FF Link/B

Connection via ControlNet Router
Technical Application Note

A-FFL/B
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CONTENTS

aparian

1 PREFACE

1.1 PURPOSE OF THIS DOCUMENT

This document will assist the user to configure a Logix connection to an FF Link via a ControlNet Router.

1.2 ADDITIONAL INFORMATION

The following resources contain additional information that can assist the user with the module installation and operation.

Resource	Link
Slate Installation	http://www.aparian.com/software/slate
FF Link User Manual FF Link Datasheet Example Code & UDTs	https://www.aparian.com/products/ff-link-b
ControlNet Router User Manual ControlNet Router Datasheet Example Code & UDTs	http://www.aparian.com/products/controlnetrouter
ControlNet	http://www.odva.org
ControlNet Cabling	ControlNet Coax Media Planning and Installation Guide https://literature.rockwellautomation.com/idc/groups/literature/documents/in/cnet-in002_-en-p.pdf

1.3 SUPPORT

Technical support will be provided via the Web (in the form of user manuals, FAQ, datasheets etc.) to assist with installation, operation, and diagnostics.

For additional support the user can use either of the following:

Resource	Link
Contact us web link	www.aparian.com/contact-us
Support email	support@aparian.com

2 INTRODUCTION

The FF Link provides an interface between FOUNDATION™ Fieldbus (FF) H1 devices and EtherNet/IP or Modbus TCP.

By using the Aparian ControlNet Router, the FF Link can be effectively connected on an existing ControlNet network.
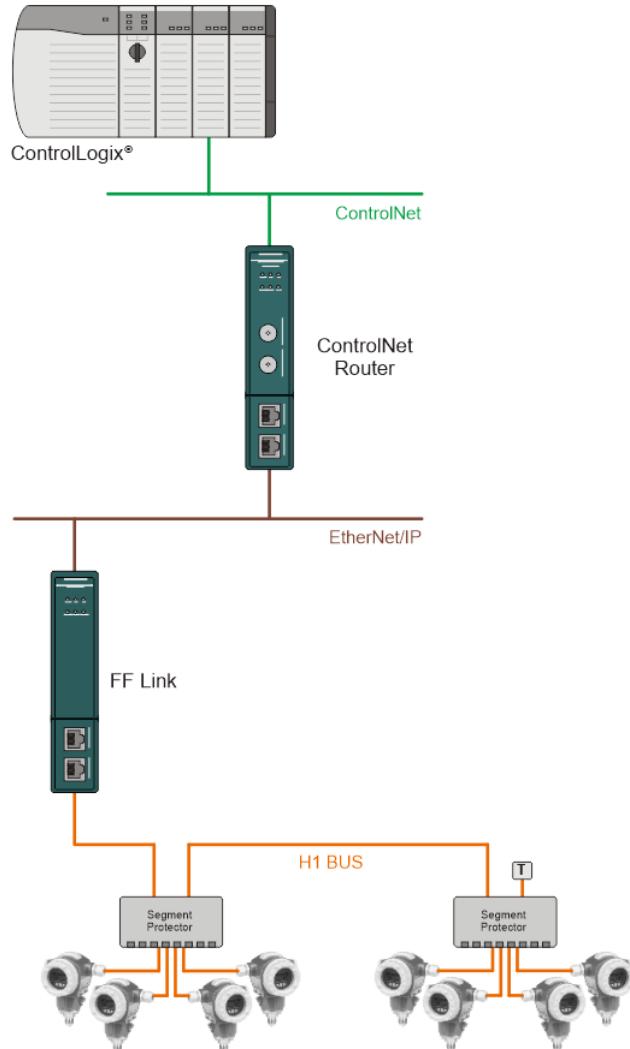

