



# Node Controller Interface User Manual

NC-x Node Controller Web Interface



***Allen-Bradley***

by **ROCKWELL AUTOMATION**

**User Manual**

Original Instructions

## Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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Rockwell Automation recognizes that some of the terms that are currently used in our industry and in this publication are not in alignment with the movement toward inclusive language in technology. We are proactively collaborating with industry peers to find alternatives to such terms and making changes to our products and content. Please excuse the use of such terms in our content while we implement these changes.

## Additional Safety Information

Although every effort is made to keep this manual accurate and up-to-date, MagneMotion and Rockwell Automation assumes no responsibility for any errors, omissions, or inaccuracies. Information that is provided in this manual is subject to change without notice. Any sample code that is referenced in this manual or included with MagneMotion® software is included for illustration only and is, therefore, unsupported.



**ATTENTION:** For additional safety notices and definitions, see the [Safety Notices](#) section and/or the [Notes, Safety Notices, and Symbols](#) section.

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# Changes

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## Overview

This manual is changed as required to keep it accurate and up-to-date to provide the most complete documentation possible for the node controller interfaces. This section provides a brief description of each significant change.

**NOTE:** Distribution of this manual and all addenda and attachments is not controlled. To identify the current revision, see the [Literature Library](#) on the Rockwell Automation website.

### Rev. A

Initial release to support NC Software Image Version 0.9.77.

### Rev. B

Revised to support NC Software Image Version 1.1.19.

Added the following:

- This Changes section.
- In Chapter 3, *Node Controller Administration – Web*, added Motor Information page [usage](#).
- In Chapter 5, *UI Reference*, added [Motor Information](#) page reference.
- Added an [Appendix A](#) with information about additional documentation and transport system limits.

Updated the following:

- Updated trademark information.
- Updated all figures to show the latest version of the user interface (UI).
- Corrected the names of all referenced MagneMotion manuals.
- Updated the descriptions of all system software.
- In Chapter 1, *Introduction*, updated the [Getting Started](#) procedure.



- In Chapter 4, *UI Reference*, updated the [Node Controller Interface Statistics](#) page reference to separate node controller and high-level controller information.
- In Chapter 5, *Troubleshooting*, updated the [Node Controller Web Interface Troubleshooting](#).
- Updated the [Glossary](#).

Removed the following:

- All references to “physical” and “virtual” components.

## Rev. C

Revised to support NC Software Image Version 7.1.20.

Added the following:

- In Chapter 2, *Node Controller Overview*, added information on the *NC-12 Node Controller*.
- In Chapter 3, *Node Controller Administration*, added a [Node Controller Web Administration Overview](#). Added procedures to identify current versions of the [Node Controller Configuration File](#), [Motor Type files](#), [Magnet Array Type files](#), [Node Controller Software Image file](#), and [motor software files](#). Added procedures to download the [Node Controller Configuration File](#), [Motor Type files](#), [Magnet Array Type files](#), [Node Controller Software Image file](#), and [motor software files](#). Added procedures to delete the [Node Controller Configuration File](#), [Motor Type files](#), [Magnet Array Type files](#), and [motor software](#). Added a procedure to [Distribute the Node Controller Software Image File to the Node Controllers](#). Added procedures for [Password Management](#), including [Add New Users](#) and [Distribute User Information](#) to multiple node controllers. Added a procedure to [Download Log Files](#).
- In Chapter 4, *UI Reference*, added descriptions of all fields that are displayed in the [Network Interface Statistics](#) section.
- In Chapter 5, *Troubleshooting*, added [Log Message Troubleshooting](#).
- In the [Appendix A](#), added [File Maintenance](#).

Updated the following:

- Updated all figures to show the latest version of the user interface (UI).
- Updated trademark and copyright information.
- Updated the Overview Note in this section.
- In the [About This Manual](#) chapter, updated the [Manual Conventions](#) to describe number and measurement conventions better. Updated [Notes](#), [Safety Notices](#), and [Symbols](#) to include [Symbol Identification](#). Updated the list of [Additional Resources](#).
- In Chapter 1, *Introduction*, updated the [Transport System Components Overview](#) to include the NC-12 node controller. Updated the [Transport System Software Overview](#) to include new Type files and updated the descriptions of existing Type files. Expanded the [Getting Started](#) procedure.

- 
- In Chapter 2, *Node Controller Overview*, expanded the *Node Controller Descriptions*.
  - Restructured Chapter 3, *Node Controller Administration* to follow the order of the Main Menu.
  - Changed all terminal emulator examples from HyperTerminal to PuTTY.
  - In Chapter 3, *Node Controller Administration*, updated procedures to upload the [Node Controller Configuration File](#), [Motor Type files](#), [Magnet Array Type files](#), [Node Controller Software Image file](#), and [motor software files](#) to include distribution to multiple node controllers. Updated the procedure for *Programming the Motors*. Updated the procedure for *Password Management*. Updated the procedure to *Set the Clock Time and Date*, including distribution to multiple node controllers. Updated the procedure to *Restore Factory Defaults*. Updated the procedure to *Open and View Log Files*. Updated the procedure to *Reboot the Node Controller* and *Restart the Node Controller* to include multiple node controllers. Updated the procedure to view *Motor Information* to include downloading of the data.
  - In Chapter 4, *UI Reference*, expanded descriptions of the fields being displayed and provided information on distribution to multiple node controllers. Updated the *Motor Information* UI page description to include page controls and examples of the information that is returned for all motor types.
  - In the *Appendix A*, updated the *Transport System Limits* tables.
  - Updated the *Glossary*.

Removed the following:

- All references to the standard node controller (replaced by the NC-12 node controller). Support for the standard node controller, including software, spare parts, technical support, and service continues to be available.

## Rev. D

Revised to support NC Software Image Version 7.2.15.

Added the following:

- In Chapter 1, *Introduction*, added information about the Virtual Scope utility.
- In Chapter 2, *Node Controller Overview*, added NC-12 node controller connections for 700-1482-00. Added *NC-12 Node Controller Indicators* and *Node Controller LITE Connections*.
- Added Chapter 4, *Node Controller Administration – Console*.
- Added Chapter 6, *Console Interface Reference*.
- Added the Back Cover.

Updated the following:

- Updated trademark and copyright information.
- Changed the logo to “A Rockwell Automation Company” version.
- Updated manual to include the console interface.

- In Chapter 3, *Node Controller Administration*, updated the [Node Controller Web Administration Overview](#) to include log review and restarting.
- Moved node controller configuration using the console interface to [Chapter 3, Node Controller Administration – Console](#).
- Changed Chapter 4, *UI Reference* to Chapter 5, *Web Interface Reference*.
- Changed Chapter 5, *Troubleshooting* to Chapter 7, *Troubleshooting*.
- In Chapter 7, *Troubleshooting*, included [Console Interface Troubleshooting](#).

Removed the following:

- In the [Appendix A](#), removed HLC VM Slaves per Master reference from the [Transport System Limits](#).

## Ver. 05/Rev. E

Supports the following NC Software Image Versions:

- MM LITE – 7.2.15
- QS 100 – 7.2.21
- QSHT – 7.2.12

Added the following:

- Added support for the NC-E node controller.
- In Chapter 2, *Node Controller Overview*, added grounding requirements for node controllers.

Updated the following:

- The revision from alpha (Rev. E) to numeric (Ver. 05).
- Trademark and copyright information.
- The structure of these changes descriptions.

Removed the following:

- In Chapter 2, *Node Controller Overview*, removed node controller shipping temperatures.

## Ver. 06/Rev. F

Revised to support the following NC Software Image Versions:

- MM LITE – 13.7.1
- QS 100 – 7.2.21
- QSHT – 7.2.12

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Added the following:

- Rockwell Automation Publication Number.
- In Chapter 2 (was Chapter 3), *Node Controller Administration – Web*, added the [Restricted Parameters File](#) section and the [MagneMotion Information and Configuration Service File](#) section to [Configuration Files](#) page usage. Added [Managed Configurations](#) and [Motor Gap Information](#) and page usage. Added the Node Controller Upgrade to New Image Format section to [Upgrading Node Controller Software](#) page usage. Added [License Information](#) page usage.
- In Chapter 3 (was Chapter 4), *Node Controller Administration – Console*, added HLC log files.
- In Chapter 4 (was Chapter 5), *Web Interface Reference*, added [Ethernet AVPs](#) to the [Interface Status](#) page. Added [Restricted Parameters File](#) and [MagneMotion Information and Configuration Service \(MICS\) File](#) references to the [Configuration Files](#) page. Added the [Managed Configurations](#) and the [Motor Gap Information](#) pages. Added [Node Controller Upgrade to New Image Format](#) reference to the [Upgrade Software](#) page. Added the [License Information](#) page reference. Added [MagneMover LITE G4 Ethernet motors](#) reference to the [Motor Information](#) page.
- In Chapter 5 (was Chapter 6), *Console Interface Reference*, added [System Statistics](#) page reference.
- In Chapter 6 (was Chapter 7), *Troubleshooting*, added additional log messages to [Log Message Troubleshooting](#).
- In the [Appendix A](#), added the [Communications Protocol](#) overview and updated the [Transport System Limits](#).
- On the *Back Cover*, added product certificate information.

Updated the following:

- The revision to include both alpha (Rev. F) and numeric (Ver. 06).
- Updated all UI images to reflect the current version of software.
- In Chapter 4 (was Chapter 5), *Web Interface Reference*, updated the [General Status](#) page reference to include additional information. Updated the [Interface Status](#) page to include Ethernet AVPs.

Removed the following:

- Removed Chapter 2, *Node Controller Overview* and restructured the remaining chapters. All hardware content moved to the *MagneMotion Node Controller Hardware User Manual*, [MMI-UM013](#).
- In Chapter 2 (was Chapter 3), *Node Controller Administration – Web*, removed the product line restriction on [Configuring Remote Logging](#).
- In Chapter 4 (was Chapter 5), *Web Interface Reference*, removed turntable references.
- In Chapter 5 (was Chapter 6), *Console Interface Reference*, removed turntable and joystick references.

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**Rev. G**

Added the following:

- In *Chapter 1, Introduction*, added descriptions of new utilities and new file types to the *Transport System Software Overview*.
- In *Chapter 2, Node Controller Administration – Web*, added a procedure for *Configuring the Host TCP Interface Control Port*. Added *Managed Configurations and Configuration Files Page Interactions* to the *Managed Configurations* section. Added the *NC Migration* section with upgrade and downgrade procedures.
- In *Chapter 3, Node Controller Administration – Console*, added the *Set Terminal Backspace Character* procedure.
- In *Chapter 4, Web Interface Reference*, added the *NC Migration* page details.
- In *Chapter 5, Console Interface Reference*, added the *Set Terminal Backspace Character* page details.

Updated the following:

- The revision to alpha (Rev. G) only.
- Updated all trademark, copyright, and support information and moved to the *Back Cover*.
- Updated the part numbers for all referenced manuals.
- Updated the appearance of the safety notices to match Rockwell Automation standards.
- Updated all UI images to reflect the current version of software.
- In *Chapter 1, Introduction*, updated the *Transport System Components Overview*, the *Transport System Software Overview*, and *Getting Started with the Node Controller Interfaces*.
- In *Chapter 2, Node Controller Administration – Web*, updated the *Upload a New Node Controller Configuration File* procedure.
- In *Chapter 3, Node Controller Administration – Console*, updated the *Change the IP Address of the Node Controller* and the *Set the Clock Time and Date* procedures.
- In *Chapter 4, Web Interface Reference*, updated the *General Status* page details. Renamed the IP Settings page to *NC Settings* and updated the page details. Updated the *Motor Gap Information* page details. Updated the *Motor Information* page details to include support for QS Plus motors and QSHT motors using QSHT 7500 Inverters.
- In *Chapter 5, Console Interface Reference*, updated the *Main Menu*, *Network Settings Menu*, and *System Statistics* page details.
- In *Chapter 6, Troubleshooting*, updated *Log Message Troubleshooting*. Renamed the Contact ICT Customer Support page to *Rockwell Automation Support* and updated the required information.
- In the *Appendix A*, updated the *Transport System Limits*.
- Updated the *Glossary* and *Index*.



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Removed the following:

- Removed all references to the *Mitsubishi PLC TCP/IP Library User Manual* as that interface is no longer supported.
- Updated the manual to remove references to PLCs and PCs. These are now referred to generically as controllers.
- Removed all references to the MagneMover LITE G3 motors.
- Removed all references to ICT Customer Support, these now refer to the Rockwell Automation Technical Support Center and TechConnect.
- In [Chapter 2, Node Controller Administration – Web](#), removed the Node Controller Upgrade to New Image Format section, this function is replaced by [NC Migration](#). Removed the Remote Support section, this function is not used.
- In [Chapter 4, Web Interface Reference](#), removed the License Information and Remote Support page details.

## Rev. H

Added the following:

- Support for NC-E Series B Node Controller.
- Publication MMI-UM042 was consolidated and migrated throughout this document.
- Publication MMI-UM040 was consolidated and migrated throughout this document.
- Publication MMI-AT037 was consolidated and migrated throughout this document.

Updated the following:

- In [Node Controller Web Administration Overview](#), updated [Configuring Node Controller Settings](#):
  - Migrate single or multiple node controllers to Next Gen image.
  - Revert single or multiple node controller images to Legacy image.
- Updated [Web Interface Reference](#) section:
  - Migrate single or multiple node controllers to Next Gen image.
  - Revert single or multiple node controller images to Legacy image.
  - Updated [General Status](#) page information.
- Updated [Transport System Limits](#) in [Appendix A](#).

Removed the following:

- The Figures reference chapter was removed.
- The Tables reference chapter was removed.
- The Glossary was removed.
- Restricted parameters information was removed.

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# About This Manual

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## Overview

This section provides information about the use of this manual, including the manual structure, related documentation, format conventions, and safety conventions.

## Purpose

This manual explains how to use the supplied interfaces to configure and administer node controllers that are used with transport systems. This manual also provides basic troubleshooting information. This manual is not intended to provide a design guide for the installation, or a reference for the operation of a transport system.

Use this manual in combination with the other manuals and documentation that accompanies the transport system to design, install, configure, test, and operate a transport system.

## Prerequisites

The information and procedures that are provided in this manual assume the following:

- Basic familiarity with general-purpose computers and the Windows<sup>®</sup> operating system, web browsers, and terminal emulators.
- The transport system has been installed and configured, and full documentation for the transport system is available.
- All personnel who configure, operate, or service the transport system are properly trained.

# Notes, Safety Notices, and Symbols

Notes, Safety Notices, and Symbols that are used in this manual have specific meanings and formats. Examples of notes, the different types of safety notices and their general meanings, and symbols and their meanings are provided in this section. Adhere to all safety notices provided throughout this manual to help achieve safe installation and use.

## Notes

Notes are set apart from other text and provide additional or explanatory information. The text for Notes is in standard type as shown in the following example.

**NOTE:** A note provides additional or explanatory information.

## Safety Notices

Safety Notices are set apart from other text. The symbol on the left of the notice identifies the type of hazard. The text in the message panel identifies the hazard, methods to avoid the hazard, and the consequences of not avoiding the hazard.

Examples of the standard safety notices that are used in this manual are provided in this section. Each example includes a description of the hazard indicated. Labels may also be on or inside the equipment to provide specific precautions.

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<b>NOTICE</b>	Identifies an informational notice that indicates practices that are not related to personal injury that could result in equipment or property damage.
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<b>IMPORTANT</b>	Identifies information that is critical for the successful application and understanding of the product.
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<b>ATTENTION:</b>	Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help to identify a hazard, avoid a hazard, and recognize the consequence.
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## Additional Resources

Before configuring or running the transport system, consult the following documentation. You can view or download publications at [rok.auto/literature](http://rok.auto/literature).

Resource	Description
<i>MagneMotion Node Controller Interface User Manual</i> , publication <a href="#">MMI-UM001</a> (this manual)	This manual explains how to use the supplied interfaces to configure and administer node controllers that are used with transport systems. This manual also provides basic troubleshooting information.
<i>MagneMotion NCHost TCP/IP Interface Utility User Manual</i> , publication <a href="#">MMI-UM010</a>	This manual explains how to use the NCHost TCP/IP Interface Utility to run a transport system for testing and debugging. This manual also explains how to develop Demo Scripts to automate vehicle motion for that testing.
<i>MagneMotion Host Controller TCP/IP Communication Protocol User Manual</i> , publication <a href="#">MMI-UM003</a>	These manuals describe the communication protocols between the high level controller and a host controller. These manuals also provide basic troubleshooting information.
<i>MagneMotion Host Controller EtherNet/IP Communication Protocol User Manual</i> , publication <a href="#">MMI-UM004</a>	
<i>MagneMotion QuickStick and QuickStick HT Design Guide</i> , publication <a href="#">MMI-RM001</a>	This manual explains how to design and configure the track layout and transport system.
<i>MagneMover LITE User Manual</i> , publication <a href="#">MMI-UM002</a>	This manual explains how to install, operate, and maintain the MagneMover® LITE™ transport system. This manual also provides information about basic troubleshooting.
<i>QuickStick 100 User Manual</i> , publication <a href="#">MMI-UM006</a>	This manual explains how to install, operate, and maintain the QuickStick® 100 transport system. This manual also provides information about basic troubleshooting.
<i>QuickStick 150 User Manual</i> , publication <a href="#">MMI-UM047</a>	This manual explains how to install, operate, and maintain the QuickStick 150 transport system. This manual also provides information about basic troubleshooting.
<i>QuickStick HT User Manual</i> , publication <a href="#">MMI-UM007</a>	This manual explains how to install, operate, and maintain the QuickStick High Thrust (QSHT) transport system. This manual also provides information about basic troubleshooting.
<i>MagneMotion LSM Synchronization Option User Manual</i> , publication <a href="#">MMI-UM005</a>	This manual explains how to install, operate, and maintain the LSM Synchronization Option for use with transport systems.
<i>MagneMotion Virtual Scope Utility User Manual</i> , publication <a href="#">MMI-UM011</a>	This manual explains how to install and use the MagneMotion Virtual Scope utility. This utility provides real-time feedback of the change in Linear Synchronous Motor performance parameters.
<i>MagneMotion System Configurator User Manual</i> , publication <a href="#">MMI-UM046</a> .	This manual explains how to use the MagneMotion Configurator to create and modify the Node Controller Configuration File (Configuration File) for transport systems.
<i>MagneMotion Node Controller Hardware User Manual</i> , publication <a href="#">MMI-UM013</a> .	This manual explains how to install and maintain the MagneMotion node controllers that are used with MagneMover LITE and QuickStick transport systems.
<a href="#">Product Compatibility and Download Center (PCDC)</a>	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.

**NOTE:** Distribution of this manual and all addenda and attachments are not controlled. Changes to the document set or the software can be made at any time. To identify the current revisions or to obtain a current version, see [Rockwell Automation Support](#).



## **Additional Documentation**

### **Release Notes**

The release notes that are supplied with MagneMotion software include special instructions, identification of software versions, identification of new features and enhancements, and a list of known issues. Reading this file is recommended before using the software.

### **Upgrade Procedure**

The upgrade procedures that are supplied with MagneMotion Configuration Tool provide instructions for upgrading from one version of MagneMotion software to another. They also include the procedures for file and driver upgrades that are associated with the software.

## Overview

This chapter provides an overview of the node controller interfaces that are used to configure and administer the transport system node controllers. This chapter also provides a basic overview of the transport system hardware and software. Additionally, the basic set of tasks using the NC interfaces with a transport system are also described.

Use this manual to administer the node controller for proper transport system operation using the node controller interfaces. Some procedures may vary based on the transport system configuration, communications, and other variables.

This manual supports:

- MagneMover<sup>®</sup> LITE<sup>™</sup> transport systems.
- QuickStick<sup>®</sup> transport systems.
- QuickStick HT<sup>™</sup> transport systems.

Included in this chapter are overviews of:

- The node controller interfaces.
- The transport system components.
- The transport system software.
- Getting started with the node controller interfaces.

## Node Controller Interface Overview

The node controller provides both a web interface and a console interface. These interfaces are used to configure and administer the transport system through the node controller. Access the web interface through any web browser that supports frames (for example, Chrome, Firefox, or Internet Explorer) on a service computer connected to the same network as the node controller. Access the console interface using any terminal emulator on a service computer that is directly connected to the console port on the node controller.

The transport system is a configuration of linear synchronous motors that are placed end-to-end to form long chains, or paths. These chains move vehicles in a controlled manner at various acceleration/ deceleration and velocity profiles while carrying a wide range of payloads with high precision. The transport system consists of the following components at a minimum:

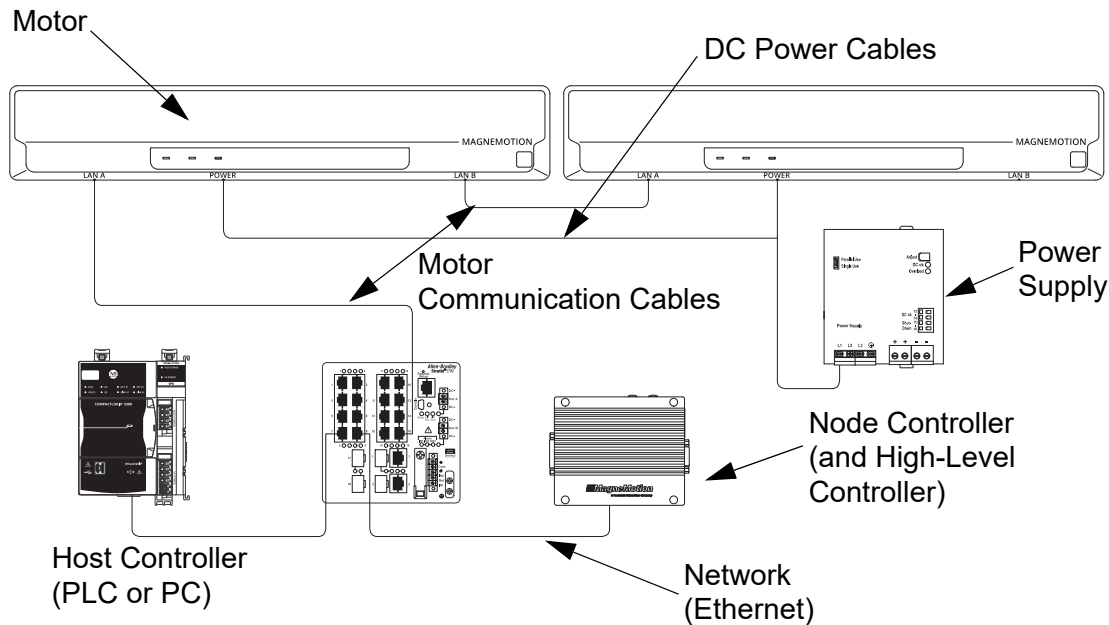
- MagneMover LITE, QuickStick, or QuickStick HT motors.
- Vehicles with magnet arrays.
- Node controllers.
- Power supplies.
- Configuration file defining paths and nodes.
- User-supplied host controller.

The configuration tasks for node controllers include setting the IP address, defining the high-level controller, programming the motors, configuring the node controller for remote diagnostics, and other tasks. Configuration also includes installing configuration files (Node Controller Configuration File, MagneMotion Information and Configuration Service (MICS) File, Motor Type files, and Magnet Array Type files) and software files (Node Controller Software Image file and Motor ERF Image files).

The administrative tasks for node controllers include managing all files on the node controller, monitoring status, performing software upgrades, setting the clock and password, and restarting the node controller.

# Transport System Components Overview

This section identifies the components of a transport system as shown in [Figure 1-1](#) and described after the figure.



*Figure 1-1: Simplified View of the Transport System using RS-422 Communication*

- **DC Power Cables and Communication Cables** – Distributes DC power to the motors and carries communications, such as RS-422 or Ethernet, between the components of the transport system.
- **High-Level Controller (HLC)** – Software application that is enabled on one node controller. This application handles all communication with the user-supplied host controller and directs communication as appropriate to individual node controllers.
- **Host Controller** – User-supplied controller for control and monitoring of the transport system using either TCP/IP or EtherNet/IP™ communication.
- **Motor/Stator** – Refers to a linear synchronous motor (LSM).
- **Network** – Ethernet network providing communication (TCP/IP or EtherNet/IP) between the host controller and the HLC (TCP/IP is used between node controllers).
- **Node Controller (NC)** – Coordinates motor operations and communicates with the HLC. Several types of node controllers are available. All node controllers support Ethernet communication with the host controller and the motors, and depending on the model, provide ports for communication with the motors. Some node controller models also provide Digital I/O and/or Serial I/O for external devices such as switches, E-stops, light stacks, and interlocks.
- **Power Supply** – Provides DC power to the motors.
- **Vehicle with Magnet Array** – Carries a payload through the transport system as directed. The magnet array is mounted to the vehicle facing the motors and interacts with the motors, which move each vehicle independently.

## Transport System Software Overview

Several software applications are used to configure, test, and administer a transport system as shown in [Figure 1-2](#) and described after the figure. See [Additional Resources on page 19](#) for the reference manuals for these applications.

