The NX3B2X-17 module is a two channel, non-servo positioning controller that communicates on either Ethernet IP or ControlNet Networks.

Part Number	Network
NX3B2C-17	ControlNet
NX3B2E-17	Ethernet IP

Each channel has four relay outputs for motor speed and direction control and utilizes a multiturn brushless resolver based transducer for absolute multiturn position feedback.

The NX3B2X-17 receives both setup data and move commands from the network. Setup data includes Transducer Setup, which sets the relationship of the transducer position to the load position, Positioning Setup, which sets the load's target position and the motor control parameters once a Move Profile is initiated, and Apply Preset, which sets the resolver's position to the machine position without having to turn the shaft.

Once configured, the NX3B2X-17 waits for a move profile command. Once the command is received from the network, the module uses the transducer position to fire its motor control outputs at the appropriate positions. The NX3B2X-17 turns the off at a programmed stop position and the load coasts to the target position.

If the load does not stop within the programmed target position range, the NX3B2X-17 adjusts the stop position and runs the move profile again. Because inertial and friction in most systems is repeatable, the module can accurately position the load without servo feedback.

The NX3B2C-17 also gives you the ability to jog the position either from the network or from an external input.

An external Emergency Stop input also allows you to stop a move that is occurring.

Table of Contents

General Information

Important User Information

The products and application data described in this manual are useful in a wide variety of different applications. Therefore, the user and others responsible for applying these products described herein are responsible for determining the acceptability for each application. While efforts have been made to provide accurate information within this manual, AMCI assumes no responsibility for the application or the completeness of the information contained herein. Throughout this manual the following two notices are used to highlight important points.

WARNINGS tell you when people may be hurt or equipment may be damaged if the procedure is not followed properly.

CAUTIONS tell you when equipment may be damaged if the procedure is not followed properly. No patent liability is assumed by AMCI, with respect to use of information, circuits, equipment, or software described in this manual. The information contained within this manual is subject to change without notice. UNDER NO CIRCUMSTANCES WILL ADVANCED MICRO CONTROLS, INC. BE RESPONSIBLE OR LIABLE FOR ANY DAMAGES OR LOSSES, INCLUDING INDIRECT OR CONSEQUENTIAL DAMAGES OR LOSSES, ARISING FROM THE USE OF ANY INFORMATION CONTAINED WITHIN THIS MANUAL, OR THE USE OF ANY PRODUCTS OR SERVICES REFERENCED HEREIN.

Standard Warranty

ADVANCED MICRO CONTROLS, INC. warrants that all equipment manufactured by it will be free from defects, under normal use, in materials and workmanship for a period of [18] months. Within this warranty period, AMCI shall, at its option, repair or replace, free of charge, any equipment covered by this warranty which is returned, shipping charges prepaid, within 18 months from date of invoice, and which upon examination proves to be defective in material or workmanship and not caused by accident, misuse, neglect, alteration, improper installation or improper testing. The provisions of the "STANDARD WARRANTY" are the sole obligations of AMCI and excludes all other warranties expressed or implied. In no event shall AMCI be liable for incidental or consequential damages or for delay in performance of this warranty.

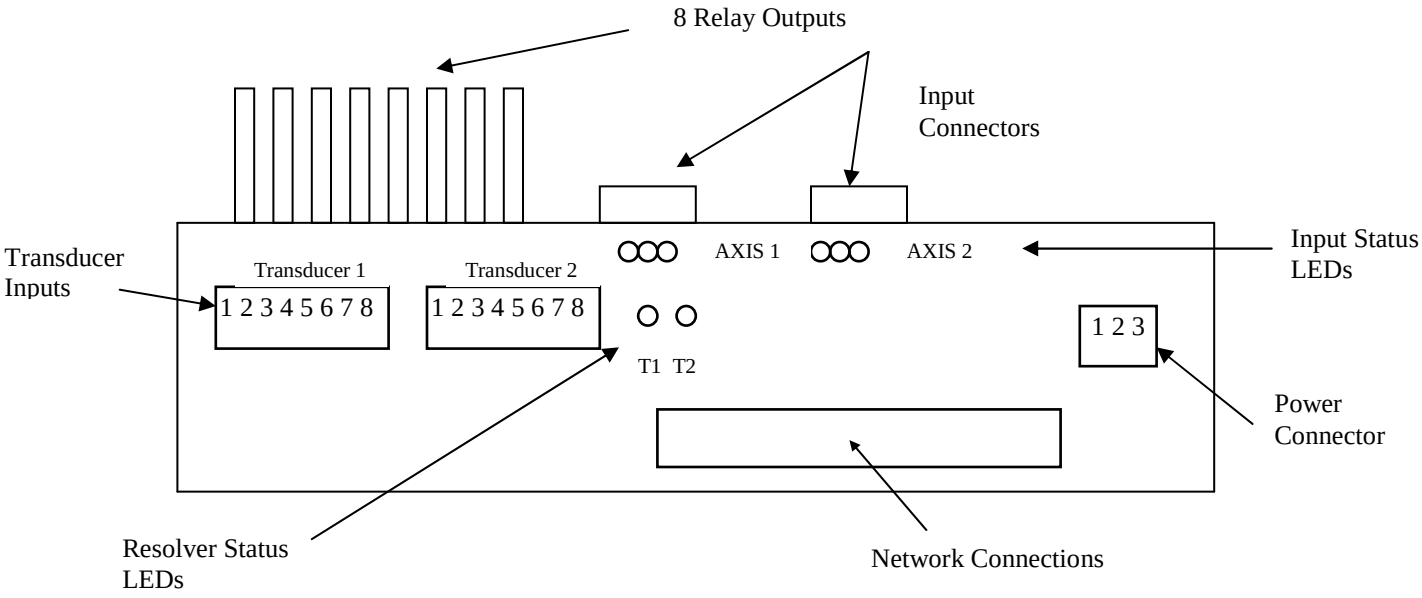
Returns Policy

All equipment being returned to AMCI for repair or replacement, regardless of warranty status, must have a Return Merchandise Authorization number issued by AMCI. Call (860) 585-1254 with the model and serial numbers along with a description of the problem. A "RMA" number will be issued. Equipment must be shipped to AMCI with transportation charges prepaid. Title and risk of loss or damage remains with the customer until shipment is received by AMCI.

24 Hour Technical Support Number

Technical Support, in the form of documents, FAQs, and sample programs, is available from our website, www.amci.com. 24 Hour technical support is also available on this product. For technical support, call (860) 583-7271. Your call will be answered by the factory during regular business hours, Monday through Friday, 8AM - 5PM EST. During non-business hours, an automated system will ask you to leave a detailed message and the telephone number that you can be reached at. The system will page an engineer on call. Please have your product model number and a description of the problem ready before you call.

Chapter 1: Hardware Overview



Power Requirements

Power Connector

Pin	Function
1	24Vdc
2	DC Common
3	Shields

The NX3B2X-17 requires 500ma @24Vdc to operate. Even though the unit will operate within a voltage range of 10 to 30Vdc, it is recommended that the unit be powered with a supply that is within the operating range of the relays. The Opto 22 ODC24 have an operating range of 18 to 30Vdc.

Compatible AMCI Dual Resolver Transducers

HTT-20-100 (100 turn)
HTT-20-180 (180 turn)
HTT-400-180-C-J (180 turn)
HTT-400-180-S-J (180 turn)
HTT-20-1000 (1000 turn)
HTT-20-1800 (1800 turn)

Digital Inputs

10 to 30Vdc isolated inputs
Requires 10mA minimum to operate
Two groups of three inputs
Can be used Sinking or Sourcing, wiring dependent

Resolver Status LEDs

LED Pattern	Function
solid green	Resolver OK
flashing green	Clearable Transducer Fault
flashing red	Non Clearable Transducer Fault
solid red	Module Fault
off	LED or channel disabled
Flashing red / green	Channel 1 Only. No communication between unit and the network board.

Data Transfer

Data updated automatically during the normal update of the Network. Motion Control commands are immediately accepted. Module setup is accomplished with a *Programming Cycle*, which uses two handshaking bits (Transmit and Acknowledge).

Data Available to Processor

Module Status, Motion Status, Resolver Position Data, Tachometer Data, and read back of Transducer and Positioning setup.

Program Storage

Non-volatile memory, battery backed RAM

Throughput Time

The NX3B2X-17 has a throughput time of 400µs. Also, there is a 1sec delay between when one direction relay turns off and the other direction relay turns on.

Network Update Time

The NX3B2X-17 has a minimum network update time of 5ms.