Figure 2.1 – FF Link connection via a ControlNet Router

3 CONFIGURATION

3.1 FF LINK CONFIGURATION

The FF Link would be configured as normal, with an EtherNet/IP Primary Interface, and its *Logix Profile* set to *ControlNet Router (A-CNR)*.
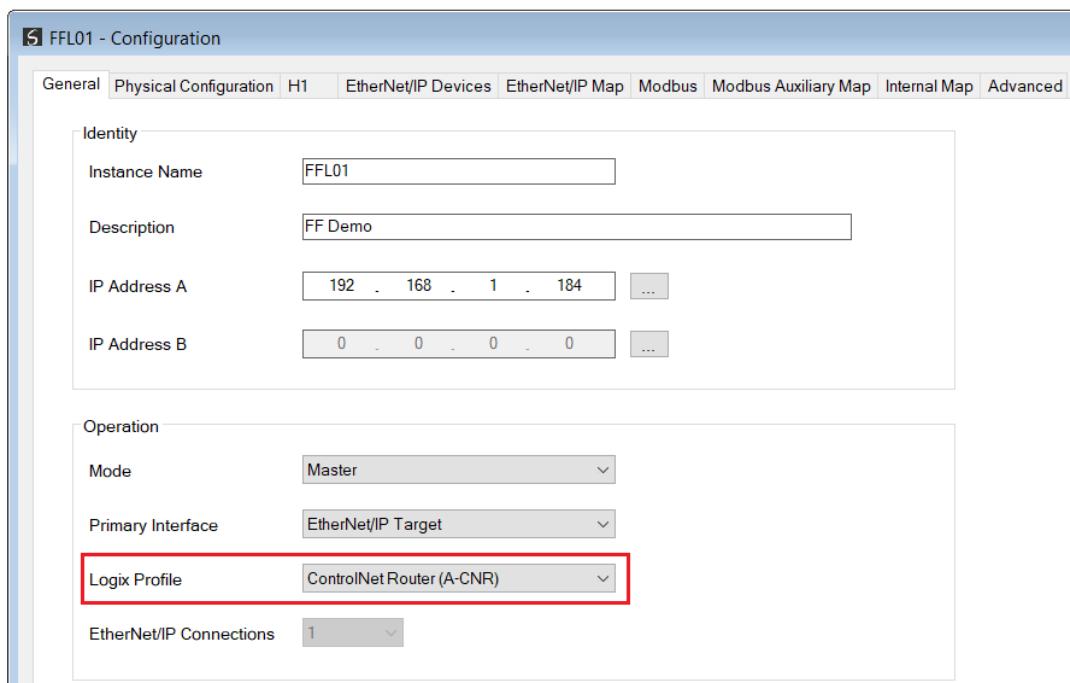
Figure 3.1 – FF Link configuration – General tab

The *Logix Profile* parameter is used when generating the Logix L5X mapping code.

⚠️ **NOTE:** When using the ControlNet Router option only a **single** connection is supported, limiting the total H1 data that can be exchanged.

The configuration can now be accepted by clicking on the *Ok* button.

Download the configuration to the FF Link module.

3.2 CONTROLNET ROUTER CONFIGURATION

The FF Link requires the ControlNet Router to be configured in a specific way, including the EtherNet/IP Originator connection to the FF Link.

To simplify the ControlNet Router configuration, a pre-configured device export file:
ControlNetRouter - FFLink Bridge Example.spx
can be imported into the FF Link's Slate project.

In Slate, right-click on the project and select the ***Import*** option.
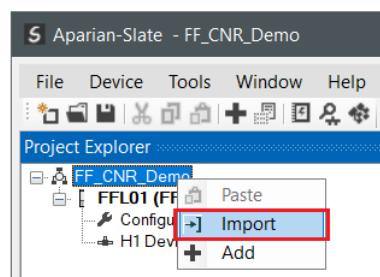
Figure 3.2 – Import ControlNet Router configuration

In the file browser, select the file (downloaded form the Aparian website):
ControlNetRouter - FFLink Bridge Example.spx

The pre-configured ControlNet Router instance will be added to the project.
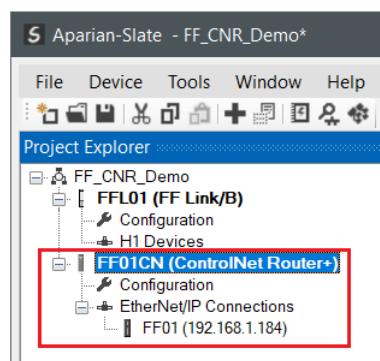
Figure 3.3 – ControlNet Router Imported

The configuration of the ControlNet Router will now need to be modified to suite the specific application.