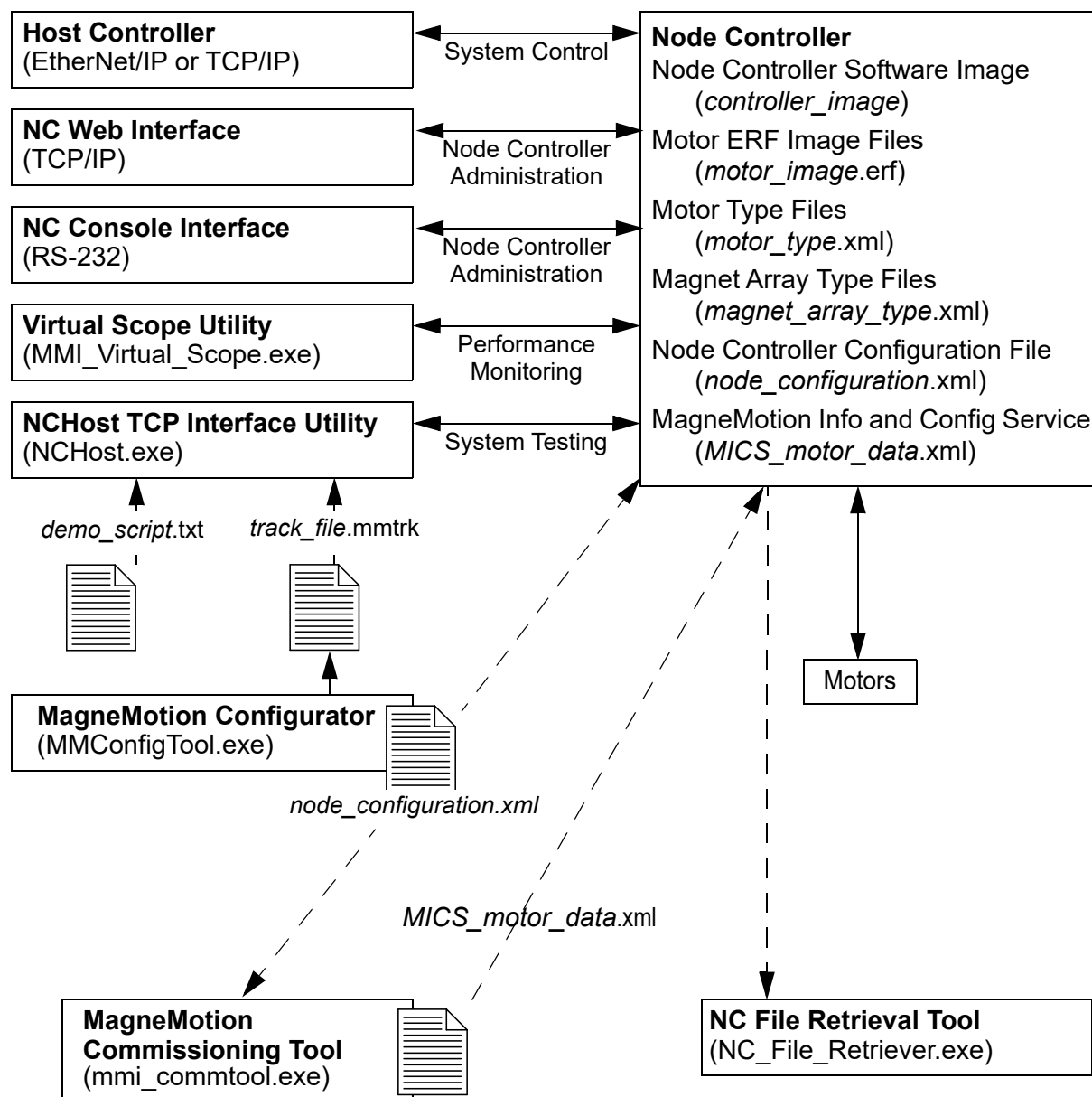


Figure 1-2: Simplified View of Transport System Software Organization

### Utilities

- **NC Web Interface** – A web-based software application that runs on the node controllers for administration of the transport system components.



- **NC Console Interface** – A serial communication software application that runs on the node controllers, for administration of the node controller.
- **Virtual Scope Utility** – A Windows<sup>®</sup> software application that is available to monitor and record the change of motor performance parameters. These parameters are displayed as waveforms to analyze the performance of the motors.
- **NCHost TCP Interface Utility** – A Windows software application that is supplied by Rockwell Automation to move vehicles for test or demonstration purposes. This application supports system testing without the host controller to verify that vehicles move correctly before integrating the transport system into a production environment.
- **MagneMotion Configurator Utility (Configurator)** – A Windows software application that is supplied by Rockwell Automation to create or change the Node Controller Configuration File. This utility is available in both MagneMover LITE and QuickStick versions. The MM LITE version is also used to create or change the Track File and Track Layout File for MagneMover LITE transport systems.
- **MagneMotion Commissioning Tool** – A Windows software application that is supplied by Rockwell Automation to create and edit MagneMotion Information and Configuration Service (MICS) files.
- **NC File Retrieval Tool** – A Windows software application that is supplied by Rockwell Automation to download configuration and operation files from the specified HLC and all node controllers in the transport system.

## File Types

- **Node Controller Software Image File (IMG file)** – The software file for the node controllers (*controller\_image*), includes the node controller and HLC applications. The Node Controller Software Image file is uploaded to all node controllers in the transport system.
- **Motor ERF Image Files (ERF file)** – The software files for the motors (*motor\_image.erf*). The Motor ERF Image files are uploaded to all node controllers in the transport system and then programmed into all motors.
- **Motor Type Files** – XML files (*motor\_type.xml*) that contain basic information about the specific motor types being used. The Motor Type files are uploaded to all node controllers in the transport system.
- **Magnet Array Type File** – An XML file (*magnet\_array\_type.xml*) that contains basic information about the specific magnet array type that is used on the vehicles in the transport system. The Magnet Array Type file is uploaded to all node controllers in the transport system.
- **Node Controller Configuration Files (Configuration file)** – An XML file (*node\_configuration.xml*) that contains all parameters for the components in the transport system. Multiple Node Controller Configuration Files can be uploaded to all node controllers in the transport system, but only one is active.

- **MagneMotion Information and Configuration Service (MICS) File** – An XML file (*MICS\_motor\_data.xml*) that contains the network topology parameters for the transport system when using Ethernet communication with the motors. The file includes the MAC address of each motor and the location of each motor on a path. The MICS file is uploaded to all node controllers in the transport system. This file is generated using the MagneMotion commissioning tool.
- **Demo Script** – A text file (*demo\_script.txt*) uploaded to the NCHost TCP Interface Utility to move vehicles on the transport system for test or demonstration purposes.
- **Track File** – A text file (*track\_file.mmtrk*) that contains graphical path and motor information about the transport system. The Track file is used by the NCHost TCP Interface Utility to provide a graphical representation of the transport system to monitor system operation. The Track file is created for MagneMover LITE transport systems using the MagneMover LITE Configurator. See [Rockwell Automation Support](#) for questions regarding the development of Track files for QuickStick transport systems.
- **Track Layout File** – An XML file (*track\_layout.ndx*) that contains the parameters for the graphical representation of a MagneMover LITE transport system. The Track Layout file is used by the MagneMover LITE Configurator to generate the Node Controller Configuration File and the Track file for MagneMover LITE systems.

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<b>NOTICE</b>	Modifications to the Image or Type files could cause improper operation of the transport system.
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## Getting Started with the Node Controller Interfaces

Use this manual as a guide and reference when performing tasks with the node controller using either the web interface or the console interface. Follow the steps in this section to get the entire transport system operational quickly with the aid of the other manuals (see [Additional Resources on page 19](#)).

**NOTE:** Make sure that all components and complete design specifications, including the physical layout of the transport system, are available before starting to install or test the transport system.

To get started quickly with the transport system:

1. Download the software for the appropriate transport system and the utilities from [rok.auto/pcdc](http://rok.auto/pcdc).

**NOTE:** The minimum requirements for running MagneMotion software applications are a general-purpose computer running Microsoft® Windows 7 with .NET 4.0. An Ethernet port (web interface) and an optional RS-232 port (console interface) are required to connect to the node controllers.

2. Install the components of the transport system as described in the *MagneMotion Node Controller Hardware User Manual*, publication [MMI-UM013](#), and either the *MagneMover LITE User Manual*, publication [MMI-UM002](#), the *QuickStick 100 User Manual*, publication [MMI-UM006](#), the *QuickStick 150 User Manual*, publication [MMI-UM047](#) or the *QuickStick HT User Manual*, publication [MMI-UM007](#).
3. Install the MagneMotion Configurator on a computer for user access (see the *MagneMotion System Configurator User Manual*, publication [MMI-UM046](#)). When using Ethernet communications with the motors, also install the MagneMotion Commissioning Tool.
  - A. For MM LITE™ systems, define the motors and paths and their relationships in the transport system graphically to create the Track Layout File (*track\_layout.ndx*) and the Track File (*track\_file.mmtrk*).
  - B. For all transport systems, create the Node Controller Configuration File (*node\_configuration.xml*) to define the components and operating parameters of the transport system.
  - C. When using Ethernet communication with the motors, use the MagneMotion Commissioning Tool to generate a MagneMotion Information and Configuration Service (MICS) file for the system.
4. Set the IP address for each node controller, record the new IP address on the unit, and specify the node controller to be used as the HLC as described in the following sections of this manual.

**NOTE:** By default, the node controller is configured with a network address of 192.168.0.1, subnet mask of 255.255.255.0. In order to access NC mode for HLC/NC/Simulator and other features via the web interface, connect to the node controller while on the same network.

**NOTE:** The node controller can also be accessed through the serial port command line interface (CLI) menu. The network address can be set from the CLI.

- A. [Run the Node Controller Web Interface on page 31.](#)
  - B. [Setting Node Controller IP Addresses on page 39.](#)
  - C. [Node Controller Function Assignment on page 45.](#)
5. Use the web interface to upload the configuration, MICS, image, and type files to each node controller as described in the following sections of this manual.
- A. [Changing Node Controller Software Image Files on page 88.](#)
  - B. [Node Controller Configuration File on page 51.](#)
  - C. [MagneMotion Information and Configuration Service File on page 58.](#)
  - D. [Motor Type Files on page 61.](#)
  - E. [Magnet Array Type Files on page 65.](#)

**NOTE:** Restart the node controller after uploading the Motor Type files or Magnet Array Type files.

Restart the node controller after uploading the MICS file when using Ethernet motor communication.

- F. [Motor ERF Image Files on page 100.](#)

Once configured, the node controllers can be used to simulate the transport system.

6. Program the motors using the Motor ERF Image files (see [Programming the Motors on page 106](#) and the *MagneMotion NCHost TCP/IP Interface Utility User Manual*, publication [MMI-UM010](#)).
7. Test and debug the transport system by using the NCHost TCP Interface Utility and Demo Scripts (see the *MagneMotion NCHost TCP/IP Interface Utility User Manual*, publication [MMI-UM010](#)). NCHost provides an easy method to verify proper operation and make adjustments such as refining the control loop tuning.

**NOTE:** The NCHost TCP Interface Utility is for test and verification trials only. The host controller must be used to control the transport system after verification of functionality.

8. Configure the host controller for transport system control as required to meet the material movement needs of the facility where the system is installed. When using TCP/IP communication, see the *MagneMotion Host Controller TCP/IP Communication Protocol User Manual*, [MMI-UM003](#). When using EtherNet/IP communication, see the *MagneMotion Host Controller EtherNet/IP Communication Protocol User Manual*, [MMI-UM004](#).

## Overview

This chapter provides examples and step-by-step procedures for administration of the node controller using the web interface that is supplied with the node controller. Administration tasks include configuring the node controller, uploading configuration and software image files to the node controller, and monitoring operation. Administration is typically per node controller, for systems with multiple node controllers each node controller must be administered separately.

Included in this chapter are:

- Running the web interface.
- Viewing general and interface status.
- Viewing, configuring, and downloading log files.
- Setting the node controller IP address.
- Configuring the node controller function.
- Uploading and downloading configuration, MICS, motor type, and magnet array type files.
- Managing multiple configurations.
- Viewing the motor gap information.
- Uploading and downloading software files and programming the motors.
- Password management and setting the date and time.
- Restoring factory default settings.
- Rebooting and restarting the node controller.
- Viewing motor information including part number, serial number, and software version.
- Viewing and updating software license information.
- Upgrading or downgrading the node controller software.

## Node Controller Web Administration Overview

The administrative tasks for the node controllers in the transport system are typically performed through the web interface. This procedure provides the basic steps for administration of each node controller in the transport system (with a reference to the detailed procedure):

1. Run the web interface for the node controller on any web browser that supports frames. Use a service computer that is connected to the same network as the node controller and enter the IP address of the node controller in the address bar of the browser (see [Run the Node Controller Web Interface on page 31](#)).
2. Set the IP address for the node controller (see [Setting Node Controller IP Addresses on page 39](#)).
3. Specify the function of the node controller (Node Controller, High-Level Controller, or High-Level Controller Simulator) (see [Node Controller Function Assignment on page 45](#)).
4. Identify the version of Node Controller Software Image that is currently loaded on the node controller then upload and activate another version if necessary (see [Changing Node Controller Software Image Files on page 88](#)).
5. Identify the version of the Motor ERF Image that is loaded on the node controller then upload another version if necessary (see [Motor ERF Image Files on page 100](#)) and program the motors.
6. Identify the version of the Node Controller Configuration File currently loaded and active on the node controller then upload or activate another version if necessary (see [Node Controller Configuration File on page 51](#)).
7. If using a system that contains Ethernet-based motors, view or upload the MICS file (see [MagneMotion Information and Configuration Service File on page 58](#)).
8. Identify the version of Motor Type files that are currently loaded on the node controller then upload another version if necessary (see [Motor Type Files on page 61](#)).
9. Identify the version of the Magnet Array Type file that is loaded on the node controller then upload another version if necessary (see [Magnet Array Type Files on page 65](#)).
10. Set the date and time on the node controller internal clock (see [Set the Clock Time and Date on page 123](#)).
11. Configure additional users as required (see [Password Management on page 113](#)).
12. Reboot or Restart the node controller as necessary if changes were made to the configuration or other node controller files (see [Reboot the Node Controller on page 127](#) and [Restart the Node Controller on page 131](#)).
13. Review the node controller and HLC log files to verify proper operation (see [Log Files on page 35](#)).
14. Review the motor information to verify proper programming (see [Motor Information on page 134](#)).

## Run the Node Controller Web Interface

The administrative tasks for node controllers are typically performed through the web interface. The web interface is accessed through any web browser that supports frames (for example, Firefox or Internet Explorer) on a service computer connected to the same network as the node controller. All examples provided in this manual use Internet Explorer.

### Run the Web Interface

1. Make sure that the node controller is connected to the local area network.
2. Make sure that the node controller is plugged in and has completed booting up.
3. Use a service computer that is connected to the local area network and open a web browser.
4. In the address bar of the browser, enter the IP address of the node controller (192.168.0.1 for a new node controller from Rockwell Automation that has not been configured using the serial port command line interface menu, or the configured address for an installed node controller).

*The password required dialog box, which is shown in [Figure 2-1](#), opens.*

**NOTE:** The dialog box varies by web browser.

If the password dialog box does not open, see [Node Controller Troubleshooting on page 254](#).

*Figure 2-1: Password Dialog Box*

5. Log in to the node controller:
  - User Name: admin
  - Password: admin (for a new node controller, or the recorded password for an installed node controller)

*The web interface for the node controller, which is shown in [Figure 2-2](#), opens with the **General Status** page displayed.*

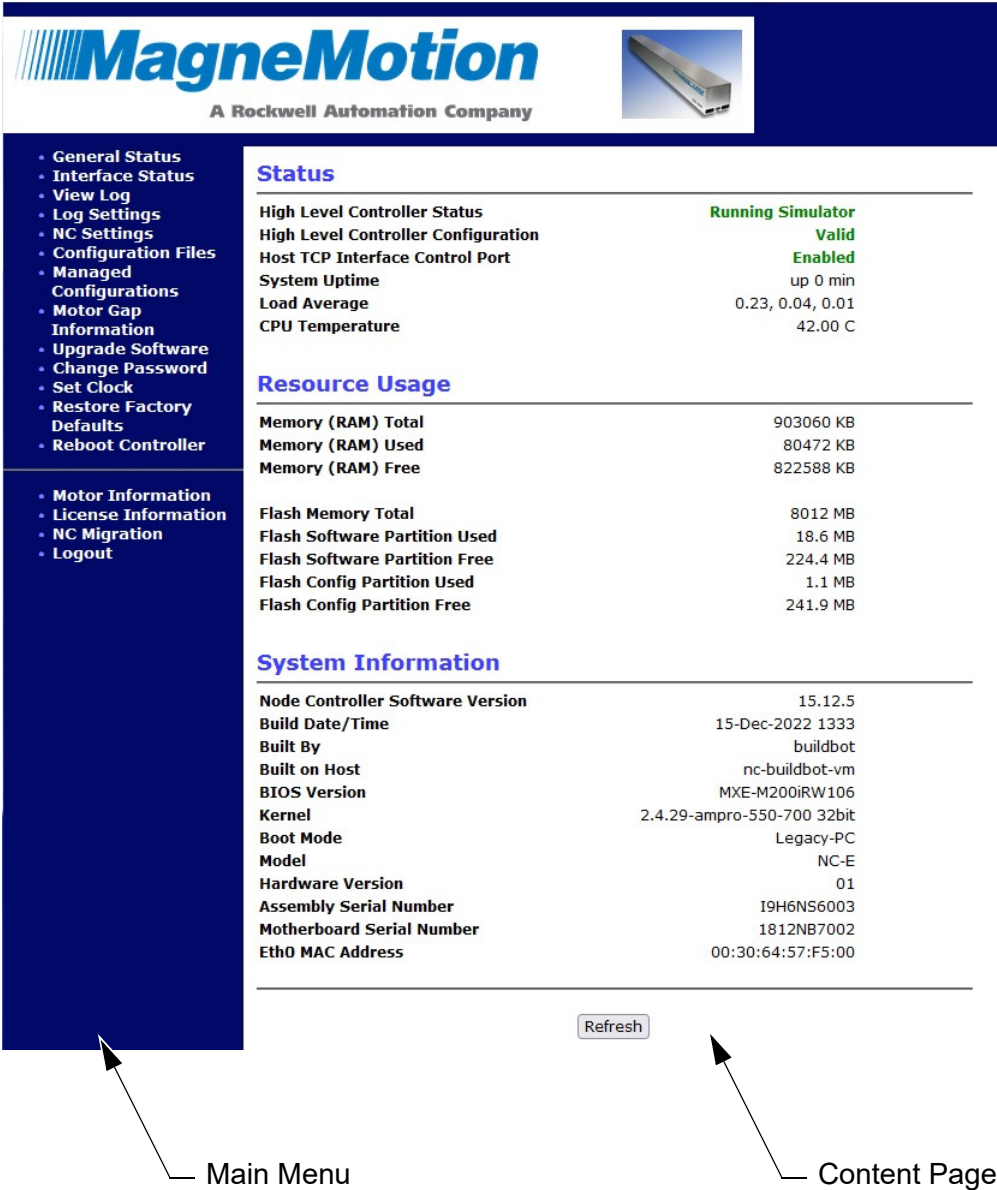


Figure 2-2: Web Interface Browser Window

6. Use the Main Menu on the left side to access other functions. Use the scroll bars to the right and bottom of the page (if provided) to see additional information.

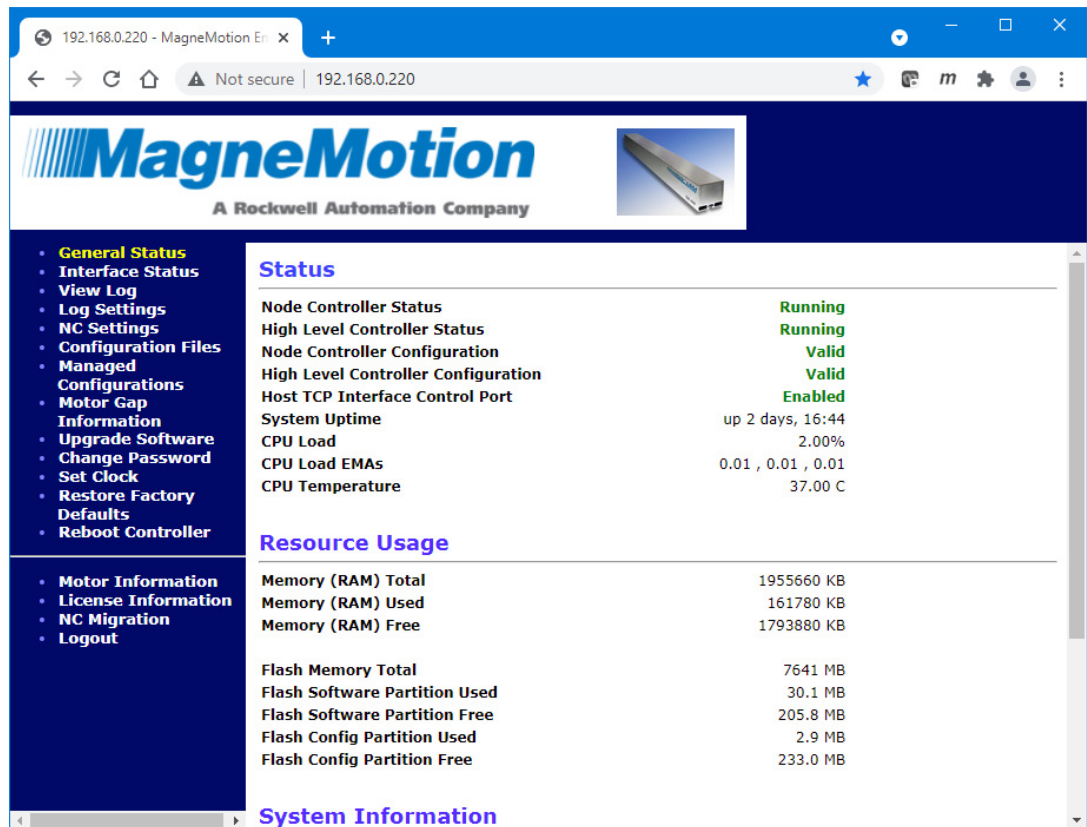


## View General Status

This section describes how to display the status, memory usage, and software version information for the node controller.

1. Select **General Status** on the Main Menu (see [General Status on page 192](#) for detailed descriptions of all items).

*The **General Status** page, which is shown in [Figure 2-3](#), is displayed showing the Status, Resource Usage, and Software Version Information.*



*Figure 2-3: General Status Page*

2. Review the status information as required (see [General Status on page 192](#) for detailed descriptions of all items).

## View Interface Status

This section describes how to display the interface status for the Ethernet and Serial I/O communication ports on the node controller.

1. Select **Interface Status** on the Main Menu (see [Interface Status on page 196](#) for detailed descriptions of all items).

*The **Interface Status** page, which is shown in [Figure 2-4](#), is displayed. Scroll down the page as necessary to display the status for the different communications ports.*

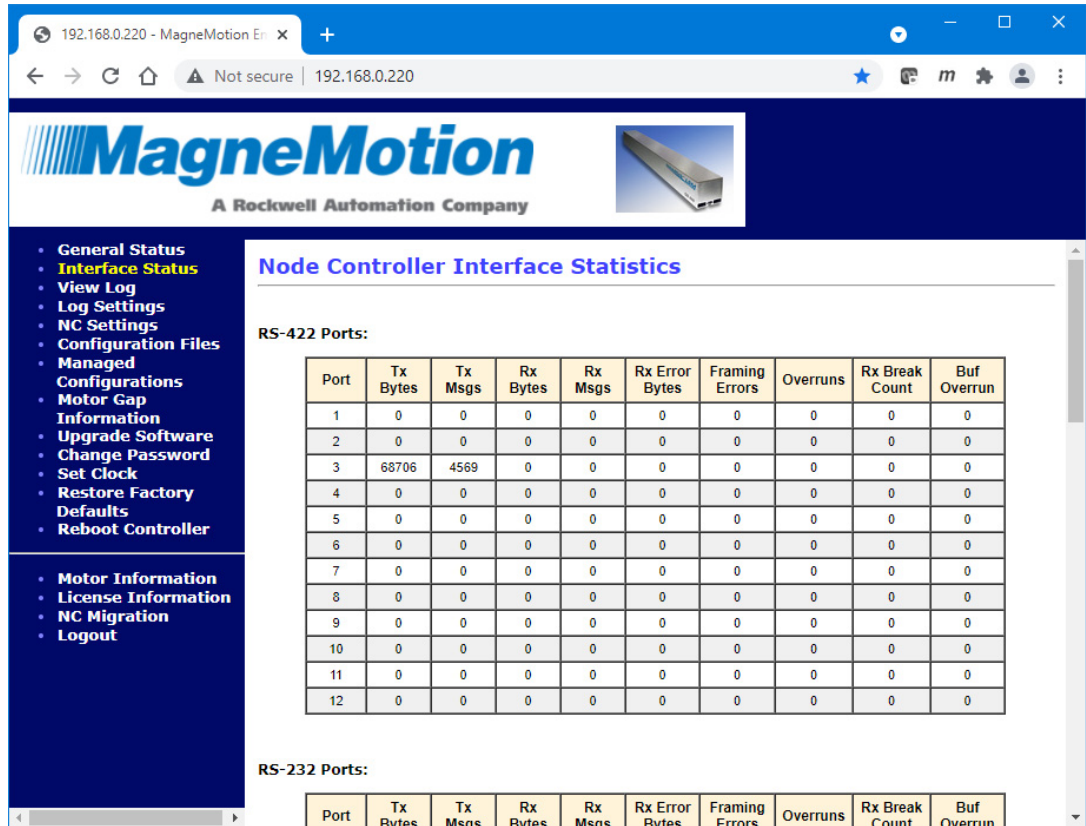


Figure 2-4: Interface Status Page

2. Review the status information as required (see [Interface Status on page 196](#) for detailed descriptions of all items).

## Log Files

This section describes how to display and configure the log files for the node controller. The log files are used to monitor the status of the node controller and to determine if there is a problem with the operation of the node controller. See [Log Message Troubleshooting on page 258](#) for descriptions of typical log messages.

**NOTE:** Whenever the node controller is rebooted, restarted, or power is cycled the old log file is deleted and a new log file is created.

The file size limit of the log file (node controller or HLC) is 12 MB. Once the log file reaches this limit, the oldest log information is over-written in 4 MB chunks.

### Open and View Log Files

This section describes how to review the log files on the node controller. The log files can be viewed in the web interface, or they can be downloaded as an unformatted text file.

1. Select **View Log** on the Main Menu (see [View Log on page 203](#) for detailed descriptions of all items).

The **Node Controller Log** page, which is shown in [Figure 2-5](#), is displayed. Use the scroll bars to display text that is not shown.

