

435NBX – Quick Start Guide

Revision 2

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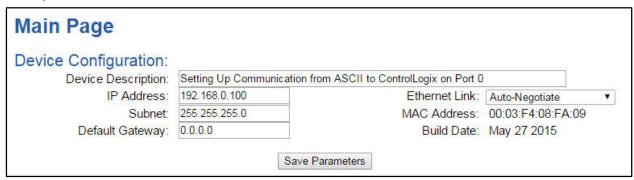
Overview

This document will explain a sample setup for a 435NBX gateway to communicate to a CompactLogix processor.

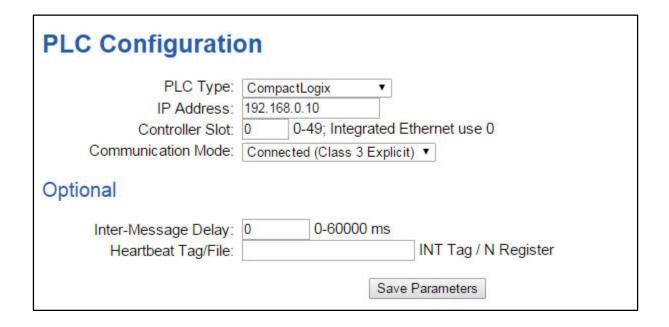
This document does not explain the basic ladder logic setup. For that, please refer to the 435_490NBX_LadderLogix.pdf which can be found on the provided CD.

ASCII / CompactLogix Example

Description



Setting up Communications for a CompactLogix PLC



With the above setup, the 435NBX is set up to communicate to a CompactLogix PLC with an IP Address of 192.168.0.10.

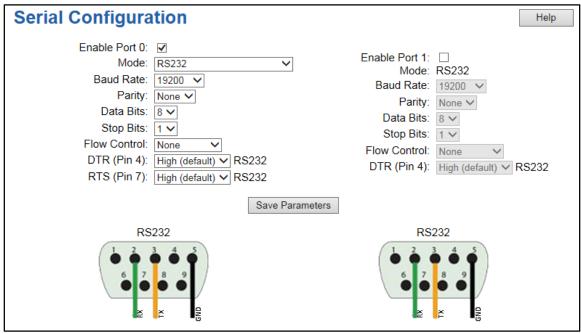
The Processor is in Slot 0

We are using Connected Messaging to ensure that the data is moving as reliably as possible.

The inter-message delay is set to 0ms, meaning the 435NBX will communicate with the PLC as fast as possible.

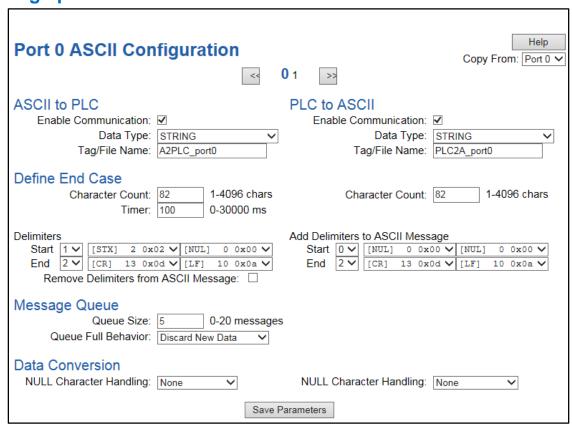
There is no heartbeat tag configured.

Setting up Serial Communication



All of the above serial settings must match the ASCII device that the 435NBX is communicating with. If any one of these fields are incorrect proper communication will not be possible.

Setting up Port 0 for Communication



ASCII to CompactLogix:

With the above setup, the 435NBX will start accepting data as soon as the ASCII device sends the character STX. Once the STX is received, the 435NBX will continue to accept characters until one of the following cases has been met:

- 1. Receive 82 characters.
- 2. There has been 100ms of no activity on the network.
- 3. End Delimiters of CR and LF (in that order) were received by the gateway.
 - Notice that the Remove Delimiters checkbox is checked, meaning that the STX, CR, and LF will not be passed to the PLC.

CompactLogix to ASCII:

With the above setup, the 435NBX will receive data only when the Length field of the "PLC2A_port0" tag in the PLC is set to a non-zero value. If a value is entered with more than 82 characters, the 435NBX will only send the first 82 characters to the ASCII device, the remainder will be discarded.

When the 435NBX receives the message, it will concatenate the CR and LF to the end of the message because we have defined 2 end delimiters of <CR> and <LF>. Once those characters are added, the message will be transmitted to the ASCII device.

ASCII / CompactLogix Example Diagnostics Page

Once the PLC, Serial, and ASCII parameters have been set, the gateway will start transmitting data between the CompactLogix PLC and the ASCII device.

To view the diagnostics page, click the **Diagnostics** button, navigate to Port 0, and select **ASCII to PLC** direction.

CompactLogix Status: Connected
Write Heartbeat to CompactLogix ()
OK: 0 Error: 0 Last Error:

Figure 1

The above screen shot shows a connected status to the CompactLogix PLC. It took 1 attempt to connect to make the connection. If the number of Connection Attempts is incrementing there is an issue with the communication between the PLC and the 435NBX. This could be due to a timeout or an error.

