

# ***435NBX/490NBX Basic Ladder Logic Setup***

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*Version 7*

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## Overview

This document explains and provides examples of the basic ladder logic required for the 435NBX/490NBX to communicate with an Allen-Bradley PLC.

## 435NBX/490NBX ASCII Setup

**ASCII to ControlLogix:** In this example a barcode reader is scanning 82 characters. That string will be transferred to the PLC Tag Name RSLogix5000: RTA\_read with the data type of a string. For the RS500 example the Tag/File name would be ST10:0.



**Port 0 ASCII Configuration**

ASCII to PLC | PLC to ASCII

Enable Communications:

**Define ControlLogix Tag/File**

Date Type: STRING  
Tag/File Name: RTA\_read

**Define ASCII Message Termination**

Character Count: 82 (1-4096 chars)  
Timer: 0 (0-30000 ms)

**Delimiters:**

Start: [0] [NUL] 0 0x00 [NUL] 0 0x00  
End: [0] [NUL] 0 0x00 [NUL] 0 0x00  
Remove Delimiters from ASCII Message:

**Message Queue**

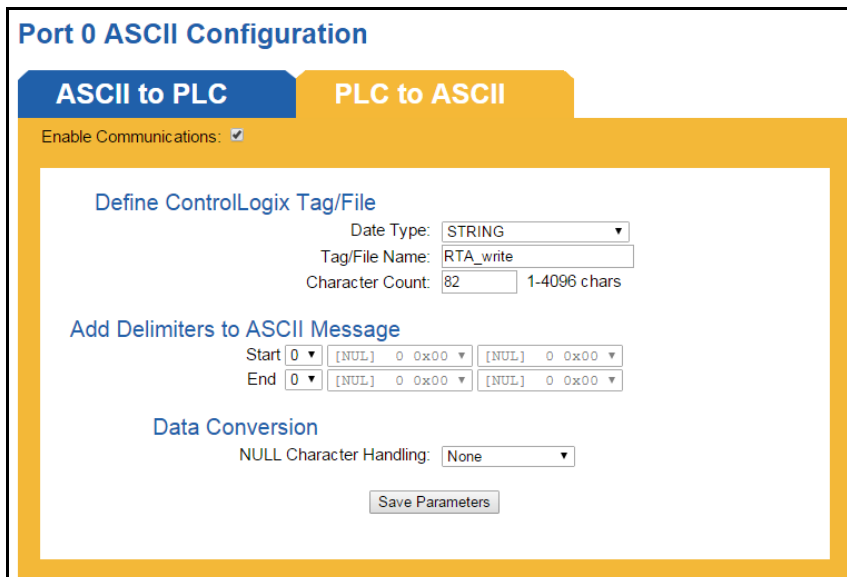
Queue Size: 5 (0-20 messages)  
Queue Full Behavior: Discard New Data

**Data Conversion**

NULL Character Handling: None

Save Parameters

**ControlLogix to ASCII:** In this example 82 characters of data from the PLC Tag Name RSLogix5000: RTA\_write will be sent to the ASCII device. For the RS500 example the Tag/File name would be ST11:0.



**Port 0 ASCII Configuration**

ASCII to PLC | PLC to ASCII

Enable Communications:

**Define ControlLogix Tag/File**

Date Type: STRING  
Tag/File Name: RTA\_write  
Character Count: 82 (1-4096 chars)