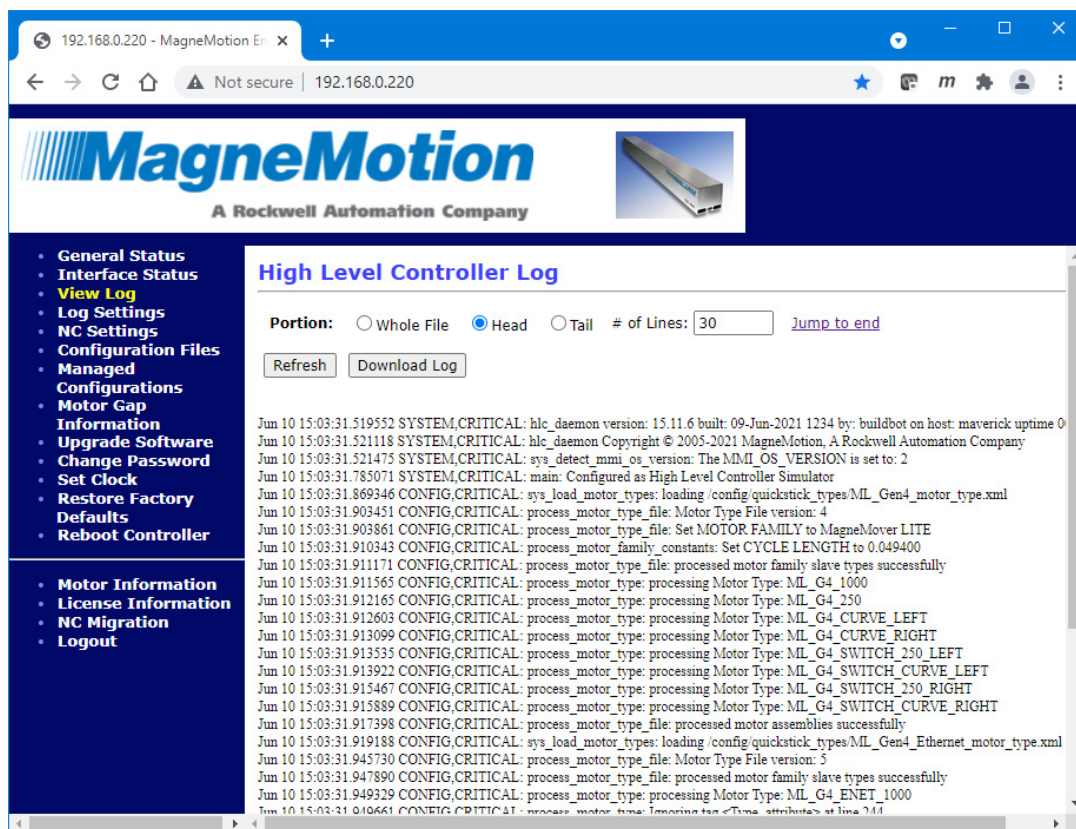


Figure 2-5: View Node Controller Log Page

2. To change the view of the log:

**NOTE:** The web interface can display approximately 100,000 lines of log text, if necessary.

- Select **Whole File** and then select **Refresh** to see the entire log.
  - Select **Head** and then select **Refresh** to see the oldest entries in the log.
  - Select **Tail** and then select **Refresh** to see the newest entries in the log.
  - Enter a value in the **# of Lines** text field to display that number of lines from either the Head or Tail of the log depending on what is selected and then select **Refresh**.
3. Select **View High Level Controller Log/View Node Controller Log** if available (only shown if the node controller has been configured as the HLC) to toggle between the log files from the node controller or the HLC.

## Download Log Files

This section describes how to download the log files from the node controller as an unformatted text file (review the text file using an application such as Notepad++).

1. Select **View Log** on the Main Menu (see [View Log on page 203](#) for detailed descriptions of all items).

*The **Node Controller Log** page, which is shown in [Figure 2-5](#), is displayed.*

2. Select **View High Level Controller Log/View Node Controller Log** if available (only shown if the node controller has been configured as the HLC) to toggle between the log files from the node controller or the HLC.

3. Select **Download Log** to save the selected unformatted log file for offline review.

*The file is downloaded as determined by the browser. The options for saving or opening this file vary by web browser.*


## Configure the Log Files

This section describes how to specify the types of information that is recorded in the node controller and HLC log files. Any changes to these settings are automatically reset to the defaults if the node controller is reset, restarted, or power is cycled.

**NOTE:** Changing the log levels from the default is typically not required and should be done only at the direction of the Rockwell Automation Technical Support Center.

1. Select **Log Settings** on the Main Menu (see [Log Settings on page 205](#) for detailed descriptions of all items).

*The **Node Controller Log Settings** page, which is shown in [Figure 2-6](#), is displayed. Scroll down the page to display additional log settings.*



- General Status
- Interface Status
- View Log
- Log Settings
- NC Settings
- Configuration Files
- Managed Configurations
- Motor Gap Information
- Upgrade Software
- Change Password
- Set Clock
- Restore Factory Defaults
- Reboot Controller

- Motor Information
- License Information
- NC Migration
- Logout

### Node Controller Log Settings

Log Module Name	Log Levels			
	OFF	INFO	WARNING	CRITICAL
SYSTEM	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
XML	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
CONFIG	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
COMM	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
TIMERS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
STARTUP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
HLC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
VEHICLE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
DIO	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
PEER	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
HOST	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
ENET_IP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
FAULTS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
NODE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

**Node Controller Persistent Log Settings:**

Status: Active

Figure 2-6: Log Settings Page

2. Update the **Log Levels** for the node controller as required (see [Log Settings on page 205](#) for detailed descriptions of all settings) and select **Apply Changes**.

**NOTE:** Some log modules are only available on certain custom configurations.

*The node controller log settings are updated as specified and the **Log Settings** page is redisplayed.*

3. On the HLC, scroll down and update the **Log Levels** for the HLC as required (see [Log Settings on page 205](#) for detailed descriptions of all settings) and select **Apply Changes**.

*The HLC log settings are updated as specified and the **Log Settings** page is redisplayed.*



## Configuring Node Controller Settings

This section describes how to display and configure the IP settings, configured functions, and remote logging for the node controller. These settings are used to configure the network address of the node controller, to specify the node controller functions, and to configure remote logging to a specified syslog server. Typically this configuration is only done for a new node controller.

### Setting Node Controller IP Addresses

All new node controllers are shipped with the factory default IP address of 192.168.0.1. To function properly as part of the transport system, the address must be changed to a unique address that matches the addressing structure of the network for the transport system. The entry for each node controller must be updated in the Node Controller Configuration File to match (see the *MagneMotion System Configurator User Manual*, publication [MMI-UM046](#)).

Once all node controllers on the network are assigned unique addresses, administration of the transport system can begin. Administration includes uploading the configuration and operating software files to the node controllers as described in [Node Controller Web Administration Overview](#) on page 30.

#### Use an RS-232 Connection to Set the IP Address

The IP address of the node controller can be changed by connecting a service computer directly to the Console Port on the node controller. This connection requires a null modem RS-232 cable (see [Use an RS-232 Connection to Set the IP Address](#) on page 167).

#### Use a Network Connection to Set the IP Address

The IP address of the node controller can be changed by connecting a service computer to the transport system network and adding the node controllers to the network one at a time. Set the address for the node controller then add the next node controller, assuming that the network has a subnet that matches the factory default (192.168.0.x).

**NOTE:** When setting the IP address on a node controller for the first time through the network, make sure that only one new node controller is connected to the network at a time.

This section describes how to set the IP address on a new node controller through a network connection using a service computer running Windows. The IP address for the node controller must be changed from the default to an address appropriate for use with the network at the facility where the transport system is installed.

**NOTE:** These instructions reference Windows 7. When using another version of Windows, or a different type of computer, the figures and steps may be different.

The IP addresses shown in these examples are for reference only. The address of a specific node controller may not match the IP addresses in the following examples. Consult the IT department at the facility where the system is being installed for specific IP address information.

### Connect the Service Computer to the Node Controller

A service computer can be connected directly to the node controller using either a standard Ethernet cable or a crossover cable. If the network is already connected to the node controller, disconnect it then connect the computer.

Or, the service computer can be connected to the node controller through the network by connecting the computer to a network hub or switch using a standard Ethernet cable. Make sure that the node controller is connected to the network through its Ethernet port.

**NOTE:** When connecting to the network, make sure that the devices being connected do not duplicate addresses that are already assigned on the network.

When changing the IP address on the node controller for the first time, make sure that only one new node controller is connected to the network at a time. Once the address for the node controller has been changed to a unique address, it can remain connected to the network.

### Temporarily Change the IP Address of the Service Computer

Change the IP address on the computer to match the factory settings of the node controller.

1. Make sure that the node controller is plugged in and has completed booting up.
2. From the **Start** menu on the computer, open the **Control Panel**, and select **Network and Sharing Center**.

*The **Network and Sharing Center** page is displayed.*

3. Select the appropriate Local Area Connection.

*The **Connection Status** dialog box, which is shown in [Figure 2-7](#), opens.*

**NOTE:** The dialog box varies by computer operating system.



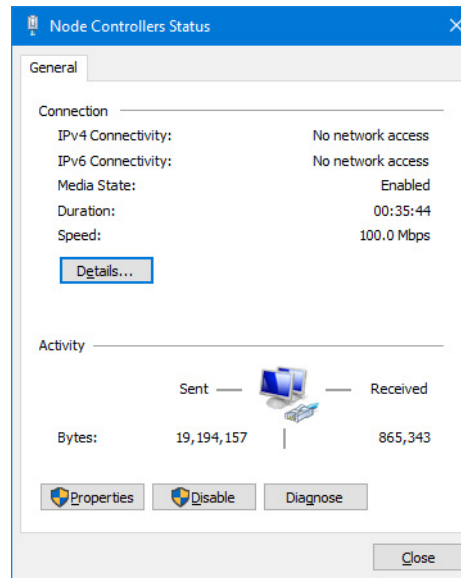


Figure 2-7: Local Area Connection Status Dialog Box

4. Select **Properties**.

The *Connection Properties* dialog box, which is shown in [Figure 2-8](#), opens.

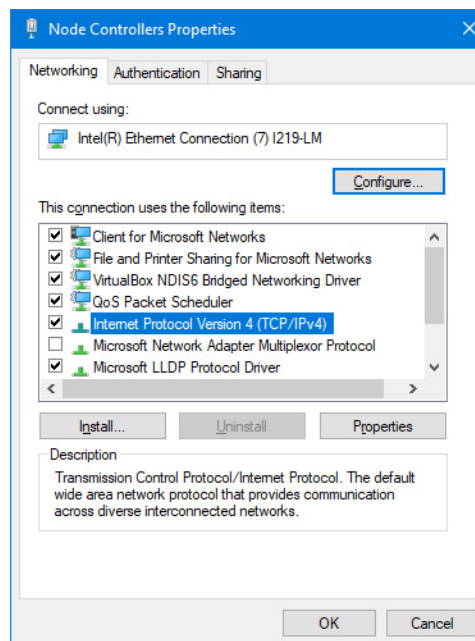


Figure 2-8: Local Area Connection Properties Dialog Box

5. Select **Internet Protocol Version 4 (TCP/IPv4)**, from the list of items and select **Properties**.

The *Internet Protocol Version 4 (TCP/IPv4) Properties* dialog box, which is shown in [Figure 2-9](#), opens.

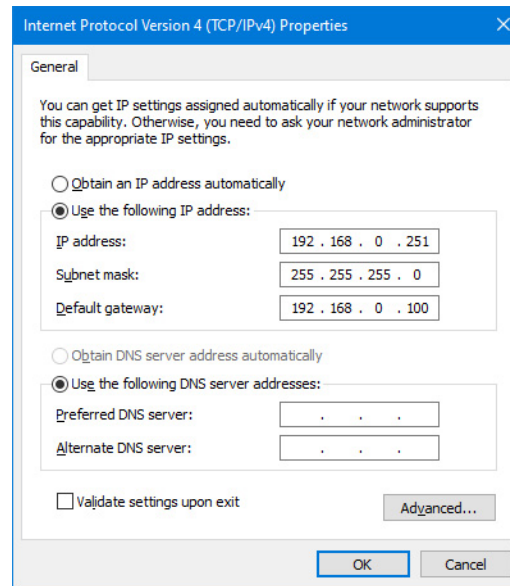


Figure 2-9: Internet Protocol Version 4 (TCP/IPv4) Properties Dialog Box

6. Record the current IP Properties so the service computer can be returned to its normal configuration after setting the IP address for the node controller.
7. Select **Use the following IP address** and enter the network settings shown to configure the computer to access the node controller as shown in [Figure 2-9](#).

**NOTE:** Set the last byte of the address to anything different than the planned node controller IP address. Make sure the first three bytes (octets) of the IP address match the transport system LAN address.

- IP address: 192.168.0.251.
  - Subnet mask: 255.255.255.0.
  - Default gateway: 192.168.0.100.
8. Select **OK**.  
*The computer updates the IP address and the **Internet Protocol Version 4 (TCP/IPv4) Properties** dialog box is closed.*
  9. On the **Connection Properties** dialog box, select **OK**.
  10. On the **Connection Status** dialog box, select **Close**.
  11. Close the **Control Panel** window by selecting **Close** on the **File** menu or selecting the **X** in the upper right corner of the window.

## Change the Node Controller IP Address

1. Run the web interface using the default IP address 192.168.0.1 (see [Run the Node Controller Web Interface on page 31](#)).
2. Select **NC Settings** on the **Main Menu** (see [NC Settings on page 207](#) for detailed descriptions of all items).

The **NC Settings** page, which is shown in [Figure 2-10](#), is displayed.

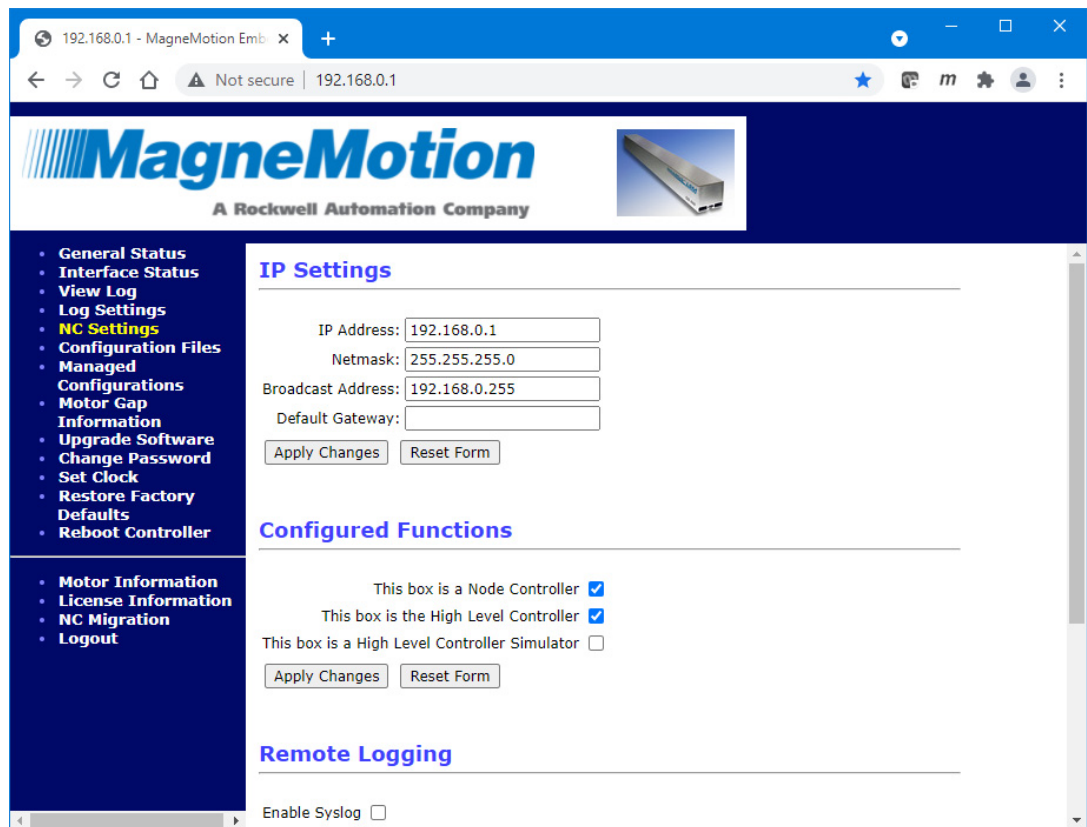


Figure 2-10: NC Settings Page Showing Factory IP Address

3. In the **IP Settings** section, change the **IP Address** and other fields to match the network for the transport system, and select **Apply Changes**.

**NOTE:** All **IP Settings** fields must be defined.

We recommend recording the IP address of the node controller in the transport system documentation.

4. Reboot the node controller for the changes to take effect (see [Reboot One Node Controller on page 128](#)).
5. Make sure that the node controller is connected to the network through the Ethernet port.

## Restore the IP Address of the Service Computer

Change the IP address on the service computer back to its original configuration.

1. From the **Start** menu, open the **Control Panel**, and select **Network and Sharing Center**.

*The Network and Sharing Center page is displayed.*

2. Select the appropriate Local Area Connection.

*The Connection Status dialog box opens.*

3. Select **Properties**.

*The Connection Properties dialog box opens.*

4. Select **Internet Protocol Version 4 (TCP/IPv4)**, from the list of connection items and select **Properties**.

*The Internet Protocol Version 4 (TCP/IPv4) Properties dialog box opens.*

5. Reset the IP Properties to their previous configuration.

6. Select **OK**.

*The IP address for the computer is updated and the Internet Protocol Version 4 (TCP/IPv4) Properties dialog box closes.*

7. On the **Connection Properties** dialog box, select **OK**.

8. On the **Connection Status** dialog box, select **Close**.

9. Close the **Control Panel** window by selecting **Close** on the **File** menu or selecting the “X” in the upper right corner of the window.

**NOTE:** If the computer was plugged directly in to the node controller, both the computer and the node controller must be reconnected to the appropriate networks.

## Verify the Node Controller IP Address

1. Run the web interface from a general-purpose computer that can access the network for the transport system using the new IP address (see [Run the Node Controller Web Interface on page 31](#)).

2. Select **NC Settings** on the Main Menu (see [NC Settings on page 207](#) for detailed descriptions of all items).

*The NC Settings page is displayed as shown in Figure 2-10.*

**NOTE:** Rockwell Automation recommends recording the IP address of the node controller in the transport system documentation.

3. In the **IP Settings** section, verify the settings and make any changes necessary.

## Node Controller Function Assignment

This section describes how to configure the functions performed by the node controller.

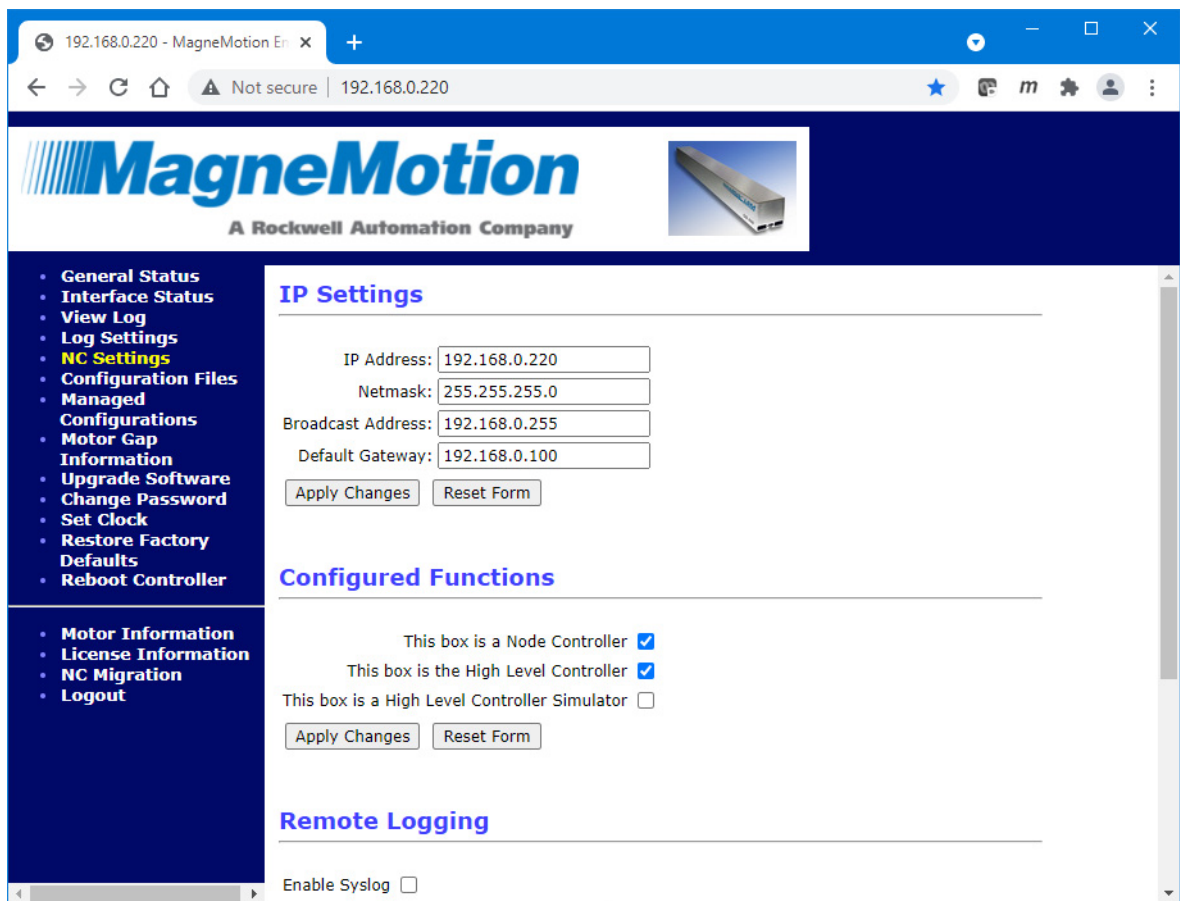


Figure 2-11: NC Settings Page

### Configure the Node Controller Function

This section describes how to configure the node controller. The node controllers communicate with the HLC for the transport system and the motors that are connected to the node controller.

1. Select **NC Settings** on the Main Menu (see [NC Settings on page 207](#) for detailed descriptions of all items).  
*The NC Settings page, which is shown in [Figure 2-11](#), is displayed.*
2. In the **Configured Functions** section, make sure that **This box is the High Level Controller** is cleared if the node controller only functions as a node controller.
3. In the **Configured Functions** section, make sure that **This box is a Node Controller** is selected.

4. Select **Apply Changes**.

*The selected changes are applied.*

5. Reboot the node controller for the changes to take effect (see [Reboot One Node Controller on page 128](#)).

## Configure the High-Level Controller Function

This section describes how to configure the node controller as the high-level controller (HLC). The HLC communicates with the host controller and all other node controllers in the transport system. One node controller in the transport system must be configured as the HLC. If there is only one node controller in the transport system, it must be configured as the HLC.

1. Select **NC Settings** on the Main Menu (see [NC Settings on page 207](#) for detailed descriptions of all items).

*The NC Settings page, which is shown in Figure 2-11, is displayed.*

2. In the **Configured Functions** section, select **This box is a Node Controller** if the node controller functions as both a node controller and the HLC.

3. In the **Configured Functions** section, make sure that **This box is the High Level Controller** is selected.

4. Select **Apply Changes**.

*The selected changes are applied.*

**NOTE:** Rockwell Automation recommends noting that the node controller is configured as the HLC in the transport system documentation.

5. Reboot the node controller for the changes to take effect (see [Reboot One Node Controller on page 128](#)).

## Configure the Simulator Function

This section describes how to configure the node controller as a Simulator. Running the node controller as a simulator allows the transport system configuration to be tested in a simulation mode without using any additional hardware.

1. Select **NC Settings** on the Main Menu (see [NC Settings on page 207](#) for detailed descriptions of all items).

*The NC Settings page, which is shown in Figure 2-11, is displayed.*

2. In the **Configured Functions** section, make sure that **This box is a High Level Controller Simulator** is selected.

3. In the **Configured Functions** section, make sure that **This box is a Node Controller** and **This box is the High Level Controller** are cleared.

**NOTE:** If either of these options are selected, an error message is displayed and the node controller is not be configured as a simulator.

4. Select **Apply Changes**.

*The selected changes are applied.*

5. Reboot the node controller for the changes to take effect (see [Reboot One Node Controller on page 128](#)).

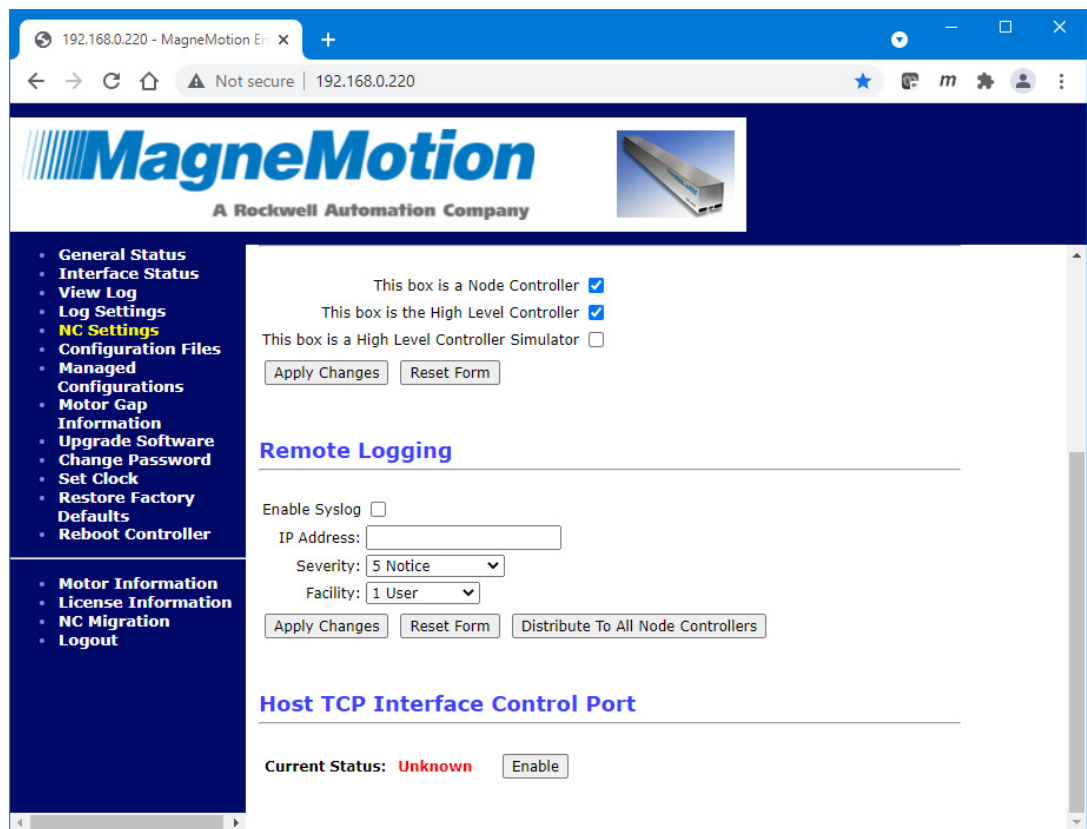
## Configuring Remote Logging

This section describes how to configure the node controller for remote logging of the log messages using the syslog protocol. The syslog feature sends log messages as defined in [Configure the Log Files on page 37](#) from the node controller to customer-supplied syslog server software on a remote computer. The log messages that are stored on that remote computer can then be parsed and sorted as needed.

