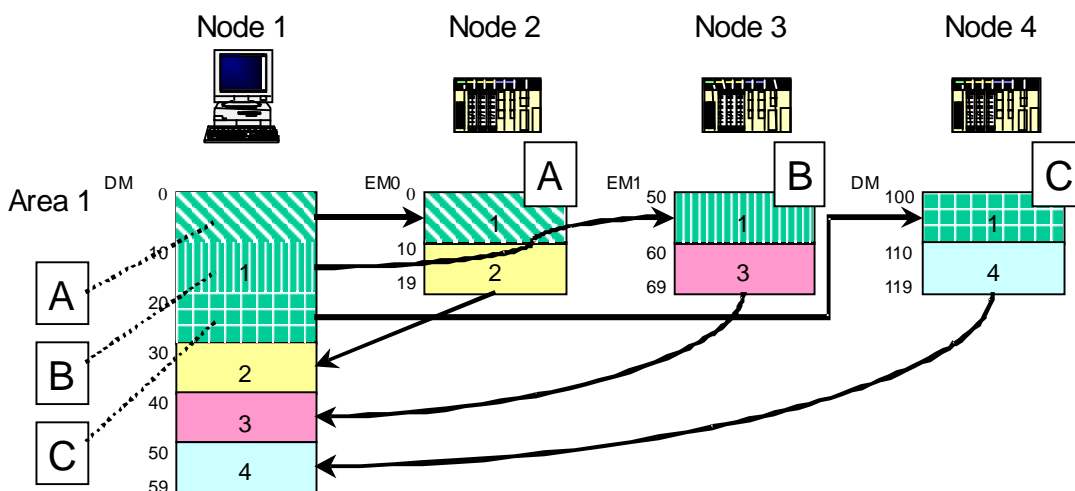


## Using Only One Data Link Area

It is also possible to use only one area for data link. In this example, area 2 is not used.

## Using EM as a Data Link Area for Some PLCs

The data area, the range of the area, and the amount of data available to data link depends on the PLC. For example, the data areas in C200HX are CIO, LR, DM, and EM 0 to 7. (Refer to the manual for the PLC for details.) The data areas in FinsGateway are CIO and DM. Each node connected to the data link can be set to a specific data area, independent of the other nodes.

## 8.2     Setting Procedure

The data link settings for the above configuration are explained using the Data Link Setting Utility included with FinsGateway.

The settings are performed and transferred according to the following procedure:

1. Start the Data Link Setting Utility.

2. Set node 1 (computer = local node).

3. Transfer the settings to node 1.

4. Set node 2 (PLC 1).

5. Transfer the settings to node 2.

6. Set node 3 (PLC 2).

7. Transfer the settings to node 3.

8. Set node 4 (PLC 3).

9. Transfer the settings to node 4.

## 8.3    Completed Setting Tables

With the Data Link Setting utility included in FinsGateway, the data link setting tables for the above example will be as follows:
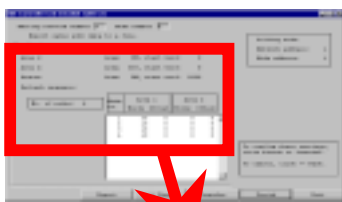


**Node 1**

| Area 1: | Area: | DM, start word: | 0 |
| Area 2: | Area: | CIO, start word: | 0 |
| Status: | Area: | DM, start word: | 2000 |

Refresh sequence:

| No. of nodes: 4 | Node no. | Area 1 Words | Area 1 Offset | Area 2 Words | Area 2 Offset |
|---|---|---|---|---|---|
| | 1 | 30 | 0 | 0 | 0 |
| | 2 | 10 | 0 | 0 | 0 |
| | 3 | 10 | 0 | 0 | 0 |
| | 4 | 10 | 0 | 0 | 0 |

**Node 2**

| Area 1: | Area: | EM0, start word: | 0 |
| Area 2: | Area: | CIO, start word: | 0 |
| Status: | Area: | DM, start word: | 2000 |

Refresh sequence:

| No. of nodes: 2 | Node no. | Area 1 Words | Area 1 Offset | Area 2 Words | Area 2 Offset |
|---|---|---|---|---|---|
| | 1 | 10 | 0 | 0 | 0 |
| | 2 | 10 | 0 | 0 | 0 |

**Node 3**

| Area 1: | Area: | EM1, start word: | 50 |
| Area 2: | Area: | CIO, start word: | 0 |
| Status: | Area: | DM, start word: | 2000 |

Refresh sequence:

| No. of nodes: 2 | Node no. | Area 1 Words | Area 1 Offset | Area 2 Words | Area 2 Offset |
|---|---|---|---|---|---|
| | 1 | 10 | 10 | 0 | 0 |
| | 3 | 10 | 0 | 0 | 0 |

**Node 4**

| Area 1: | Area: | DM, start word: | 100 |
| Area 2: | Area: | CIO, start word: | 0 |
| Status: | Area: | DM, start word: | 2000 |

Refresh sequence:

| No. of nodes: 2 | Node no. | Area 1 Words | Area 1 Offset | Area 2 Words | Area 2 Offset |
|---|---|---|---|---|---|
| | 1 | 10 | 20 | 0 | 0 |
| | 4 | 10 | 0 | 0 | 0 |

A data link table needs to be created for each node as shown above, and transferred. The procedure to accomplish this is described in the following pages.

## 8.4      Starting the Data Link Setting Utility

Before starting the Data Link Setting Utility, all the nodes to participate in the data link must be connected to the network. Be sure that all the nodes are connected to the network and ready for communications.

Start the FinsGateway Controller Link Data Link Setting Utility as follows:

From the Start menu, select Programs | FinsGateway | FINS Network Navigator. The following screen will be displayed:



Select Controller Link and click Properties.

The Controller Link Properties dialog will be displayed:



Select the Data Link tab and click Data Link Table settings... This starts the Data Link Setting Utility.

## 8.5    Setting Up Node 1

First set up the local node (computer = node 1).