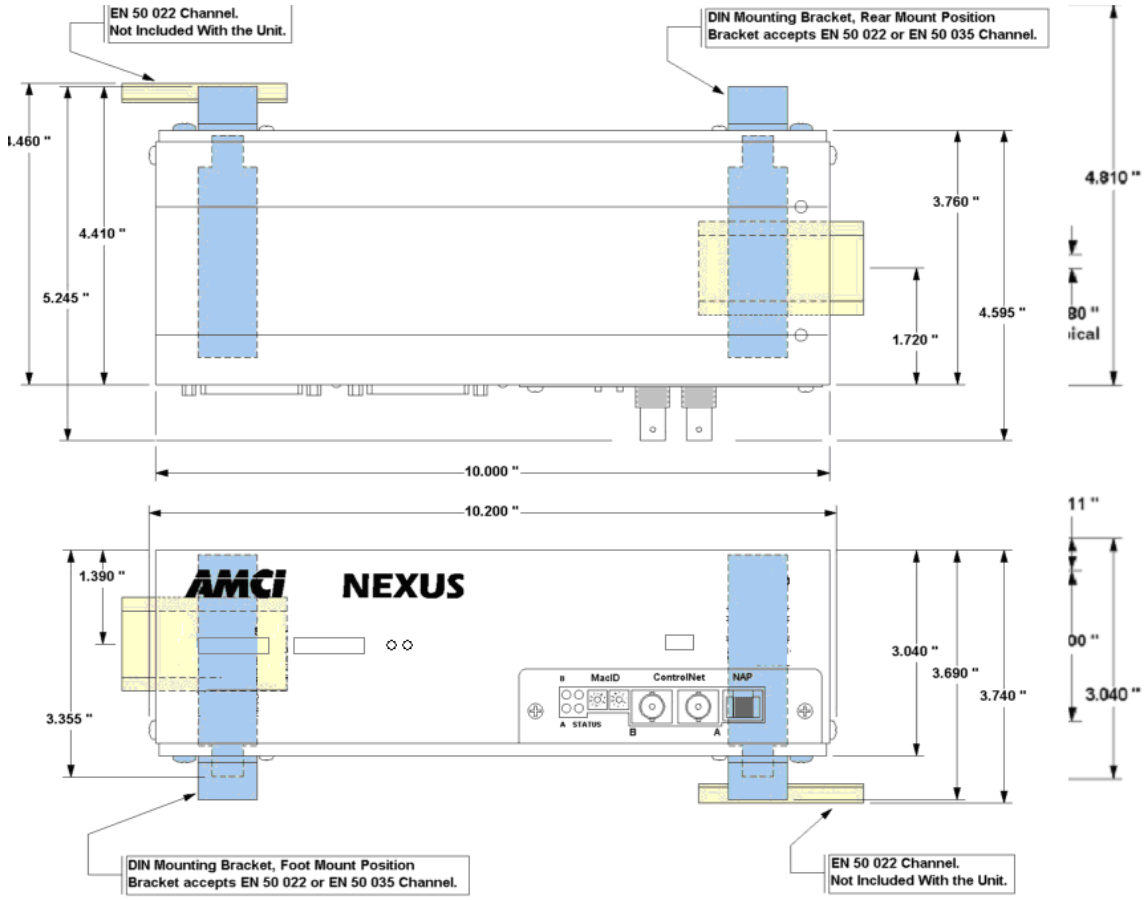
Environmental Conditions

Operating Temperature: 0 to 60° C
Relative Humidity: 5 to 95% (non-condensing)
Storage Temperature: -40 to 85° C

Module Dimensions:

Length = 10.00 inches (25.4cm); Height = 3.04 inches (7.72cm); Width = 3.76 inches (9.55cm)

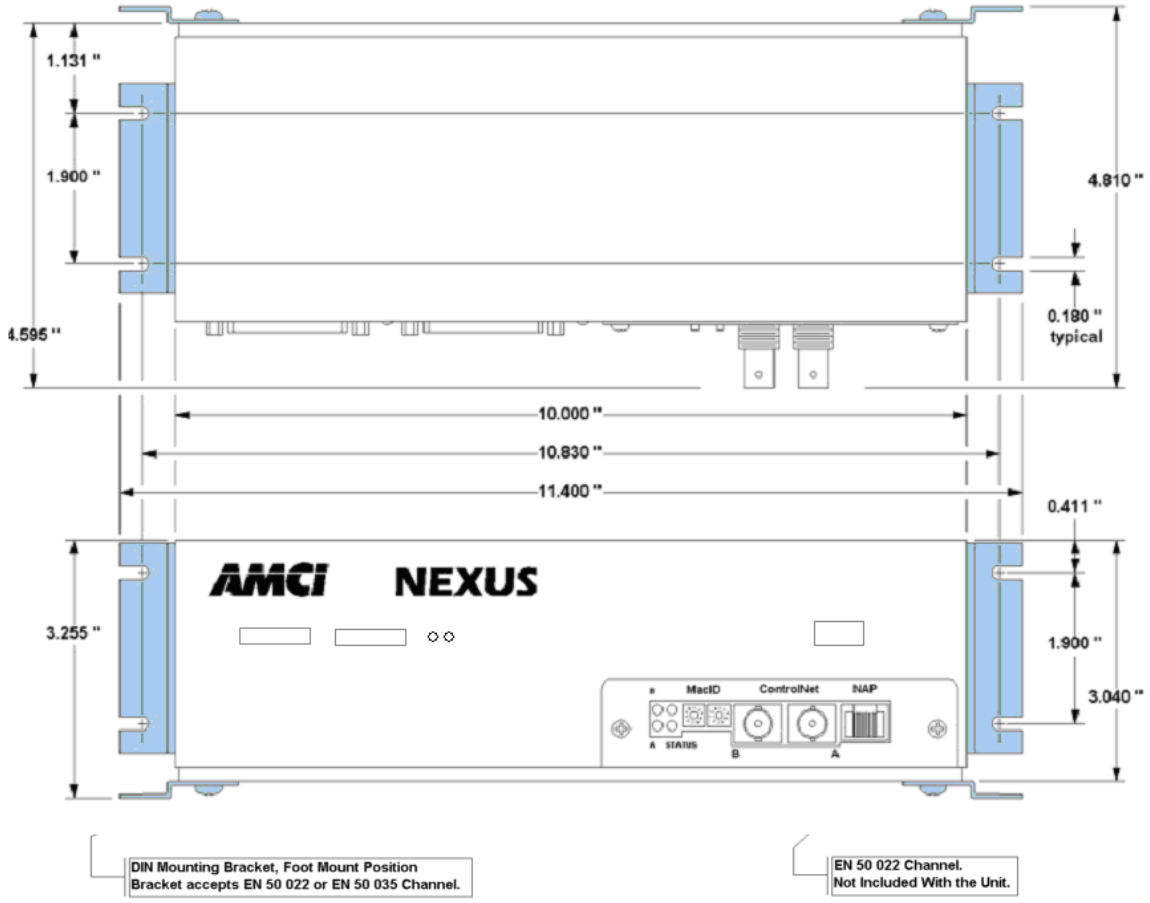
The following diagrams show the dimensions of the din rail mounting, either bottom or rear, mounting options (ControlNet version shown).



Attaching the DIN brackets to the NX2A4x-12

1. Remove a DIN bracket, two #8 screws, and two #8 washers from the mounting kit bag.
2. Slide the DIN bracket onto the unit.
3. Install the two #8 screws and lock washers to secure the bracket on the unit.
4. Repeat on the other side.

The following diagrams show the dimensions of the two panel, either bottom or rear, mounting options (ControlNet version shown).

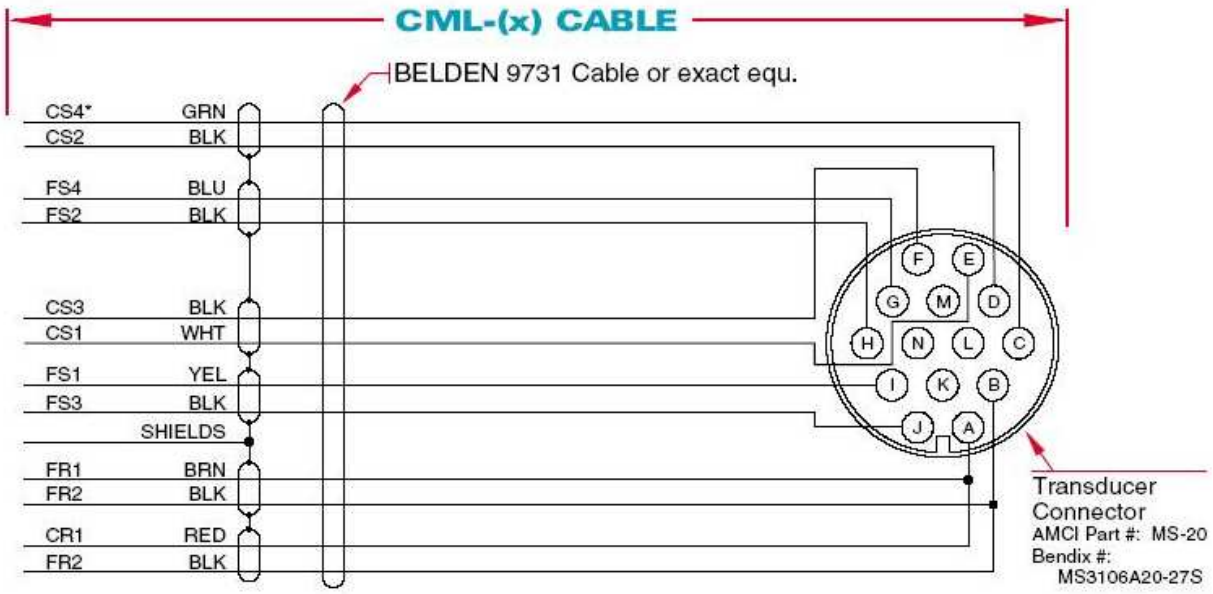


Attaching the panel brackets to the NX2A4x-12

1. Remove a panel bracket, two #8 screws, and two #8 lock washers from the mounting kit bag.
2. Position the panel bracket onto the unit.
3. Install the two #8 screws and lock washers to secure the bracket to the unit.
4. Repeat on the other side.

