



## Technical Note

# **Configuring Scheduled Sends & Receives with a ControlLogix PLC Using RSNetworx**

Edition: 1.1

Document #: 760-0040



**Edition:** 1.1

**Date:** May 28, 2004

**This document applies to the ControlNet family of interface cards.**

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# Configuring Scheduled Sends & Receives with a ControlLogix PLC Using RSNetworkx

## Topic overview

Before SST ControlNet cards can be used to scan I/O or exchange data with PLCs using scheduled messaging, the network parameters and I/O configurations must be configured and downloaded to the ControlNet devices. The RSNetWorx® tool from Rockwell Software® can be used to build the network configuration for SST ControlNet cards and Allen-Bradley® ControlNet devices and download the configuration to the network.

The CN Node Diagnostics utility (*Start/Programs/SST CN/CN Node Diagnostics*) is useful for monitoring and verifying scheduled connections. For more information on using the utility, refer to the *SstCn\_SchdTroubleshoot.pdf* technical note on the installation CD.

## About this Technical Note

This technical note describes the steps in using RSNetworkx to configure an SST ControlNet card to exchange data with a ControlLogix PLC, using scheduled sends and receives. It also explains the steps required to configure the ControlLogix PLC in RSLogix5000.

## This Technical Note assumes that:

The user is familiar with constructing a ControlNet network, familiar with programming Allen-Bradley ControlLogix PLCs with RSLogix5000 and familiar with using the RSNetworkx configuration tool

The SST ControlNet card has a firmware/flash module version minimum of 1.49.13. The firmware/flash module can be updated using the *CN Card Utilities* utility (*Start/Program Files/SST CN/CN Card Utilities*) in the Windows environment. Please consult the card's User Guide, or Technical Support, for more information on how to upgrade the firmware/flash in non-Windows environments.



## Hardware used

<input checked="" type="checkbox"/> Interface card	SST 5136-CN-ISA, 5136-CN-104, 5136-CN-PCI or 5136-CN-VME
<input checked="" type="checkbox"/> Physical I/O	Allen-Bradley ControlLogix processor and ControlNet bridge module

## Software used

<input checked="" type="checkbox"/> Operating system	Windows NT 4.0/2000
<input checked="" type="checkbox"/> Any other software required (network configuration software)	RSNetWorx to configure and schedule the network. Version 3.23.0 (Build 11) was used in this technical noteRSLogix5000 to program the ControlLogix PLC. Version 11.11.00 was used in this technical noteRSLinx to communicate with the PLCEDS files for SST CN cards with major revision 2 and minor revision 1

## Recommended reading

- Shared RAM Application Interface for 5136-CN cards – SstCn\_SharedRamAPI.pdf
- Relevant User's Guide for each SST ControlNet card



## **Procedure 1: Prepare RSNetworkx to configure SST cards**

1. Register the new eds files in RSNetworkx by using the EDS Wizard. The new eds filenames are 0008000Cxxxx0201.eds, where xxxx is 0001 for the ISA card, 0008 for the PC/104 card, 000B for the VME card and 017B for the PCI card. This is required to allow RSNetworkx to configure the SST cards with the *Scanlist Configuration* tool.

The EDS Wizard can be started by selecting *Tools* in the menu and then selecting *EDS Wizard...*