Remote logging provides the benefit of preserving the node controller log messages through reboots and restarts. Additionally, the ability to gather log messages in a central location from multiple HLCs and node controllers is useful in large networked installations.

1. Select **NC Settings** on the Main Menu and scroll down the page to the Remote Logging section (see [NC Settings on page 207](#) for detailed descriptions of all items).

*The NC Settings page, which is shown in [Figure 2-12](#), is displayed.*

The screenshot shows a web browser window with the URL 192.168.0.220 - MagneMotion En. The page has a blue header with the MagneMotion logo and a Rockwell Automation Company tagline. A left sidebar contains a menu with items like General Status, Interface Status, View Log, Log Settings, NC Settings (highlighted), Configuration Files, Managed Configurations, Motor Gap Information, Upgrade Software, Change Password, Set Clock, Restore Factory Defaults, Reboot Controller, Motor Information, License Information, NC Migration, and Logout. The main content area shows configuration options for the Node Controller. It includes checkboxes for 'This box is a Node Controller' (checked), 'This box is the High Level Controller' (checked), and 'This box is a High Level Controller Simulator' (unchecked). Below these are 'Apply Changes' and 'Reset Form' buttons. The 'Remote Logging' section has an 'Enable Syslog' checkbox (unchecked), an 'IP Address' text field, 'Severity' and 'Facility' dropdown menus (set to '5 Notice' and '1 User' respectively), and 'Apply Changes', 'Reset Form', and 'Distribute To All Node Controllers' buttons. The 'Host TCP Interface Control Port' section shows a 'Current Status' of 'Unknown' and an 'Enable' button.

*Figure 2-12: NC Settings Page Showing Remote Logging*

2. In the **Remote Logging** section, select **Enable Syslog**.
3. In the **IP Address** field, enter the address of the remote computer running the syslog server software.
4. Select the appropriate **Severity** (typically 5 - Notice).



5. Select the appropriate **Facility** (typically 1 - User).
6. Select **Apply Changes**.  
*The selected changes are applied.*
7. Reboot the node controller for the changes to take effect (see [Reboot One Node Controller on page 128](#)).
8. For transport systems with multiple node controllers, select **Distribute To All Node Controllers**.  
**NOTE:** File distribution writes the updated files to the nonvolatile memory in each node controller. Distribution can interrupt normal operations and should only be done during transport system maintenance when there are no active vehicle commands.  
Files are only distributed to those node controllers identified in the Node Controller Configuration File.
9. Reboot all node controllers (see [Reboot All Node Controllers on page 130](#)).

## Configuring the Host TCP Interface Control Port

This section describes how to configure the Host TCP Interface Control Port on the node controller. This function is typically used when the node controller is communicating with the host controller using EtherNet/IP to prevent commands being sent through the TCP/IP interface. When the Host TCP Interface Control Port is disabled, the Host TCP Status port can still be used to monitor system operation. This function is only available when the **Configured Functions** includes *This box is the High Level Controller*.

1. Select **NC Settings** on the Main Menu and scroll down the page to the Host TCP Interface Control Port section (see [NC Settings on page 207](#) for detailed descriptions of all items).

*The NC Settings page, which is shown in [Figure 2-13](#), is displayed with the current status of the Host TCP Interface Control Port displayed at the bottom of the page.*

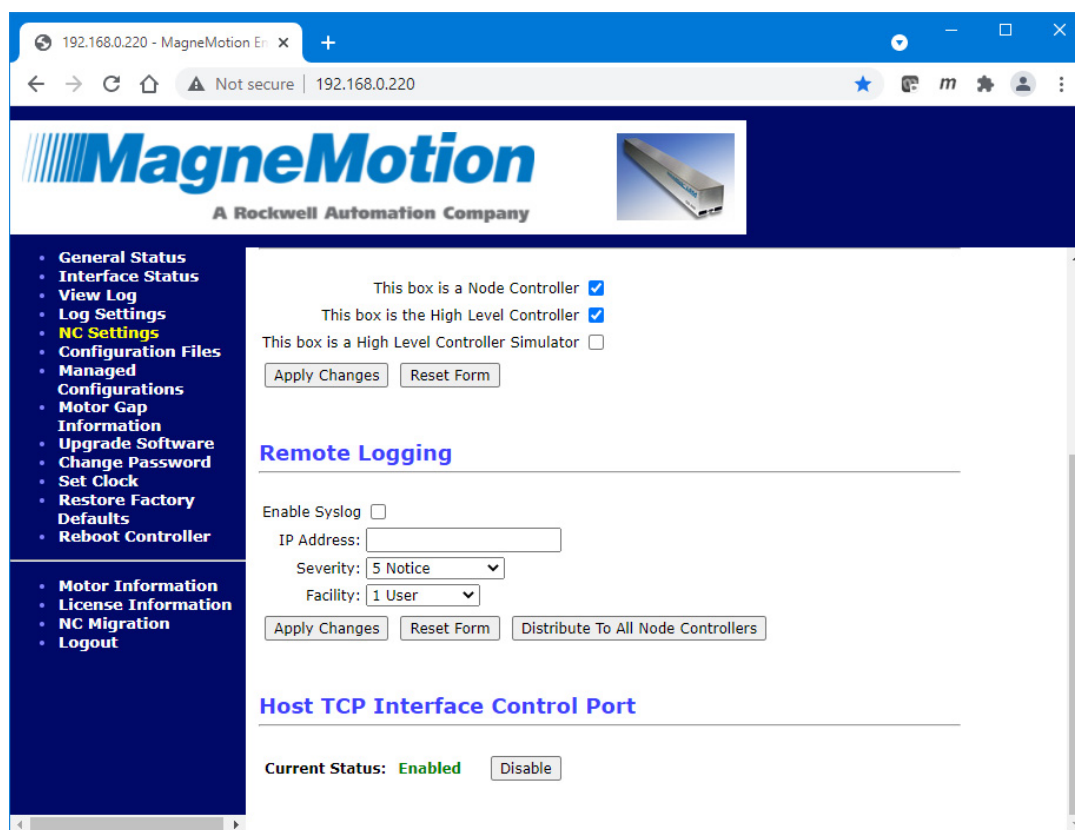


Figure 2-13: NC Settings Page Showing Host TCP Interface Control Port

2. In the **Host TCP Interface Control Port** section, select **Disable/Enable** to set the port to the required state.

## Configuration Files

The various configuration files are used to configure the node controller with the transport system configuration, network topology, and with information about the motors and magnet arrays.

### Node Controller Configuration File

This section describes how to identify the current Node Controller Configuration File and download that file or upload a new Node Controller Configuration File to the node controller. Node Controller Configuration Files contain basic information about the configuration of the transport system. This information includes the number of paths, the number and types of motors on each path, the types of nodes connecting the paths, the IP address of each node controller, and other user configurable features of the transport system. See the *MagneMotion System Configurator User Manual*, publication [MMI-UM046](#), for information on Node Controller Configuration Files.

**NOTE:** For transport systems with multiple node controllers, if a new Node Controller Configuration File is being uploaded, it must be uploaded to each node controller.

---

**IMPORTANT** After activating a Managed Configuration, do not upload a Node Controller Configuration File to the **Configuration Files** page. The active Managed Node Controller Configuration File becomes the current Node Controller Configuration File and must be managed through the [Managed Configurations](#) page.

---

### Identify the Current Node Controller Configuration File

This section describes how to identify the Node Controller Configuration File currently active on the node controller.

1. Select **Configuration Files** on the Main Menu (see [Configuration Files](#) on page 210 for detailed descriptions of all items).

*The **Configuration Files** page, which is shown in [Figure 2-14](#) and [Figure 2-15](#), is displayed. The current Configuration file is listed under **Node Controller Configuration File** with the size and date the file was uploaded shown. If Managed Configurations are being used, the **Config ID** is displayed in green after the Configuration file name as shown in [Figure 2-15](#) (see [Managed Configurations](#) on page 71).*

*The contents of the file can be displayed in the browser by selecting **View**. Some browsers may not display the file correctly. If the file does not display correctly, download the file and review it in the Configurator to determine if it is the current revision.*

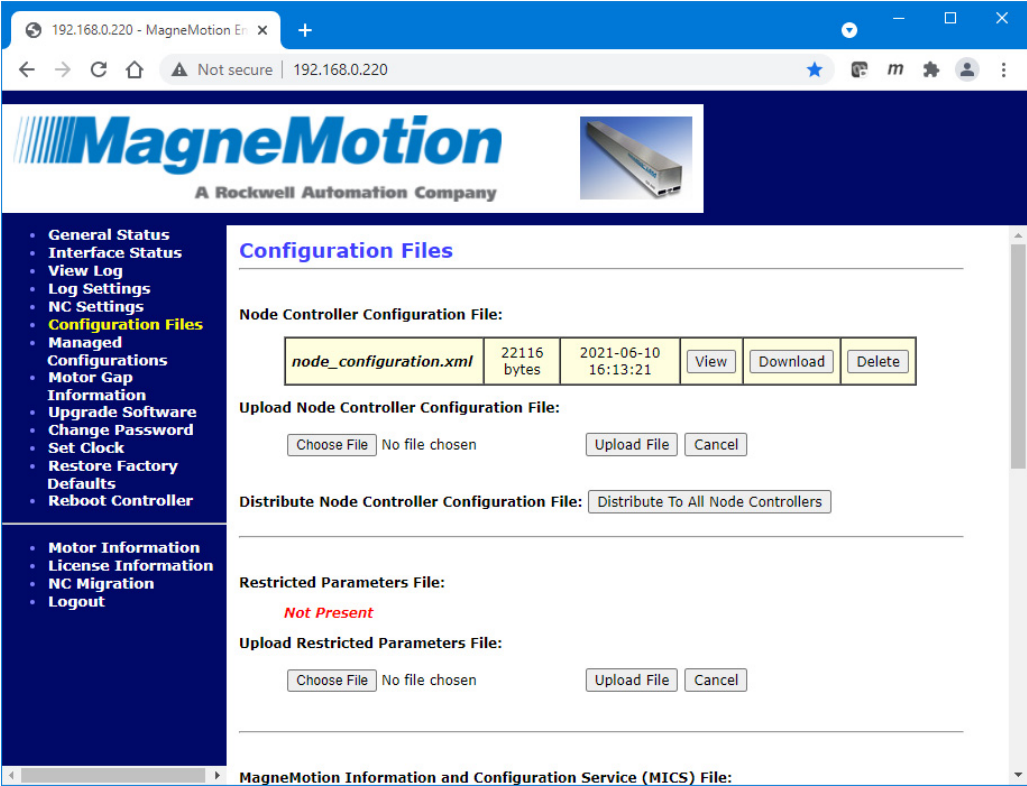


Figure 2-14: Configuration Files Page, Node Controller Configuration File

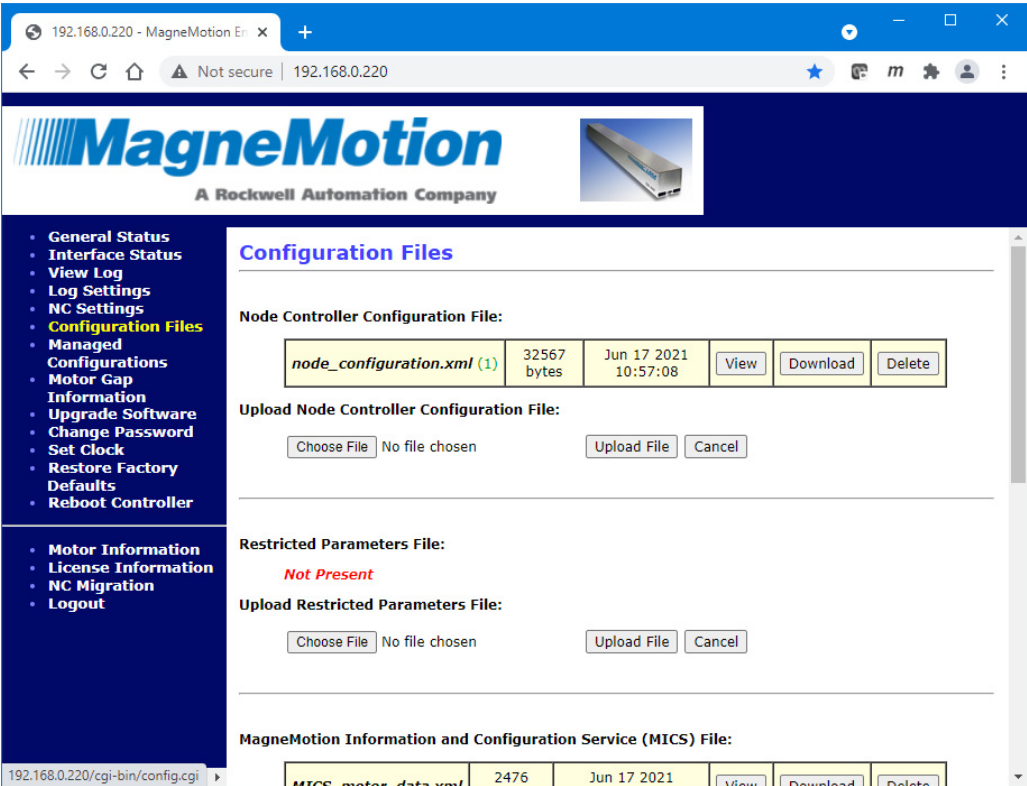


Figure 2-15: Configuration Files Page, Managed Node Controller Configuration File

## Download the Existing Node Controller Configuration File

This section describes how to download the existing Node Controller Configuration File from the node controller.

1. Select **Configuration Files** on the Main Menu (see [Configuration Files on page 210](#) for detailed descriptions of all items).

*The **Configuration Files** page, which is shown in [Figure 2-14](#), is displayed.*

2. Under **Node Controller Configuration File**, select **Download**.

*The file is downloaded as determined by the browser. The options for saving or opening this file vary by web browser.*

## Upload a New Node Controller Configuration File

This section describes how to upload a Node Controller Configuration File to both single and multiple node controllers. The Node Controller Configuration File is created specifically for the transport system and must be uploaded to every node controller in the transport system during initial setup and if the configuration is changed.

**NOTE:** Uploading a new Node Controller Configuration File on the **Configuration Files** page automatically deletes the existing Configuration file and replaces it with the new static Node Controller Configuration File. The static Node Controller Configuration File is displayed with no Config ID following it.

When a managed Node Controller Configuration File (identified by the Config ID in green after the name) is replaced using the **Configuration Files** page, the existing Configuration file is not deleted and is still accessible through the [Managed Configurations](#) page.

Static Node Controller Configuration Files uploaded through the **Configuration Files** page are only accessible through the **Configuration Files** page.

When a managed Node Controller Configuration File (identified by the Config ID in green after the name) is deleted using the **Configuration Files** page, the existing Configuration file is removed from the **Configuration Files** page, but it is still accessible through the [Managed Configurations](#) page.

1. If the transport system has multiple node controllers, run the web interface on the HLC (see [Run the Node Controller Web Interface on page 31](#)).
2. Select **Configuration Files** on the Main Menu (see [Configuration Files on page 210](#) for detailed descriptions of all items).

*The **Configuration Files** page, which is shown in [Figure 2-14](#), is displayed.*

3. Under **Upload Node Controller Configuration File**, select **Browse**.

*The **Choose File to Upload** dialog box is displayed.*

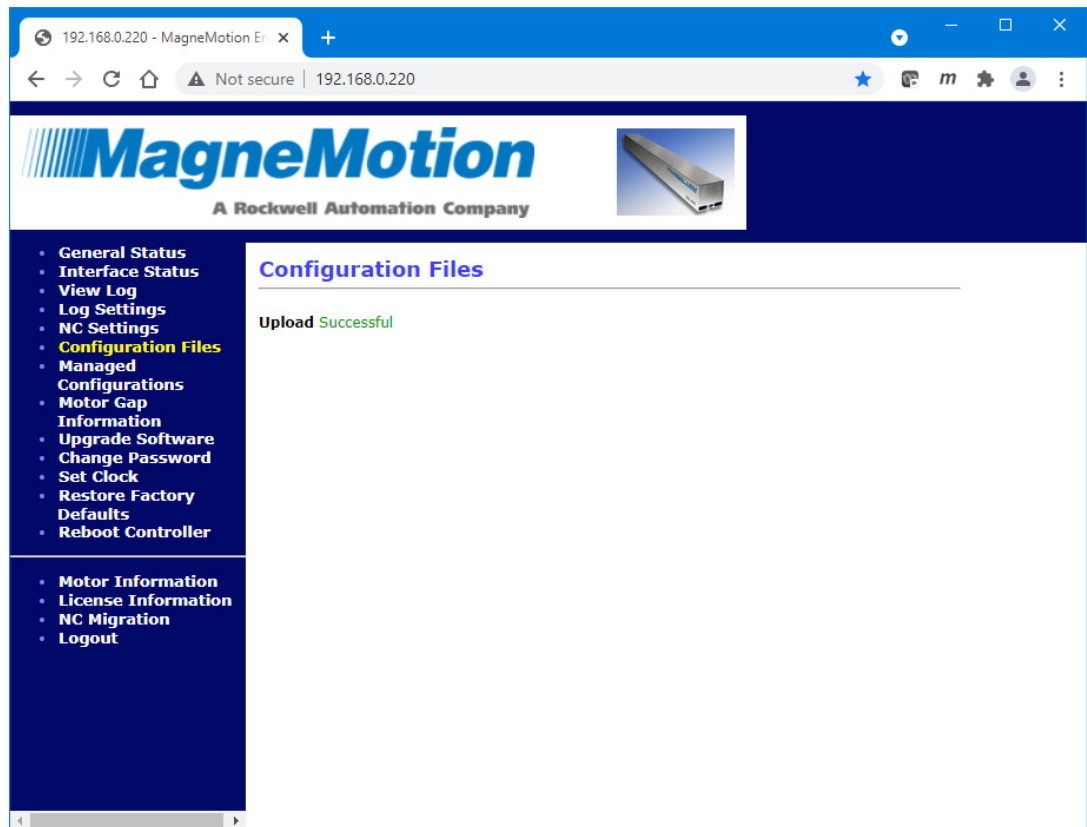
**NOTE:** The dialog box varies by web browser.

4. Use the dialog box controls to select the appropriate Node Controller Configuration File (*node\_configuration.xml*) and select **Open**.

*The file name is displayed in the **Browse** text field.*

5. Select **Upload File**.

*The file upload status is temporarily displayed when the file is uploaded as shown in [Figure 2-16](#).*



*Figure 2-16: Configuration Files Successful Upload*

*The **Configuration Files** page is redisplayed as shown in [Figure 2-17](#) showing the new Node Controller Configuration File with instructions to restart or reboot the node controller.*

**NOTE:** The Node Controller Configuration File is automatically renamed to *node\_configuration.xml* when it is uploaded.

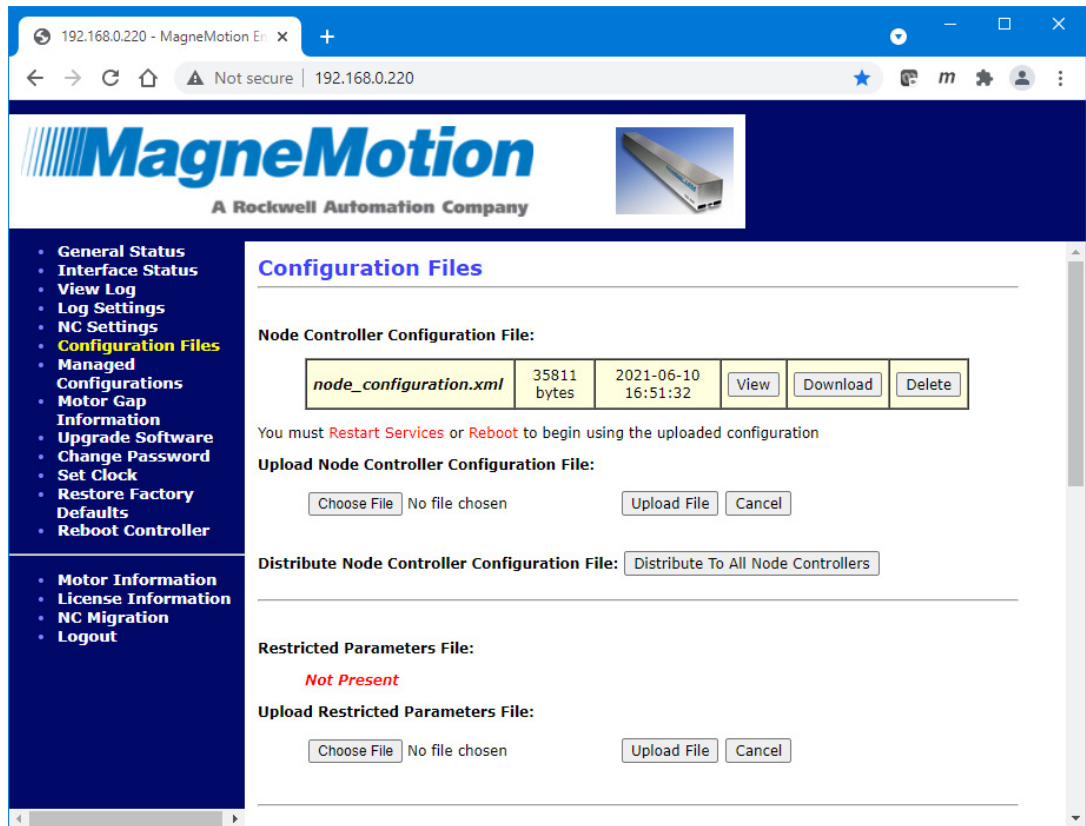


Figure 2-17: Node Controller Configuration File Upload Complete

6. For transport systems with one node controller, restart the node controller (see [Restart One Node Controller on page 131](#)).
7. For transport systems with multiple node controllers, select **Distribute To All Node Controllers**.

**NOTE:** File distribution writes the updated file to the nonvolatile memory in each node controller. Distribution can interrupt normal operations and should only be done during transport system maintenance when there are no active vehicle commands.

Files are only distributed to those node controllers identified in the Node Controller Configuration File.

*The Node Controller Configuration File is distributed to all node controllers in the transport system. The **Configuration Files** page is redisplayed as shown in [Figure 2-18](#) showing the request to distribute the Node Controller Configuration File to all node controllers is complete. The page also provides a reminder to review the log for the HLC to verify the distribution status.*



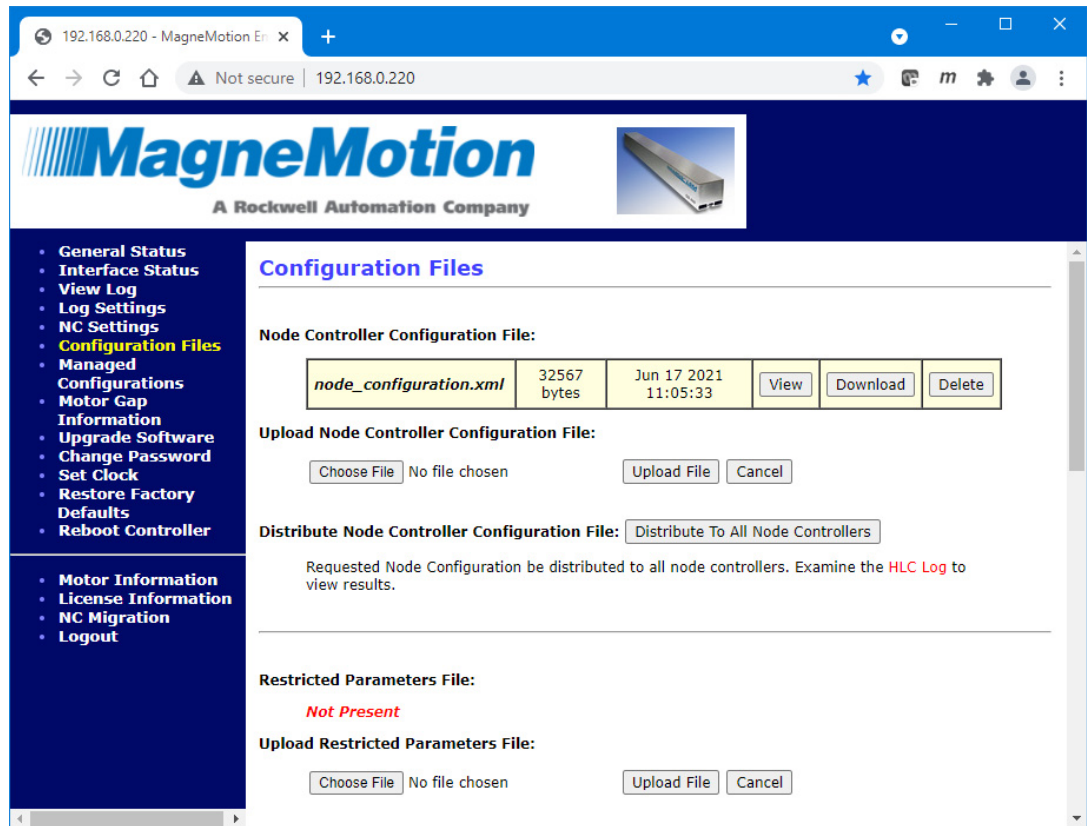


Figure 2-18: Node Controller Configuration File Distribution

- A. Select **View Log** from the Main Menu (see [Log Files on page 35](#)).  
*The Node Controller Log page is displayed.*
- B. Select **View High Level Controller Log**.  
*The Node Controller Log page is updated to display the HLC log. The last lines in the log show the distribution of the Node Controller Configuration File and the distribution status as shown in [Figure 2-19](#).*

```
Feb 24 15:32:32.746834 SYSTEM,CRITICAL: CONF DIST: Sending File: node_configura-
tion.xml of type: Node Controller Configuration XML to NC @ 192.168.110.228
Feb 24 15:32:32.781163 SYSTEM,CRITICAL: CONF DIST: SUCCESS: Transfer Reported
Complete.
```

Figure 2-19: HLC Log Entries Showing Node Controller Configuration File Distribution

- C. Restart all node controllers (see [Restart All Node Controllers on page 133](#)).