In the ***General*** configuration tab, modify the ***IP Address***. Note that this IP address must be on the same subnet has the previously configured FF Link.
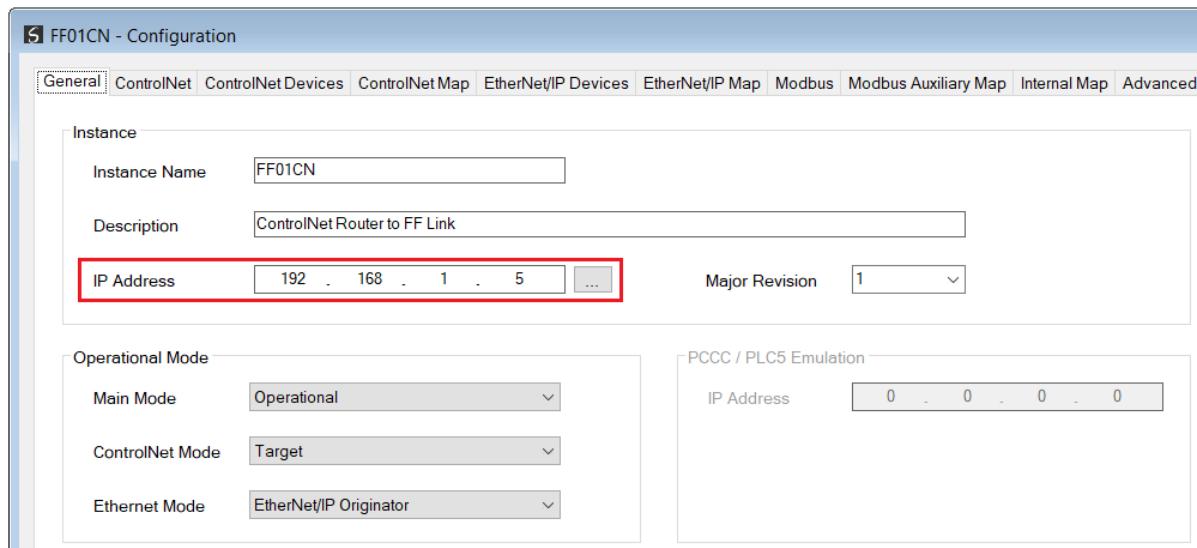
Figure 3.4 – ControlNet Router configuration – General tab

In the ControlNet tab, adjust the *ControlNet Channel* configuration and the ControlNet *Node Address*.
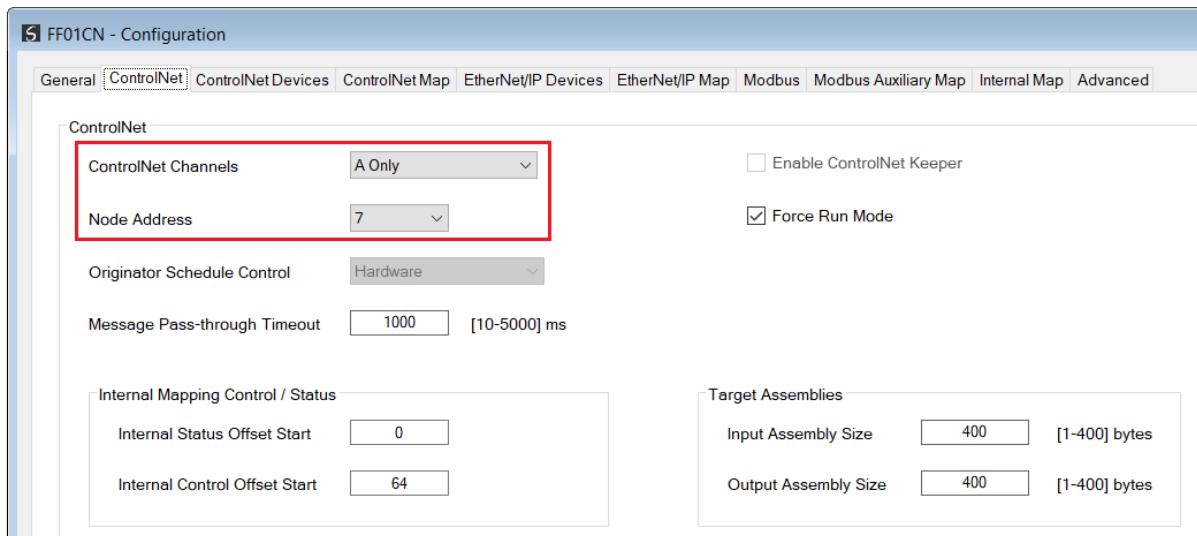
Figure 3.5 – ControlNet Router configuration – ControlNet tab