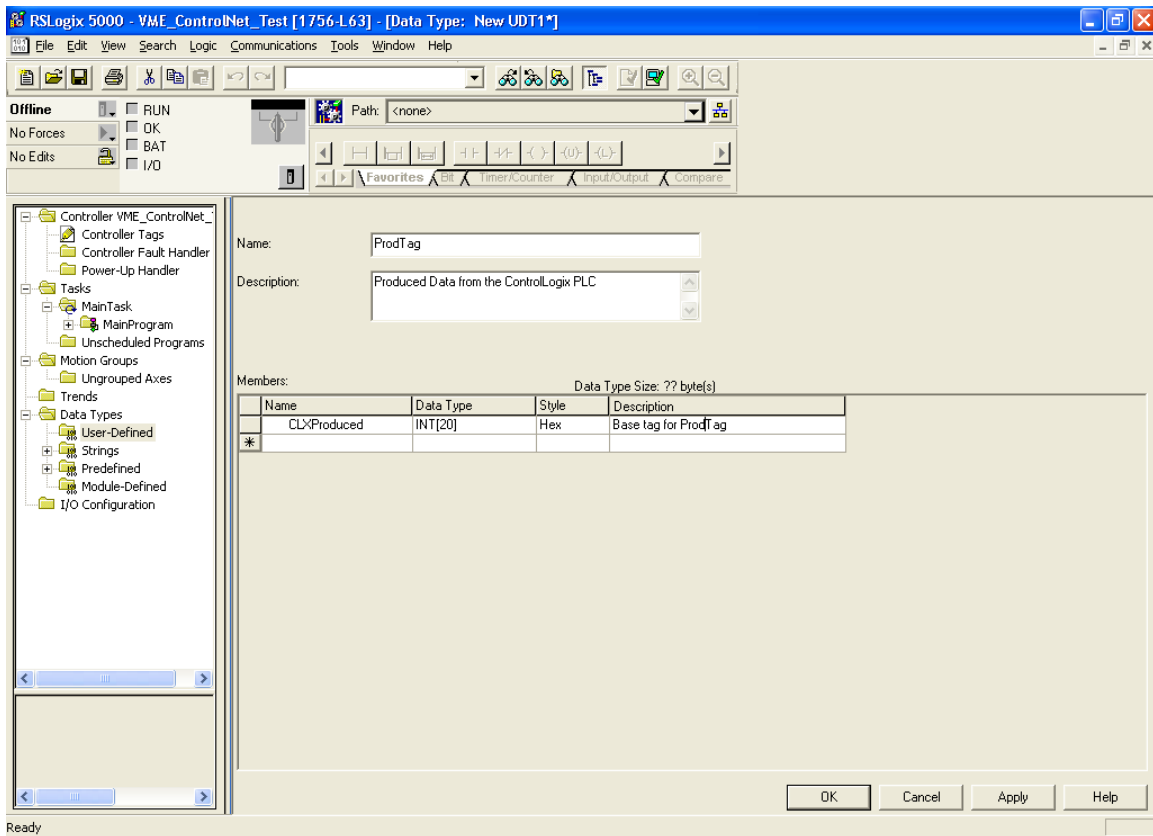
2. Click *Next* after the initial screen appears.
3. Select *Register an EDS file(s)* and click *Next*.
4. Select *Register a directory of EDS files* and click *Browse* to browse to the directory where the eds files were saved. Click *Next* once the directory is located.
5. Ensure all the files are selected and click *Next*.
6. Click *Next* in the *Graphic Image* window to use the default icon, or choose a different icon by clicking *Change Icon...* Click *Next*.
7. Click *Next* in the *Final Task Summary* window.
8. Click *Finish* when the *EDS Wizard* completes and restart the computer.

## **Procedure 2: Configuring the Produced and Consumed tags in RSLogix5000 for the ControlLogix PLC**

### **Creating a produced tag (scheduled send) in RSLogix5000**

**NOTE:** You must be offline in RSLogix5000 to complete this procedure.

1. Expand the *Data Types* folder in the tree in the *Controller Organizer* window. Right click on *User-Defined* and select *New Data Type...*
2. In the dialog box that appears, give the new type a Name, for example, ProdTag, and optionally a Description.
3. Create Members for the data type. Give each one a name, data type (INT, BOOL, etc.), style (HEX, etc.); this is how the member is described and displayed. **Note:** members can be arrays; e.g. if a data type is of INT[20], the member is an array of 20 signed integers. The maximum size is 240 words – this is based on the maximum ControlNet frame size.



4. Click *Apply* and RSLogix5000 will display the current size of the structure in bytes.
5. When the desired members have been created click *OK*.
6. Expand the Controller in the tree in the *Controller Organizer* window. Right click on *Controller Tags* and select *Edit Tags*. RSLogix5000 displays a list of the existing controller tags.
7. Right click on an empty entry in the list and select *Edit Tag Properties*.
8. In the dialog box that appears, give the tag a Name and optionally a Description.
9. Select the user defined data type created earlier as the Data Type.
10. The Scope should be Controller.
11. Select the Tag Type to be *Produced*, and enter the number of consumers.