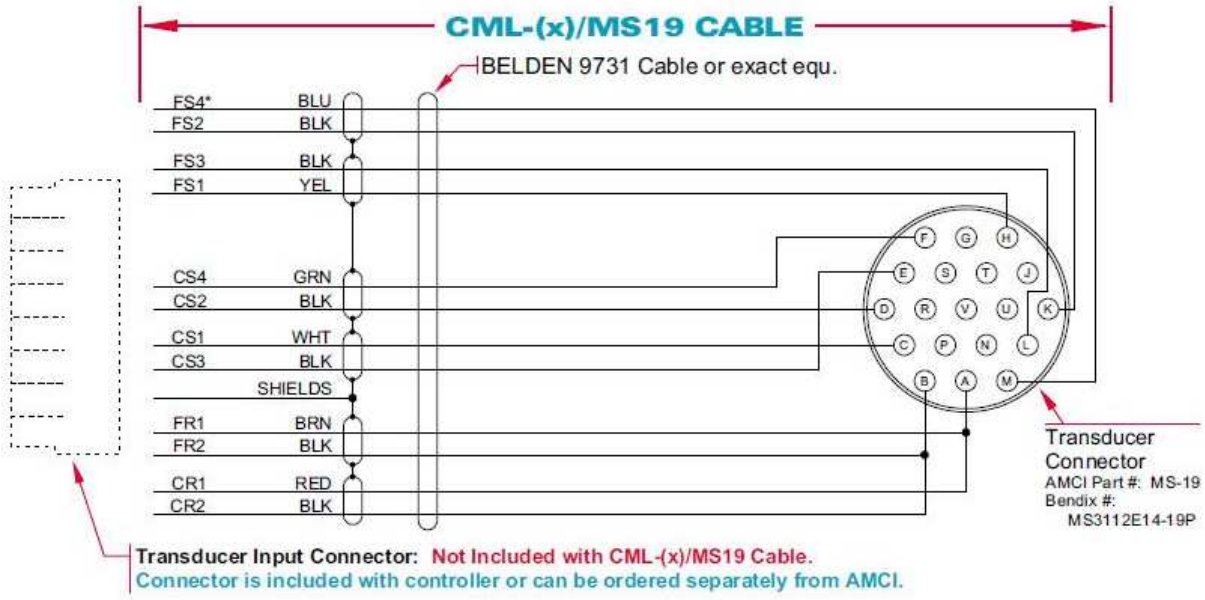
Resolver Wiring

The NX3B2X-17 is connected to the AMCI HTT-20-X transducers using a CML-(x) cable, where "x" is the length in feet.



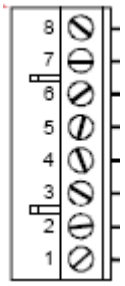
*Industry standard resolver designations. The "F" or "C" prefix refers to the Fine or Coarse resolver in the transducer. The Fine resolver yields the position with in the turn, while the difference in position between the Fine and Coarse resolvers yields the number of turns completed.

The NX3B2X-17 is connected to the AMCI HTT-400-180-X-J transducers using a CML-(x)/MS19 cable, where "x" is the length in feet.



These cables ship with the cable soldered to the Transducer Connector, and tinned pig tail wires at the module end of the cable that can be attached to the NX3B2X-17's removable MS-8 connectors.

MS-8



Pin Number	Function
8	S4F
7	S1F
6	S4C
5	S3C
4	S2F, S3F, S1C, S2C
3	Shields
2	R2
1	R1

F = Fine Resolver, C = Coarse Resolver

Inputs

The NX3B2X-17 unit has six inputs that are divided into two groups, each with its own common. The inputs in the first group affect channel 1 and the inputs in the second group affect channel 2. Depending on what is connected to the common, the inputs can be either sinking or sourcing. The following table shows the function of the module's six inputs.

Input	Input Label	Common Terminal	Function
1	IN1	COM 1	channel 1 jog up
2	IN2	COM 1	channel 1 jog down
3	IN3	COM 1	Emergency Stop channel 1
4	IN9	COM2	channel 2 jog up
5	IN10	COM2	channel 2 jog down
6	IN11	COM2	Emergency Stop channel 2

Note 1: If the emergency stop inputs are active when motion is requested, then the motion will not occur. The module status bits show the state of the emergency stop input even if there is no motion in progress.

Note 2: After the Emergency Stop input is used, the control bit must transition from 0 to 1 before motion can resume

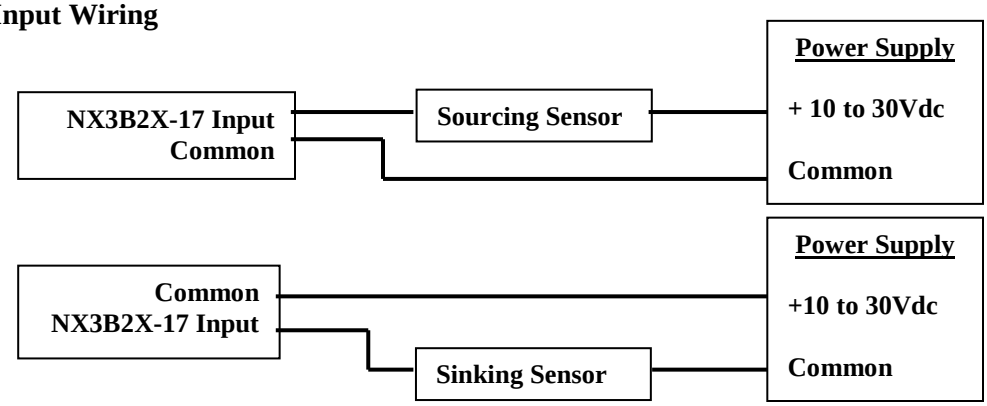
Note 3: If the emergency stop inputs are used, the motion control bits will have to transition from 0 to 1 before motion will start again.

Note 4: The inputs have an input voltage range of 10 to 30Vdc and require a minimum 10mA of current to activate.

Input Status LEDs

Common Connection	Input Type	LED color when input active
Ground	sinking	Red
+DC voltage	sourcing	Green

Input Wiring



Relay Outputs

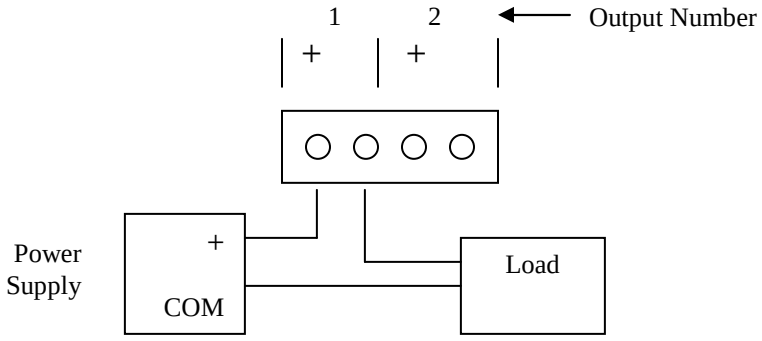
The NX3B2X-17's outputs consist of eight Opto 22 G4OC24 solid state relays. These relays have a logic voltage of 24Vdc and a line voltage of 5 to 60Vdc. They also have a turn on and turn off time of 50µs. The following table shows the function of each of the outputs.

Output	Channel	Function
K1	1	Motor Forward
K2		Motor Reverse
K3		High Speed
K4		Low Speed
K5	2	Motor Forward
K6		Motor Reverse
K7		High Speed
K8		Low Speed

Note 1: The outputs will be disabled if the channel is in transducer fault. Depending on how the module is configured, the outputs will either be disabled or remain active if the network connection is lost.
Note 2: The function of forward and reverse outputs will be reversed when the direction of increasing counts is set to negative.
Note 3: The outputs do not turn off if the PLC is in program mode.

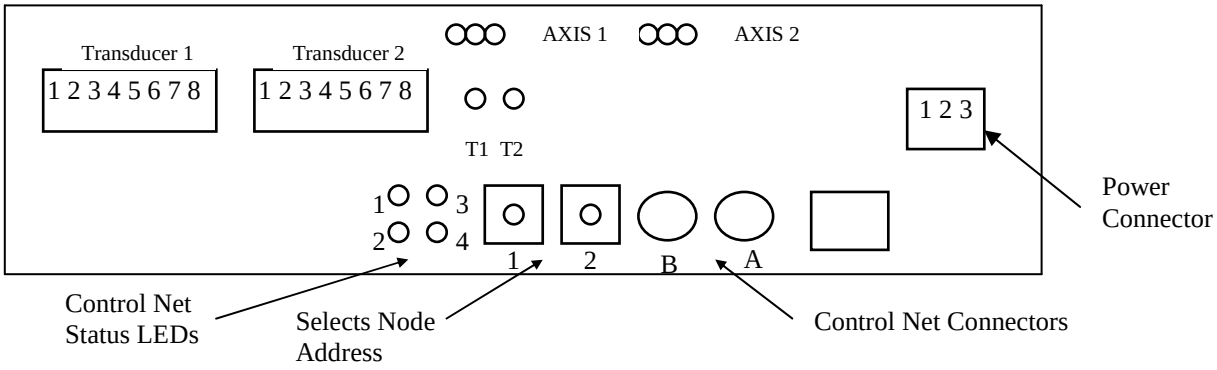
Relay Output Wiring

Each Relay output on the NX3B2X-17 has two terminals. One is labeled + and the other that is unlabeled. Connect your power supply to the + terminal and your load to the unlabeled terminal.