**Add Delimiters to ASCII Message**

Start: [0] [NUL] 0 0x00 [NUL] 0 0x00  
End: [0] [NUL] 0 0x00 [NUL] 0 0x00

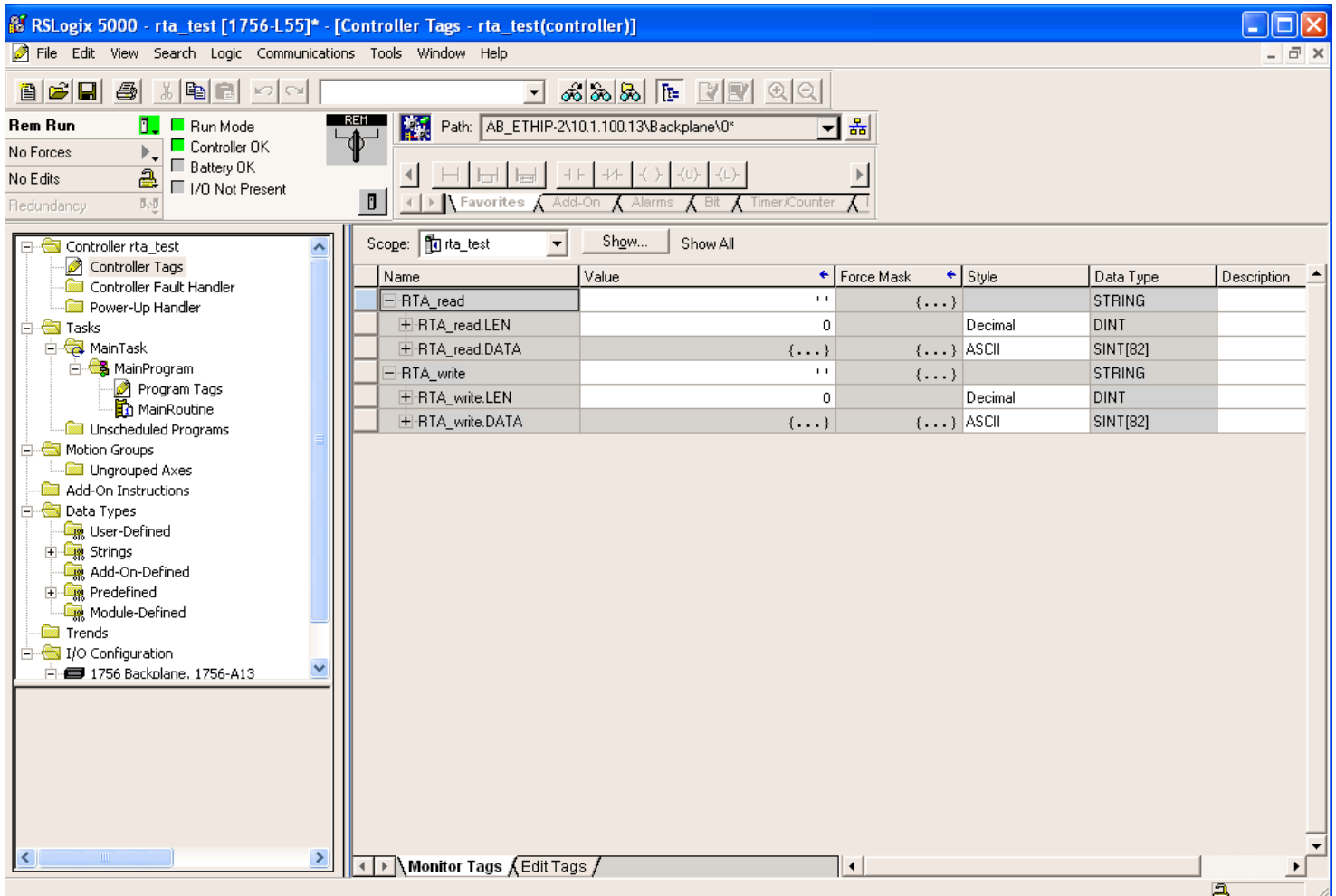
**Data Conversion**

NULL Character Handling: None

Save Parameters

## RSLogix 5000 Tag Setup

Expand the **USER DEFINED Controller** folder. For this example we are using Controller folder rta\_test. In the Controller Tags list, create the two tags that are assigned in the gateway. The Name and Data Types must match those set up in the gateway or an error will occur.



The screenshot shows the RSLogix 5000 software interface. The title bar reads "RSLogix 5000 - rta\_test [1756-L55]\* - [Controller Tags - rta\_test(controller)]". The menu bar includes File, Edit, View, Search, Logic, Communications, Tools, Window, and Help. The toolbar contains various icons for file operations and navigation. The status bar at the top shows "Rem Run" with "Run Mode" selected, and "No Forces" and "No Edits" options. The path is "AB\_ETHIP-2\10.1.100.13\Backplane\0".