## Delete the Existing Node Controller Configuration File

This section describes how to delete the current Node Controller Configuration File from the node controller.



**NOTE:** If the Node Controller Configuration File is deleted and the node controller is rebooted or restated, the HLC status becomes invalid until a new Node Controller Configuration File is uploaded.

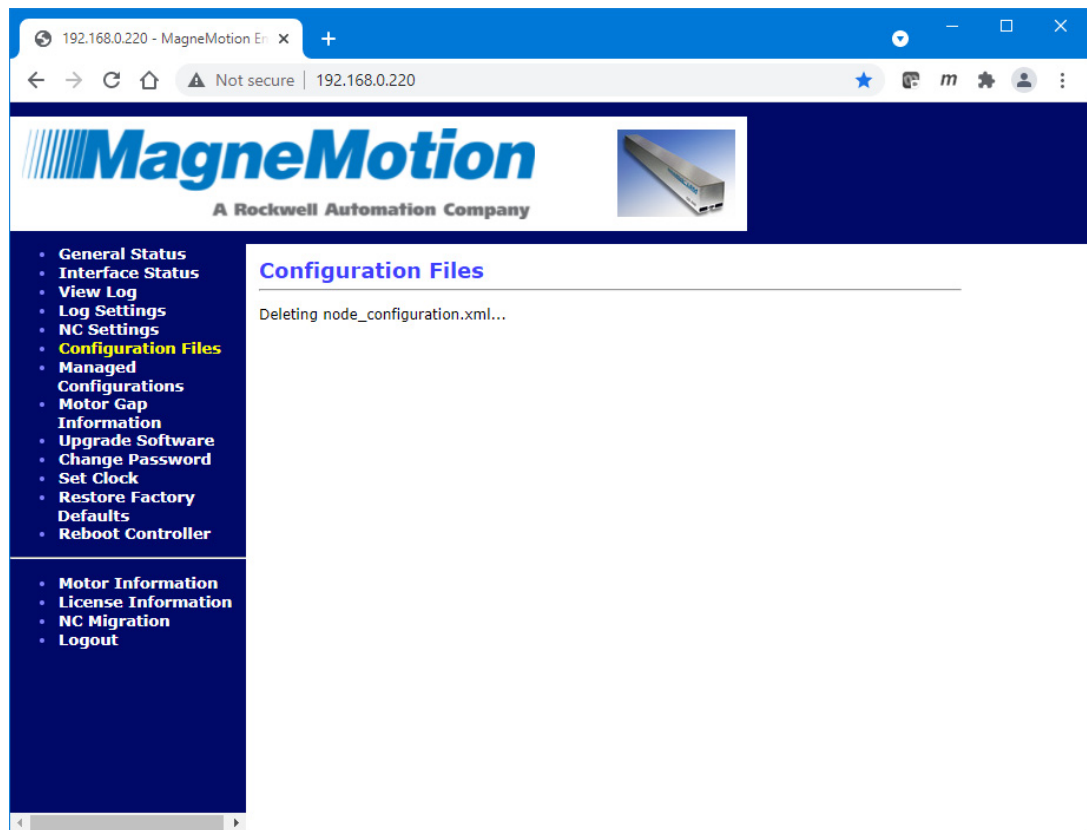
When a managed Node Controller Configuration File (identified by the Config ID in green after the name) is deleted using the **Configuration Files** page, the existing Configuration file is removed from the **Configuration Files** page, but it is still accessible through the [Managed Configurations](#) page.

1. Select **Configuration Files** on the Main Menu (see [Configuration Files on page 210](#) for detailed descriptions of all items).

*The **Configuration Files** page, which is shown in [Figure 2-14](#), is displayed.*

2. Under **Node Controller Configuration File**, select **Delete**.

*The Node Controller Configuration File is deleted and the file deletion status is temporarily displayed as shown in [Figure 2-20](#).*



*Figure 2-20: Node Controller Configuration File Deletion Status*

*The Configuration Files page is redisplayed showing the Node Controller Configuration File has been deleted.*

## MagneMotion Information and Configuration Service File

This section describes how to identify the MagneMotion Information and Configuration Service (MICS) file being used and download that file or upload a new MICS file to the node controller. The MICS file defines the Ethernet track topology by mapping the motor MAC address and IP address to the track layout. This mapping provides a correlation from a logical track location to the motor MAC address and IP address, which is designed to simplify wiring.

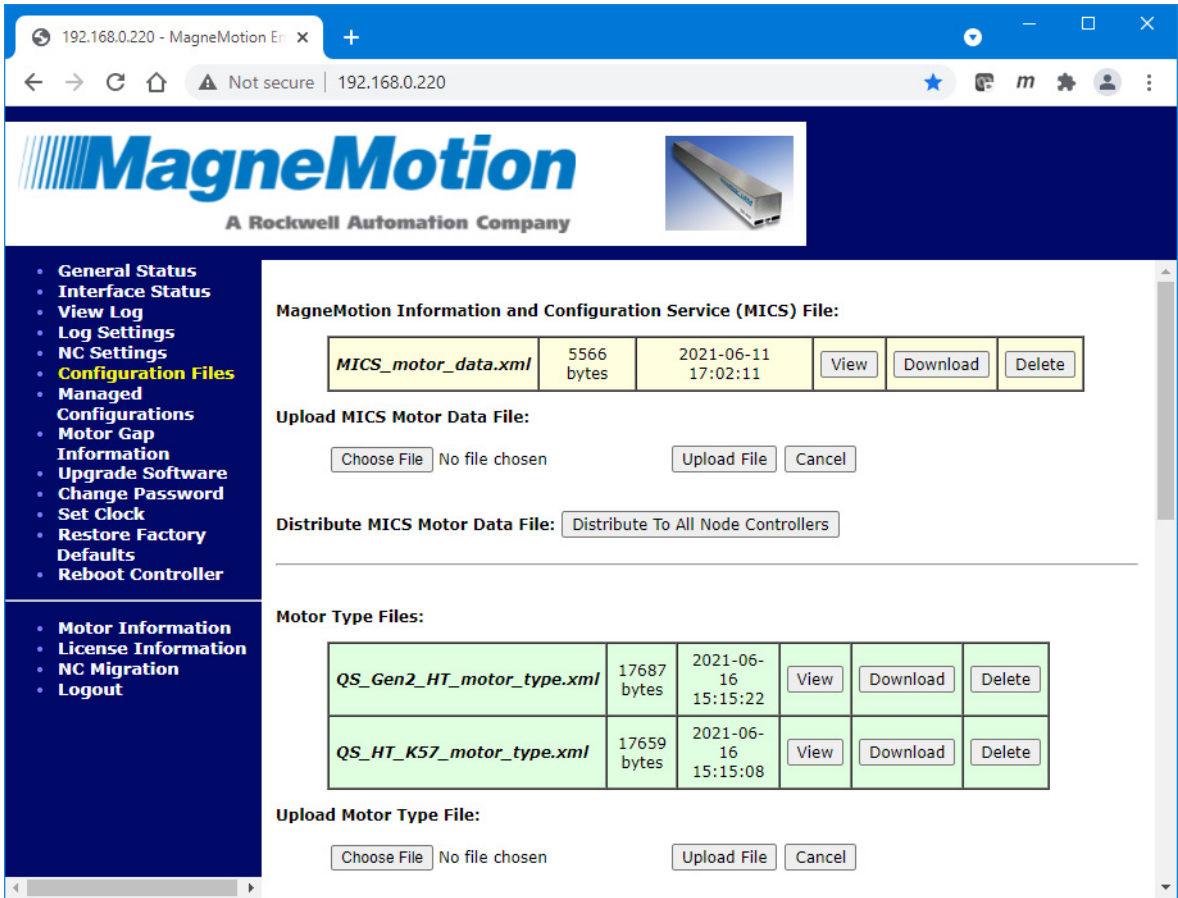


Figure 2-21: MagneMotion Information and Configuration Service (MICS) File

### Identify the Current MICS File

This section describes how to identify the current MICS file on the node controller.

1. Select **Configuration Files** on the Main Menu (see [Configuration Files](#) on page 210 for detailed descriptions of all items).

*The **Configuration Files** page, which is shown in [Figure 2-14](#), is displayed.*

2. Scroll down to the **MagneMotion Information and Configuration Service (MICS) Files** section as shown in [Figure 2-21](#).

*The current MICS file is listed under **MagneMotion Information and Configuration Service (MICS) File** with the size and date the file was uploaded shown. The contents*

*of the file can be displayed in the browser by selecting **View**. Some browsers may not display the file correctly. If the file does not display correctly, download the file and review it in a text editor to determine if it is the current revision.*

## Download the Existing MICS File

This section describes how to download the existing MICS file from the node controller.

1. Select **Configuration Files** on the Main Menu (see [Configuration Files on page 210](#) for detailed descriptions of all items).

*The **Configuration Files** page, which is shown in [Figure 2-14](#), is displayed.*

2. Scroll down to the **MagneMotion Information and Configuration Service (MICS) File** section as shown in [Figure 2-21](#).

*The current MICS file is listed under **MagneMotion Information and Configuration Service (MICS) File** with the size and date the file was uploaded shown.*

3. Under **MagneMotion Information and Configuration Service (MICS) File**, select **Download** for the file to be downloaded.

*The file is downloaded as determined by the browser. The options for saving or opening this file vary by web browser.*

## Upload a New MICS File

This section describes how to upload MICS files to the node controller.

**NOTE:** Uploading a MICS file to the node controller automatically deletes the existing MICS file and replaces it with the new file.

1. If the transport system has multiple node controllers, run the web interface on the HLC (see [Run the Node Controller Web Interface on page 31](#)).
2. Select **Configuration Files** on the Main Menu of the HLC (see [Configuration Files on page 210](#) for detailed descriptions of all items).

*The **Configuration Files** page, which is shown in [Figure 2-14](#), is displayed.*

3. Scroll down to the **MagneMotion Information and Configuration Service (MICS) File** section as shown in [Figure 2-21](#).

4. Under **Upload MICS Motor Data File**, select **Browse**.

*The **Choose File to Upload** dialog box is displayed.*

**NOTE:** The dialog box varies by web browser.

5. Use the dialog box controls to select the appropriate MICS file (*MICS\_motor\_data.xml*).

*The file name is displayed in the **Browse** text field.*

6. Select **Upload File**.

*The file upload status is temporarily displayed when the file is uploaded as shown in [Figure 2-16](#).*

*The **Configuration Files** page is redisplayed showing the new MICS file with instructions to restart or reboot the node controller.*

**NOTE:** The MICS file is automatically renamed to MICS\_motor\_data.xml when it is uploaded.

7. For transport systems with one node controller, restart the node controller (see [Restart One Node Controller on page 131](#)).
8. For transport systems with multiple node controllers, select **Distribute To All Node Controllers**.

*The MICS file is distributed to all node controllers in the transport system. The **Configuration Files** page is redisplayed showing that the request to distribute the MICS file to all node controllers is complete. The page also provides a reminder to review the log for the HLC to verify the distribution status.*

  - A. Review the HLC log to verify distribution.
  - B. Restart all node controllers (see [Restart All Node Controllers on page 133](#)).

## Delete the Existing MICS File

This section describes how to delete the current MICS file from the node controller.

**NOTE:** Once the MICS file is deleted, a new MICS file must be uploaded to the node controller to enable use of Ethernet motors with the transport system.

1. Select **Configuration Files** on the Main Menu (see [Configuration Files on page 210](#) for detailed descriptions of all items).

*The **Configuration Files** page, which is shown in [Figure 2-14](#), is displayed.*
2. Scroll down to the **MagneMotion Information and Configuration Service (MICS) File** section as shown in [Figure 2-21](#).
3. Under **MagneMotion Information and Configuration Service (MICS) File**, select **Delete**.

*The MICS file is deleted and the file deletion status is temporarily displayed.*  
*The Configuration Files page is redisplayed showing the MICS file has been deleted.*
4. For transport systems with multiple node controllers, select **Delete From All Node Controllers**.

*The MICS file is deleted from all node controllers. Examine the HLC Log to view results.*

## Motor Type Files

This section describes how to identify the Motor Type files being used and download those files or upload new Motor Type files to the node controller. Motor Type files contain basic information about motor configuration, such as the type of motor, the maximum velocity, the cycle length, the number of motor blocks, the distance from the motor end to the coil end, and sensor information. For additional information on motors, see the motor technical data manuals in the [Additional Resources](#) on page 19.

**NOTE:** For transport systems with multiple node controllers, if new Motor Type files are being uploaded, they must be uploaded to each node controller.

### Identify Current Motor Type Files

This section describes how to identify the current Motor Type files on the node controller.

1. Select **Configuration Files** on the Main Menu (see [Configuration Files](#) on page 210 for detailed descriptions of all items).

*The **Configuration Files** page, which is shown in [Figure 2-14](#), is displayed.*

2. Scroll down to the **Motor Type Files** section as shown in [Figure 2-22](#).

*The current Motor Type files are listed under **Motor Type Files** with the size and date the files were uploaded shown. The contents of the file can be displayed in the browser by selecting **View**. Some browsers may not display the file correctly. If the file does not display correctly, download the file and review it in a text editor to determine if it is the current revision.*

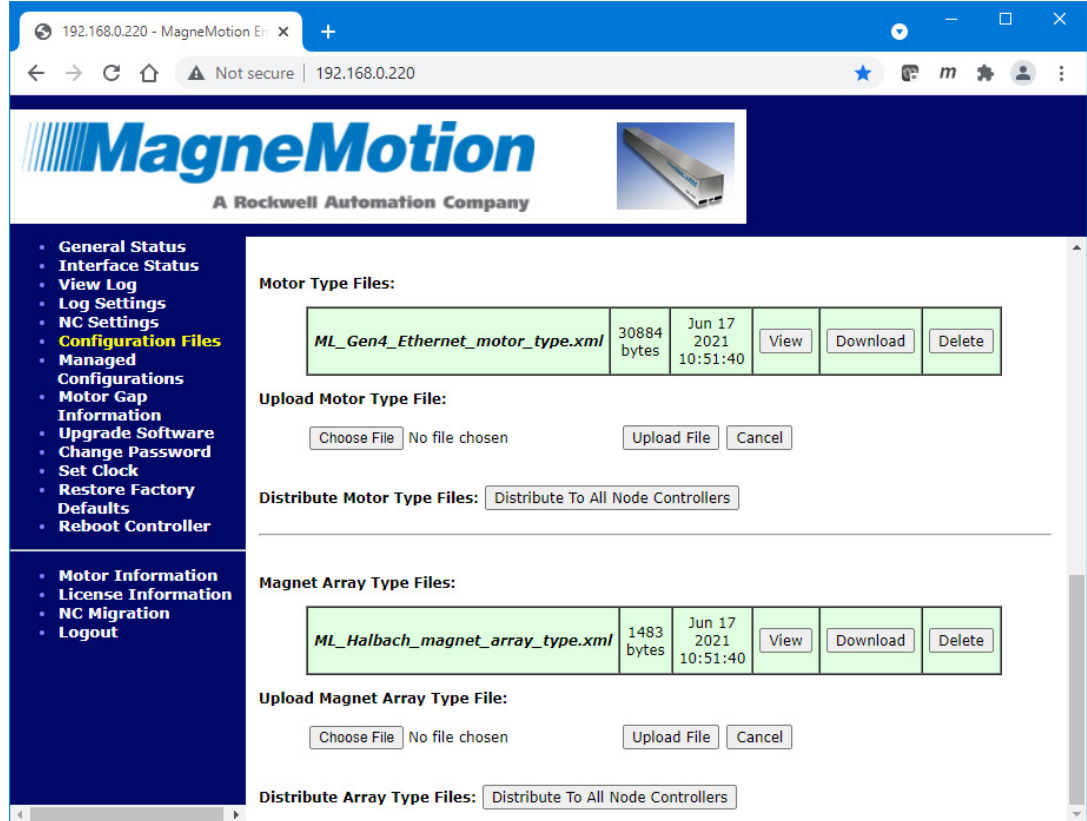


Figure 2-22: Configuration Files Page, Motor Type Files

## Download Existing Motor Type Files

This section describes how to download the existing Motor Type files from the node controller.

1. Select **Configuration Files** on the Main Menu (see [Configuration Files on page 210](#) for detailed descriptions of all items).

*The **Configuration Files** page, which is shown in [Figure 2-14](#), is displayed.*

2. Scroll down to the **Motor Type Files** section as shown in [Figure 2-22](#).

3. Under **Motor Type Files**, select **Download** for the file to be downloaded.

*The file is downloaded as determined by the browser. The options for saving or opening this file vary by web browser.*

## Upload New Motor Type Files

This section describes how to upload Motor Type files to the node controller. These Type files must be uploaded to every node controller in the transport system during initial setup and when updated files are supplied.

**NOTE:** Uploading a Motor Type file to the node controller automatically deletes the existing Motor Type file of the same name and replaces it with the new file.

1. If the transport system has multiple node controllers, run the web interface on the HLC (see [Run the Node Controller Web Interface on page 31](#)).

2. Select **Configuration Files** on the Main Menu (see [Configuration Files on page 210](#) for detailed descriptions of all items).

*The **Configuration Files** page, which is shown in [Figure 2-14](#), is displayed.*

3. Scroll down to the **Motor Type Files** section as shown in [Figure 2-22](#).

4. Under **Upload Motor Type File**, select **Browse**.

*The **Choose File to Upload** dialog box is displayed.*

5. Use the dialog box controls to select the appropriate Motor Type file (*motor\_type.xml*) and select **Open**.

*The file name is displayed in the **Browse** text field.*

6. Select **Upload File**.

*The file upload status is temporarily displayed when the file is uploaded as shown in [Figure 2-16](#).*



The **Configuration Files** page is redisplayed as shown in [Figure 2-14](#). Scroll down the page to display the new Motor Type file.

7. For transport systems with one node controller, restart the node controller (see [Restart One Node Controller on page 131](#)).
8. For transport systems with multiple node controllers, select **Distribute To All Node Controllers**.

**NOTE:** File distribution writes the updated files to the nonvolatile memory in each node controller. Distribution can interrupt normal operations and should only be done during transport system maintenance when there are no active vehicle commands.

Files are only distributed to those node controllers identified in the Node Controller Configuration File.

The Motor Type files are distributed to all node controllers in the transport system. The **Configuration Files** page is redisplayed as shown in [Figure 2-23](#) showing the request to distribute the Motor Type files to all node controllers. The page also provides a reminder to review the log for the HLC to verify the distribution status.

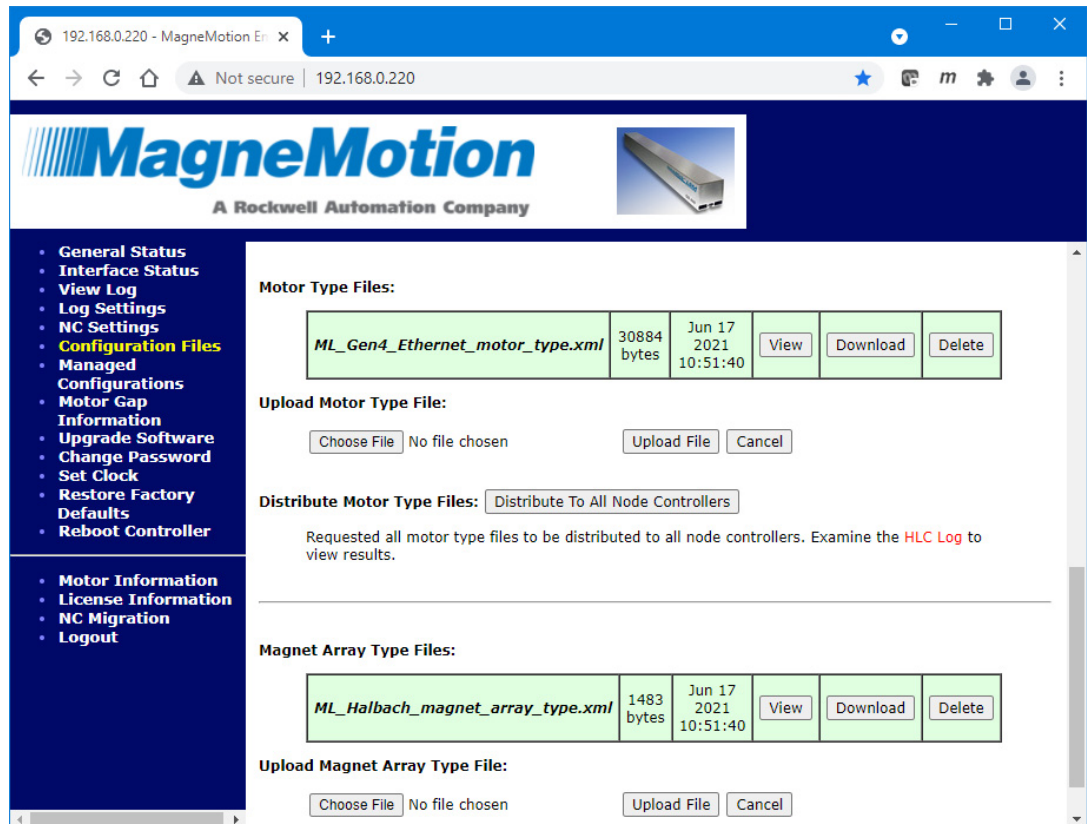


Figure 2-23: Motor Type File Distribution

- A. Select **View Log** from the Main Menu (see [Log Files on page 35](#)).

The **Node Controller Log** page is displayed.

B. Select **View High Level Controller Log**.

*The **Node Controller Log** page is updated to display the HLC log. The last lines in the log show the distribution of the Motor Type files and the distribution status shown in [Figure 2-24](#).*

```
Feb 24 15:41:19.903216 SYSTEM,CRITICAL: CONF DIST: Sending Delete Files request  
for type: Motor Type XML to NC @ 192.168.110.228  
Feb 24 15:41:20.406895 SYSTEM,CRITICAL: CONF DIST: SUCCESS: NC acknowledged re-  
quest  
Feb 24 15:41:20.407203 SYSTEM,CRITICAL: CONF DIST: Sending File: ML_Gen3_motor_  
type.xml of type: Motor Type XML to NC @ 192.168.110.228  
Feb 24 15:41:20.954262 SYSTEM,CRITICAL: CONF DIST: SUCCESS: Transfer Reported  
Complete.
```

*Figure 2-24: HLC Log Entries Showing Motor Type File Distribution*

C. Restart all node controllers (see [Restart All Node Controllers on page 133](#)).

### Delete Existing Motor Type Files

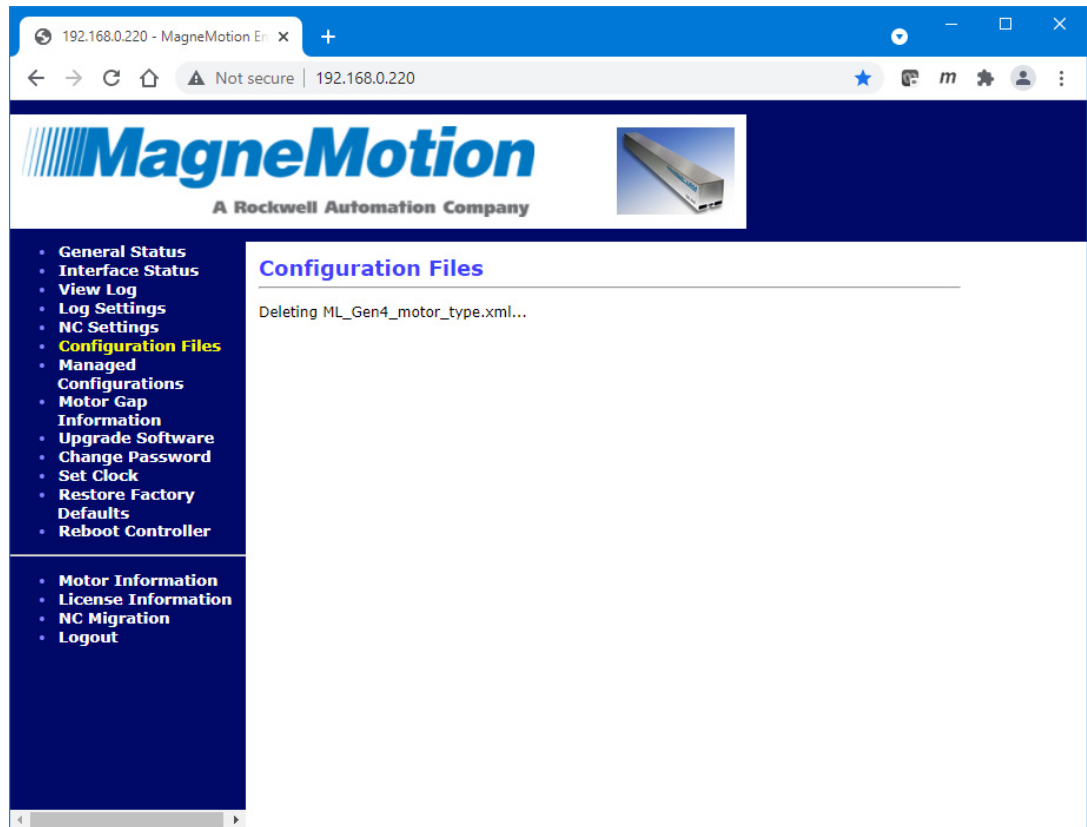
This section describes how to delete existing Motor Type files from the node controller.