Chapter 2: Network Setup

NX3B2C-17 ControlNet Hardware Overview



ControlNet Connectors

The NX3B2C-17 has two BNC network connections labeled A and B.

Node Address Selection

The NX3B2C-17 has two rotary switches used to set the module's address on the network. Any node from 0 to 99 can be selected. Switch 1 sets the 1s digit and switch 2 sets the 10s digit of the address. For example, if the NX3B2C-17 is to be installed at node 46, switch 1 would be set to 6, and switch 2 would be set to 4. Note, changing the node address only takes affect at power up. Changing the address while power is applied to the NX3B2C-17 will generate a minor fault.

ControlNet Status LEDs

The following table describes the function of the four network status LEDs.

LED Number	Name	LED Pattern	Function
1	Channel B status	Solid Green Flashing Red/Off Solid Off	Channel Operating Correctly Channel Disconnected from Network Channel Disabled
2	Channel A status	Solid Green Flashing Red/Off Solid Off	Channel Operating Correctly Channel Disconnected from Network Channel Disabled
3	Module Owned	Solid Green Off Solid Red	Network Card is communicating with Nexus Network Card is not communicating with Nexus Incorrectly Configured Network. Possible causes are incorrect Node #, Number of I/O words, or Comm format.
4	Module Status	Flashing Green Solid Green Flashing Red Solid Red	Network Card is waiting for initialization Module is initialized and operating correctly Minor Fault (For example Node address changed) Major Fault, module must be restarted

Note: If the NX3B2C-17 is removed from the Network, than both LEDs 1 and 2 will flash RED.

AMCI Nexus to ControlNet ControlLogix system

1. With the power off, use the rotary switches on the Nexus to select the desired node address.
2. Connect the Nexus to the ControlNet using a ControlNet Tap to coax media. Either the A or B port can be used, depending on how your network is configured.
3. Apply power to the Nexus unit.
4. Start RSLogix 5000
5. Start RSLinx and establish communications to the ControlLogix system.
6. Configure the ControlLogix hardware system, processor and discrete I/O. If it is not already present, also add the ControlNet adapter 1756-CNB(R) module to the system.
7. Right-click on the 1756-CNB(R) module and Click on **New Module…**
8. Define the NX3B2X-17 as a generic CONTROLNET-MODULE. Click on **OK** and define the properties as follows.

Name: *Your Choice*
Description: *Your Choice*
Comm Format: Data-INT (must be set to Data-INT)
Node: Set it to the same value as the Node address on the NX3B2C-17

	Assembly Instance	**Size**
Input	100	18
Output	150	16
Configuration	110	0

9. Click on **Next>**
10. Define the RPI. The minimum value is 5.0ms, however the value may be set higher.
11. Click **Finish**.
12. Save and Download the file to the Processor
13. Start RSNetworx for ControlNet and either open an existing project or create a new one.
14. If this is the first time using the NX3B2X-17, register the appropriate EDS file and icon from AMCI's website www.AMCI.com.
15. Go Online. RSNetWorx will scan the ControlNet network and should discover the NX3B2X-17.
16. Click on the Enable Edits checkbox and then save the project.

At this point, the 1756-CNB(R) should be communicating; steady green LED and the top right LED (ControlNet Status LED #3) for the NEXUS communication should be on.

Go online to the ControlLogix processor. Select the **Logic** menu, followed by **Monitor Tags**. The data associated with the NX3B2X-17 is available under the name you chose when configuring it.

Quick Start Guide
AMCI Nexus to ControlNet PLC-5

1. With the power off, use the rotary switches on the Nexus to select the desired node address.
2. Connect the Nexus to the ControlNet using a ControlNet Tap to coax media. Either the A or B port can be used, depending on how your network is configured.
3. Apply power to the Nexus unit.
4. Start RSNetworx. If this is the first time using the NX3B2X-17, register the appropriate EDS file and icon from AMCI's website www.AMCI.com.
5. From RSNetworx for ControlNet, go Online. After browsing the network, the NX3B2C-17 will appear as an "Extra Device" at the node selected by the Nexus' rotary switches.
6. Click the **Enable Edits** checkbox and choose "Use online data (upload)". Click **OK**. At this point you can right click on the NX3B2C-17 icon and select **Properties** from the pop-up menu. In the properties window, you can change the name associated with the unit and add a description.
7. Go Offline.
8. Click the **Enable Edits** checkbox.
9. Right Click on the PLC-5 icon and click on **Scanlist Configuration** in the pop-up menu.
10. In the Device Name column, right click on the name of the Nexus unit, and click on **Insert Connection** in the pop-up menu. The Connection Properties window will appear on the screen.
11. If needed, set the Input Size and Input Address of the Data Input File. This file resides in the PLC-5 and is used by all of the ControlNet nodes. Therefore, it must be large enough to hold all of the input data on the network. The number of words that the NX3B2C-17 transfers to the PLC-5 is shown below.

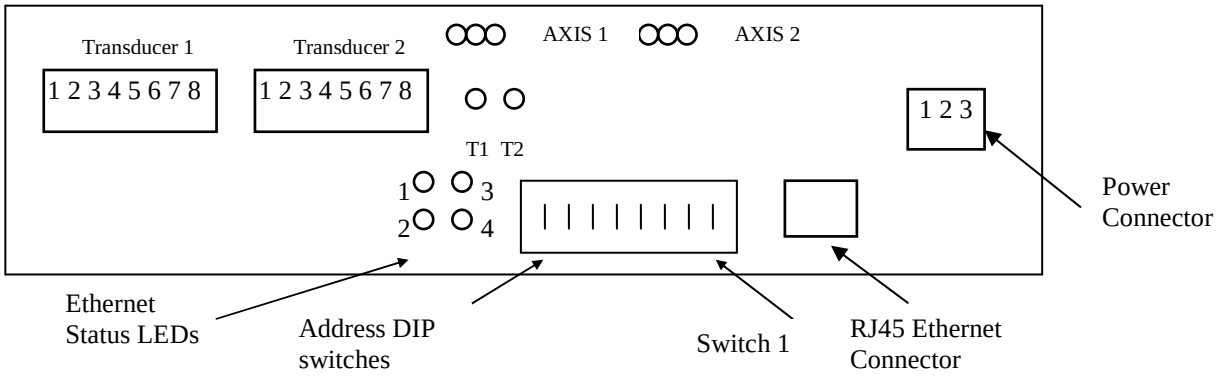
    16 Input words for the NX3B2C-17

12. If needed, set the Output Size and Output Address of the Data Output File. This file resides in the PLC-5 and is used by all of the ControlNet Nodes. Therefore, it must be large enough to hold all of the output data on the network. The number of words that the NX3B2X-17 receives from the PLC-5 is shown below.

    16 Output words for the NX3B2C-17

13. Set the Request Packet Interval time. This has a minimum acceptable value of five milliseconds, but can be set higher.
14. Click OK to close the Connection Properties window. In the Scanlist Configuration window, save the changes and close the window.
15. Go Online.
16. Verify that the PLC is in Program Mode.
17. Click on **Network** in the toolbar and select **Download to Network** from the pull down menu that appears. After the download is complete, the Nexus unit should be communicating with the PLC.

NX3B2E-17 Ethernet Hardware Overview



Ethernet Status LEDs

LED Number	Name	LED Pattern	Function
1	Network Status	Steady Off Steady Green Flashing Green Flashing Red Steady Red Flashing Green/Red	The module has no power or on IP address has been assigned. The module has at least one established Ethernet/IP connection. There are no Ethernet/IP connections established to the module One or more of the connections in which this module is the target has timed out The module has detected that its IP address is already in use The module is performing a power on self test
2	Module Status	Steady Off Steady Green Flashing Green Flashing Red Steady Red Flashing Green/Red	No Power. The module is operating correctly. The module has not been initialized. A minor recoverable fault has been detected. A major internal error has been detected. The module is performing a power on self test.
3	Activity LED		This LED flashes green each time a packet is received or transmitted
4	Link		This LED indicates that the module is connected to an Ethernet network

Ethernet Address Selection using the DIP switches

The NX3B2E-17 uses an IP address of 192.168.000.XXX where "XXX" can be any number between 1 and 254. Eight dip switches on the NX3B2E-17 are used to set the "XXX" portion of the address. Switch 8, the left most switch, is the least significant bit and switch 1, the right most switch, is the most significant bit. The address is programmed using the following procedure.