Select Local Node.
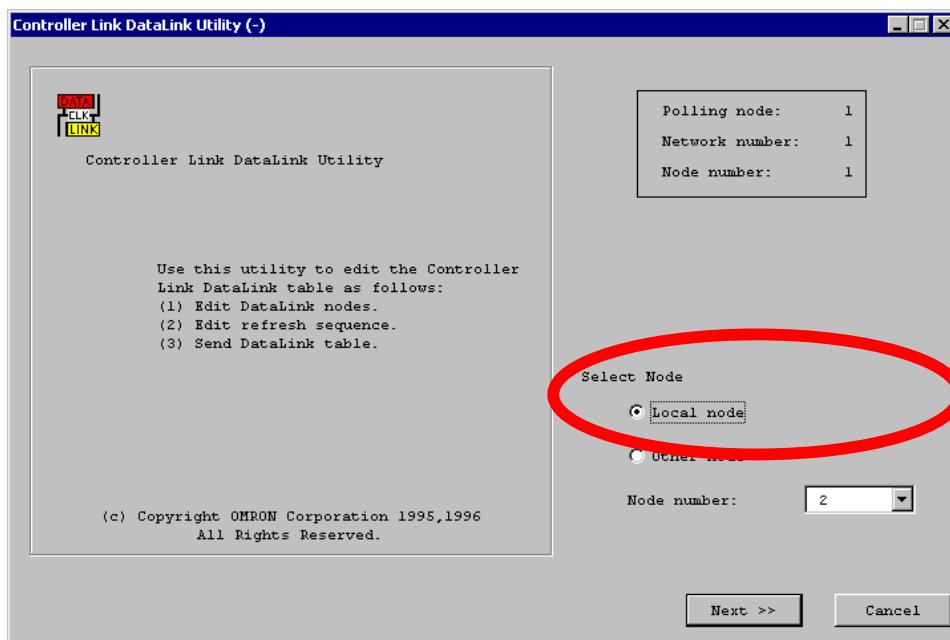


Click Next >> to proceed to the next screen.

## Specify the Data Area and Start Word

Set DM to Area Type and 0 to Start Word of Area 1.

In this example, Area 2 will not be used. Therefore the settings for Area 2 can be anything. Set CIO to Memory and 0 to Start word for Area 2.

## Specify the Data Area and Start Word for the Status Data

Set DM to Memory and 2000 to Start word.

## Set the Participating Nodes

Specify node number 1 (the local node).

Set 30 to Words and 0 to the Offset for Area 1. This is the total data to be written by node 1.

Set 0 to Words and 0 to the Offset for Area 2 because it is not used.

Click Add >>.

Following node 1, add node numbers 2, 3, and 4.

For node 2, set 10 to Words and 0 to the Offset for Area 1, and 0 to Words and 0 to the Offset for Area 2.

For node 3, set 10 to Words and 0 to the Offset for Area 1, and 0 to Words and 0 to the Offset for Area 2.

For node 4, set 10 to Words and 0 to the Offset for Area 1, and 0 to Words and 0 to the Offset for Area 2.

Add each of these nodes, as you complete the settings, by clicking Add >>.

Confirm that your data link table is set the same as the one shown below:



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## Node Order Setup

The refresh order of the data link area for this node can be changed here.

In this example, the order needs to be 1 -> 2 -> 3 -> 4 from the top. If the order is not 1 -> 2 -> 3 -> 4 from the top, change it to 1 -> 2 -> 3 -> 4.

**Note:**         For details on how to change the order, refer to the example in Application Settings.

Confirm that your data link table is set the same as the one shown below:

## Confirmation and Transfer

Confirm that the settings are displayed as follows and click Finish.

The data link settings are then transferred to node 1 (the local node).

At this point, only the settings for node 1 are complete. The settings for the other nodes still need to be done. If the settings for all nodes are same, click Transfer to set the same settings to all the nodes.



## Data Link Startup Dialog

The following dialog will be displayed asking whether to start the data link:



Select Not start, because the settings for nodes 2, 3, and 4 are not done.

Click Back enough times to return to the initial screen.

## 8.6 Setting Up Node 2

Select Other node, and specify node 2 from the Node number list.

**Note:** If node 2 is not correctly connected to the network, it will not be in the list. Be sure that all the nodes are correctly connected to the network and ready for communications.
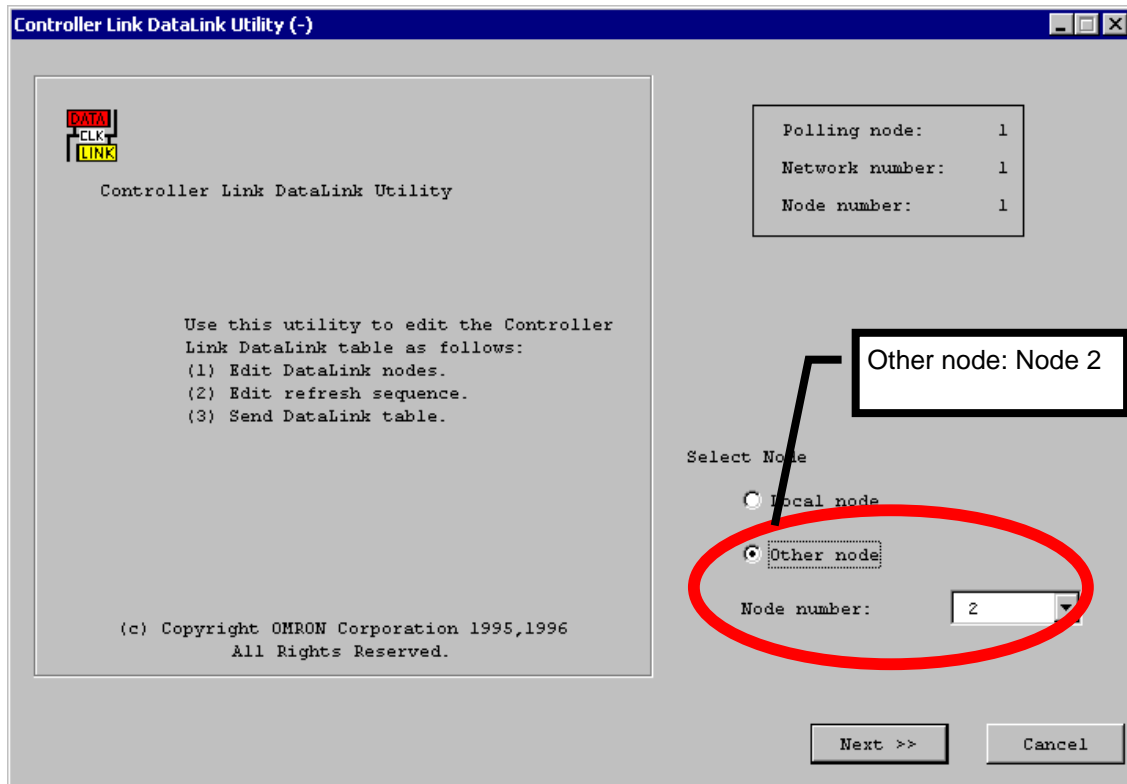


Click Next >> to proceed to the next screen.