**NOTE:** Once the Motor Type files are deleted, new Motor Type files must be uploaded to the node controller to enable the node controller to be used with the transport system.

1. Select **Configuration Files** on the Main Menu (see [Configuration Files on page 210](#) for detailed descriptions of all items).  
*The **Configuration Files** page, which is shown in [Figure 2-14](#), is displayed.*
2. Scroll down to the **Motor Type Files** section as shown in [Figure 2-22](#).
3. Under **Motor Type Files**, identify the Motor Type file to be deleted and select **Delete** for that file.



*The file is deleted and the file deletion status is temporarily displayed as shown in Figure 2-25.*



*Figure 2-25: Motor Type File Deletion Status*

*The **Configuration Files** page is redisplayed showing the selected Motor Type file has been deleted.*

## Magnet Array Type Files

This section describes how to identify the Magnet Array Type files being used and download those files or upload new Magnet Array Type files to the node controller. Magnet Array Type files contain basic information about the configuration of the magnet array, such as the type of magnet array, the array length, the nominal vehicle gap, and sensor information. For additional information on magnet array type files, see the magnet array data manuals in the [Additional Resources on page 19](#).

**NOTE:** For transport systems with multiple node controllers, if new Magnet Array Type files are being uploaded, they must be uploaded to each node controller.

### Identify Current Magnet Array Type Files

This section describes how to identify the current Magnet Array Type files on the node controller.

1. Select **Configuration Files** on the Main Menu (see [Configuration Files](#) on page 210 for detailed descriptions of all items).

*The **Configuration Files** page, which is shown in [Figure 2-14](#), is displayed.*

2. Scroll down to the **Magnet Array Type Files** section as shown in [Figure 2-26](#).

*The current Magnet Array Type files are listed under **Magnet Array Type Files** with the size and date the files were uploaded shown. The contents of the file can be displayed in the browser by selecting **View**. Some browsers may not display the file correctly. If the file does not display correctly, download the file and review it in a text editor to determine if it is the current revision.*

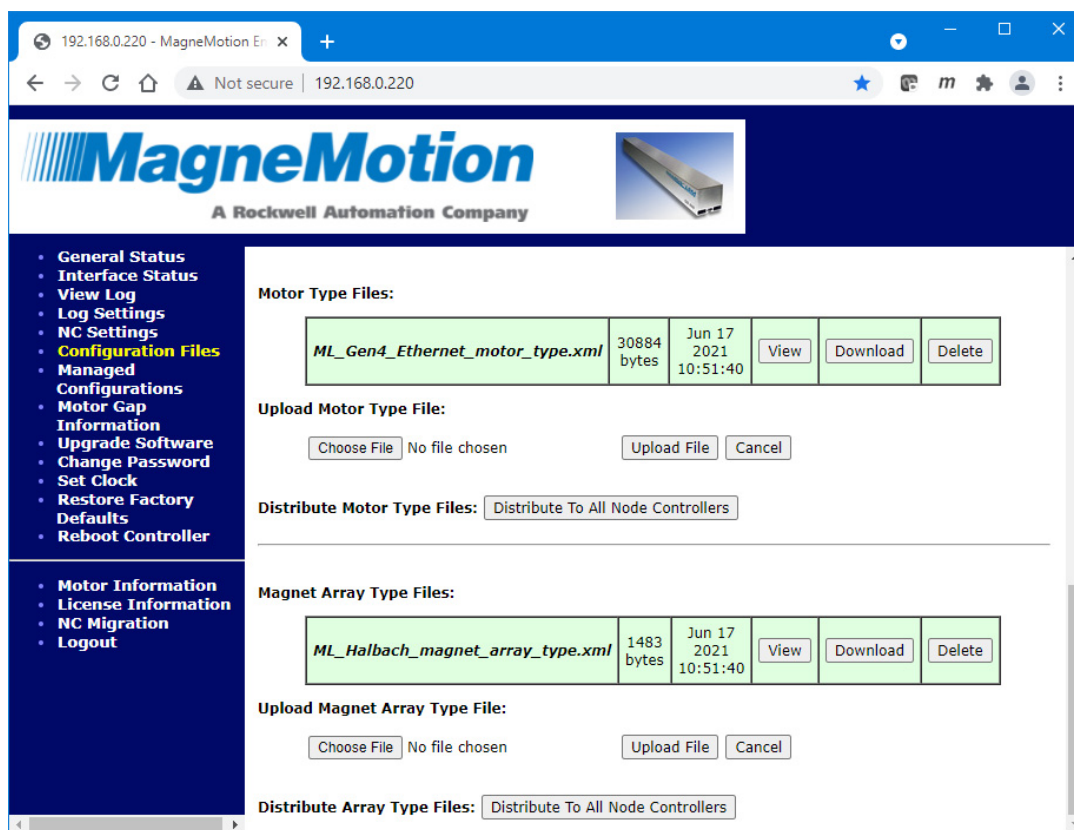


Figure 2-26: Configuration Files Page, Magnet Array Type Files

## Download Existing Magnet Array Type Files

This section describes how to download Magnet Array Type files from the node controller.

1. Select **Configuration Files** on the Main Menu (see [Configuration Files](#) on page 210 for detailed descriptions of all items).

*The **Configuration Files** page, which is shown in [Figure 2-14](#), is displayed.*

2. Scroll down to the **Magnet Array Type Files** section as shown in [Figure 2-26](#).

3. Under **Magnet Array Type Files**, select **Download** for the file to be downloaded.

*The file is downloaded as determined by the browser. The options for saving or opening this file vary by web browser.*

## Upload New Magnet Array Type Files

This section describes how to upload Magnet Array Type files to the node controller. These Type files must be uploaded to every node controller in the transport system during initial setup and when updated files are supplied.

**NOTE:** Uploading a Magnet Array Type file to the node controller automatically deletes the existing Magnet Array Type file of the same name and replaces it with the new file.

1. If the transport system has multiple node controllers, run the web interface on the HLC (see [Run the Node Controller Web Interface on page 31](#)).
2. Select **Configuration Files** on the Main Menu (see [Configuration Files on page 210](#) for detailed descriptions of all items).

*The **Configuration Files** page, which is shown in [Figure 2-14](#), is displayed.*

3. Scroll down to the **Magnet Array Type Files** section as shown in [Figure 2-26](#).
4. Under **Upload Magnet Array File**, select **Browse**.

*The **Choose File to Upload** dialog box is displayed.*

5. Use the dialog box controls to select the appropriate Magnet Array Type file (*magnet\_array\_type.xml*) and select **Open**.

*The file name is displayed in the **Browse** text field.*

6. Select **Upload File**.

*The file upload status is temporarily displayed when the file is uploaded as shown in [Figure 2-16](#).*

*The **Configuration Files** page is redisplayed as shown in [Figure 2-14](#). Scroll down the page to display the new Magnet Array Type file.*

7. For transport systems with one node controller, restart the node controller (see [Restart One Node Controller on page 131](#)).
8. For transport systems with multiple node controllers, select **Distribute To All Node Controllers**.

**NOTE:** File distribution writes the updated files to the nonvolatile memory in each node controller. Distribution can interrupt normal operations and should only be done during transport system maintenance when there are no active vehicle commands.

Files are only distributed to those node controllers identified in the Node Controller Configuration File.

The *Magnet Array Type* file is distributed to all node controllers in the transport system. The **Configuration Files** page is redisplayed as shown in [Figure 2-27](#) showing the request to distribute the Magnet Array Type files to all node controllers. The page also provides a reminder to review the log for the HLC to verify the distribution status.

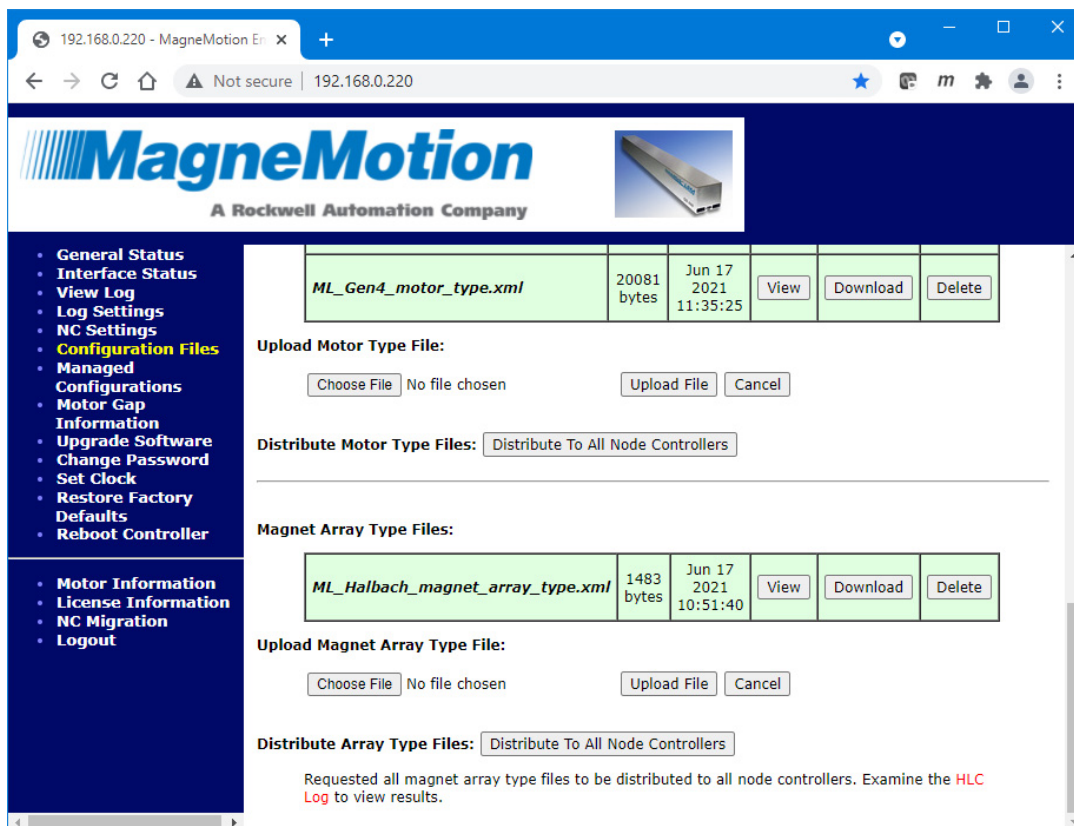


Figure 2-27: Magnet Array Type File Distribution

- A. Select **View Log** from the Main Menu (see [Log Files on page 35](#)).  
The *Node Controller Log* page is displayed.
- B. Select **View High Level Controller Log**.  
The *Node Controller Log* page is updated to display the HLC log. The last lines in the log show the distribution of the Magnet Array Type files and the distribution status as shown in [Figure 2-28](#).

```
Feb 24 16:03:55.771537 SYSTEM,CRITICAL: CONF DIST: Sending Delete Files request  
for type: Magnet Array Type XML to NC @ 192.168.110.228  
Feb 24 16:03:55.922183 SYSTEM,CRITICAL: CONF DIST: SUCCESS: NC acknowledged re-  
quest  
Feb 24 16:03:55.922480 SYSTEM,CRITICAL: CONF DIST: Sending File: ML_Halbach_mag-  
net_array_type.xml of type: Magnet Array Type XML to NC @ 192.168.110.228  
Feb 24 16:03:56.100925 SYSTEM,CRITICAL: CONF DIST: SUCCESS: Transfer Reported  
Complete.
```

*Figure 2-28: HLC Log Entries Showing Magnet Array Type File Distribution*

- C. Restart all node controllers (see [Restart All Node Controllers on page 133](#)).

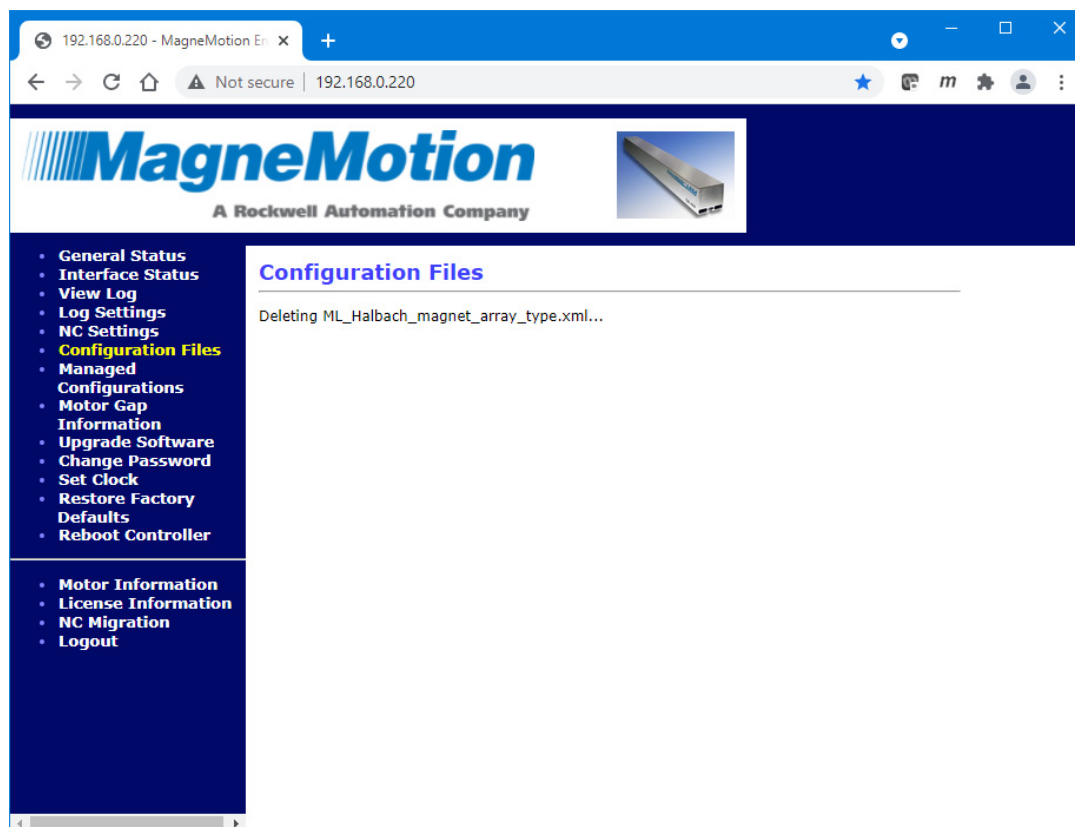
## Delete Existing Magnet Array Type Files

This section describes how to delete existing Magnet Array Type files from the node controller.

**NOTE:** Once the Magnet Array Type files are deleted, new Magnet Array Type files must be uploaded to the node controller to enable the node controller to be used with the transport system.

1. Select **Configuration Files** on the Main Menu (see [Configuration Files on page 210](#) for detailed descriptions of all items).  
*The **Configuration Files** page, which is shown in [Figure 2-14](#), is displayed.*
2. Scroll down to the **Magnet Array Type Files** section as shown in [Figure 2-26](#).
3. Under **Magnet Array Type Files**, identify the Magnet Array Type file to be deleted and select **Delete** for that file.

*The file is deleted and the file deletion status is temporarily displayed as shown in Figure 2-29.*



*Figure 2-29: Magnet Array Type File Deletion Status*

*The **Configuration Files** page is redisplayed showing the selected Magnet Array Type file has been deleted.*

## Managed Configurations

Managed Configurations allows up to 20 managed Node Controller Configuration Files to be uploaded and managed for a system. Using multiple Node Controller Configuration Files allows creation of custom files with different system behavior (for example different PID settings). A managed Node Controller Configuration File can be activated on the HLC, and distributed to all node controllers system wide using the web interface or through the host interface (see either the *MagneMotion Host Controller TCP/IP Communication Protocol User Manual*, publication [MMI-UM003](#), or the *MagneMotion Host Controller EtherNet/IP Communication Protocol User Manual*, publication [MMI-UM004](#)). See the *MagneMotion Configurator Manual*, publication [MMI-UM046](#), for information on Node Controller Configuration Files.

**NOTE:** For transport systems with multiple node controllers, if a new or different Node Controller Configuration File is uploaded or activated, it must be uploaded and activated on each node controller.

---

**IMPORTANT** After activating a Managed Configuration, do not upload a Node Controller Configuration File to the [Configuration Files](#) page. The active Managed Node Controller Configuration File becomes the current Node Controller Configuration File and must be managed through the **Managed Configurations** page.

---

## Managed Configurations and Configuration Files Page Interactions

The Managed Configurations feature impacts the use of the **Node Controller Configuration Files** section on the **Configuration Files** page of the web interface.

After activating a Managed Configuration, do not upload a Node Controller Configuration File to the Configuration Files page. The active Managed Node Controller Configuration File becomes the current Node Controller Configuration File. The Config ID of the activated Managed Node Controller Configuration File is shown in green next to the name of the file in the **Configuration Files** page as shown in [Figure 2-37](#).

The **Node Controller Configuration File** section on the **Configuration Files** page affects Managed Configurations as follows:

- Uploading a new Node Controller Configuration File on the **Configuration Files** page automatically deletes the existing Node Controller Configuration File and replaces it with the new static Node Controller Configuration File. The static Node Controller Configuration File is displayed with no Config ID following it.
- No Managed Node Controller Configuration File is deleted.



- Deleting the Managed Node Controller Configuration File on the **Configuration Files** page results in the deletion of the current Node Controller Configuration File.
  - No Managed Node Controller Configuration File is deleted.

## Identify the Current Node Controller Configuration Files

This section describes how to identify the Node Controller Configuration Files currently loaded on the node controller.

1. If the transport system has multiple node controllers, run the web interface on the HLC (see [Run the Node Controller Web Interface on page 31](#)).
2. Select **Managed Configurations** on the Main Menu (see [Managed Configurations on page 214](#) for detailed descriptions of all items).

*The **Managed Configurations** page, which is shown in [Figure 2-30](#), is displayed. The current set of configuration files are listed under **Managed Node Configuration Files** with the filename, size, and date the file was uploaded shown. The file that is highlighted in green is the active configuration file. If no file is highlighted in green, **Managed Configurations** is not being used.*

*The contents of each file can be displayed in the browser by selecting **View**. Some browsers may not display the file correctly. If the file does not display correctly, download the file and review it in a text editor to determine if it is the current revision.*

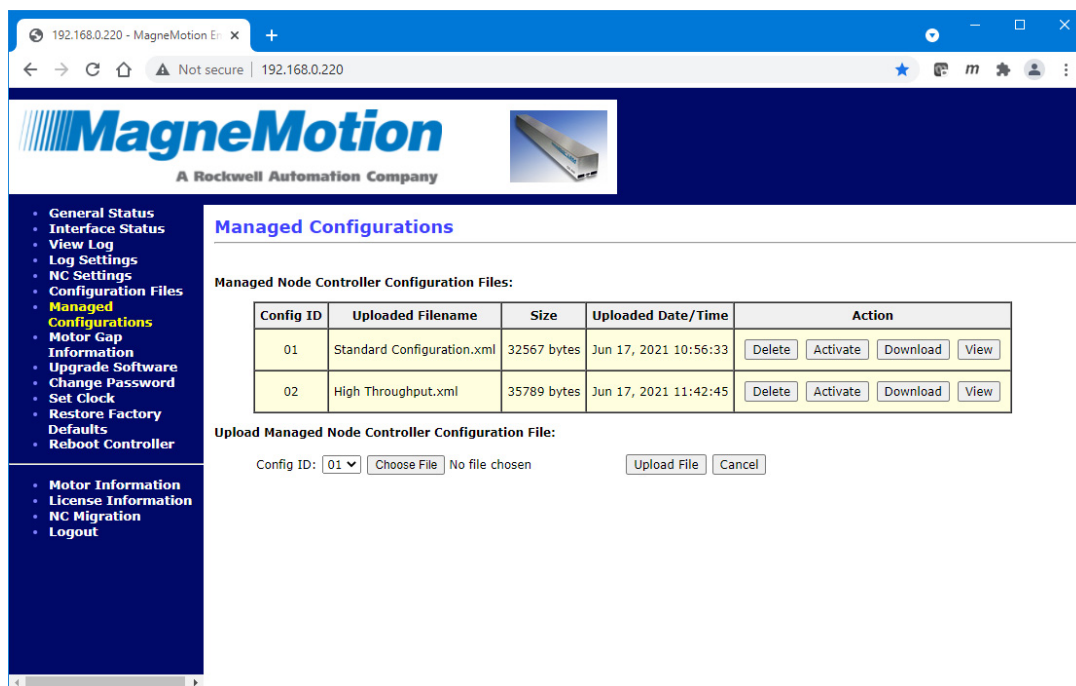


Figure 2-30: Managed Configurations Page



## Download the Existing Managed Node Controller Configuration Files

This section describes how to download any, or all, of the existing Node Controller Configuration Files from the node controller.

1. If the transport system has multiple node controllers, run the web interface on the HLC (see [Run the Node Controller Web Interface on page 31](#)).
2. Select **Managed Configurations** on the Main Menu (see [Managed Configurations on page 214](#) for detailed descriptions of all items).

*The **Managed Configurations** page, which is shown in [Figure 2-30](#), is displayed.*

3. Under **Managed Node Controller Configuration Files**, select **Download** for the file to be downloaded.

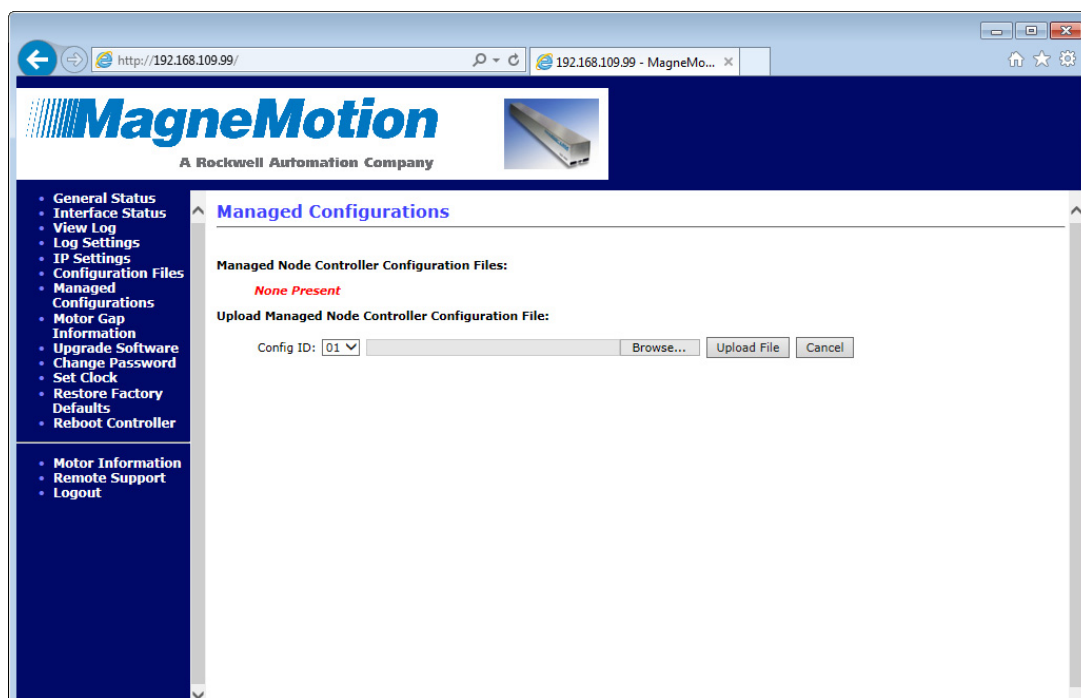
*The file is downloaded as determined by the browser. The options for saving or opening this file vary by web browser.*

## Upload a New Managed Node Controller Configuration File

This section describes how to upload a new managed Node Controller Configuration File.

1. If the transport system has multiple node controllers, run the web interface on the HLC (see [Run the Node Controller Web Interface on page 31](#)).
2. Select **Managed Configurations** on the Main Menu (see [Managed Configurations on page 214](#) for detailed descriptions of all items).

*The **Managed Configurations** page, shown in [Figure 2-31](#), is displayed.*



*Figure 2-31: Managed Configurations Page*

3. Under **Upload Managed Node Controller Configuration File**, select an available **Config ID**.

**NOTE:** Selecting a **Config ID** that is already in use overwrites the existing Node Controller Configuration File with that ID.

4. Select **Browse**.

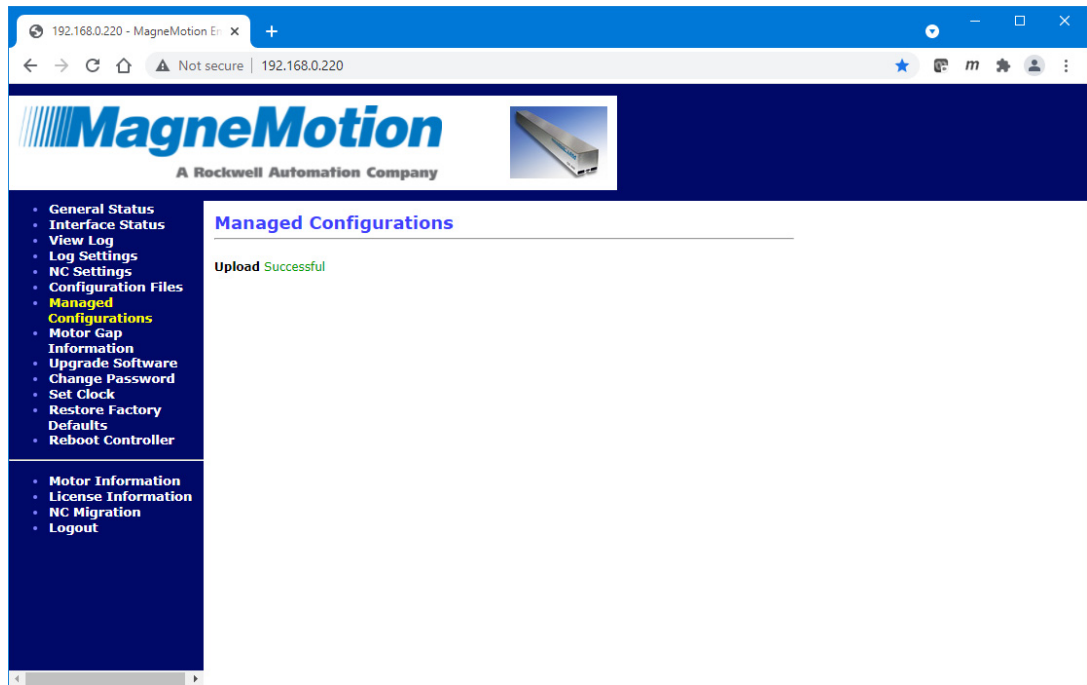
*The **Choose File to Upload** dialog box is displayed.*

5. Use the dialog box controls to select the appropriate Node Controller Configuration File (*node\_configuration.xml*) and select **Open**.