The left pane shows a tree view of the project structure. The "Controller Tags" folder is expanded, showing a list of tags. The main pane displays a table of tags for the scope "rta\_test".

Name	Value	Force Mask	Style	Data Type	Description
- RTA_read		''	{...}	STRING	
+ RTA_read.LEN		0	Decimal	DINT	
+ RTA_read.DATA		{...}	ASCII	SINT[82]	
- RTA_write		''	{...}	STRING	
+ RTA_write.LEN		0	Decimal	DINT	
+ RTA_write.DATA		{...}	ASCII	SINT[82]	

The bottom status bar shows "Monitor Tags" and "Edit Tags" options.

## RSLogix 5000 Ladder Logic Examples

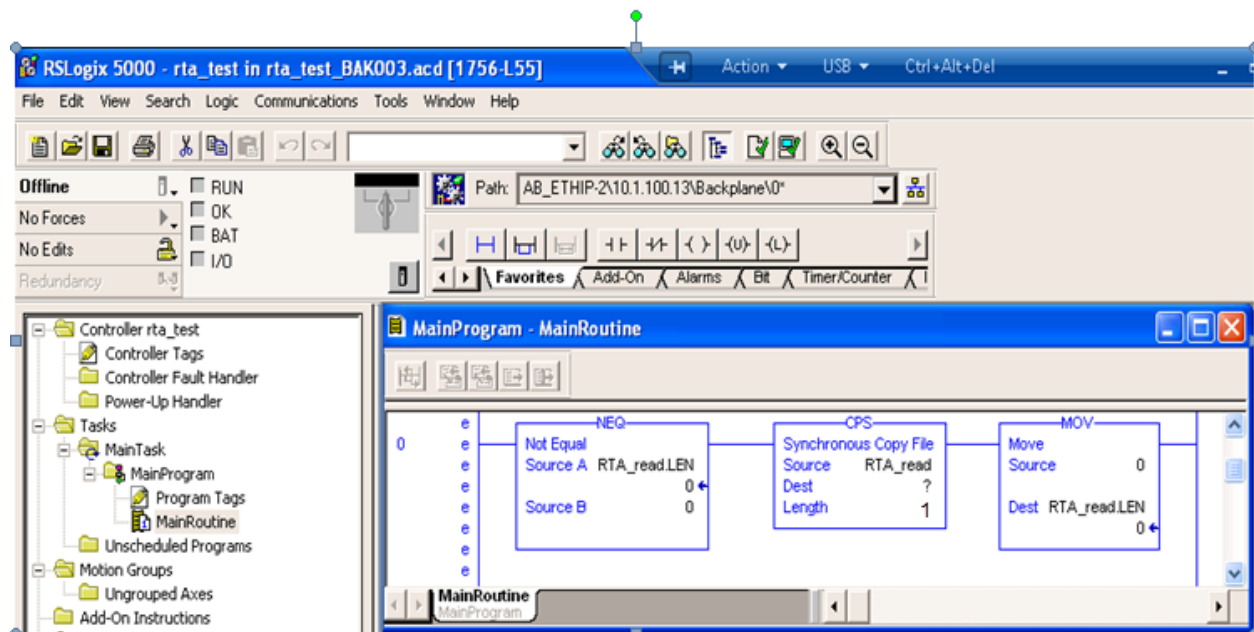
### ASCII to PLC Direction

**ASCII to ControlLogix Logic** : This rung will zero out the **RTA\_read.LEN** tag when the tag **RTA\_read** is populated by the CPS instruction.

For diagnostic purposes, a counter can be added to monitor when the .LEN field does not get cleared out. The value of that counter should match the **Wr ASCII Msg to PLC** counter on the Diagnostics page of the gateway.

The ? in the CPS instruction represents a user defined tag location that will receive the ASCII data from the RTA\_read string.