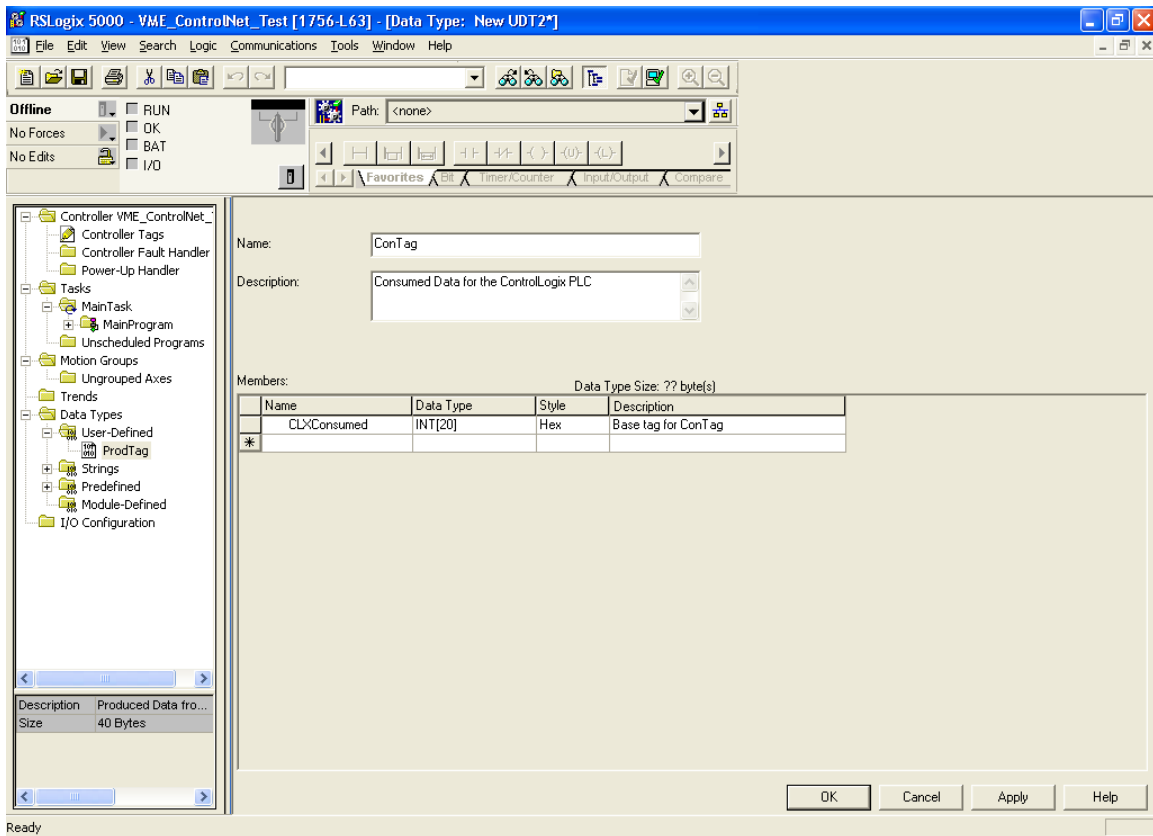


12. Click the *OK* button.
13. Save the program and download it to the processor.

### **Creating a consumed tag (scheduled receive) in RSLogix5000**

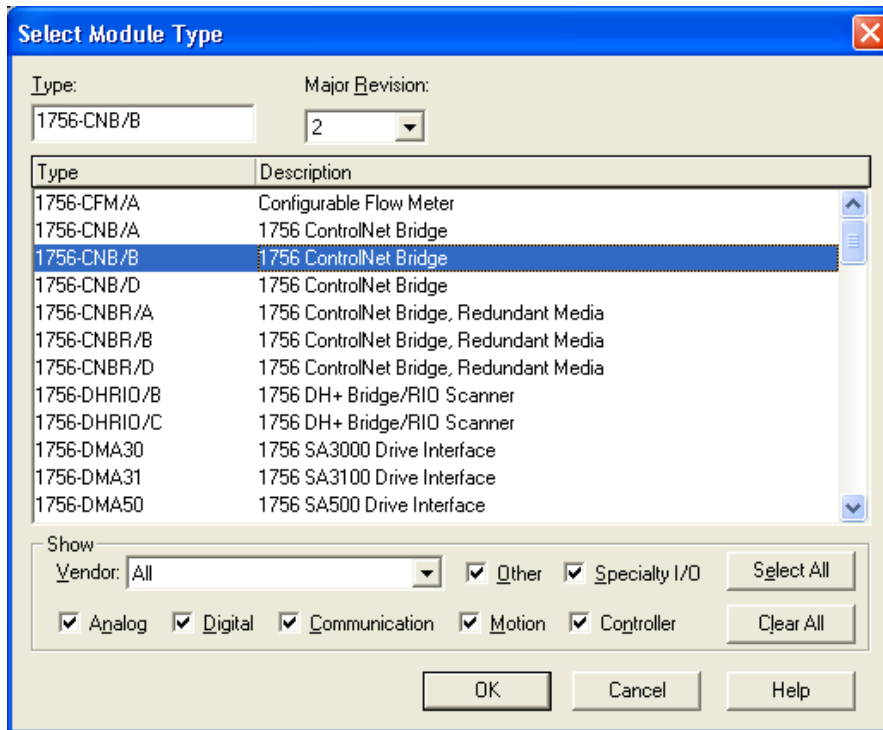
**NOTE:** You must be offline in RSLogix5000 to complete this procedure.

1. Expand the *Data Types* folder in the tree in the *Controller Organizer*. Right click on *User-Defined*, and select *New Data Type...*
2. In the dialog box that appears, give the new data type a Name, for example, ConTag, and optionally a Description.
3. Create Members for the data type. Give each one a name, data type (INT, BOOL, etc.), style (HEX, etc.); this is how the member is described and displayed. **Note:** members can be arrays; e.g. if a data type is of INT[20], the member is an array of 20 integers. The maximum size is 240 words – this is based on the maximum ControlNet frame size.