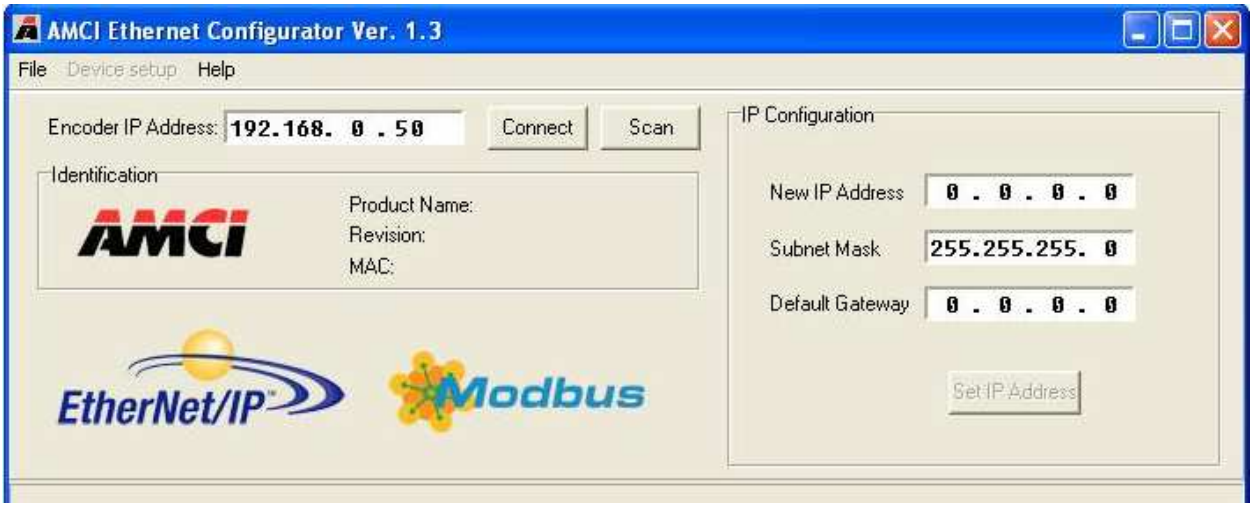
1. Determine the address of the NX3B2E-17 It can be any unused address between 1 and 254.
2. Convert the address to a binary number. A value of 50 will be 0011 0010.
3. Enter the address on the dip switches. Continuing the above example, switches 8, 6, 5, 2 and 1 will be off (down) and switches 7, 4, and 3 will be on (up).

Setting an Arbitrary Ethernet IP Address using AMCI software

1. This software will only work with AMCI Ethernet units that have a serial number of 02110001 or above. A crossover cable must be used if you are connecting your PC directly to the Nexus unit.
2. Download, extract, and run the **AMCI Ethernet Configuration software** from the following page of AMCI's website.

   http://www.amci.com/product-software.asp

   The following window will open.



1. The Nexus unit ship has a default IP address of 192.168.0.XXX where the XXX is set by the unit's eight dip switches. Set the dip switches to the desired address, or set all of the dip switches to the ON, up, position if you want to use a previously programmed IP address.
2. Set the Ethernet Port of your PC to be on the same network as the current address IP address of your AMCI Nexus unit.
3. Enter the AMCI Ethernet unit's current IP address in the "Encoder IP Address" field.
4. Click on Connect. The button will change from Connect to Disconnect and the lower left hand portion of the window will change from "Idle…" to "Connected to: XXX.XXX.XXX.XXX." The device type and MAC ID will also appear in the Identification field.
5. Enter the new IP address, the subnet mask, and the default gateway in the IP Configuration field.
6. Click the Set IP Address button. An "IP configuration written successfully" window will be displayed. Click on OK to close this window.
7. Click on Disconnect.
8. Remove power from the Nexus unit. The Nexus unit will not use the new IP address until power has been cycled.
9. Set all of the switches to the ON (up) position.

Setting an Arbitrary Ethernet IP Address Using BOOTP

The NX3B2E-17 has a default IP address of 192.168.000.XXX where "XXX" can be any number between 1 and 254 and is set by the DIP switches located on the front of the module.
Use the following procedure if you want your IP address to be something other than 192.168.000.XXX.

1. Remove power from the unit.
2. Set all of the unit's dip switches to the OFF (Down) position. This will set the unit's address to 0000 0000.
3. Start and configure your BootP server. Any BootP server running on a computer, which is connected to the same network, may be used for this purpose. Please note that the Nexus Unit's MAC ID address is located on a label on the module's back cover.
4. Apply power to the Nexus Unit.
5. At power-up the module will attempt to get an IP address by broadcasting several BootP requests. This operation will require approximately 30 seconds. At this point LED2 will be flashing green. If retrieved, the IP configuration will be used and stored in the unit's Flash Memory, overwriting older IP settings. The Nexus Unit will now join the network with the newly set IP configuration. If a BootP server is not found, the Nexus Unit will use the IP configuration that had been previously stored in its flash memory.
6. Close the BootP server program. Cycle power to the NX2A4E-12. The changes to the IP address will not be permanent until power has been cycled.

Setup Example
AMCI NX3B2E-17 to Rockwell Automation 1756-ENET/B module

1. With power removed, use the dip switches to set the address of the NX2C4C.
2. Open an existing or create a new ControlLogix program.
3. From the project tree, right click on I/O configuration and select New Module.
4. From the Module Type list that appears, select 1756-ENET/B, the 1756 Ethernet Bridge module.
5. Type a name for the Bridge module, which must begin with a letter, in the Name field.
6. Enter the slot number where the 1756-ENET/B module is located in the ControlLogix rack.
7. In the Address/Host Name field, select the IP Address enter the desired address, for example, 192.168.000.XXX where XXX can be a unique number between 1 and 254.
8. Click the Finish button.
9. From the project tree, right click on the 1756-ENET/B module and select New Module.
10. Select ETHERNET-MODULE Generic Ethernet Module from the list that appears and click on OK.
11. In the module properties that appear, enter the following parameters.

    Name: **Your Choice** (must begin with a letter)
    Comm Format: **Data-INT** (must be changed from Data-DINT to Data-INT)
    IP Address: **IP Address of NX3B2E-17**

	Assembly Instance	**Size**
Input	100	16
Output	150	16
Configuration	110	0

12. Click on Next.
13. Select the RPI time, minimum = 3ms
14. Click on Finish.
15. Save and download the program to the ControlLogix rack.
16. While online with the PLC, right click on the Ethernet Bridge module and select Properties.

Click on the Port Configuration tab and modify the following fields.

Enable Bootp: **Unselected** (This will allow the data to be manually entered in the IP address and Domain Name fields.)
IP Address: **192.168.000.XXX** (must be the same as step 7 above)
Subnet Mask: **255.255.255.0**

The Gateway Address, Domain Name, Primary DNS Server Address, and Secondary DNS Server Addresses all remain unchanged.

Chapter 3: Setup Parameter Description

The NX3B2X-17unit is configured using by three programming blocks, Transducer Setup, Positioning Setup, and Auxiliary Commands. The following is a description of the parameters contained in each of these programming blocks.

Transducer Setup Parameters

Transducer setup for each channel consists of ten parameters that define the transducer, the relationship between transducer position and load position, and the upper and lower position limits for the load.

Transducer Type
This parameter must be set to the type of transducer attached to the channel, 100, 180, 1000, or 1800 turn. The NX3B2X-17needs this information to decode the multiturn position from the difference in positions of the two resolvers.

Number of Turns
Use this parameter, along with the *Scale Factor* parameter, to set the correlation between the transducer position and the load position. This parameter is usually set to the number of rotations the transducer makes for the expected linear travel of the load. Its minimum value is 0.1 turns. Its maximum value is equal to the number of turns of the transducer, 100 or 180 turns, with 0.1 turn resolution. When using it with a 1000 or 1800 turn transducer, the number of turns parameter is programmable from 1 turn to 1000 or 1800 turns with 1.0 turn resolution.

Scale Factor
Use this parameter, along with the *Number of Turns* parameter, to set the correlation between the transducer position and the load position. The Scale Factor sets the position resolution and must be set to the number of counts needed over the programmed Number of Turns parameter. The range of values that can be programmed for the Scale Factor is 2 to (4096 * Number of Turns) for 100 and 180 turn transducers, or 2 to (409.6 * Number of Turns) for 1000 and 1800 turn transducers.

Linear Offset
The Linear Offset is a fixed number that is added to the transducer position data. It adjusts the range of position values the NX3B2X-17uses. For example, a twenty inch expected travel is over a range of 35.000 to 55.000 inches. Programming a linear offset of 35,000 will force the position data to read from 35,000 to 55,000. The Linear Offset has a range of -999,999 to (1,000,000 – Full Scale Count).

Preset Value
The Preset Value allows you to adjust the position data without rotating the transducer shaft. It is most commonly used to set the position data equal to the actual position of the load. Once programmed as part of the Transducer Setup Parameters, the transducer position can be set to the preset value from the network using the Apply Preset programming block. The programmable range of the Preset Value is Linear Offset to (Linear Offset + Full Scale Count -1).

Upper and Lower Travel Limits
In many applications, the machine will be damaged if the load exceeds the boundaries of expected travel. The Upper and Lower Travel Limits are programmable boundaries that will disable the motor outputs if the position exceeds them during a move profile. Once the position exceeds these limits, the only way to move the load is by using the jog command or inputs. The upper travel limit sets the upper boundary and is programmable from (Lower Travel Limit + 1) to (Linear Offset + Full Scale Count -1). The lower travel limit sets the lower boundary and is programmable from Linear Offset to (Upper Travel Limit -1).

Transducer Fault Latch
Transducer faults can be caused by improper wiring, electrical noise, or a damaged transducer. When the unit detects a fault condition, it reports this fault over the backplane by setting the Transducer Fault bit pattern in the Module Status bits. Normally, a transducer fault is latched by the NX3B2X-17module and will remain until the Clear Error command is sent to the NX3B2X-17. If you have a situation where electrical noise is causing spurious transducer faults that you can safely ignore, program the Transducer Fault Latch parameter set to self clearing.

Count Direction
By default, the transducer position increases with CW rotation of the shaft, when looking at the shaft. This bit level parameter changes the rotation for increasing position. In application terms, if the position of the load is increasing and the transducer position is decreasing, simply change this parameter.

Disable Channel LED
The bit level parameter turns off the channel's transducer status LED. The NX3B2X-17 will continue to report the resolver's position and velocity data, and will continue to perform its positioning operations, regardless whether the channel's LED is enable or disabled. By default, both of the channel LEDs are enabled.