The gateway will not deliver the next ASCII message to the PLC until the .LEN field for that tag is zeroed out.

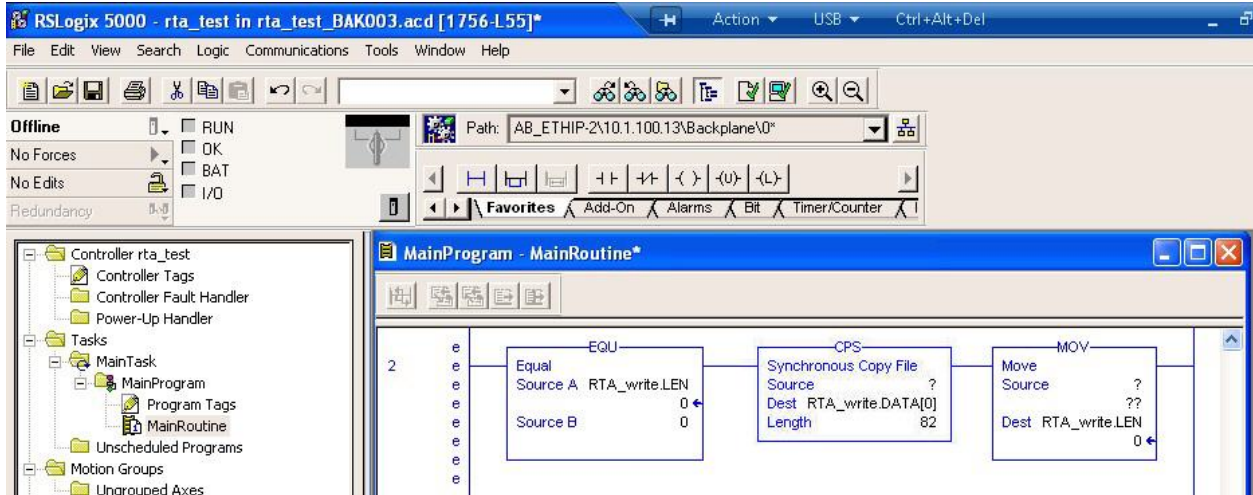


## PLC to ASCII Direction

### ControlLogix to ASCII Logic:

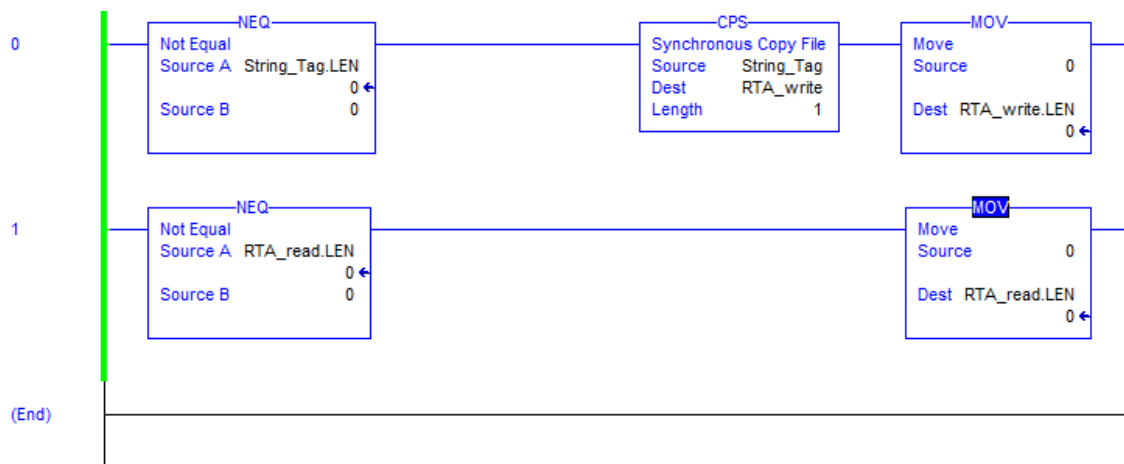
To write data to the gateway, you must copy your message into the user defined tag in two separate instructions. Copy the .DATA part of the message first and then copy the .LEN part second. If you write the .LEN field first you will likely resend the last message sent.