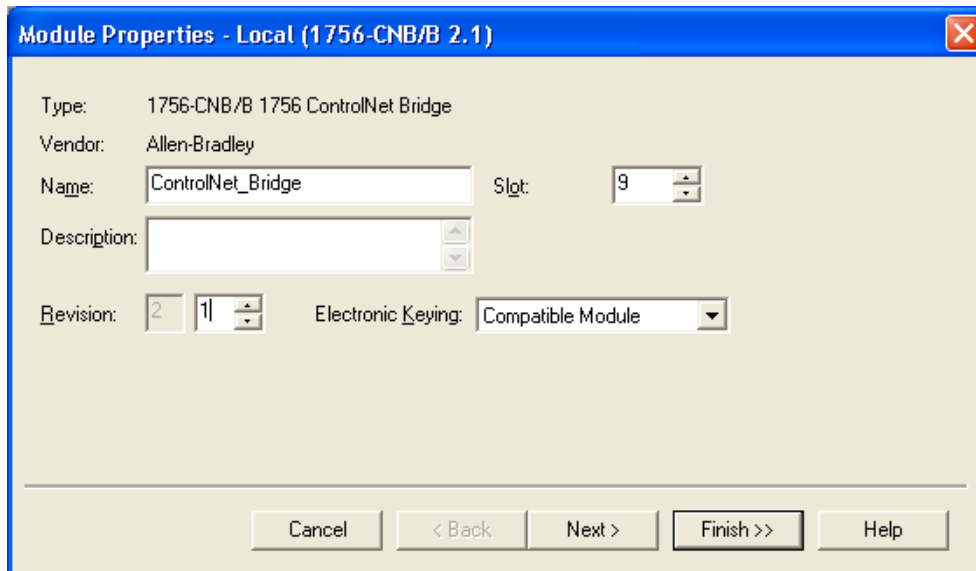


4. Click *Apply* and RSLogix5000 will display the current size of the structure in bytes.
5. When the desired members have been created click *OK*.
6. Right click on *I/O Configuration* in the tree in the *Controller Organizer* window and select *New Module*.
7. Add a ControlNet bridge module (1756-CNB) of the appropriate type (redundant or non-redundant), and revision. Click *OK*.

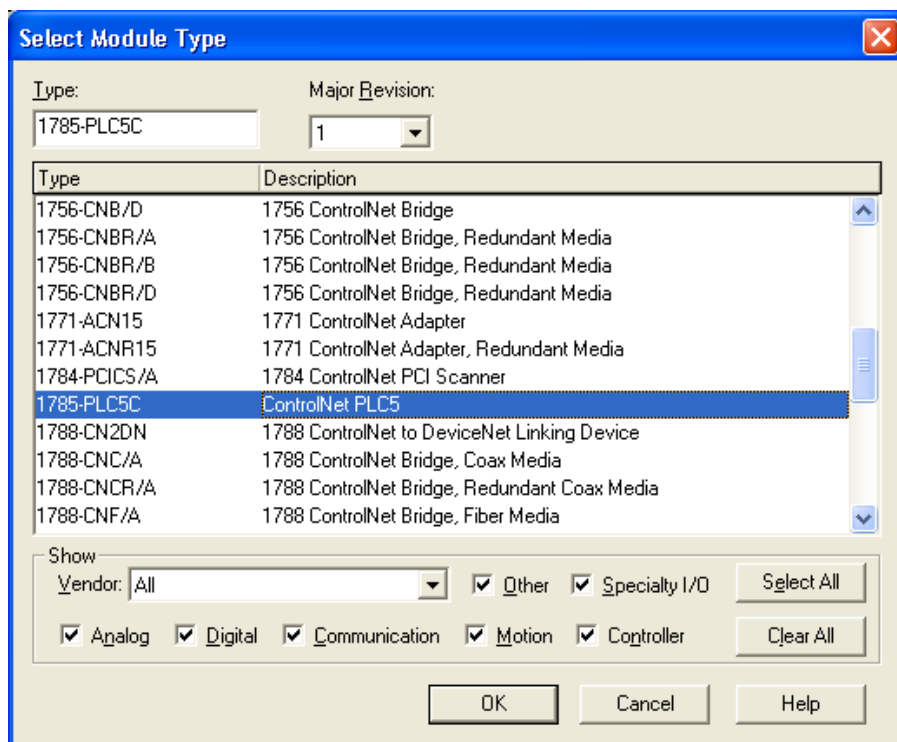




8. In the dialog box that appears, assign a Name, optionally a Description and enter the slot it occupies in the ControlLogix chassis. Click *Finish* to accept the entry.



