



Technical Note

Configuring Scheduled Sends and Receives with a ControlLogix using the SST ControlNet Configuration Tool

Topic Overview

Before you can use an SST ControlNet card to scan I/O, you must configure the network parameters and I/O configuration and download the configuration to the card. The SST ControlNet Configuration Tool is used to build the configuration and download it to the card.

About this Technical Note

This technical note describes the steps in using the SST ControlNet Configuration Tool to configure an SST ControlNet card to exchange data with a ControlLogix PLC, using scheduled sends and receives.

This technical note assumes that:

You are familiar with constructing a ControlNet network, and that you are familiar with programming Allen-Bradley ControlLogix PLCs.

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
<input checked="" type="checkbox"/> Any other software required (network configuration software)	SST ControlNet Configuration Tool RSNetWorx to schedule the Allen-Bradley PLCs on the same network. We used version 1.80.38.0 RSLogix 5000 to program the ControlLogix. We use version 2.25.0 RSLinx to communicate with the PLC



Procedure

Setting the ID Object on the Card

If you use RSNetWorx 1.8 or below to schedule the network, you must change the ID object on the card to make it look like a KTCS card, so that RSNetWorx can recognize it. Run *Start/Program Files/SST CN/CN Card Utilities*. Select *IdObj/Display/Edit*. Click the Edit button, then click the *KTCS Emu* button. Click the *Update* button to save the change to Flash memory on the card. You must reload the card after you change the ID Object.

If you are using RSNetWorx 2.0 or above, you do not need to update the ID Object on the card. Use the EDS Wizard in RSNetWorx to register the EDS file 0008000Cxxxx0101.EDS (where xxxx is the 0001 for the ISA card, 0008 for the PC/104 card, 000B for the VME card and 017B for the PCI card) so that RSNetWorx can recognize the card. The EDS files are found in *directory D:\Program Files\SST\CM\CN Config Tool\EDS*. You must restart your computer after you run the EDS wizard. When you run RSLinx and RSNetWorx, they will recognize SST cards. (An SST directory has been created in the left window in RSNetWorx main screen.)

Scheduled Sends (Produced Tags) in the ControlLogix, Scheduled Receives in the Card

NOTE: you must be offline in RSLogix 5000 to complete this procedure.

Use the following steps to create a produced tag (scheduled send) in RSLogix 5000:

1. Expand the *Data Types* item in the tree, right click on *User-Defined*, and select *New Data Type...* In the dialog box that appears:
 - Give the new type a name, for example, *ProdTag*, and optionally a Description.
 - 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 displayed), and description. Note that members can be arrays. If you enter a data type of INT[20], the member is an array of 20 integers. The maximum size is approximately 240 words (the actual value depends on the network schedule.)
 - Click *Apply* and RSLogix 5000 displays the current size of the structure.
 - When you have created the desired members, click *OK*.
2. Expand the Controller in the tree. Right click on *Controller Tags* and select *Edit Tags*. RSLogix 5000 displays a list of the existing controller tags
3. Right click on an empty entry in the list and select *Edit Tag Properties*. In the dialog box that appears:
 - Give the tag a Name and optionally a description.
 - For the *Data Type*, select the user-defined data type you created earlier.
 - The *Scope* should be *Controller*.
 - Check the *Produce this tag for up to xxx consumers* box and set the number of consumers to an appropriate value.
 - Click the *OK* button.
4. Save your program and download it to the processor.



Use the following steps to set up the corresponding receive or consumed connection in the SST ControlNet Configuration Tool:

1. If you haven't already done so, create a new network and add a scanner. Double click on The Network and set the network properties. Double click on the scanner. On the *Scanner* tab, set MAC ID. On the *Connections* tab, set the *Card Type* to the appropriate type (usually *Standard*).
2. Click on the scanner to select it, then drag the appropriate (size and revision) ControlLogix chassis from the EDS library to the scanner.
3. Click on the chassis to select it, then double click on the appropriate ControlLogix processor from the EDS library to add it to the scanner. Place it in the processor slot, not the CNB slot.
4. Double click on the ControlLogix processor to edit it. In the dialog box that appears:
 - Set the O=>T RPI and T=>O RPI to the required update time. This time is shown in microseconds. For example, if you want the receive to update every 30 ms, enter 30000. The default values for the RPIs is the network update time (NUT).
 - Set the T=>O size to match the size of the tag in the ControlLogix. This size is in words whereas the size of the user defined data type shown in RSLogix 5000 is in bytes.
 - Click on the *ControlLogix Tag Name* button. In the dialog that appears, enter the tag name you created in RSLogix 5000. Note that this must be the name of the tag, not the name of the user-defined data type. Click *OK* to accept the tag name.
 - Click *OK* to accept the configuration.
5. For every consumed or receive from a given ControlLogix processor, you must add a chassis and processor (repeat steps 2-4)
6. Double click on *The Network* in the configuration to build the schedule. Click *OK* to close the dialog.
7. Download the configuration to the card (see below).
8. Schedule the ControlLogix and the other nodes on the network using RSNetWorx (see the section Scheduling Using RSNetWorx below).

Setting up Scheduled Receives (Consumed Tags) in the ControlLogix, Scheduled Sends in the Card

NOTE: You must be offline in RSLogix 5000 to complete this procedure.