The source field in the CPS and MOV instructions is the user defined tag that contains the data to be written to the gateway.



## Loopback

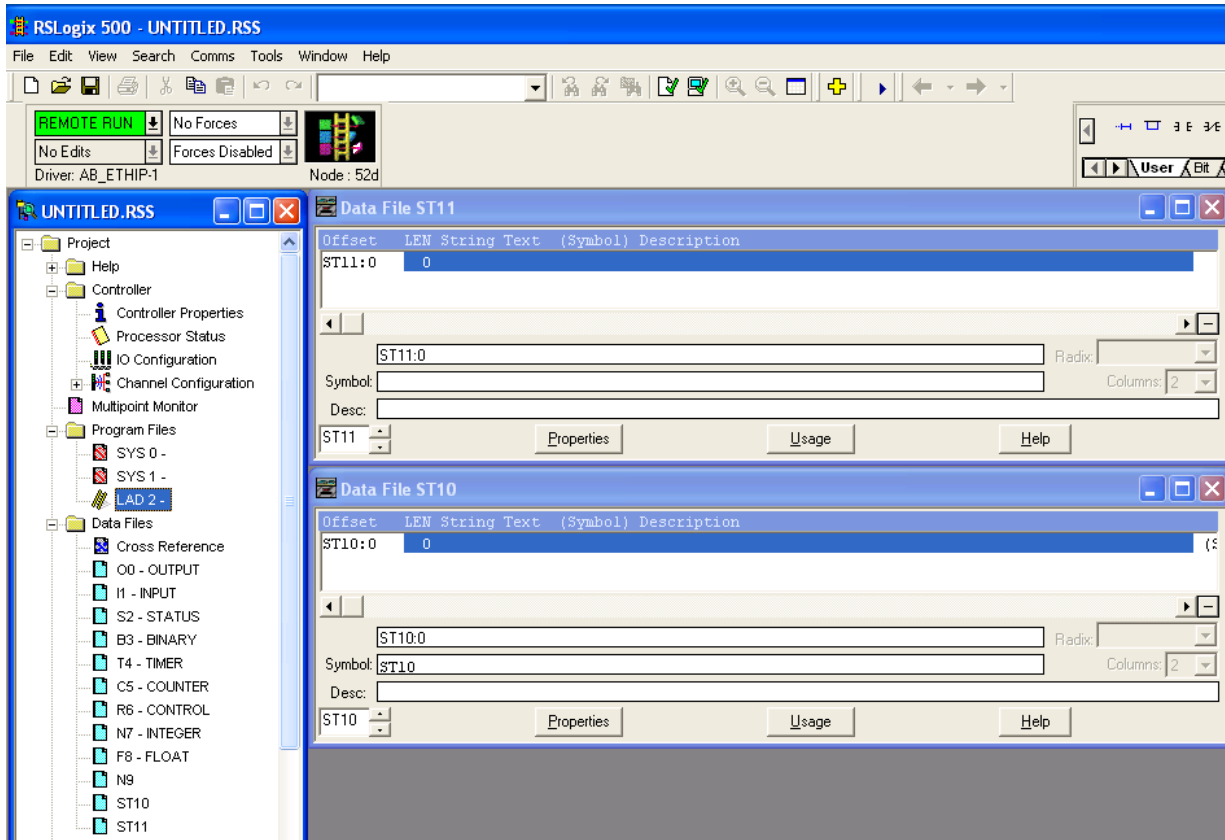
**Loopback Logic:** This Logic is demonstrating a write from the PLC to ASCII direction which then loops the data back from ASCII to the PLC. Set up the tags in both directions for Port 0. For this example to work, connect a null modem cable to Port 0 and on the other end short out pins 2 and 3. Use the String\_Tag to enter in the data from the PLC that will be copied to the RTA\_write tag, which will then be sent out Port 0 of the gateway, and looped back to the RTA\_read tag.