9. Right click on the bridge module just added and select *New Module*. Highlight the entry for a ControlNet PLC5 – 1785-PLC5C ControlNet PLC5 – and click *OK*.



10. Enter a name in the dialog box that appears.
11. Specify the node number, which is the node number of the SST card that contains the corresponding scheduled send (produced tag).
12. Click *Finish* to accept the new module.
13. Expand the Controller in the tree. Right click on *Controller Tags* and select *Edit Tags*. RSLogix5000 displays a list of the existing controller tags.
14. Right click on an empty entry in the list and select *Edit Tag Properties*.
15. In the dialog box that appears, give the tag a Name and optionally a Description.
16. Select the *Tag Type* to be *Consumed*.
17. In the *Producer* list box, select the name given to the PLC5C type device.
18. The *Remote Instance* should be the Produced Buffer ID that will be assigning the Scheduled send on the card; the default is 1.
19. Select an appropriate RPI for the update time, in ms.
20. Select the user defined data type as the Data Type created earlier.
21. Click the *OK* button.



**New Tag**

Name: Consumed\_by\_ControlLogix

Description: Data consumed by the ControlLogix PLC

Tag Type:  Base  Alias  Produced 1 consumers  Consumed

Producer: SST\_CN\_VME RPI (ms):

Remote Instance: 1 RPI (ms): 5.0

Data Type: ConTag Configure...

Style:

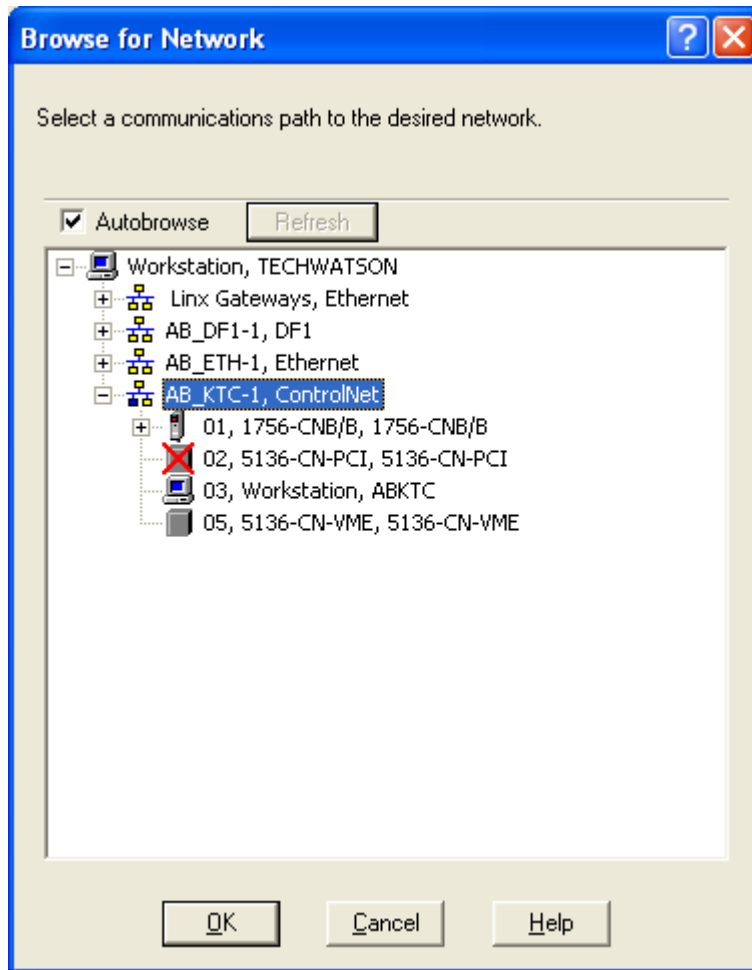
OK Cancel Help

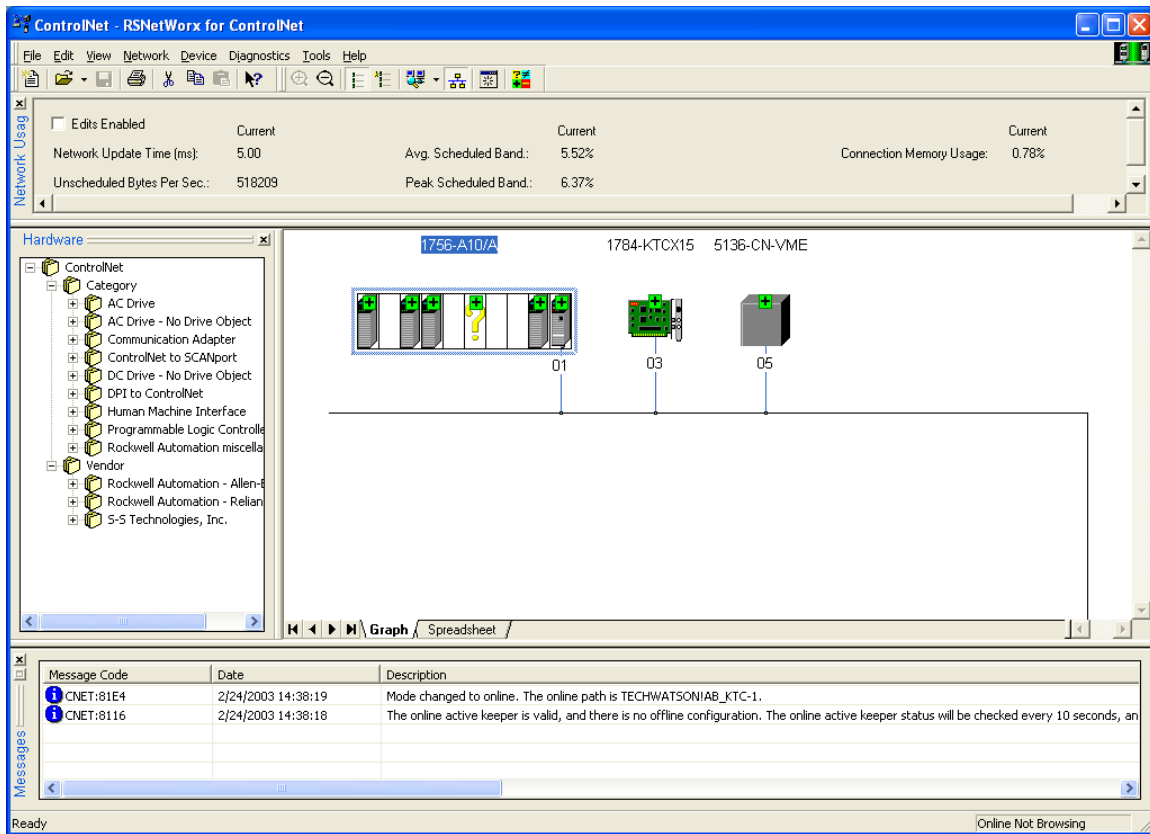
22. Save the program and download it to the processor.

### **Procedure 3: Using RSNetworkx to set up the corresponding produced and/or consumed connections**

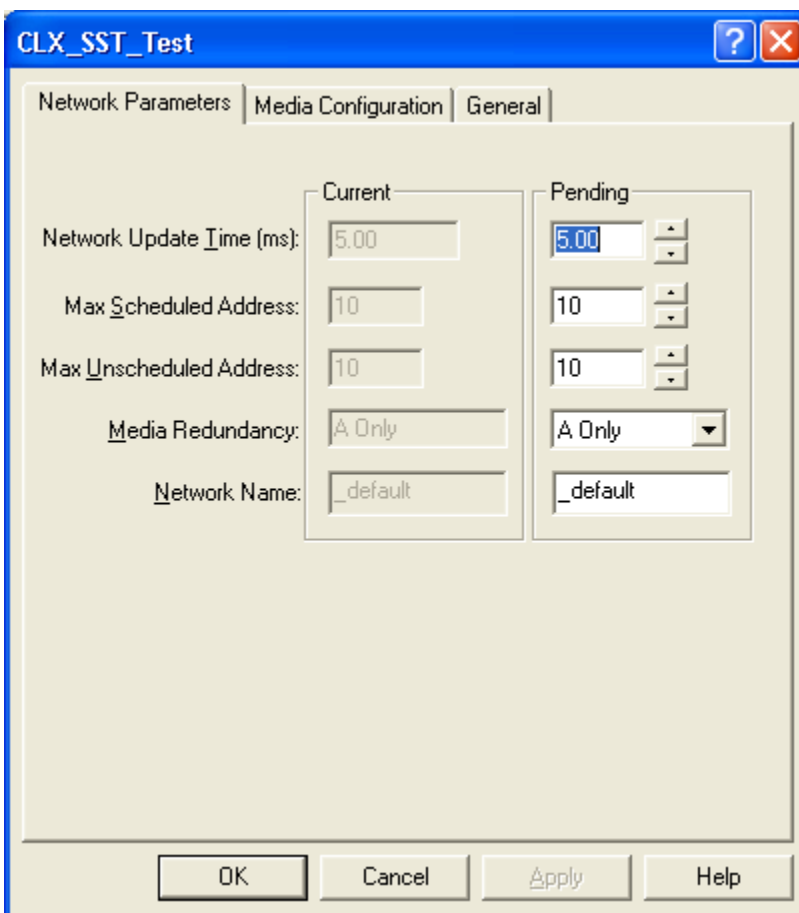
1. Put the SST ControlNet card(s) online. This can be done in a Windows environment by launching *CN Node Diagnostics*, or by issuing the *TRG\_CMD\_SUPR\_GO\_ON* trigger in a non-Windows environment.
2. Create a new network in RSNetworkx by selecting *File* in the menu and then *New*.
3. Begin creating an online configuration by selecting *Network* in the menu, and then *Online*. Browse to find the ControlNet network to be uploaded and click *OK*. This will upload the network configuration present on the ControlNet bus.