Disable the Transducer Channel
This bit level parameter gives you the ability to disable the channel. That is, there will be no status bits or resolver data reported to the network if this bit has been set. A disabled channel will also ignore any command for motion and will only accept a Transducer Setup Command with the Transducer Channel enabled. By default both of the NX3B2X-17 channels are enabled.

Positioning Setup Parameters

Positioning setup for each channel consists of six parameters that define the positions at which the motor control outputs change state.

Target Position
The Target Position is the desired position of the load when a move profile is completed. It is programmed as an absolute position within the Lower and Upper Travel Limits. Except for the Positioning Direction, the other parameters are programmed as absolute values relative to this position. The direction of approach to the Target Position is programmable. Therefore, the definitions of the parameters refer to a *positive side of the Target Position* and a *negative side of the Target Position*. The *positive side* refers to all values greater than the Target Position and the *negative side* refers to all values less than the Target Position.

Positioning Direction
Positioning Direction is a bit level parameter that defines the direction of the approach to the Target Position. A *Positive Approach* forces an approach from the positive side of the Target Position. A *Negative Approach* forces an approach from the negative side. If the starting position of the move profile is on the opposite side of the Target Position, the NX3B2X-17 will drive the load to the correct side of the Target Position before completing the move profile.

Overshoot Offset
The NX3B2X-17 uses the Overshoot Offset to determine how far away from the Target Position to drive the load before beginning the approach to the Target Position. If the starting position is between the Target Position and Overshoot Offset, or on the opposite side of the Target Position, the NX3B2X-17 will drive the load to the Overshoot Offset before beginning the approach. The Overshoot Offset is also used when backing off from the Target Position if the previous attempt to reach it failed. The Overshoot Offset can be programmed to any value between (Low Speed Offset +1) and (Full Scale Count -1). If a positive approach is defined and (Target Position + Overshoot Offset) is greater than the Upper Travel Limit, the module will issue an 'Program Parameter Error' error message when a move profile is initiated. The same error message will be issued if a negative approach is defined and (Target Position - Overshoot Offset) is less than the Lower Travel Limit.

Low Speed Offset
The Low Speed Offset defines the position that the motor switches from high to low speed. It is used in two ways. When approaching the Target Position from the correct direction, (Target Position ± Low Speed Offset) is the point at which the motor switches from high to low speed. When traveling towards the Overshoot, the motor will switch to low speed when the position is (Overshoot ± Low Speed Offset). It will then travel at low speed to the Overshoot position, turn off the motor, and reverse direction before completing the profile. The Low Speed Offset can be programmed to zero or from (Stop Offset + 1) to (Overshoot Offset - 1). Setting the Low Speed Offset to zero disables the high speed motor output. All movement will be at the low speed if the Low Speed Offset equals zero.

Stop Offset
Once on the correct side of the Target Position, the Stop Offset defines the position at which the motor outputs are turned off at the end of the move profile. The load then coasts to the Target Position. The Stop Offset can be programmed to any value between one and (Low Speed Offset - 1). If the Low Speed Offset equals zero, the Stop Offset can be programmed to any value between one and (Overshoot Offset -1). If the load is not at Target Position at the end of the move profile, the NX3B2X-17 adjusts the Stop Offset by the difference between the actual position and the Target Position. The module will then back out to the overshoot position and run the profile again with the adjusted Stop Offset. The NX3B2X-17 will not allow the adjusted value of the Stop Offset to be greater than the Overshoot Offset. The module will adjust and re-run the profile the number of times specified by the *Retry Value* parameter before issuing an error message. If the Target Position is reached and the Stop Offset is within the ranges listed above, the NX3B2X-17 will store the adjusted Stop Offset in its memory.

Target Range
The Target Range defines a dead band around the Target Position. If the position at the end of a move profile is (Target Position ± Target Range) then the move profile is considered complete. The Target Range can be programmed to any value between zero and (Full Scale Count-1). The Target Range is added to and subtracted from the Target Position. For example, assume a Target Position of 10,000 and a Target Range of five. The acceptable positions at the end of the move profile are then 9,995 to 10,005.

Retry Value
The Retry Value specifies the maximum number of attempts the NX3B2X-17will make to reach the target position if the first attempt failed. The Retry Value can be programmed to any value between 1 and 255, with a default value of three.

Auxiliary Commands

These five bit level parameters allow you to clear errors, determine what data is reported to the input registers, and how the NX3B2X-17 should respond to a loss of the network connection.

Clear Errors
Setting this bit will clear a latched transducer fault error and any programming errors. The NX3B2X-17 will not accept any motion commands if there is a transducer fault. The NX3B2X-17 will also not accept any new programming commands if a programming error exits.

Read Position and Velocity
Set this bit to have the NX3B2X-17 report position and velocity data to the input registers. By default, and at power up, the NX3B2X-17 will report Position and Velocity data to the network.

Read Transducer Setup
Set this bit to have the NX3B2X-17 report the Transducer Setup parameters that are currently stored in its memory. An additional bit allows you to select which channel's Transducer Setup data is placed in the input registers.

Read Positioning Setup
Set this bit to have the NX3B2X-17 report the Positioning Setup parameters that are currently stored in its memory. An additional bit allows you to select which channel's Positioning Setup data is placed in the input registers.

Output State when Network Communication is lost
This bit level parameter allows you to determine how the NX3B2X-17 will react to a loss of a network communications. The options are that the outputs will be disabled or that the NX3B2X-17's inputs and outputs will continue to function normally. By default the NX3B2X-17's outputs will be disabled when the network connection is lost.

Chapter 4: Input Data

Input Tags (16 Words sent from the NX3B2X-17 Unit to the Network)
(18 Words sent from the NX3B2X-17 Unit to a ControlLogix PLC using ControlNet)

Ethernet Word	ControlLogix ControlNet Word	Position and Velocity	Readback Transducer Setup	Readback Positioning Setup
0	2	Channel 1 Status	Channel 1 Status	Channel 1 Status
1	3	Channel 2 Status	Channel 2 Status	Channel 2 Status
2	4	Upper 3 digits channel 1 position	Bit level Transducer Setup parameters	Bit level Positioning Setup parameters
3	5	Lower 3 digits channel 1 position	Transducer Type 100, 180, 1000, 1800	Upper 3 digits Target Position
4	6	Upper 3 digits channel 1 velocity	Number Of Turns	Lower 3 digits Target Position
5	7	Lower 3 digits channel 1 velocity	Upper 3 digits Scale Factor	Upper 3 digits Overshoot Offset
6	8	Upper 3 digits channel 2 position	Lower 3 digits Scale Factor	Lower 3 digits Overshoot Offset
7	9	Lower 3 digits channel 2 position	Upper 3 digits Linear Offset	Upper 3 digits Low Speed Offset
8	10	Upper 3 digits channel 2 velocity	Lower 3 digits Linear Offset	Lower 3 digits Low Speed Offset
9	11	Lower 3 digits channel 2 velocity	Upper 3 digits Preset Value	Upper 3 digits Stop Offset
10	12	0	Lower 3 digits Preset Value	Lower 3 digits Stop Offset
11	13	0	Upper 3 digits Upper Travel Limit	Upper 3 digits Target Range
12	14	0	Lower 3 digits Upper Travel Limit	Lower 3 digits Target Range
13	15	0	Upper 3 digits Lower Travel Limit	Retry Value 1 to 255
14	16	0	Lower 3 digits Lower Travel Limit	0
15	17	0	0	0

Note 1: Input words 0 and 1 in a ControlNet ControlLogix System will always be zero.
Note 2: If the Most Significant bit in the upper word of the Linear Offset, Preset Value, Upper Travel Limit, Lower Travel Limit, and the Target Position parameters is set, then the value is negative.
Note 3: The bit level read back data for the transducer setup includes, bit 0 = channel number, bit 1 = transducer fault latch, bit 2 = count direction.
Note 4: The bit level read back data for the positioning setup includes, bit 0 = channel number and bit 1 = positioning direction.
Note 5: The readback data also includes the command bit.
Note 6: The last word in the above table are reserved for future use and will always be zero.

Channel 1 & Channel 2 Status Words

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 09	Bit 08	Bit 07	Bit 06	Bit 05	Bit 04	Bit 03	Bit 02	Bit 01	Bit 00
Acknowledge Bit ch 1 status only	0	Reported Data 0 0 = Position & Velocity 0 1 = Transducer Setup 1 0 = Positioning Setup		Global Motion Bit	Module Status (See description below)			Channel Motion Status (See description below)				Low Speed Move Occurring	High Speed Move Occurring	Position Decreasing	Position Increasing

Note 1: The Acknowledge bit only exists in the channel 1 status word.
Note 2: The bits used in both status words have identical functions.
Note 3: Bit 11, the Global Motion bit will be set when any motion on the any channel is taking place.
Note 4: The function of bits 0 and 1 is reversed if the module is set for negative increasing counts.