ASCII to PLC Direction

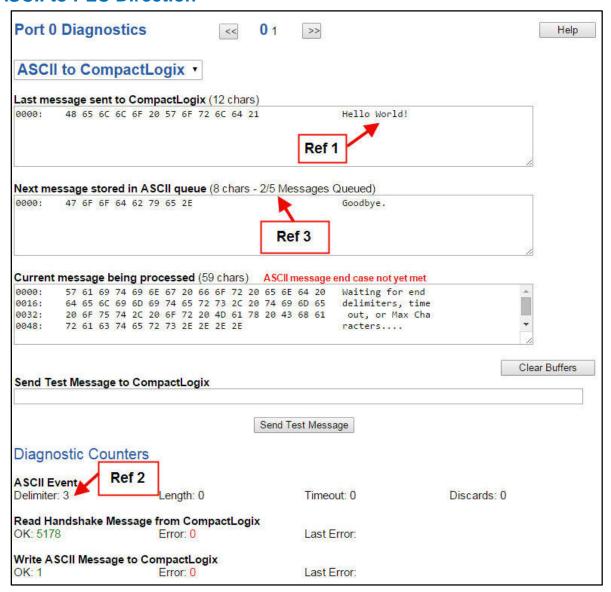
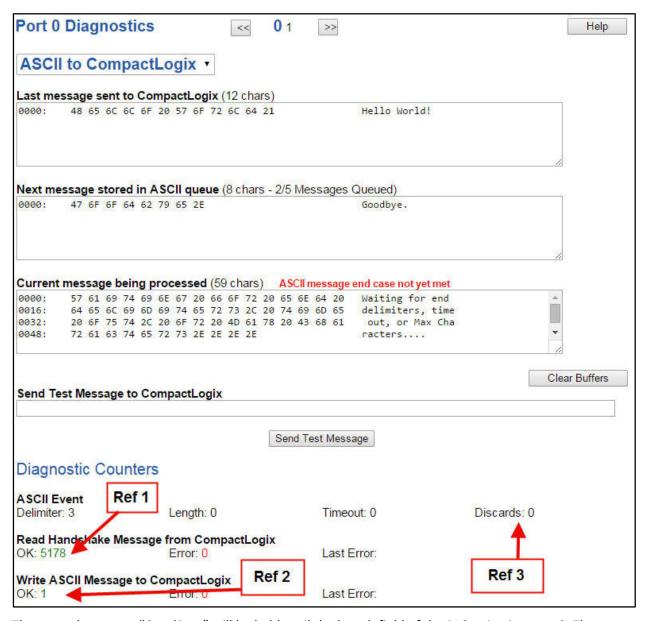


Figure 2

Figure 2 shows the first message sent to the PLC, **Ref 1**, of "Hello World!" It was defined by end delimiters because the ASCII Event Delimiter Counter is incrementing, **Ref 2**. Each time a message is processed, its end state is recorded.

In the above example, 3 messages meeting the defined end delimiters, CR and LF, have been received. The third complete message is not displayed because it is in the Queue buffer, **Ref 3**. This is identified in the gateway by "2 Messages Queued" next to the *Next message stored in ASCII queue* buffer. Only the next message to be sent to the PLC is visible in the queue.

ASCII to PLC Direction



The second message "GoodBye." will be held until the length field of the PLC string is set to 0. The non-zero length will also trigger the Read Handshake Message counter to increment, **Ref 1**.

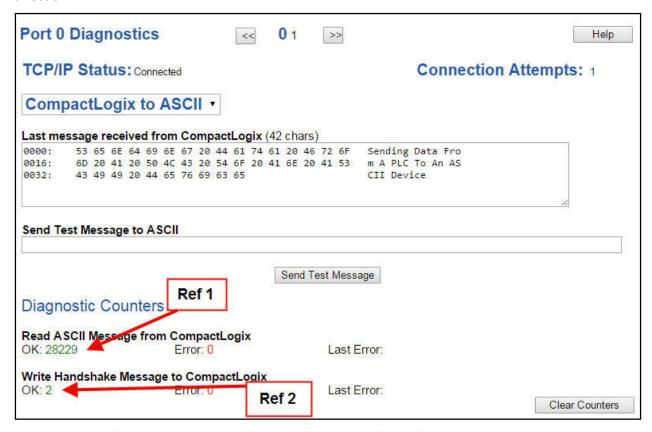
The data in the *Current message being processed* buffer has not reached an end case. It will not be considered complete until the gateway receives a [CR][LF], 100ms pass after receiving a character, or the length reaches 82 characters.

The Write ASCII Message to PLC OK counter indicates the number of messages sent to the PLC, **Ref 2**. This value should be equal to ASCII Event Delimiter Count + Length Count + Timeout Count. If these values are not equal, then the length field in the PLC is non-zero.

If the ASCII Event Discard counter is incrementing, **Ref 3**, the gateway is receiving messages faster than the PLC is processing them.

PLC to ASCII Direction

To view the diagnostics page, click the **Diagnostics** button, navigate to Port 0, and select **PLC to ASCII** direction.



For moving data from the PLC to the ASCII device, the length field of the tag in the PLC needs to be set to non-zero. The gateway monitors the length field for a non-zero value. Once a non-zero value is seen, the gateway will read the data and send it to the ASCII device. It will also clear the tag and reset the length field to 0. This handshake lets the PLC know the data has been processed.

In the above example "Sending Data From A PLC to An ASCII Device" was written to a tag, changing the length field to 42. The non-zero length of 42 triggered the gateway to process the message.

The *Read ASCII Message from PLC OK* counter should always be incrementing. This is a heartbeat counter that increments every time the gateway reads the PLC tag length to determine if there is a new message, **Ref 1.**

The Write Handshake Message to PLC OK counter will increment when a message is received, Ref 2.