It is also possible to manually create a configuration offline.

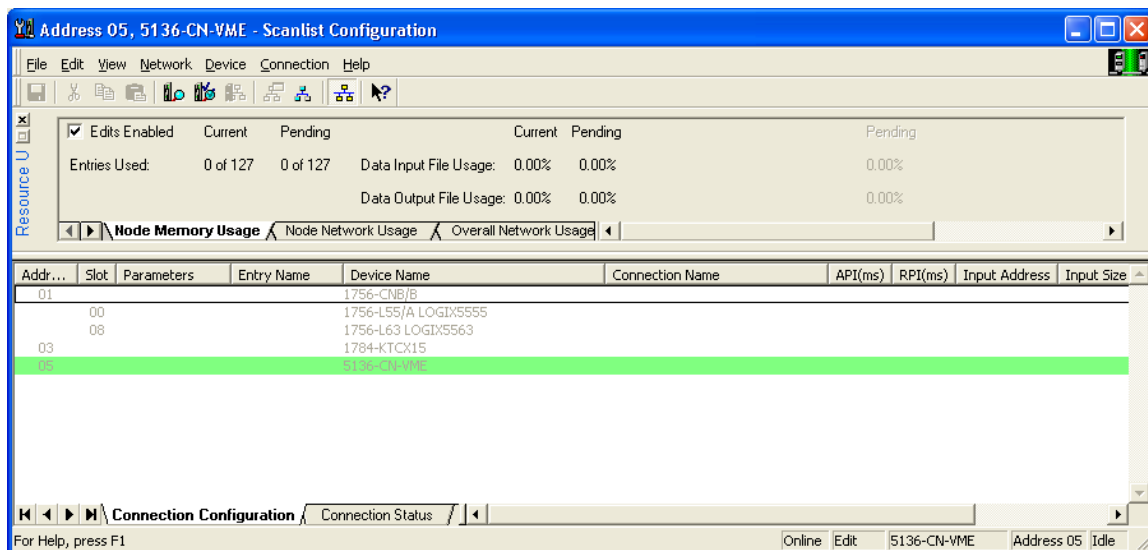




4. Click the *Edits Enabled* checkbox. If there is an online/offline mismatch a window will appear; select *Use online data (upload)* and click *OK*.
5. Save the configuration when prompted.
6. Select *Network* in the menu and then *Properties*. Enter the network parameters, e.g. NUT, SMAX, UMAX, that are to be used.