The *Internal Map* tab shows the required mapping items, which includes the mapping between the EtherNet/IP (FF Link) and the ControlNet Target assemblies. It also includes the mapping of the connection failure status word (Internal:100).

Figure 3.6 – ControlNet Router configuration – Internal Map tab

NOTE: Do not modify these mapping items.

The ControlNet Router configuration form can then be accepted by clicking the *Ok* button.

To modify the connection parameters to FF Link, double-click on the "FF01" connection, or right-click on it and select the *Configuration* option.
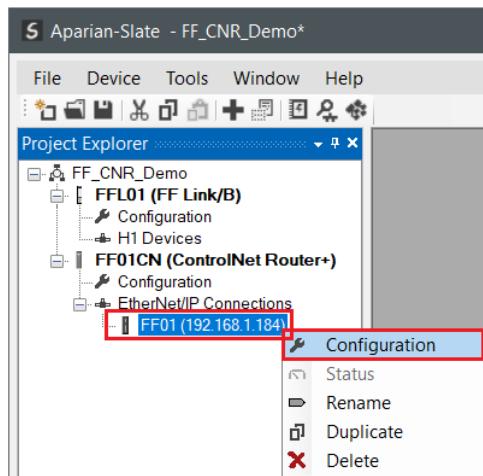

Figure 3.7 – EtherNet/IP Connection configuration

Update the *Path* to the IP Address assigned to the FF Link (section 3.1.).
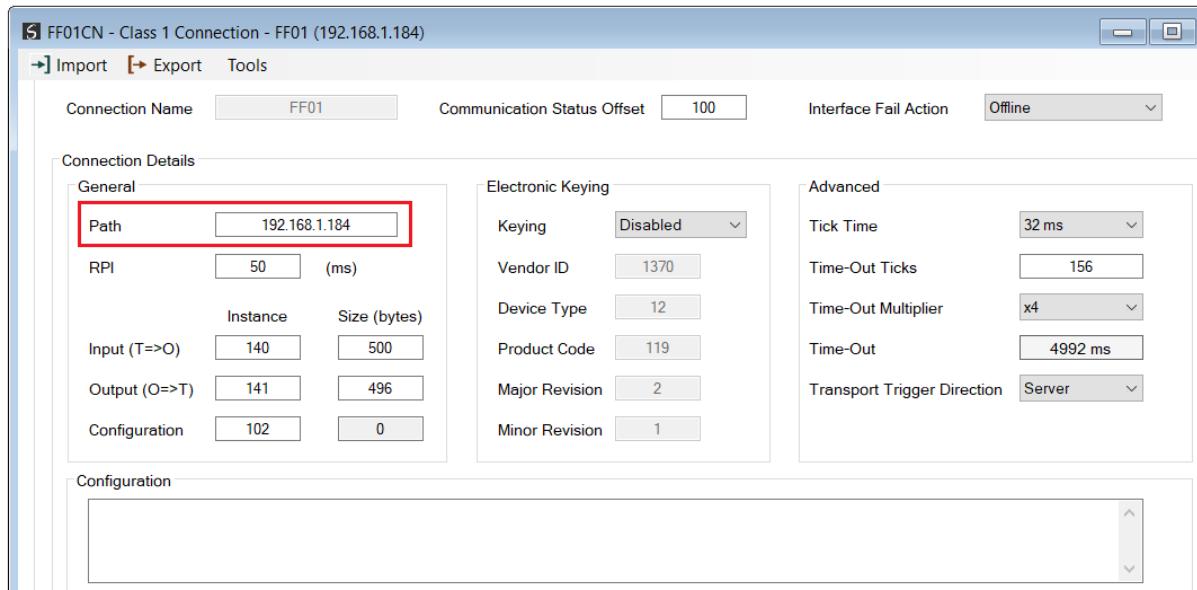
Figure 3.8 – EtherNet/IP Class 1 Conneciton parameters