Use the following steps to create a consumed tag in RSLogix 5000:

1. Expand the *Data Types* item in the tree, right click on *User-Defined*, and select *New Data Type...* In the dialog box that appears:
 - Give the new type a name, for example, *ConsumedTag*, and optionally a *Description*.
 - 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 displayed), and description. Members can be arrays; if you enter a data type of INT[20], the member is an array of 20 integers.
 - Click *Apply* and RSLogix 5000 displays the current size of the structure.
 - When you have created the desired members, click *OK*.
2. Right click on *I/O Configuration* in the tree and select *New Module*.



3. Add a ControlNet bridge module of the appropriate type and revision. In the dialog box that appears, assign it a name and enter the slot that it occupies in the ControlLogix chassis. Click OK to accept the entry.
4. Right click on the bridge module you just added and select *New Module*. Add a ControlNet PLC5C. In the dialog box that appears, give it a name, for example, OurCard, and a node number. The node number is the node number of the card, which will contain the corresponding scheduled send (produced tag).
5. Click *OK* to accept the new module.
6. Expand the *Controller* in the tree. Right click on *Controller Tags* and select *Edit Tags*. RSLogix 5000 displays a list of the existing controller tags.
7. Right click on an empty entry in the list and select *Edit Tag Properties*. In the dialog box that appears:
 - Give the tag a Name and optionally a description.
 - For *Tag Type*, check *Consumed*.
 - In the *Controller* listbox, select the name you gave the PLC5C, in this example, OurCard.
 - The *Remote Instance* should be the message number you will be assigning the Scheduled send on the card (see below).
 - Select an appropriate RPI for the update time, in ms.
 - For the *Data Type*, select the user-defined data type you created earlier, in this example, ConsumedTag.
 - Leave the *Produce this tag for up to xxx consumers* checkbox unchecked.
 - Click the *OK* button.
8. Save the program and download it to the processor.

Use the following steps to set up the corresponding send in the SST ControlNet Configuration Tool.

1. If you haven't already done so, create a new network and add a scanner. Double click on The Network and set the network properties. Double click on the scanner. On the *Scanner* tab, set the MAC ID. On the *Connections* tab, set the *Card Type* to an appropriate type (usually *Standard*).
2. Click on the scanner to select it. If you are using RSNetWorx 1.8 or below, double click on an SST-CN KTCS Send from the Communication Adapter section of the EDS tree to add it to the scanner. If you are using RSNetWorx 2 or above, double click on an SST-CN KTCS Send from the Communication Adapter section of the EDS tree to add it to the scanner.
3. Double click on the send to edit it. In the dialog box that appears:
 - On the *General* tab, set the T=>O size to the required value. This size is in words whereas the size of the user defined data type shown in RSLogix 5000 is in bytes. The maximum is approximately 240 words (the exact value depends on the network schedule.)
 - On the Parameters tab, double click on the *Produce Buffer ID Value* field and enter the message number you entered in RSLogix 5000. Every scheduled send on a node must have a unique message number.
 - Click *OK* to accept the configuration.
4. Double click on *The Network* in the configuration to build the schedule. Click *OK* to close the dialog.



5. Either download the configuration directly over ControlNet or generate a BSS file and download it to the card. Put the card online with this configuration.
6. Schedule the ControlLogix and card using RSNetWorx (see the section Scheduling Using RSNetWorx below).

Downloading over ControlNet using an SST Card

If the computer you are running the SST ControlNet Configuration Tool on has an SST ControlNet card that is online on the network (even if it is not running RSLinx), you can use it to download the configuration over ControlNet.

From the ControlNet Configuration Tool, right click on the scanner and select *Send Config Through SST CN Card*. If necessary, select the path to the network. The Configuration Tool downloads the configuration to the selected SST card and notifies you of its success or failure.

If you right click on *The Network* and select *Send Config Through SST CN Card*, the Configuration Tool downloads the configuration to all SST cards on the network.

Downloading over ControlNet using RSLinx

NOTE: To download the configuration using RSLinx, you must have either the full (9355-WAB) or OEM (9355-WABOEM) version of RSLinx installed on your computer. You cannot download using RSLinx Lite.

Start RSLinx and establish a connection to the network. From the ControlNet Configuration Tool, right click on the scanner and select *Send Config Through RSLinx*. If necessary, select the path to the network. The Configuration Tool downloads the configuration to the selected card and notifies you of its success or failure.

If you right click on *The Network* and select *Config Through RSLinx*, the Configuration Tool downloads the configuration to all SST cards on the network.

Scheduling Using RSNetWorx

You must run RSNetWorx to build a network schedule for the ControlLogix processor. The card must be online for RSNetWorx to read the schedule from the card. Each time you change the network configuration using the Configuration Tool, you must re-run RSNetWorx and do a *Network/Save* to reschedule the network.

1. Start RSNetWorx and go Online. RSNetWorx should find all the stations on the network.
2. Enable Edits and select *Network/Save*. In the dialog box that appears, select *Optimize and re-write schedule for all connections*.

NOTE: If you are using scheduled receives (Consumed tags) in the ControlLogix, you must always run RSNetWorx to schedule the receives after you make any changes in the network configuration using the ControlNet Configuration Tool.



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Technical Support

Technical support is available during regular business hours by telephone, fax or email from any SST office, or from the company Web site at www.sstech.on.ca.

Documentation and software updates are available on our Web site.

North America

Telephone: 519-725-5136, Fax: 519-725-1515

Email: techsupport@sstech.on.ca

Europe

Telephone: +49/(0) 7252/9496-30, Fax: +49/(0) 7252/9496-39

Email: sst@woodhead.de

Asia

Telephone: +81-4-5224-3560, Fax: +81-4-5224-3561

Email: techsupport@woodhead.co.jp