*The file name is displayed in the **Browse** text field.*

6. Select **Upload File**.

*The file upload status is temporarily displayed when the file is uploaded as shown in Figure 2-32.*



*Figure 2-32: Managed Node Controller Configuration File Successful Upload*

*The **Managed Configurations** page is redisplayed as shown in Figure 2-33 showing the new Node Controller Configuration File.*

**NOTE:** The managed Node Controller Configuration Files are not renamed when they are uploaded.

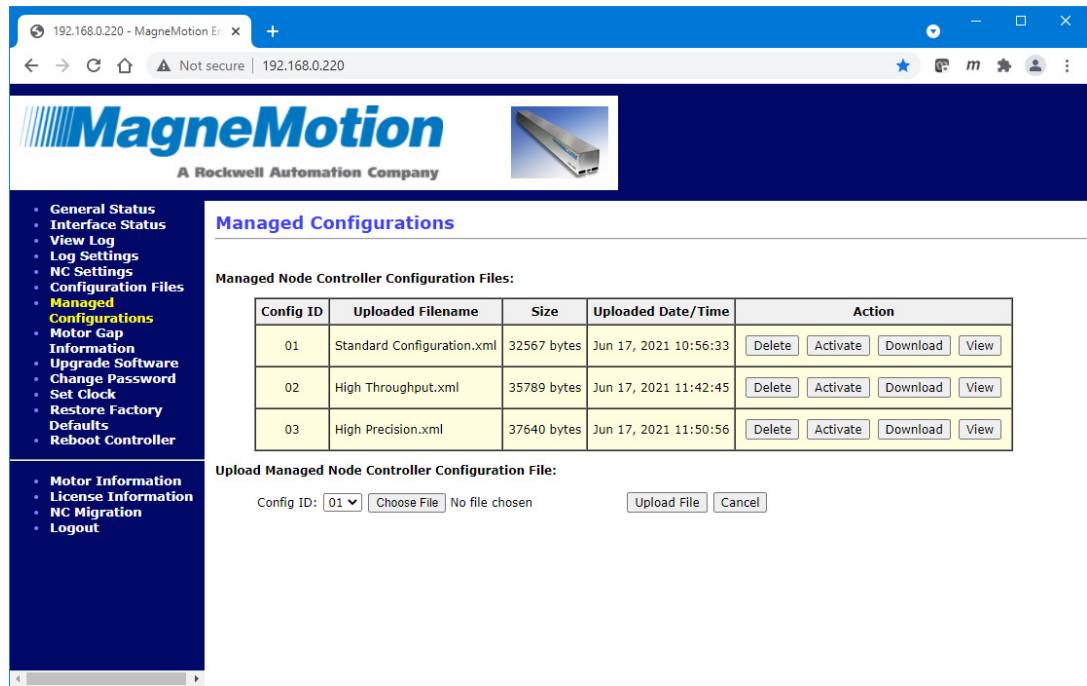


Figure 2-33: Managed Node Controller Configuration File Upload Complete

## Activate a Managed Node Controller Configuration File

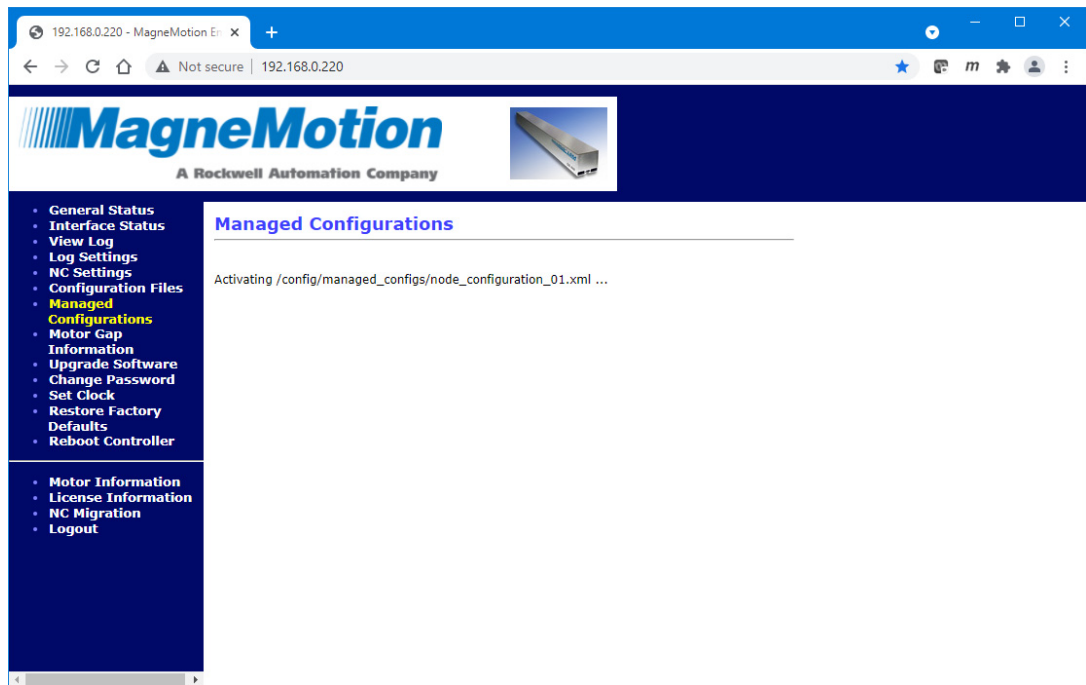
This section describes how to activate a managed Node Controller Configuration File. When a managed Node Controller Configuration File is activated the **Config ID** of that file is shown on the Configuration Files page as shown in [Figure 2-15](#).

1. If the transport system has multiple node controllers, run the web interface on the HLC (see [Run the Node Controller Web Interface on page 31](#)).
2. Select **Managed Configurations** on the Main Menu (see [Managed Configurations on page 214](#) for detailed descriptions of all items).

*The **Managed Configurations** page, which is shown in [Figure 2-30](#), is displayed.*

3. Under **Managed Node Controller Configuration Files**, select **Activate** for the file to be used.

*The activation status for the selected file is temporarily displayed as shown in Figure 2-34. A copy of the file is renamed `node_configuration.xml` and used as the Node Controller Configuration File.*



*Figure 2-34: Managed Node Controller Configuration File Activating*

*The **Managed Configurations** page is redisplayed as shown in Figure 2-35 showing the selected Node Controller Configuration File is active by displaying its name in green.*

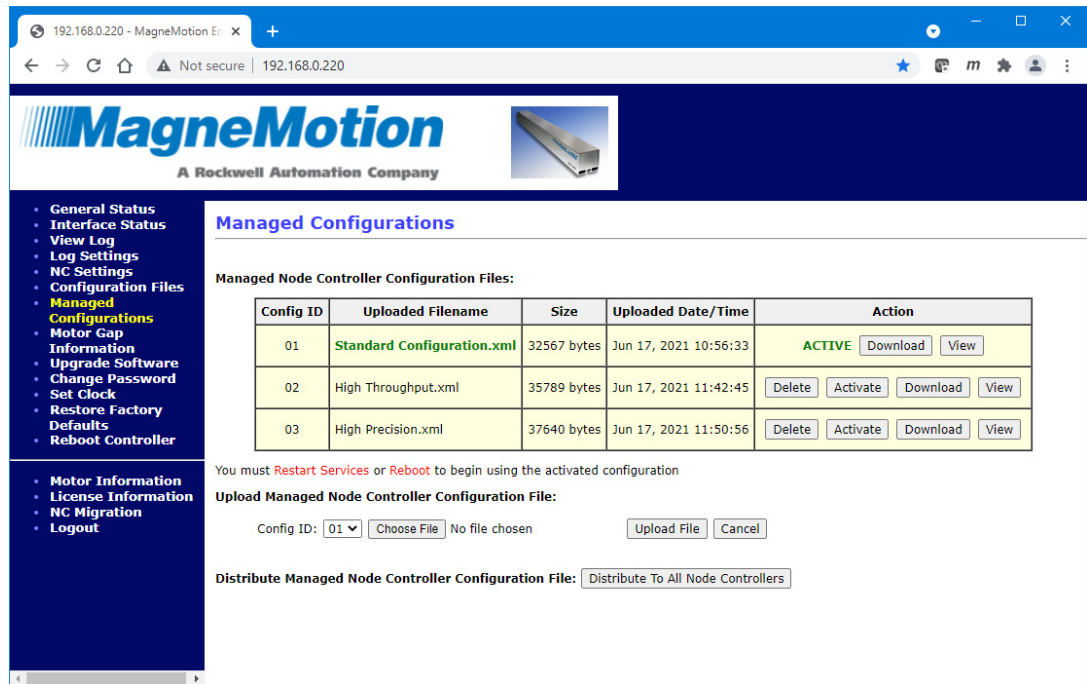


Figure 2-35: Managed Node Controller Configuration File Activation Complete

4. For transport systems with one node controller, restart the node controller (see [Restart One Node Controller on page 131](#)).
5. For transport systems with multiple node controllers, select **Distribute To All Node Controllers**.

**NOTE:** File distribution writes the updated file to the nonvolatile memory in each node controller. Distribution can interrupt normal operations and should only be done during transport system maintenance when there are no active vehicle commands.

Files are only distributed to those node controllers identified in the Node Controller Configuration File.

*The Node Controller Configuration File is distributed to all node controllers in the transport system. The **Managed Configuration Files** page is redisplayed as shown in [Figure 2-36](#) showing the request to distribute the Node Controller Configuration File to all node controllers. The page also provides a reminder to review the log for the HLC to verify the distribution status.*

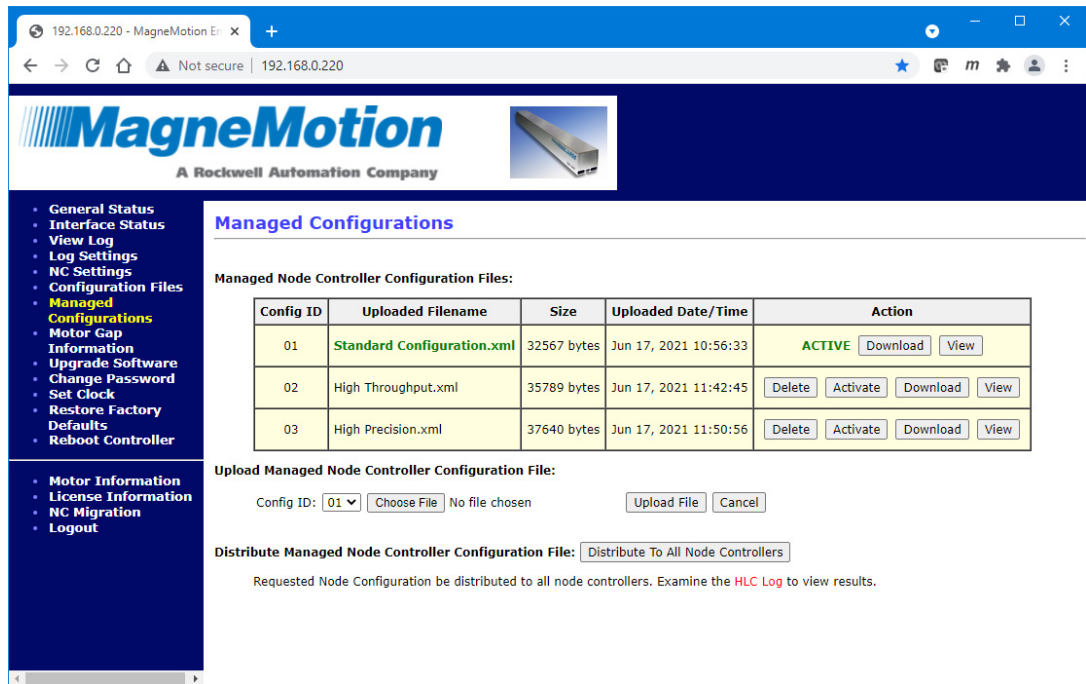


Figure 2-36: Node Controller Configuration File Distribution

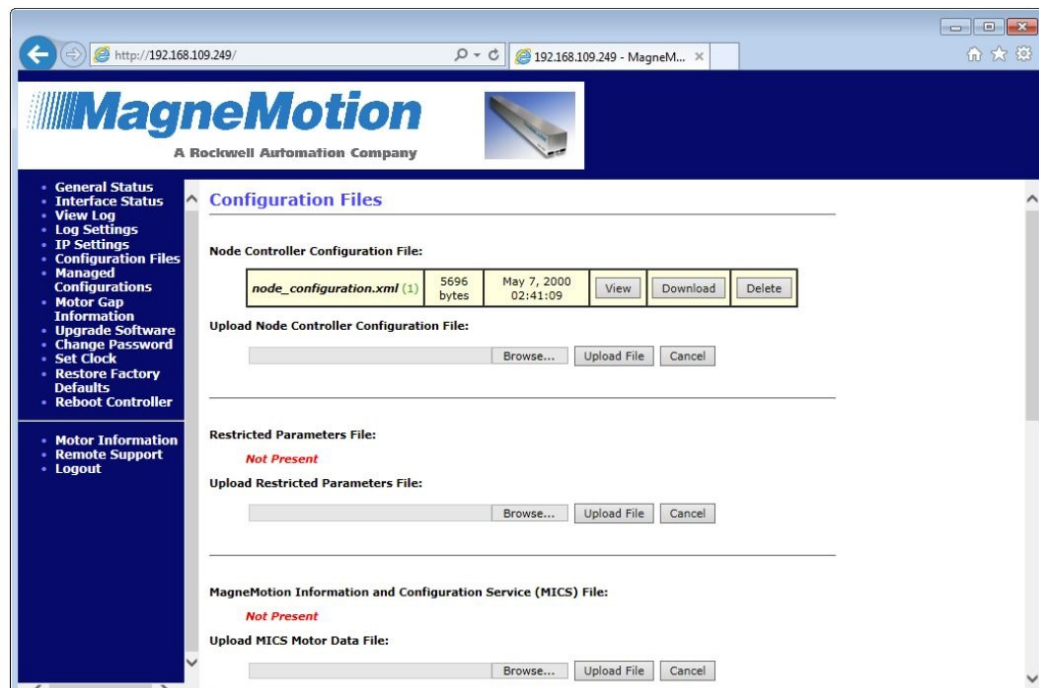


Figure 2-37: Configuration Files Page Using a Managed Configuration

- A. Select **View Log** from the Main Menu (see [Log Files](#) on page 35).

*The **Node Controller Log** page is displayed.*

- B. Select **View High Level Controller Log**.

*The **Node Controller Log** page is updated to display the HLC log. The last lines in the log show the distribution of the Node Controller Configuration File and the distribution status as shown in [Figure 2-38](#).*

<pre>Feb 24 15:32:32.746834 SYSTEM,CRITICAL: CONF DIST: Sending File: node_configura- tion.xml of type: Node Controller Configuration XML to NC @ 192.168.110.228 Feb 24 15:32:32.781163 SYSTEM,CRITICAL: CONF DIST: SUCCESS: Transfer Reported Complete.</pre>
---

*Figure 2-38: HLC Log Entries Showing Node Controller Configuration File Distribution*

- C. Restart all node controllers (see [Restart All Node Controllers on page 133](#)).

### Delete the Existing Node Controller Configuration File

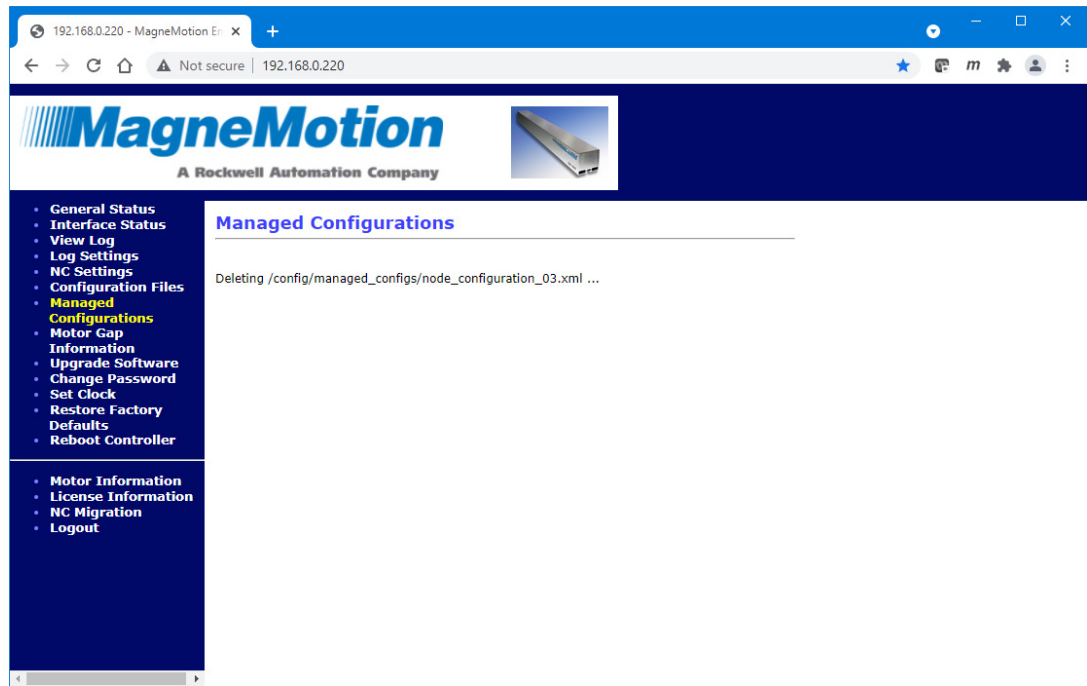
This section describes how to delete a Managed Node Controller Configuration File from the node controller.

**NOTE:** The active Managed Node Controller Configuration File cannot be deleted. If the active Managed Node Controller Configuration File is deleted using the Configuration Files page and the node controller is rebooted or restated, the HLC status becomes invalid until a new Node Controller Configuration File is uploaded using the Configuration Files page.

1. If the transport system has multiple node controllers, run the web interface on the HLC (see [Run the Node Controller Web Interface on page 31](#)).
2. Select **Managed Configurations** on the Main Menu (see [Managed Configurations on page 214](#) for detailed descriptions of all items).  
*The **Managed Configurations** page, which is shown in [Figure 2-30](#), is displayed.*
3. Under **Managed Node Controller Configuration Files**, select **Delete** for the file to be removed.

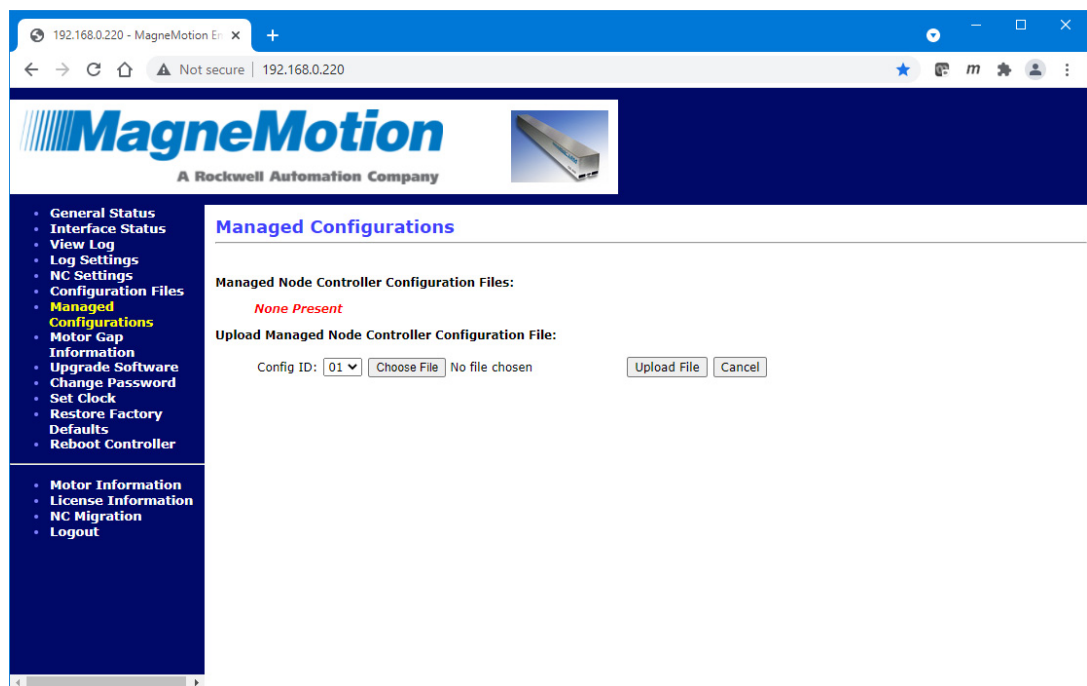


*The Node Controller Configuration File is deleted and the file deletion status is temporarily displayed as shown in Figure 2-39.*



*Figure 2-39: Managed Configuration File Deletion Status*

*The Configuration Files page is redisplayed showing the Node Controller Configuration File has been deleted. If there are no Managed Node Controller Configuration Files, a notice is displayed as shown in Figure 2-40.*



*Figure 2-40: No Managed Configurations*

## Distribute a Managed Node Controller Configuration File

This section describes how to distribute an active Managed Node Controller Configuration File to all node controllers in the transport system.

1. If the transport system has multiple node controllers, connect to the node controller assigned as the HLC. Once connected, run the **Node Controller Web Interface** (see the *MagneMotion Node Controller Interface User Manual*, publication [MMI-UM001](#)).
2. Select **Managed Configurations** from the Main Menu.

The *Managed Configurations* page ([Figure 2-41](#)) is displayed showing the Managed Node Controller Configuration Files and identifying the active file.

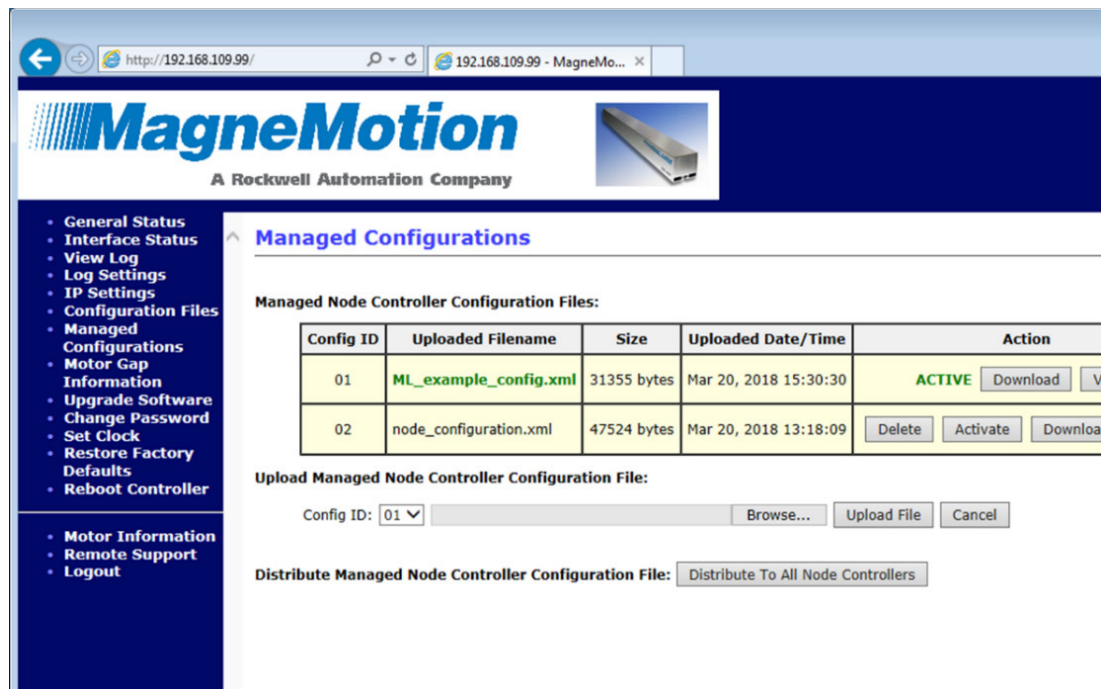


Figure 2-41: Distribute Active Managed Configuration To All Node Controllers

3. Select **Distribute To All Node Controllers**.

The active Managed Node Controller Configuration file is distributed to all node controllers in the transport system.

The *Managed Configurations* page is redisplayed showing the request to distribute the Managed Node Controller Configuration File to all node controllers and instructions to review the HLC log to verify the status of the distribution.

4. Select **View Log** from the Main Menu (see the *MagneMotion Node Controller Interface User Manual*, publication [MMI-UM001](#)).

*The Node Controller Log page is displayed.*

5. Select **View High Level Controller Log**.

*The Node Controller Log page is updated to display the HLC Log. The last lines in the log show the distribution of the Managed Node Controller Configuration File and the status of the distribution. See [Figure 2-42](#) for an example of the log messages.*

---

**IMPORTANT** A Restart Services on all node controllers is required after distribution to run the new Managed Node Controller Configuration File.

---

```
Mar 20 16:46:09.103450 SYSTEM, CRITICAL: CONF DIST:
Sending File: node_configuration.xml of type: Node
Controller Configuration XML to NC @ 192.168.110.230 Mar
20 16:46:09.223214 SYSTEM, CRITICAL: CONF DIST: SUCCESS:
Transfer Reported Complete.
```

```
Mar 20 16:46:09.223385 SYSTEM, CRITICAL: CONF DIST:
Sending File: node_configuration.config_id of type: Node
Controller Configuration ID to NC @ 192.168.110.230 Mar
20 16:46:09.303113 SYSTEM, CRITICAL: CONF DIST: SUCCESS:
Transfer Reported Complete.
```

*Figure 2-42: HLC Log Showing Managed Node Controller Configuration File Distribution*

## Download a Managed Node Controller Configuration File

This section describes how to download an existing Node Controller Configuration File from the Managed Node Controller Configuration Files to a user-specified location.