The **RPI** can be adjusted if required.

NOTE: Do not modify any other parameters.

Press the **Ok** button to accept the configuration.

Download the configuration to the ControlNet Router.

3.3 LOGIX CONFIGURATION

3.3.1 ADDING THE CONTROLNET ROUTER TO THE IO TREE

The ControlNet Router can be added to the Logix 5000 I/O tree under a ControlNet bridge (e.g. 1756-CNB). The module will need to be added as a generic ControlNet module. This is done by right clicking on the ControlNet Bridge in the Logix 5000 and selecting *New Module* after which the *CONTROLNET-MODULE* is selected to be added as shown in the figure below.
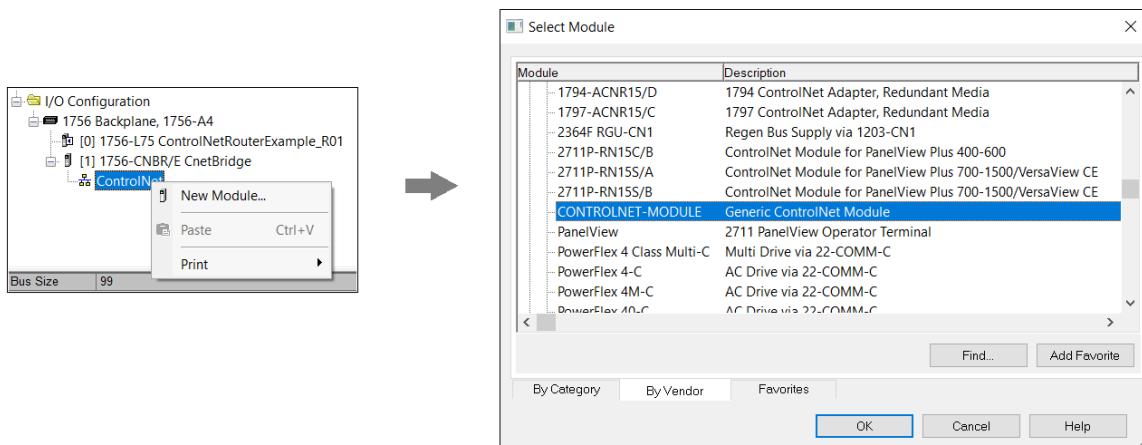

Figure 3.9 – Adding ControlNet Router – Generic profile

The **Name** of the added module must match the ***Instance Name*** configured in Slate for the FF Link module.
That is, it must be the **FF Link** name, not the **ControlNet Router** name.

The ControlNet ***Node*** must match that configured in Slate for the ControlNet Router.