Bits 4 to 7: Channel Motion Status

Bit # 7 6 5 4	Function
0 0 0 0	Stopped. Move profile terminated before it completed or a jog is stopped within the lower and upper travel limits.
0 0 0 1	Stopped, In Position. The present position is within the specified Target Range, regardless of how the position was reached. True only after the Stop Offset is reached.
0 0 1 0	Jogging Up. Position is manually forced to increase.
0 0 1 1	Jogging Down. Position is manually forced to decrease.
0 1 0 0	Positioning Up, Low Speed. Move Profile active, position increasing at low speed.
0 1 0 1	Positioning Down, Low Speed. Move profile active, position decreasing at low speed
0 1 1 0	Positioning Up, High Speed. Move Profile active, position increasing at high speed.
0 1 1 1	Positioning Down, High Speed. Move profile active, position decreasing at high speed
1 0 0 0	At Upper Travel Limit. Position ≥ Upper Travel Limit.
1 0 0 1	At Lower Travel Limit. Position ≤ Lower Travel Limit.
1010 – 1100	Reserved
1 1 0 1	The channel Emergency Stop Input is Active. This bit pattern is removed when the input is removed..
1 1 1 0	Attempted to External Jog in both directions at the same time
1 1 1 1	Stopped, Not in Position. The present position is not within the specified target range. Also set if a move profile is started and the (target position + overshoot offset) ≥ upper travel limit or if the (target position – overshoot offset) ≤ lower travel limit.

Bits 8 to 10: Module Status

Bit # 10 9 8	Function
0 0 0	No Errors: Module operating without errors.
0 0 1	Transducer Fault. There is a transducer fault or wiring error. This fault takes priority over all of the other programming faults shown in this table.
0 1 0	NvRAM Error. Parameters have not been stored correctly.
0 1 1	Program Command Error. This error will appear during a programming cycle under the following conditions. 1. Indicates an error in the command bits stored in the Command Word. This error will be displayed in the status words of both channels. 2. Indicates that the unused words in the Auxiliary or Apply Preset Commands are not zero. 3. Sending an Apply Preset Command without bits 0 or 1 set. This error will appear during a motion operation under the following conditions. 4. If a move operation is started with two or more control bits set. 5. If a Stop Command is issued when there is no move profile taking place. 6. If a Stop Command is issued to stop a Jog operation.
1 0 0	Program Parameter Error. Set under the following conditions. 1. If a parameter sent with the last programming cycle is outside of its valid range. 2. If the unused words in the Transducer Setup or Positioning Setup programming blocks are not zero. 3. If a move profile is started and the Target Position is greater than the Upper Travel Limit or less than the Lower Travel Limit.
1 0 1	Command Ignored Error. Set under the following conditions. 1. Attempting to program the module when there is a NvRAM error. 2. Attempting to preset a position, jog a position, or run a move profile when the channel is in transducer fault. 3. If the Transmit Bit transitions from 0 to 1 when any motion, either a move operation or a jog, is occurring. 4. If either the Transmit or Acknowledge bit are set when any motion is requested. 5. If the transmit bit transitions from 0 to 1 during the same PLC scan that a move operation is started. In this case, neither operation will be performed. 6. Programming the module when a Program Parameter Error exists. The Program Parameter Error must be cleared using the Clear Error command before any additional commands will be accepted. 7. Issuing a move command on a channel that has been disabled. 8. Setting an unused bit in the move command words. 9. Setting a move profile bit when a different bit is already set. 10. Changing from Jog up to Jog down during the same programming scan. 11. Starting a move profile if the current position is above the upper travel limit or below the lower travel limit.
1 1 0	Reserved
1 1 1	Reserved

Chapter 5: Output Data (16 Words sent from the Network to the NX3B2X-17)

Word	Transducer Setup	Positioning Setup	Auxiliary Commands	Apply Preset
0	Channel 1 Motion Control	Channel 1 Motion Control	Channel 1 Motion Control	Channel 1 Motion Control
1	Channel 2 Motion Control	Channel 2 Motion Control	Channel 2 Motion Control	Channel 2 Motion Control
2	Command Word and setup bits	Command Word and setup bits	Command Word	Command Word
3	Transducer Type	Upper 3 digits Target Position	Must be zero	Must be zero
4	Number Of Turns	Lower 3 digits Target Position	Must be zero	Must be zero
5	Upper 3 digits Scale Factor	Upper 3 digits Overshoot Offset	Must be zero	Must be zero
6	Lower 3 digits Scale Factor	Lower 3 digits Overshoot Offset	Must be zero	Must be zero
7	Upper 3 digits Linear Offset	Upper 3 digits Low Speed Offset	Must be zero	Must be zero
8	Lower 3 digits Linear Offset	Lower 3 digits Low Speed Offset	Must be zero	Must be zero
9	Upper 3 digits Preset Value	Upper 3 digits Stop Offset	Must be zero	Must be zero
10	Lower 3 digits Preset Value	Lower 3 digits Stop Offset	Must be zero	Must be zero
11	Upper 3 digits Upper Travel Limit	Upper 3 digits Target Range	Must be zero	Must be zero
12	Lower 3 digits Upper Travel Limit	Lower 3 digits Target Range	Must be zero	Must be zero
13	Upper 3 digits Lower Travel Limit	Retry Value	Must be zero	Must be zero
14	Lower 3 digits Lower Travel Limit	Must be zero	Must be zero	Must be zero
15	Must be zero	Must be zero	Must be zero	Must be zero

Note 1: Words 0 and 1 are used to command motion on channels 1 and 2 and do not use the programming sequence.

Note 2: Word 2 contains the transmit bit and bits that determine which of the four programming blocks (Transducer Setup, Positioning Setup, Auxiliary Commands, or Apply Preset), are being sent to the NX3B2X-17.

Note 3: Word 2 also contains additional setup bits for the Transducer and Positioning setup programming blocks.

Words 0 and 1, channel 1 and channel 2 Motion Control

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 09	Bit 08	Bit 07	Bit 06	Bit 05	Bit 04	Bit 03	Bit 02	Bit 01	Bit 00
0	0	0	0	0	0	0	0	0	0	0	Enable External Jog	Jog down	Jog up	Stop move profile	Start move profile

Note 1: Output words 0 and 1 do not use the programming cycle. The module will act on the state of these bits immediately, without the use of the Transmit or Acknowledge bit.
Note 2: Motion Profiles will not be allowed when a programming cycle is taking place. If either the Transmit or Acknowledge bits are set when any motion is requested, a Command Ignored error will be generated.
Note 3: If the transmit bit transitions from 0 to 1 when any motion, either a move profile or a jog, is occurring, a Command Ignored error will be generated and motion will continue.
Note 4: If the transmit bit transitions from 0 to 1 during the same scan that a move operation is started, then neither operation will be performed and a Command Ignored error will be generated.
Note 5: The NX3B2X-17 must see at least one scan where the jog control bits are both zero when changing the direction of the jog operation. A Command Ignored Error will be generated if the jog bits request a change in direction in the same program scan.
Note 6: If a Command Ignored Error is generated by any of the conditions listed above, the error will have to be cleared using the Clear Error Command in the Auxiliary Commands before any move profiles will be allowed to occur.
Note 7: The *JOG Function* is allowed at any time. You can jog in either direction even if the current position is currently outside of the travel limit ranges. This functionality is true of both the jog inputs or the backplane jog commands and is intended to allow the press to be jogged back into position regardless of the current position.

Word 2 Command Word

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 09	Bit 08	Bit 07	Bit 06	Bit 05	Bit 04	Bit 03	Bit 02	Bit 01	Bit 00
Transmit Bit	0	0	0	Apply Preset	Auxiliary Commands	Positioning Setup	Transducer Setup	0	Additional Setup and Command Bits, Programming Block Specific						

Word 2 Transducer Setup Control and Setup Word

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 09	Bit 08	Bit 07	Bit 06	Bit 05	Bit 04	Bit 03	Bit 02	Bit 01	Bit 00
Transmit Bit 0	0	0	0	0	0	0	1	0	0	0	Disable the Transducer channel	Disable the channel LED	Direction, 0 = positive, 1 = negative	Transducer Fault Latch, 0 = fault latched, 1 = fault self clearing	Channel Number 0 = ch 1, 1 = ch 2

Transducer Setup: Words 3 to 15

Word	Parameter	Range	Default
3	Transducer Type	100, 180, 1000, 1800	180
4	Number Of Turns	HTT-20-100: 0.1 to 100.0 turn resolution (0.1 turn resolution entered as 1 to 1000) HTT-20-180: 0.1 to 180.0 turn resolution (0.1 turn resolution entered as 1 to 1800) HTT-20-1000: 1 to 1000 turn resolution (1 turn resolution entered as 1 to 1000) HTT-20-1800: 1 to 1800 turn resolution (1 turn resolution entered as 1 to 1800)	1800
5	Upper 3 digits Scale Factor	2 to (Number of Turns * 4096) for HTT-20-100 or HTT-20-180 2 to (Number of Turns * 409.6) for HTT-20-1000 or HTT-20-1800	737
6	Lower 3 digits Scale Factor		280
7	Upper 3 digits Linear Offset	-999,999 to (1,000,000 – Full Scale Count)	0
8	Lower 3 digits Linear Offset		0
9	Upper 3 digits Preset Value	Linear Offset to (Linear Offset + Full Scale Count – 1)	0
10	Lower 3 digits Preset Value		0
11	Upper 3 digits Upper Travel Limit	(Lower Travel Limit + 1) to (Linear Offset + Full Scale Count – 1)	737
12	Lower 3 digits Upper Travel Limit		279
13	Upper 3 digits Lower Travel Limit	Linear Offset to (Upper Travel Limit – 1)	0
14	Lower 3 digits Lower Travel Limit		0
15	0	Must be zero	0

Note 1: The module will still provide resolver position and status information to the network even if the Disable Channel LED bit, bit 3, has been set.