## Specify the Data Area and Start Word for Areas 1 and 2

Set EM to Memory and 0 to the Start word of Area 1.

In this example, Area 2 will not be used. Therefore the settings for Area 2 can be anything. Set CIO to Memory and 0 to the Start word for Area 2.

## Specify the Data Area and Start Word for the Status Data

Set DM to Memory and 2000 to the Start word.

## Set the Participating Nodes

Node 2 handles the data of nodes 1 and 2 only. Therefore, nodes 1 and 2 will be added to the table. Nodes 3 and 4 will not be added.

Select node 1.

Set 10 to Words and 0 to the Offset for Area 1, and 0 to Words and 0 to the Offset for Area 2. The data that node 2 will receive from node 1 is just one part of the total data that node 1 writes. Node 1 writes 30 words of data starting from DM 0. However, the data received by node 2 will only be the first 10 words. Therefore, the Offset is set to 0 and Words is set to 10.

Click Add >>.

Now, select node 2.

Set 10 to Words and 0 to the Offset for Area 1, and 0 to Words and 0 to the Offset for Area 2.

Click Add >>.

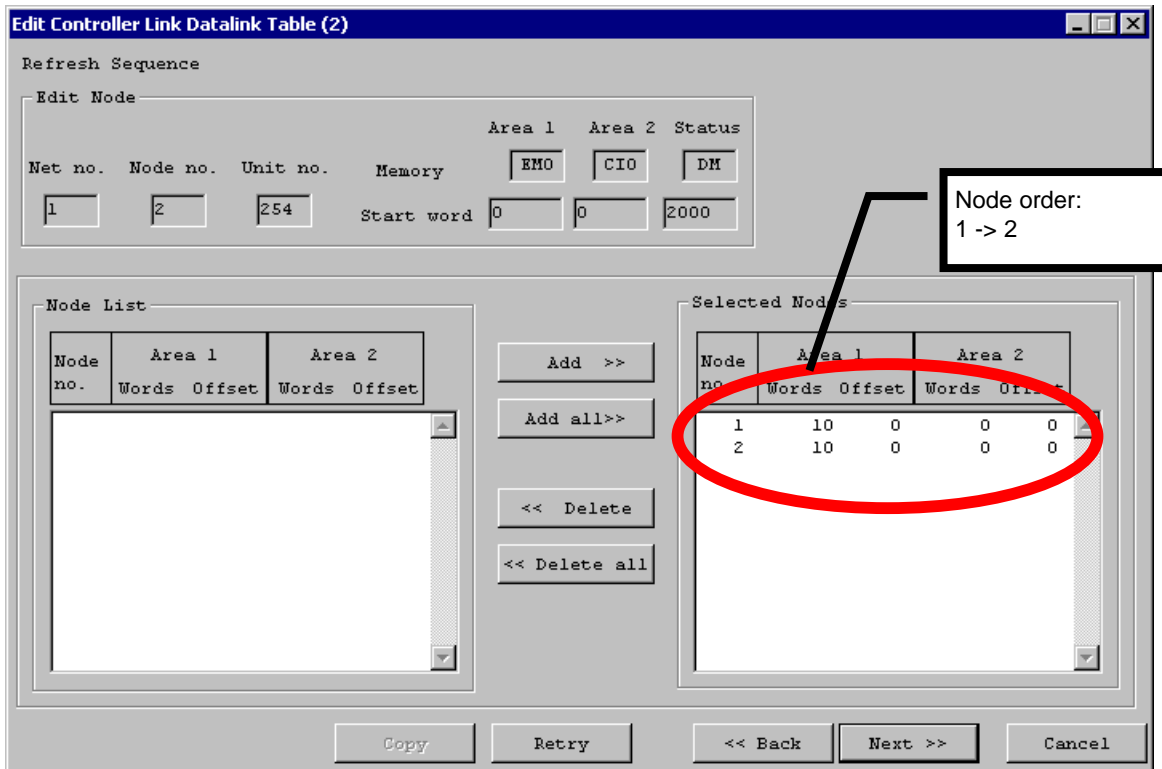Confirm that your data link table is set the same as the one shown below:



Click Next >> to proceed to the next screen.

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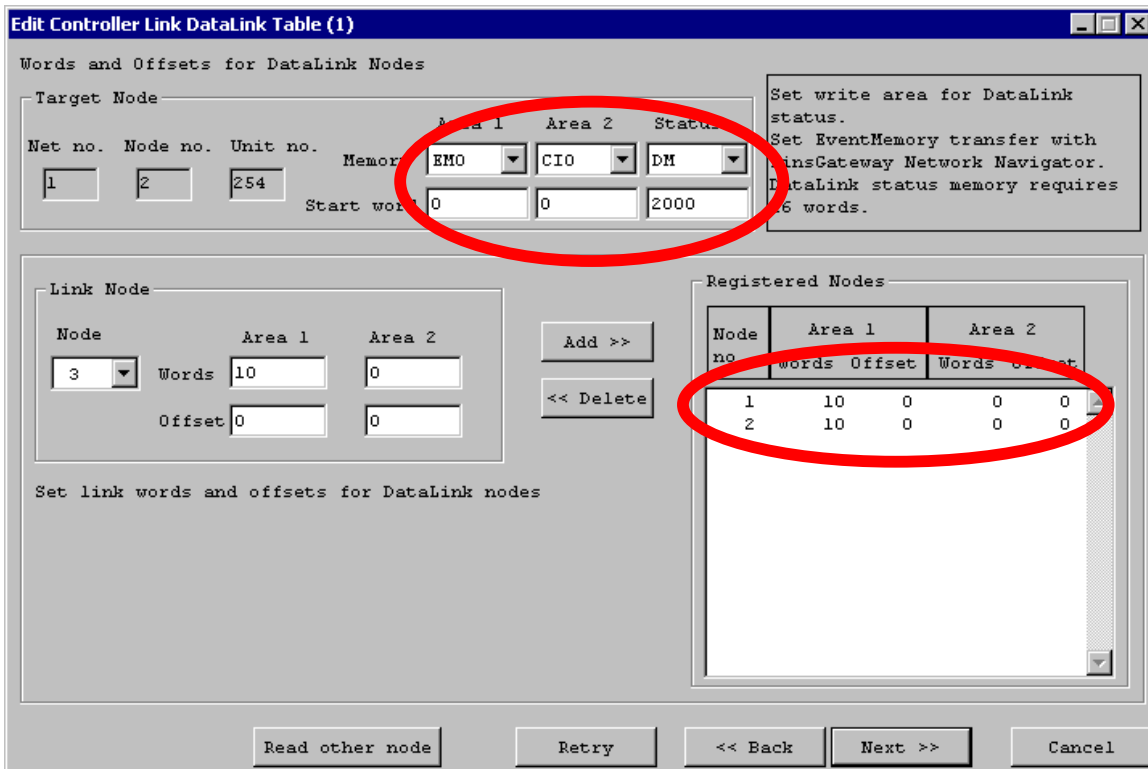
## Node Order Setup

The refresh order of the data link area for this node can be changed here.