The Connection Parameters must be as follows:

Connection Parameter	Assembly Instance	Size
Input	130	408
Output	131	404
Configuration	102	0

Table 3.1. – ControlNet Router (ControlNet) Connection Parameters
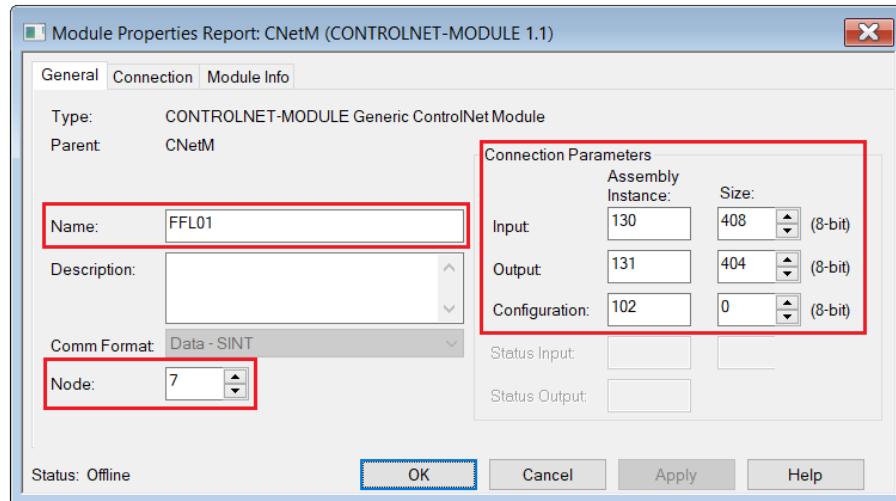
Figure 3.10 – ControlNet Router configuration - General

In the **Connection** tab, adjust the **RPI** as required, typically 50ms.
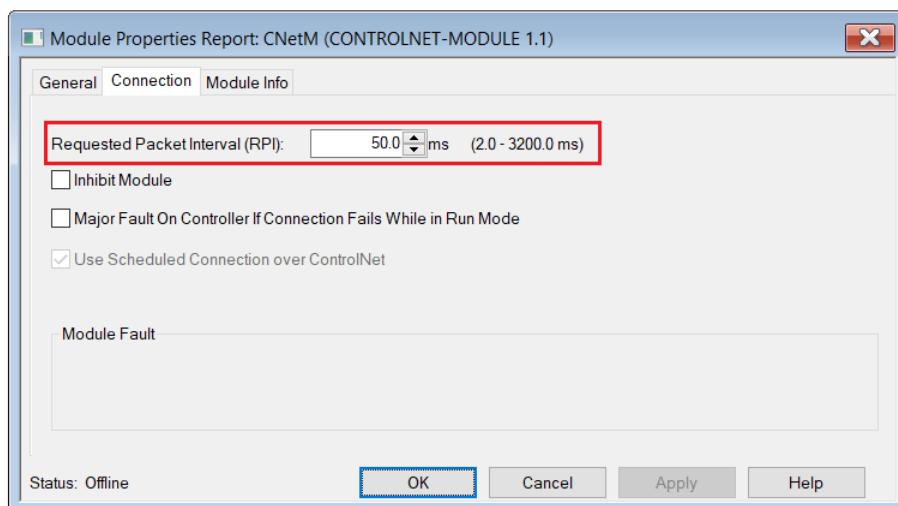
Figure 3.11 – ControlNet Router configuration - Connection

3.3.2   IMPORT FF LINK MAPPING

Slate will generate the required UDTs and Routines (based on the FF Link configuration) to map the required H1 device input and output data.

This mapping will be specifically modified to suit the ControlNet Router.

In Slate, right-click on the FF Link module and select the **Generate Logix L5X** option.
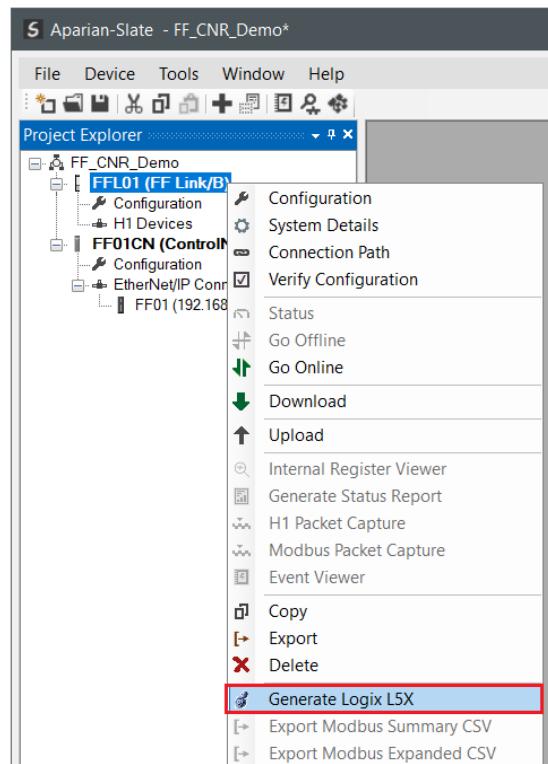
Figure 3.12 – FF Link – Generate Logix L5X