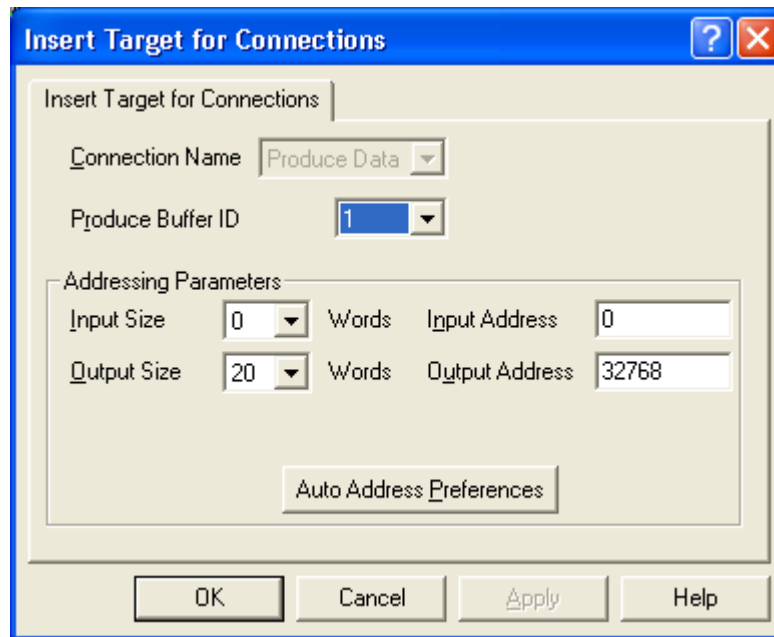


7. Right click on the SST ControlNet card and select *Scanlist Configuration*.





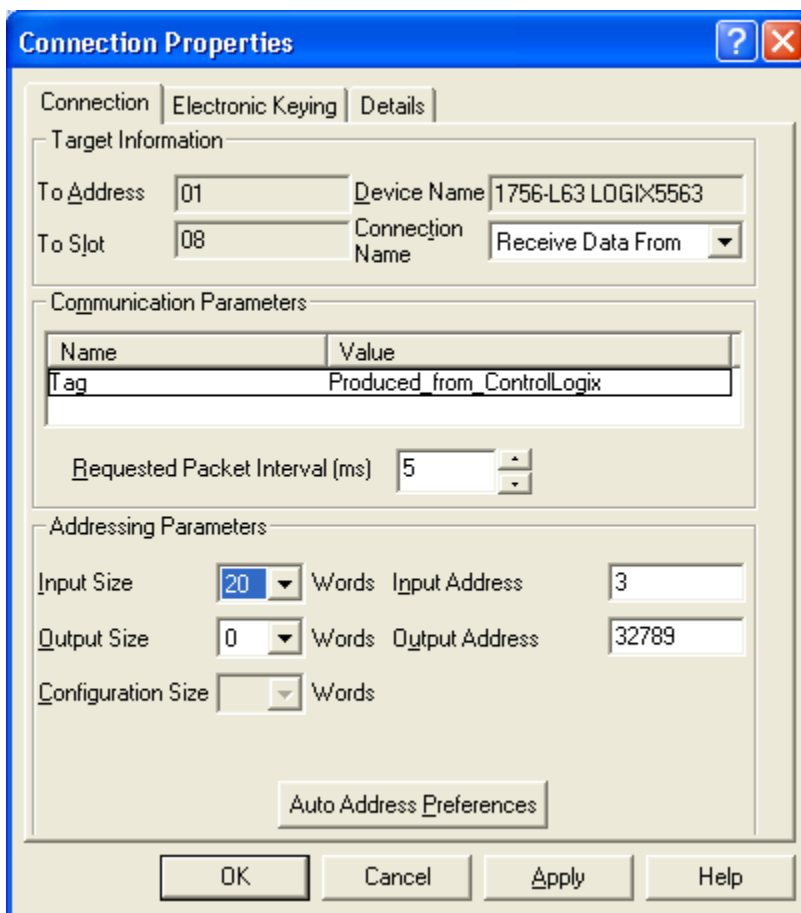
- Right click on the green highlighted card, the SST ControlNet card for which the scanlist is being edited, and select *Insert target for Connections...*



- Select *Produce Data* in the *Connection Name* field and set the *Output Size* to match the size of the consumed tag defined earlier in RSLogix5000. Note: this size is in words, whereas the size of the user defined data type shown in RSLogix5000 is in bytes. Click *Apply*, then *OK*.

This has defined the producer connection for the SST ControlNet card that corresponds to the consumer connection for the ControlLogix processor.

- Right click the ControlLogix entry and select *Insert Connection...*

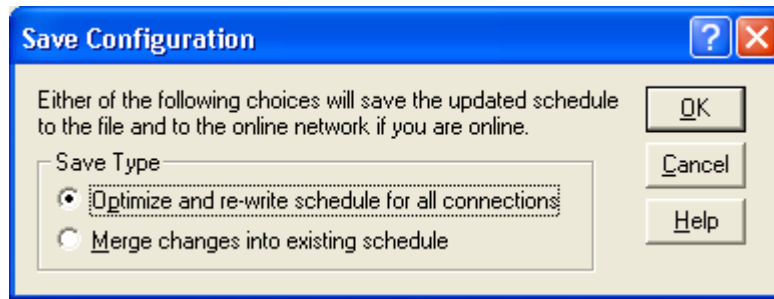


11. Double click the *Value* field and enter the produced tag name created in RSLogix5000. Enter the *Input Size*, which should be the size of the produced tag defined earlier in RSLogix5000. **Note:** this size is in words, whereas the size of the user defined data type shown in RSLogix5000 is in bytes. Set the *Requested Packet Interval*, in ms; the minimum possible value is the NUT. Click *Apply*, then *OK*.

This has defined the consumer connection for the SST ControlNet card that corresponds to the producer connection for the ControlLogix processor.

12. Select *File* in the menu and then *Save*. When the *Save Configuration* window appears choose whether the schedule should be re-written with the changes, or whether the changes should be merged into the existing schedule. Click *OK*.





13. Close the *Scanlist Configuration* tool.
14. The network is now configured with the SST/ControlLogix producer/consumer connections and is ready to use.



## Technical support

Technical support is available during regular business hours by telephone, fax or email from any Woodhead Software & Electronics office, or from [www.mySST.com](http://www.mySST.com). Documentation and software updates are also available on the Web site.

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