In this example, the order needs to be 1 -> 2 from the top. If the order is not 1 -> 2 from the top, change it to 1 -> 2.
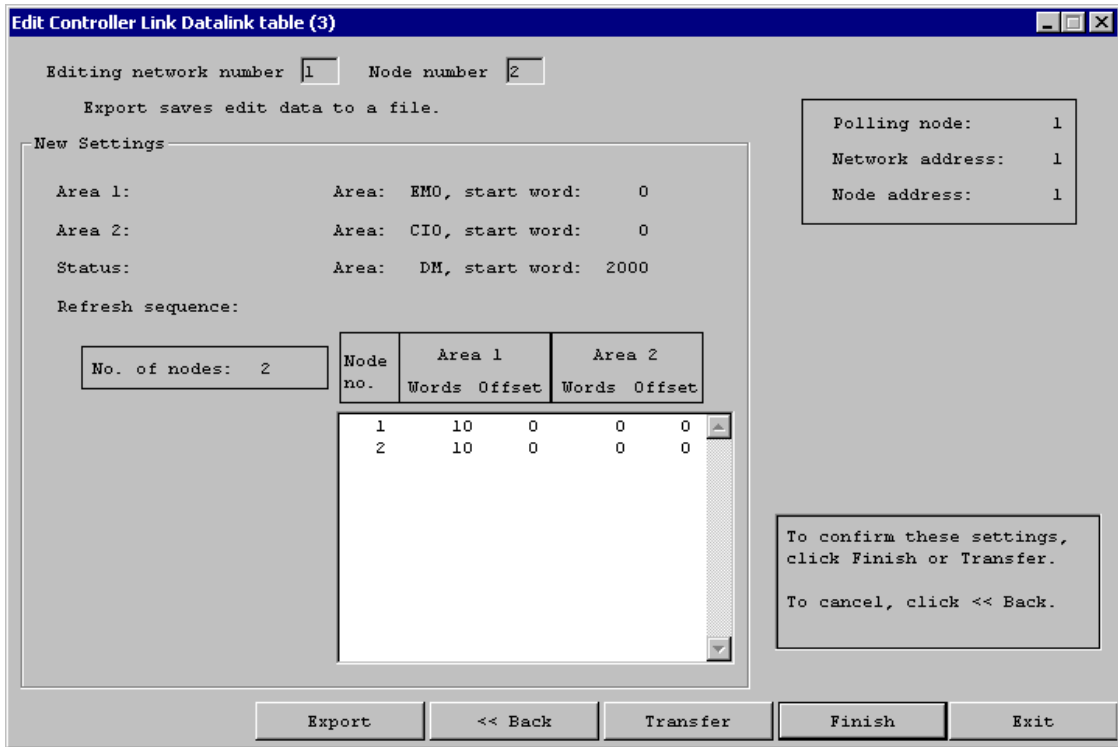


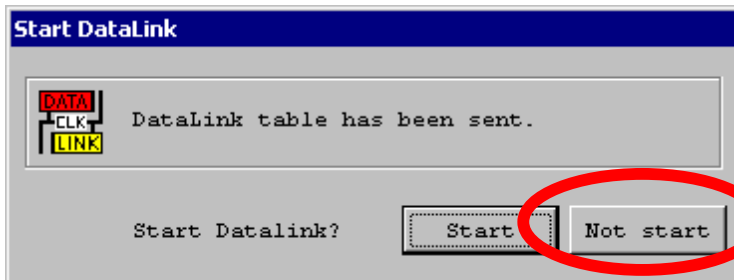Click Next >> to proceed to the next screen.

## Confirmation and Transfer

Confirm that the settings are displayed as follows and click Finish.

If the settings for all nodes are same, click Table Transfer to set the settings to all the nodes.



## Data Link Startup Dialog

The following dialog will be displayed asking whether to start the data link:



Select Not start, because the settings for nodes 3 and 4 are not done.

Click Back enough times to return to the initial screen.

## 7.7    Setting Up Node 3

Select Other node, and specify node 3 from the Node number list.

**Note:**        If node 3 is not correctly connected to the network, it will not be in the list. Be sure that all the nodes are correctly connected to the network and ready for communications.
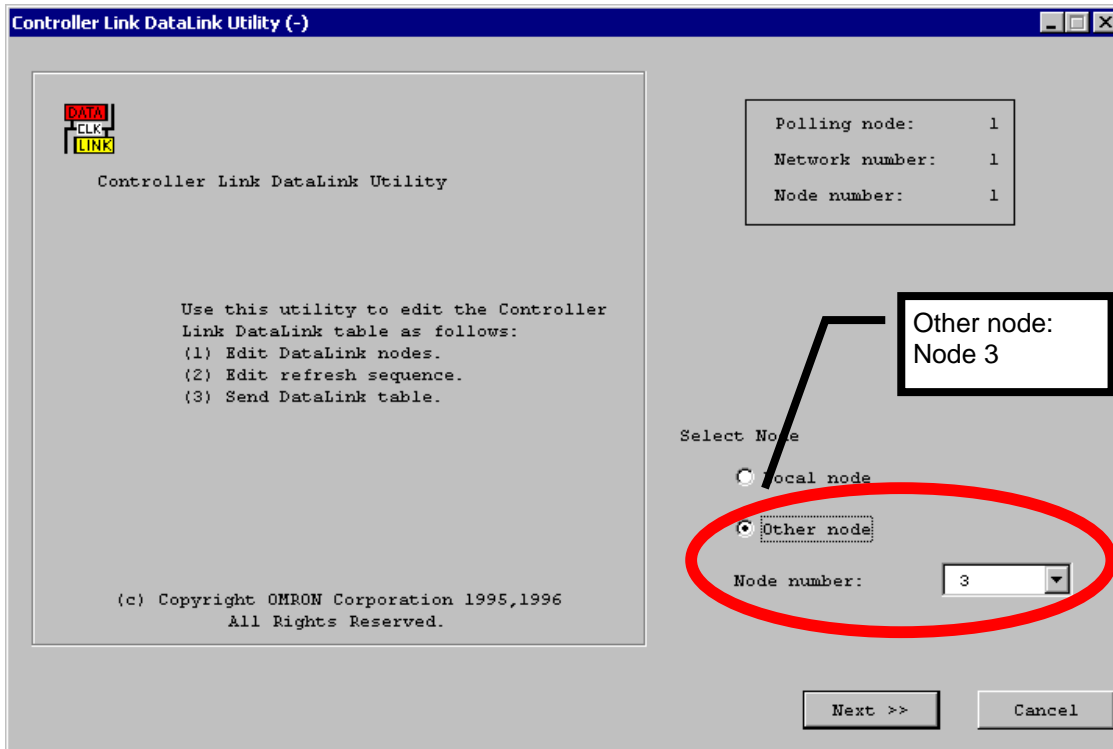


Click Next >> to proceed to the next screen.