Select a suitable file name and path for the L5X file.

This L5X file can now be imported into the Studio 5000 project by right-clicking on a suitable **Program** and selecting **Add**, and then **Import Routine**.
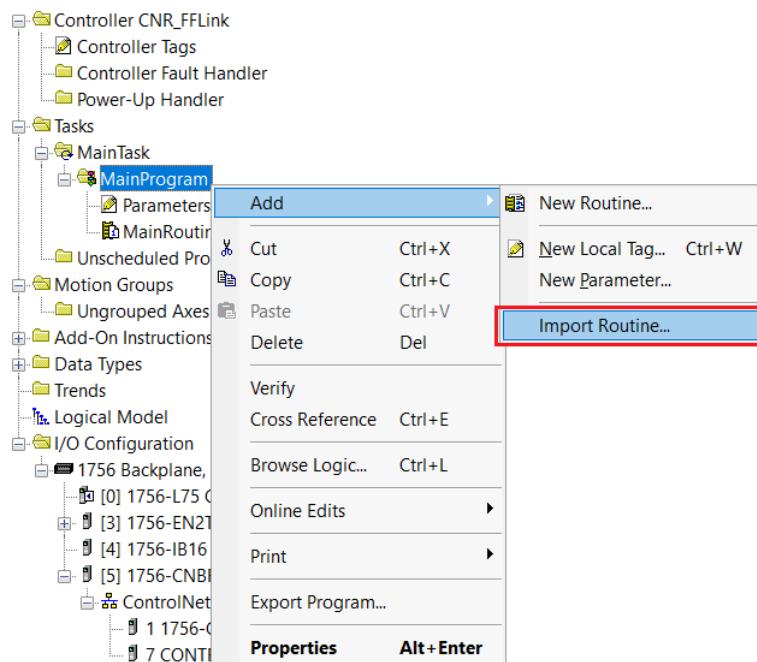

Figure 3.13 – Studio5000 – Import Routine

3.3.3 DOWNLOAD TO LOGIX

Once the configuration is complete, the Studio5000 configuration can be downloaded to the Logix controller.

At this point, it may be beneficial to leave the Logix controller in *Program* mode to facilitate the ControlNet scheduling in RSNetworx for ControlNet.

3.3.4 SCHEDULE CONTROLNET

The ControlNet network will then need to be scheduled using RSNetworx for ControlNet, as normal.

In the *Network Parameters*, make sure that the *Max. Scheduled Address* and *Max. Unscheduled Address* are such to include the assigned ControlNet Router's Node Address.
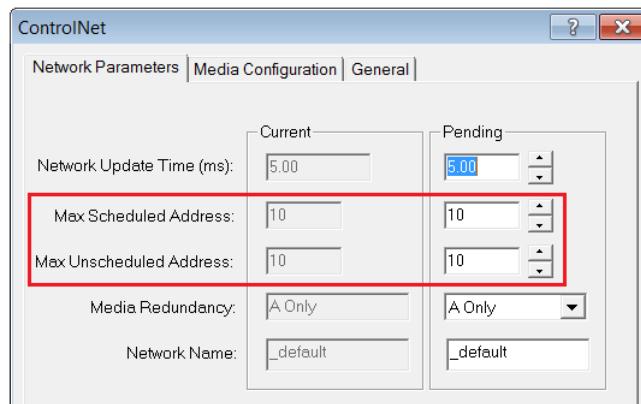
Figure 3.14 – RSNetworx – Network Parameters