## RSLogix 500 Tag Setup

Expand the **Data Files** folder and create the two files that are assigned in the gateway. The Name and Data Types must match what is set up in the gateway.



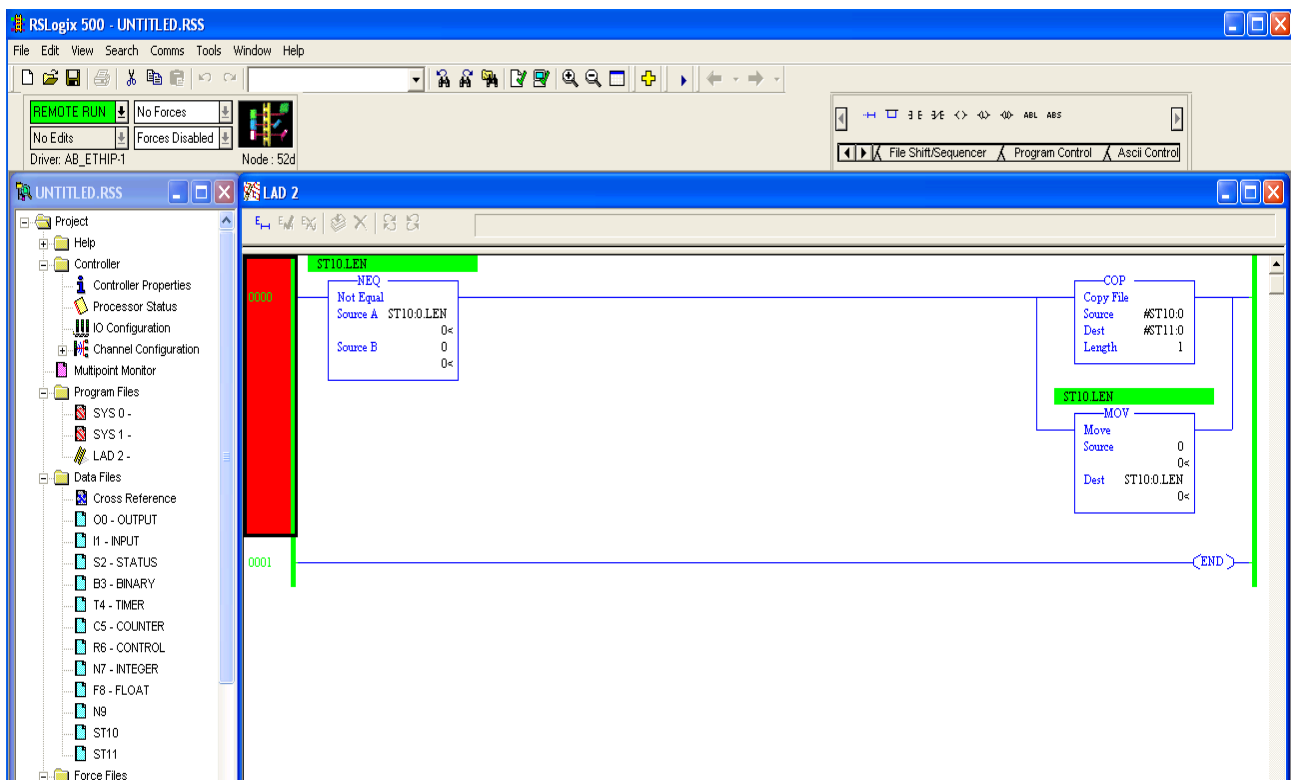
## RSLogix 500 Ladder Logic Examples

**ASCII to PLC Logic** : This rung will zero out the **ST10:0.LEN** file when the file **ST10:0** is populated by the CPS instruction.

For diagnostic purposes, a counter can be added to monitor when the .LEN field does not get cleared out. The value of that counter should match the **Wr ASCII Msg to PLC** counter on the Diagnostics page of the gateway.

The **ST11:0** Dest field in the CPS instruction represents a user defined file location that will receive the ASCII data from the **ST10:0** string.

The gateway will not deliver the next ASCII message to the PLC until the .LEN field for that file is zeroed out.



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