## Specify the Data Area and Start Word for Areas 1 and 2

Set EM to Memory and 50 to the Start word of Area 1.

In this example, Area 2 will not be used. Therefore the settings for Area 2 can be anything. Set CIO to Memory and 0 to the Start word for Area 2.

## Specify the Data Area and Start Word for the Status Data

Set DM to Memory and 2000 to the Start word.

## Set the Participating Nodes

Node 3 handles the data of nodes 1 and 3 only. Therefore, nodes 1 and 3 will be added to the table. Nodes 2 and 4 will not be added.

Select node 1.

Set 10 to Words and 10 to the Offset for Area 1, and 0 to Words and 0 to the Offset for Area 2. The data that node 3 will receive from node 1 is just one part of the total data that node 1 writes. Node 1 writes 30 words of data starting from DM 0. However, the data received by node 3 will only be the second 10 words. Therefore, the Offset is set to 10 and Words is set to 10.
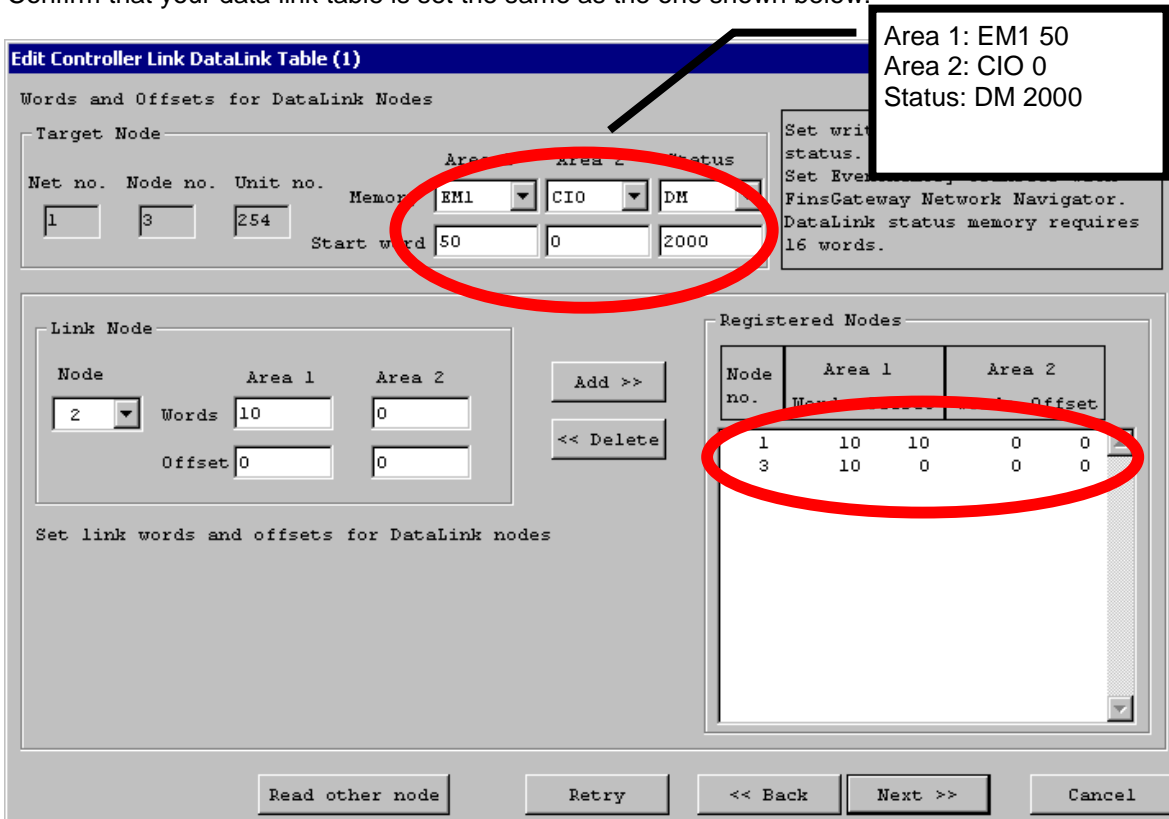
Click Add >>.

Now, select node 3.

Set 10 to Words and 0 to the Offset for Area 1, and 0 to Words and 0 to the Offset for Area 2.

Click Add >>.

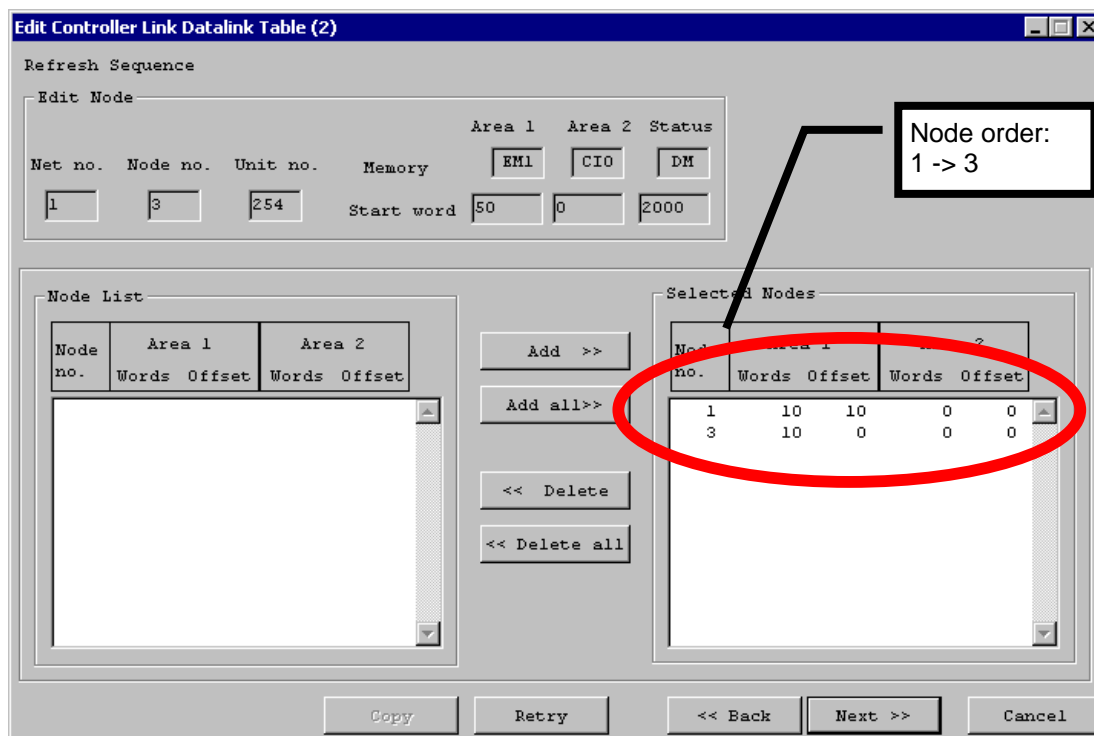Confirm that your data link table is set the same as the one shown below:



Click Next >> to proceed to the next screen.

## Node Order Setup

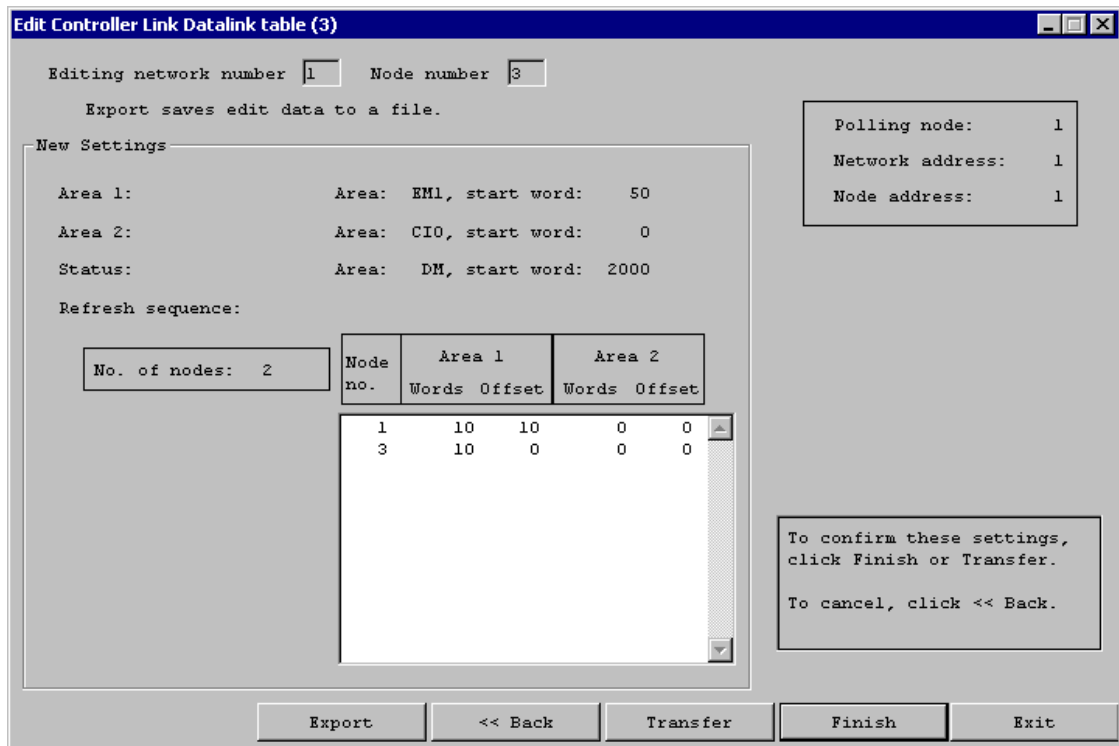The refresh order of the data link area for this node can be changed here.

In this example, the order needs to be 1 -> 3 from the top. If the order is not 1 -> 3 from the top, change it to 1 -> 3.



Click Next >> to proceed to the next screen.

## Confirmation and Transfer

Confirm that the settings are displayed as follows and click Finish.



## Data Link Startup Dialog

The following dialog will be displayed asking whether to start the data link:



Select Not start, because the settings for node 4 are not done.

Click Back enough times to return to the initial screen.

## 8.8    Setting Up Node 4

Select Other node, and specify node 4 from the Node number list.

**Note:**          If node 4 is not correctly connected to the network, it will not be in the list. Be sure that all the nodes are correctly connected to the network and ready for communications.
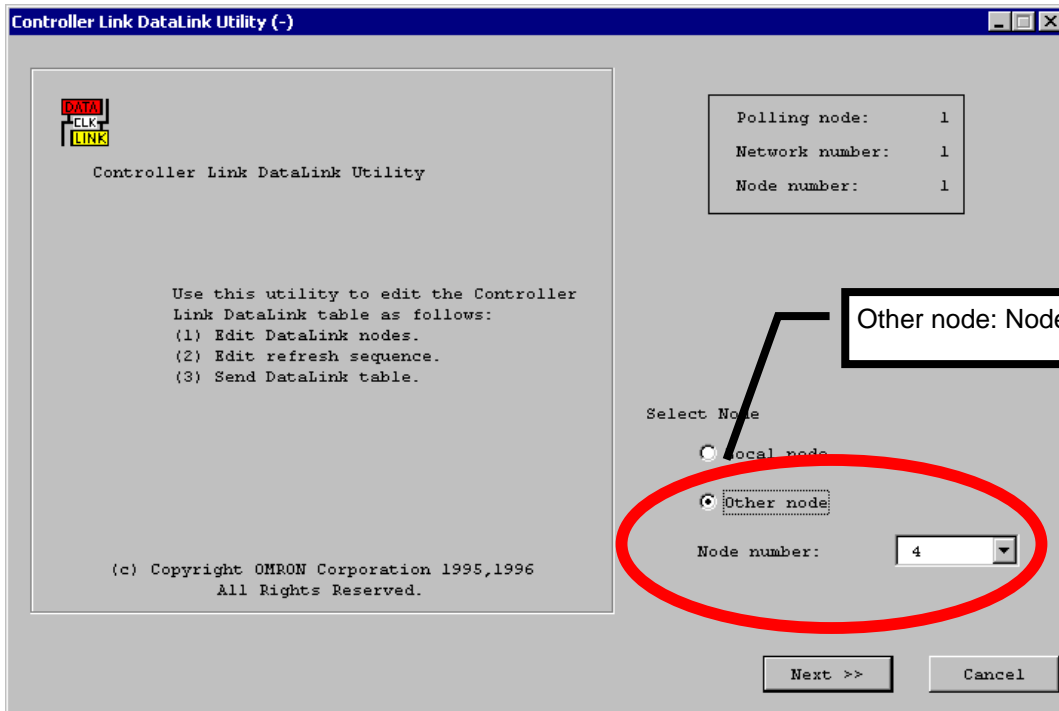


Click Next >> to proceed to the next screen.