Note 2: There will be no status bits or resolver data reported to the PLC if the channel disable bit, bit 4, has been set. A disabled channel will ignore any command for motion and will only accept a Transducer Setup Command with the Transducer Channel enabled (bit 4 reset).

Note3: Programming the transducer setup data will clear the internal offset generated by an Apply Preset operation.

Note 4: The two word parameters are divided in the following way. The word with the upper three digits contain the 1000s places of the value, and the word with the lower three digits contain the 1s, 10s, and 100s places of the value. For example, a value of 123,456 will have 123 in the upper word and 456 in the lower word.

Note 5: The Most Significant bit in the upper word of the Linear Offset, Preset Value, Upper Travel Limit, and the Lower Travel Limit is the sign bit. Setting this bit will cause the parameter to be negative.

Word 2 Positioning Setup Control and Setup

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 09	Bit 08	Bit 07	Bit 06	Bit 05	Bit 04	Bit 03	Bit 02	Bit 01	Bit 00
Transmit Bit 0	0	0	0	0	0	1	0	0	0	0	0	0	0	Approach Direction, 0 = greater, 1 = less than	Channel Number 0 = ch 1, 1 = ch 2

Positioning Setup Words 3 to 15

Word	Positioning Setup	Range	Default
3	Upper 3 digits Target Position	Linear Offset to (Linear Offset + (Full Scale Count - 1))	0
4	Lower 3 digits Target Position		0
5	Upper 3 digits Overshoot Offset	(Low Speed Offset + 1) to (Full Scale Count – 1) if Low Speed ≠ 0 (Stop Offset + 1) to (Full Scale Count – 1) if Low Speed = 0	0
6	Lower 3 digits Overshoot Offset		0
7	Upper 3 digits Low Speed Offset	0 and (Stop Offset + 1) to (Overshoot Offset – 1)	0
8	Lower 3 digits Low Speed Offset		0
9	Upper 3 digits Stop Offset	1 to (Overshoot Offset - 1) if Low Speed Offset = 0 1 to (Low Speed – 1) if Low Speed ≠ 0	0
10	Lower 3 digits Stop Offset		0
11	Upper 3 digits Target Range	0 to (Full Scale Count – 1)	0
12	Lower 3 digits Target Range		0
13	Retry Value	1 to 255	0
14	0	Must Be Zero	0
15	0	Must Be Zero	0

Note 1: The two word parameters are divided in the following way. The word with the upper three digits contain the 1000s places of the value, and the word with the lower three digits contain the 1s, 10s, and 100s places of the value. For example, a value of 123,456 will have 123 in the upper word and 456 in the lower word.

Note 2: The Most Significant bit in the upper word of the Target Position is the sign bit. Setting this bit will cause the parameter to be negative.

Note 3: The Approach Direction Parameter, bit 1, works in the following way. If the bit is reset to zero, the NX3B2X-17 will approach the target from a position that is greater then the Target Position. If this bit is set to one, the NX3B2X-17 will approach the target from a position that is less than the Target Position.

Note 4: The Full Scale Count = (Transducer Type * Scale Factor/Number of Turns) –1

Word 2 Auxiliary Commands

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 09	Bit 08	Bit 07	Bit 06	Bit 05	Bit 04	Bit 03	Bit 02	Bit 01	Bit 00
Transmit Bit 0	0	0	0	0	1	0	0	0	0 = Outputs & Inputs disabled, 1 = Outputs & Inputs Operate	Program the input and output state if the network connection is lost	Read Positioning Setup	Read Transducer Setup	Read Position and Velocity	Clear Errors	Read Back Channel Number 0 = channel 1, 1 = channel 2

Note 1: The Clear Error bit can be set along with any of the Auxiliary Command bits

Note 2: Reading back the Positioning Setup data will also report the most current Stop Offset Value that might have been adjusted during a move profile operation.

Note 3: The module and motion status bits remain in their last state when the network connection is lost.

Note 4: The state of bit 6, the Input and Output state when the network connection is lost, is only read when bit 5 is set. The following table shows the functions of bit 6.

Bit 6	Input and Output State
0	The outputs will be disabled and the inputs ignored if the network connection is lost.
1	The module will continue to operate normally if the network connection is lost. If a move profile was in progress, it will run to completion. If a jog operation was in progress, the jog will continue. The inputs will continue to function.

Apply Preset Position Data Word 2, bits 0 to 7

Word 2 Positioning Setup Control and Setup

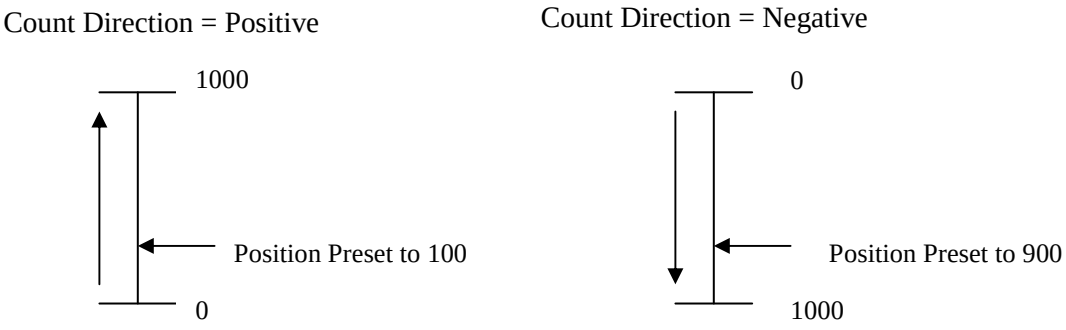
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 09	Bit 08	Bit 07	Bit 06	Bit 05	Bit 04	Bit 03	Bit 02	Bit 01	Bit 00
Transmit Bit 0	0	0	0	1	0	0	0	0	0	0	0	0	0	Apply Preset Channel 2	Apply Preset Channel 1

Note 1: The Apply Preset command can be sent to both channel 1 and channel 2 during the same programming cycle.
Note 2: Programming the transducer setup data will clear the internal offset generated by an Apply Preset operation.

Applying the Preset Value, Count Direction = Negative

The effect of the Apply Preset function on the current position data is different when the Count Direction parameter is set to positive than when the parameter is set to negative. When the Count Direction parameter is set to positive, the current position data becomes the Preset Value. When the Count Direction parameter is set to negative, the current position data is offset to the (Scale Factor – Preset value). This results in the Apply Preset function always changing the position to the same physical location, as illustrated by the following example.

Scale Factor = 1000
Preset Value = 100



So, applying the Preset Value with the Count Direction set to negative causes the position data to become 900, not 100.

Programming Sequence

1. The ladder logic program writes the data into the output registers.
2. The ladder logic program sets the transmit bit in output word 2
3. When the module detects the 0 to 1 transition of the transmit bit, it will respond by setting any error bits and the Acknowledge bit in the input word 2.
4. When the ladder logic program sees that the Acknowledge bit is set, it will examine any error bits, and then reset the transmit bit.
5. The module will reset the Acknowledge bit. The programming sequence is now complete

Chapter 6: Manual Revision History

Version 0: Initial release of the specifications.
Version 1.0: Added details about the programming, as well as a description of the hardware.
Version 2.0: The following changes were made to the specifications.

1. The Jog and E-Stop status bits were moved from the module status to the motion status.
2. Information was added on how the ControlLogix PLC requires the use of two additional input words. These input words will always be zero.
3. Default Values were added to Transducer and Positioning setup data.
4. Additional information was added to the input and output information.
5. A description of the Transmit bit/Acknowledge bit programming sequence was added to the specifications.
6. A section was added on how the Apply Preset instruction works when the direction of increasing counts is set to negative.
7. Information was added on how the function of the Forward and Reverse outputs is different when the direction of increasing counts is set to negative.
8. Quickstart guides for both PLC-5 and ControlLogix systems were added to the specifications.
9. A note was added on how the programming of the output state when the network connection is lost does not function in the Version 0 firmware.

Version 3.0: The following changes were made to the specifications.

1. These specifications were written for the version 1 firmware where the problem of programming the output state for the loss of a network connection has been corrected. The warning message indicating that programming this parameter did not work was removed.
2. Additions were made to the conditions that will cause a Program Command Error, Program Parameter Error, and a Command Ignored Error.
3. Changes were made to the ranges of the positioning setup parameters.
4. A note was added on how the NX3B2X-17 must see at least one scan where the jog control bits are both zero when changing the direction of the jog operation.

Version 3.1: Released on 3/18/02. The following changes were made to the specifications.

1. The dimensions were added to the Hardware Overview
2. The RSLogix revision references were removed from the quickstart quide.
3. An additional status LED function was added. This feature always existed; it was just not referenced in the specifications.

Version 3.2: Released on 5/14/02. This version changed the name from NX3A2C-17 to NX3B2X-17.

Version 3.3 was released on 4/28/05. This version added a note to the functionality of ControlNet LED 3. A note on how jogging is allowed even outside of the upper and lower travel limits was also added.

Version 3.4 was released on 1/23/2014. The following changes were made.

- The name was changed from specifications to manual.
- General Information, including warranty information was added
- A table of contents was added
- Specifications were added
- Resolver cable wiring was added
- Ethernet IP network connections and setup were added, including a section on changing the IP address.
- A description of the programmable parameters was added
- More detail was added to the input and output data word layout

file: NX3B2X-17_manual.doc
date: 1/23/2014