## Specify the Data Area and Start Word for Areas 1 and 2

Set DM to Memory and 100 to the Start word of Area 1.

In this example, Area 2 will not be used. Therefore the settings for Area 2 can be anything. Set CIO to Memory and 0 to the Start word for Area 2.

## Specify the Data Area and Start Word for the Status Data

Set DM to Memory and 2000 to the Start word.

## Set the Participating Nodes

Node 4 handles the data of nodes 1 and 4 only. Therefore, nodes 1 and 4 will be added to the table. Nodes 2 and 3 will not be added.

Select node 1.

Set 10 to Words and 20 to the Offset for Area 1, and 0 to Words and 0 to the Offset for Area 2. The data that node 3 will receive from node 1 is just one part of the total data that node 1 writes. Node 1 writes 30 words of data starting from DM 0. However, the data received by node 3 will only be the last 10 words. Therefore, the Offset is set to 20 and Words is set to 10.
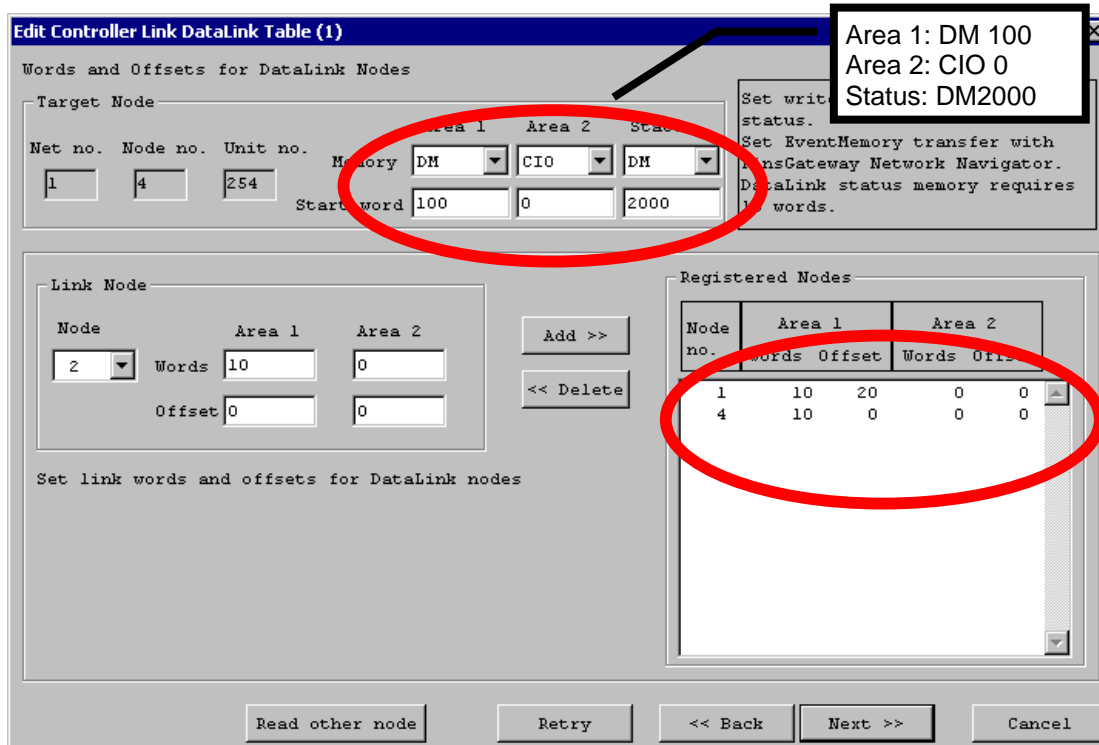
Click Add >>.

Now, select node 4.

Set 10 to Words and 0 to the Offset for Area 1, and 0 to Words and 0 to the Offset for Area 2.

Click Add >>.

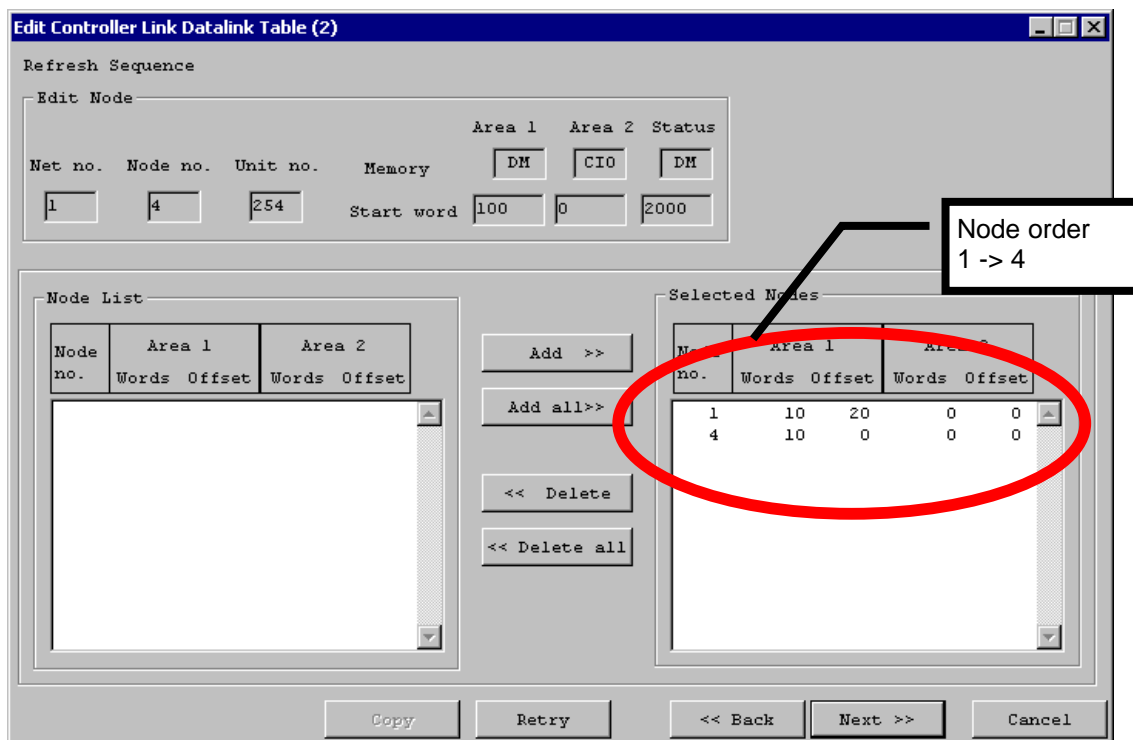Confirm that your data link table is set the same as the one shown below:



Click Next >> to proceed to the next screen.

## Node Order Setup

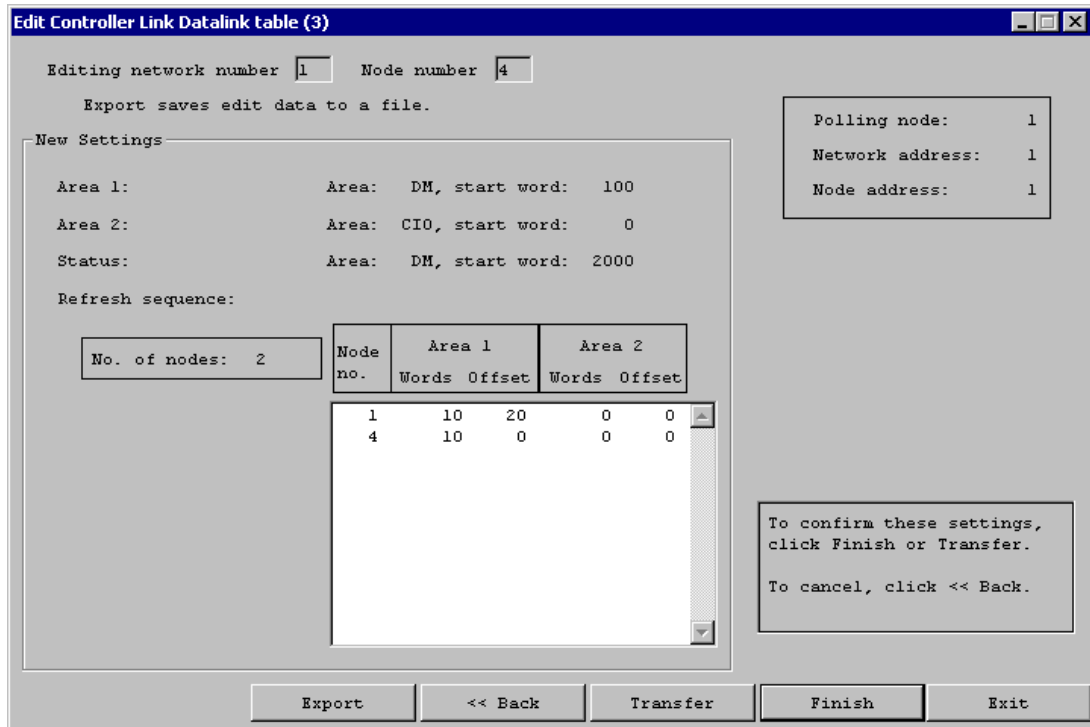The refresh order of the data link area for this node can be changed here.

In this example, the order needs to be 1 -> 4 from the top. If the order is not 1 -> 4 from the top, change it to 1 -> 4.



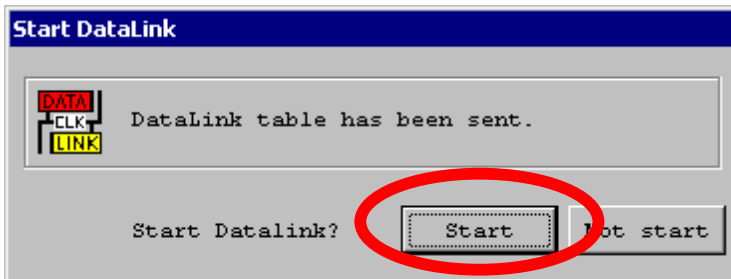Click Next >> to proceed to the next screen.

## Confirmation and Transfer

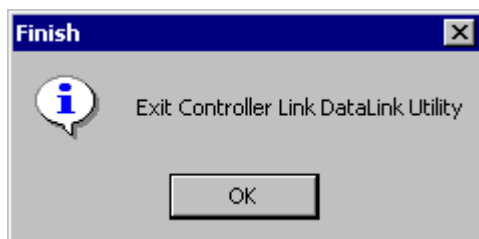Confirm that the settings are displayed as follows and click Finish.



## Data Link Startup Dialog

The following dialog will be displayed asking whether to start the data link:



Select Start, because the settings for all the nodes are now complete.

If the data link is successfully started, the Data Link Setting Utility exits with the following confirmation dialog:
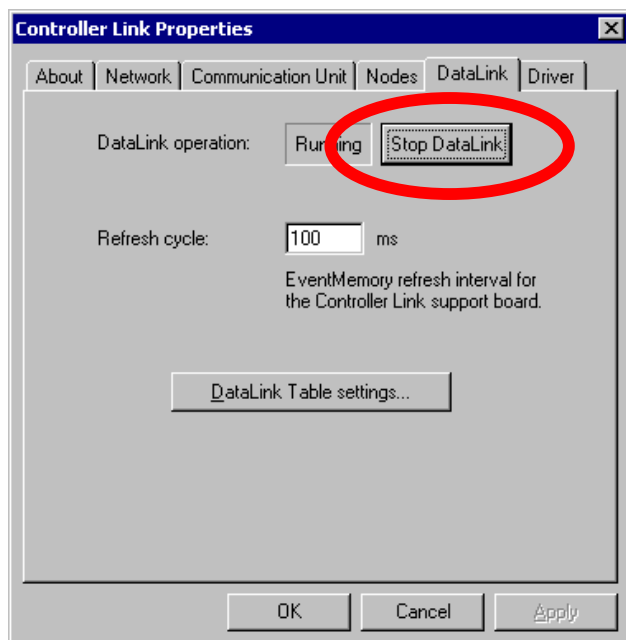


Confirm that the data link is operating properly by referring to the Checking Data Link section of the Controller Link Data Link Setup Guide - Basic.

## 8.9        Starting/Stopping Data Link

The data link can be started or stopped at any time.

Click the Data Link tab in the Controller Link Properties dialog.



Clicking Run Data Link starts the data link, and clicking Stop Data Link stops the data link.