1. If the transport system has multiple node controllers, connect to the node controller assigned as the HLC. Once connected, run the Node Controller Web Interface (see the *MagneMotion Node Controller Interface User Manual*, publication [MMI-UM001](#)).

2. Select **Managed Configurations** from the Main Menu.

*The Managed Configurations page ([Figure 2-41](#)) is displayed.*

3. Under **Managed Node Controller Configuration Files**, identify the Node Controller Configuration File to be downloaded and select **Download** for that file.

*The File Download confirmation dialog box is displayed.*

---

**IMPORTANT** The options for saving or opening this file can vary by web browser.

---

4. Select **Save** to download the file.

*The Save As dialog box is displayed.*

5. To save the file, browse to the appropriate location.
6. Change the file name as appropriate, and select **Save**.

*The file is named and saved as specified.*

## Motor Gap Information

The Motor Gap Information page displays motor downstream gap data for all motors that are connected to the node controller or for all motors in the transport system if the node controller is also the HLC. The downstream gap is the distance from the end of the stator in one motor to the beginning of the stator in the next motor, which is shown in [Figure 2-43](#). The downstream gap information for each motor is continuously updated and reported to the Motor Gap Information page each time a vehicle on the transport system moves over the gap. See the *MagneMotion System Configurator User Manual*, publication [MMI-UM046](#), for information on how to configure and use motor gaps and gap deltas.

**NOTE:** Motor Gap Information page is always available. However, only QS and QSHT motors that support the measuring of motor gaps report gap values.

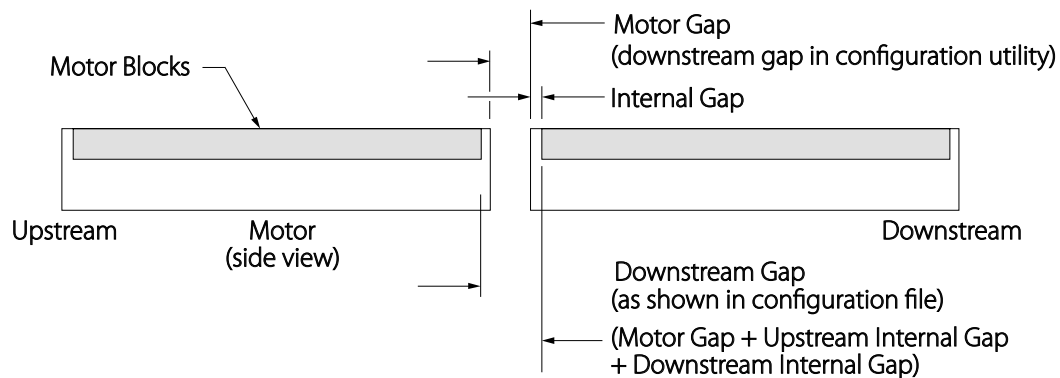


Figure 2-43: Motor Gaps

This section describes how to display and use the downstream gap information for the motors.

1. If the transport system has multiple node controllers, run the web interface on the HLC (see [Run the Node Controller Web Interface on page 31](#)) to view the information for all motors. Or, run the web interface on the NC responsible for just the motors being reviewed.
2. Select **Motor Gap Information** on the Main Menu.

*The **Motor Gap Information** page, which is shown in [Figure 2-44](#), is displayed listing all motors that are connected to the node controller or HLC. Use the scroll bar to display text that is not shown.*

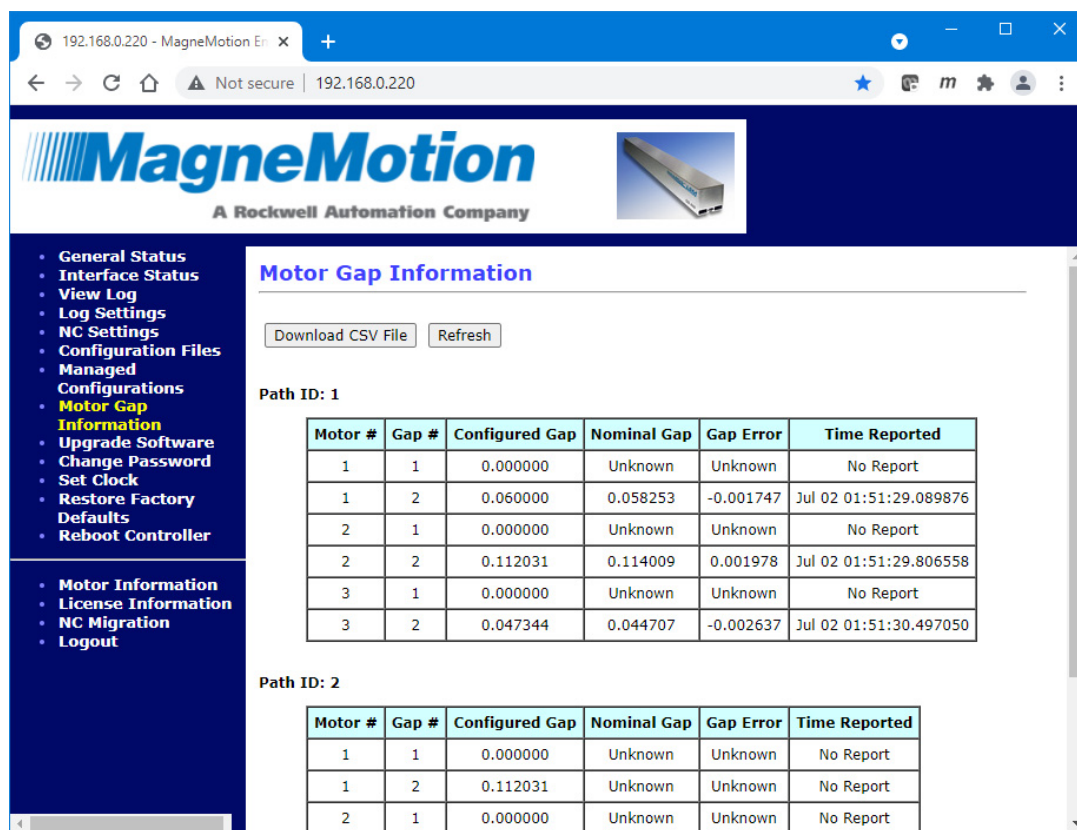


Figure 2-44: Motor Gap Information Page

3. Review the motor gap information as required (see [Motor Gap Information on page 216](#) for detailed descriptions of all items).
4. Download the motor gap information as a CSV file if necessary. The measured motor gap information can then be copied from the file into the Node Controller Configuration File so vehicles can make smoother transitions from motor to motor during operation.

**NOTE:** Due to measuring discrepancies based on differences in the vehicles crossing the gap and the speed of the vehicles crossing the gap, the **Nominal Gap** measurement varies continuously by a small amount (typically less than  $\pm 2$  mm).

When the last motor on a path is not connected through a node to a motor on another path, there is no gap to measure and the **Nominal Gap** and **Gap Error** report as Unknown.

- Select **Download CSV File**.

*The file is downloaded as determined by the browser. The options for saving or opening this file vary by web browser.*

5. Upload the revised Node Controller Configuration File and restart the node controller after making any changes to the downstream gaps for the motors in the file (see [Node Controller Configuration File on page 51](#)).
6. Update the **Nominal Gap** and **Gap Error** information by selecting **Refresh**.

## Using the Motor Gap Information

### Setting Motor Gaps

See the *MagneMotion Configurator Manual*, publication [MMI-UM046](#), for information on defining downstream gaps for QuickStick and QuickStick HT.

# Upgrading Node Controller Software

## Changing Node Controller Software Image Files

This section describes how to identify the existing Node Controller Software Image file (controller software) version and download that software or upload new software to the node controller. The Node Controller Software Image (controller\_image) is the control application for the node controllers and contains both the node controller and HLC applications. New node controller software must be uploaded to each node controller in the transport system.

**NOTE:** All software that is installed on the node controller must be part of the same release to make sure of compatibility.

See [Identify the Current Node Controller Software Image File Version on page 88](#) to determine the version of control software currently installed on the node controller. See [Upload a New Node Controller Software Image File on page 90](#) for the node controller control software upload directions. Once the software is uploaded to the node controllers, it must be activated (see [Activate a Different Version of the Node Controller Software Image File on page 94](#)). The old version can be removed if necessary (see [Delete a Node Controller Software Image File on page 98](#)).

## Identify the Current Node Controller Software Image File Version

This section describes how to determine the current version of the Node Controller Software Image on the node controller.

### Method 1

Select **General Status** on the Main Menu (see [Figure 2-2 on page 32](#)).

*The version and build date and time are listed in the System Information section at the bottom of the page.*

### Method 2

Select **View Log** on the Main Menu (see [Log Files on page 35](#)).

*The version and build date and time are the first line in either the HLC log or the NC log if the log file has not wrapped around (see [Log Message Troubleshooting on page 258](#)).*

### Method 3

Select **Upgrade Software** on the Main Menu.

*The **Upgrade Software** page, which is shown in [Figure 2-45](#), is displayed. The first section of the page, titled **Node Controller Software Images on Flash**, lists all Node Controller Software Image versions (controller\_image) currently loaded on the node*



controller. The active version is displayed in green and has **ACTIVE** displayed to the right of the file name.

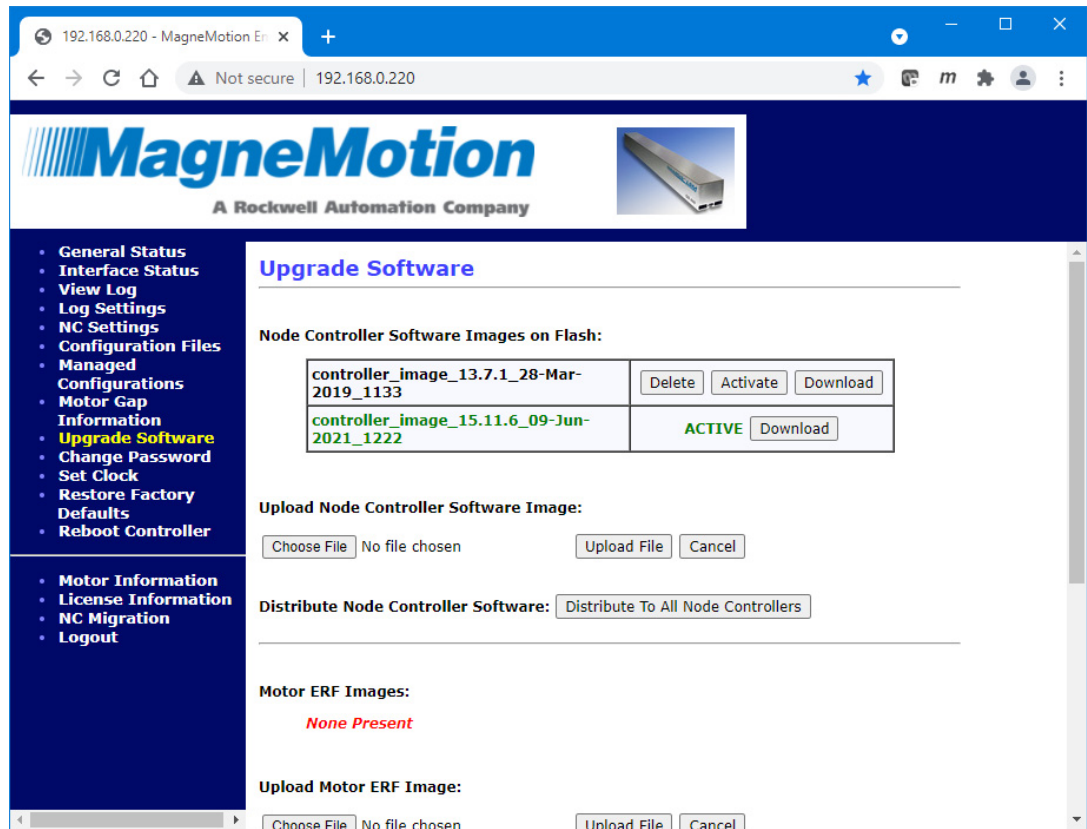


Figure 2-45: Upgrade Software Page

The version is included in file name as shown in Figure 2-46.

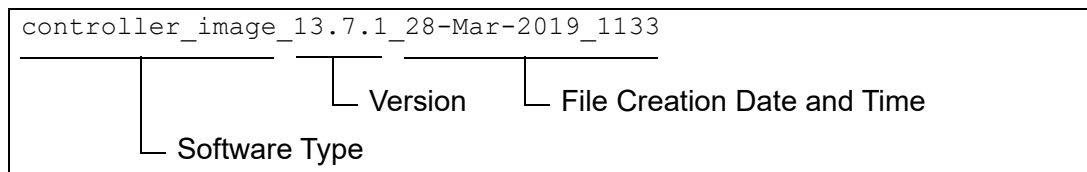


Figure 2-46: Node Controller Software Image File Version

## Download an Existing Node Controller Software Image File

This section describes how to download the existing Node Controller Software Image (controller software) from the node controller.

1. Select **Upgrade Software** on the Main Menu (see [Upgrade Software on page 218](#) for detailed descriptions of all items).

The **Upgrade Software** page, which is shown in [Figure 2-45](#), is displayed.

2. Under **Node Controller Software Images on Flash**, select **Download** for the version to be downloaded.

*The file is downloaded as determined by the browser. The options for saving or opening this file vary by web browser.*

## Upload a New Node Controller Software Image File

This section describes how to upload a new Node Controller Software Image (controller software) to one or more node controllers. The controller software for the transport system must be uploaded to every node controller in the transport system.

**NOTE:** Up to three versions of the controller software image can be saved on the node controller, but only one image can be active at a time. If there are three images already on the node controller, either one must be deleted before another can be uploaded or a file can be uploaded to replace the currently active image.

1. If the transport system has multiple node controllers, run the web interface on the HLC (see [Run the Node Controller Web Interface on page 31](#)).
2. Select **Upgrade Software** on the Main Menu (see [Upgrade Software on page 218](#) for detailed descriptions of all items).

*The **Upgrade Software** page, which is shown in [Figure 2-45](#), is displayed.*

3. Under **Upload Node Controller Software Image**, select **Browse**.

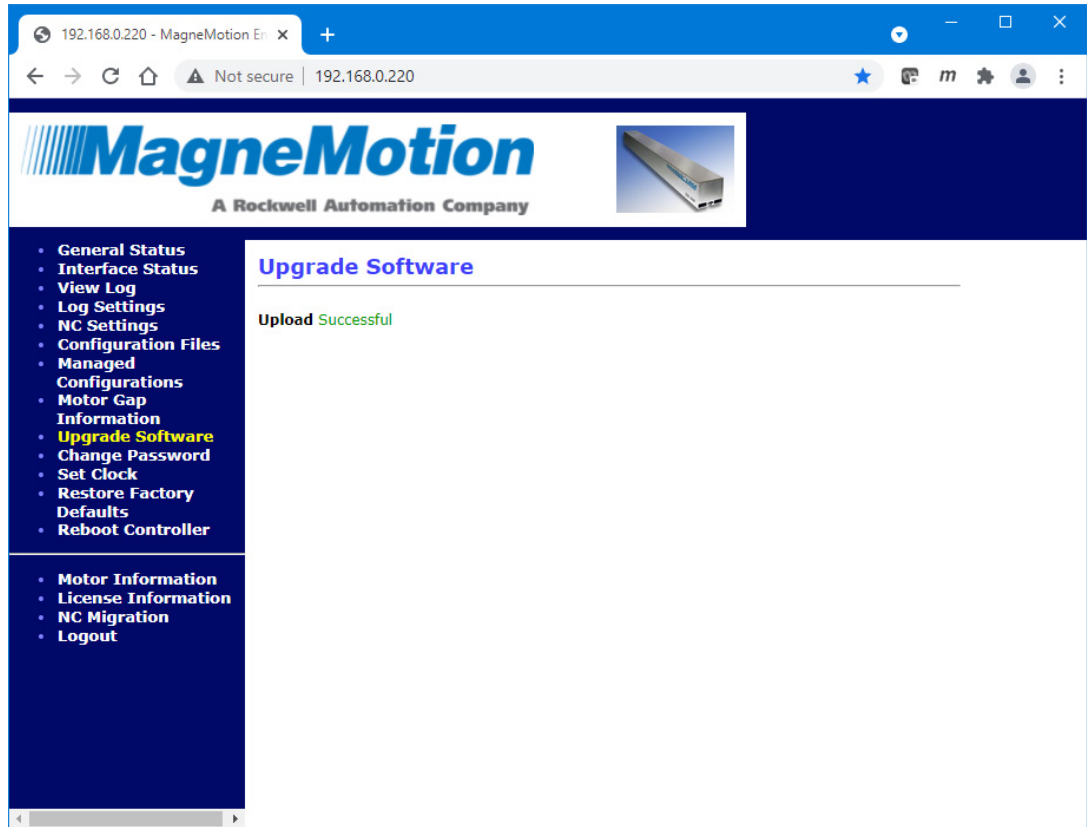
*The **Choose File to Upload** dialog box is displayed.*

4. Use the dialog box controls to select the appropriate Node Controller Software Image file (controller\_image) and select **Open**.

*The file name is displayed in the **Browse** text field.*

5. Select **Upload File**.

*The file upload status is displayed when the file is uploaded as shown in [Figure 2-47](#).*

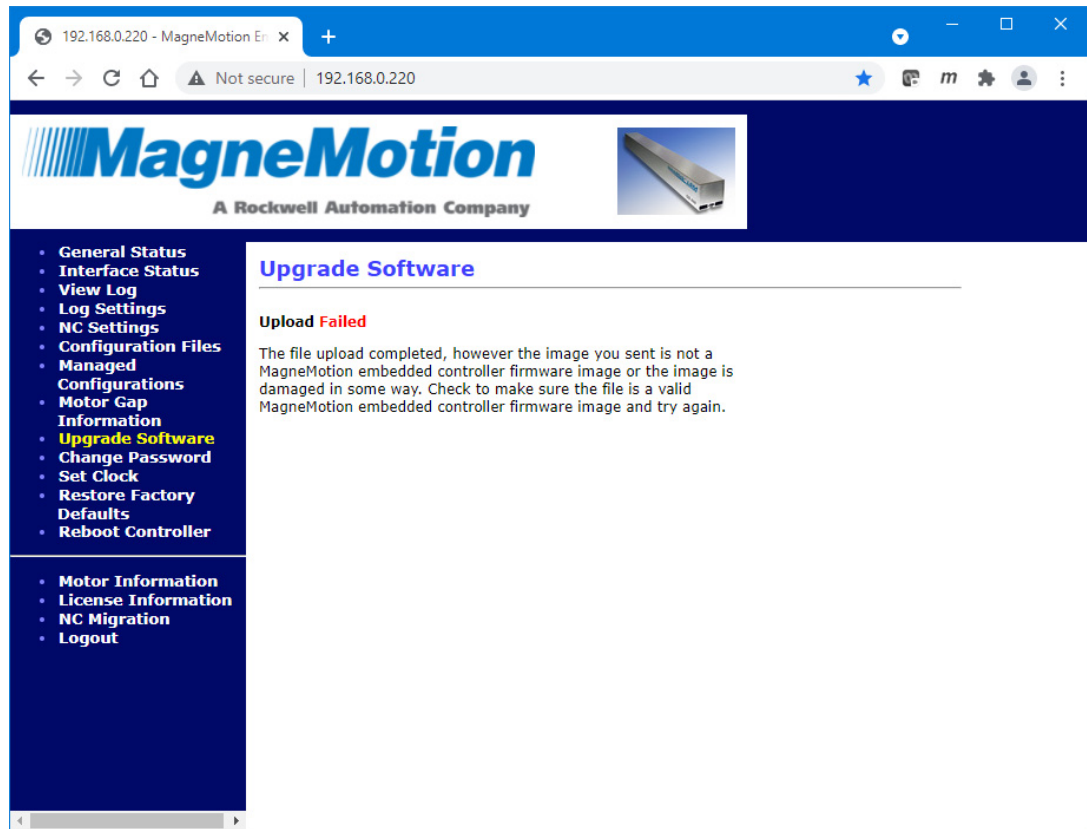


*Figure 2-47: Node Controller Software Image Upload Successful*

*If the upload was successful, the **Upgrade Software** page is redisplayed showing the new Node Controller Software Image.*

**NOTE:** Once the upload is complete, the software must be activated before it takes effect (see [Activate a Different Version of the Node Controller Software Image File](#) on page 94).

*If the upload failed, the reason for the failure is displayed on the file upload status (see [Figure 2-48](#)). Return to the **Upgrade Software** page to upload another file.*



*Figure 2-48: Node Controller Software Image Upload Failed*

## Upload and Replace a Node Controller Software Image File

This section describes how to replace the active Node Controller Software Image (controller software) on one or more node controllers when the node controller already has three controller software images installed. The controller software for the transport system must be uploaded to every node controller in the transport system.

**NOTE:** Up to three versions of the Node Controller Software Image can be saved on the node controller, but only one image can be active at a time. If there are three images already on the node controller, either one must be deleted before another can be uploaded or a file can be uploaded to replace the currently active image.

1. If the transport system has multiple node controllers, run the web interface on the HLC (see [Run the Node Controller Web Interface on page 31](#)).
2. Select **Upgrade Software** on the Main Menu (see [Upgrade Software on page 218](#) for detailed descriptions of all items).

The *Upgrade Software* page, which is shown in [Figure 2-49](#), is displayed.

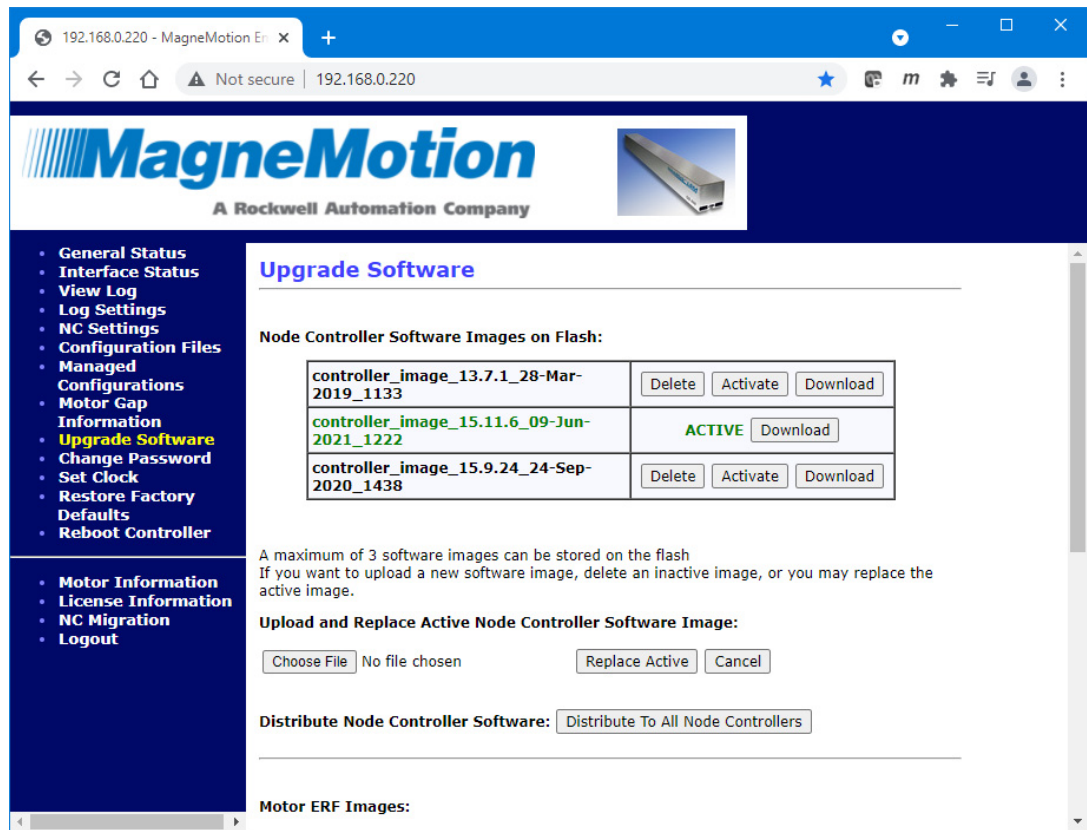


Figure 2-49: Upload and Replace Active Node Controller Software Image

3. Under **Upload and Replace Active Node Controller Software Image**, select **Browse**.

The *Choose File to Upload* dialog box is displayed.

4. Use the dialog box controls to select the appropriate Node Controller Software Image file (controller\_image) and select **Open**.

The file name is displayed in the **Browse** text field.

5. If there is only one node controller in the system:

- A. Select **Replace Active**.

The file upload status is temporarily displayed when the file is uploaded as shown in [Figure 2-47](#).

- B. Reboot the node controller to use the new controller software (see [Reboot One Node Controller](#) on page 128).

**NOTE:** It may be necessary to clear the browsers cache to make sure that any changes to the user interface are properly displayed.

6. If there are multiple node controllers in the system:

- A. Select **Distribute To All Node Controllers**.

*All Node Controller Software Image files are distributed to all node controllers in the transport system. The existing Node Controller Software Image files that are installed on the node controllers receiving the new files are deleted. Following the transfer, the image that is active on the HLC is activated on each node controller.*

*The **Upgrade Software** page is redisplayed as shown in [Figure 2-52](#) showing the request to distribute the Node Controller Software Image files to all node controllers. A reminder is displayed to review the log for the HLC to verify the distribution status.*

- B. Reboot all node controllers to use the new controller software (see [Reboot All Node Controllers on page 130](#)).

**NOTE:** It may be necessary to clear the browsers cache to make sure that any changes to the user interface are properly displayed.

### Activate a Different Version of the Node Controller Software Image File

This section describes how to activate another version of the controller software on the node controller.

**NOTE:** Up to three versions of the controller software image can be saved on the node controller, but only one image can be active at a time.

---

**IMPORTANT** Make sure that the transport system is stopped before activating a different version of the NC Image File. Performing this procedure causes all processes running on the node controller and all communication with the host controller to halt.

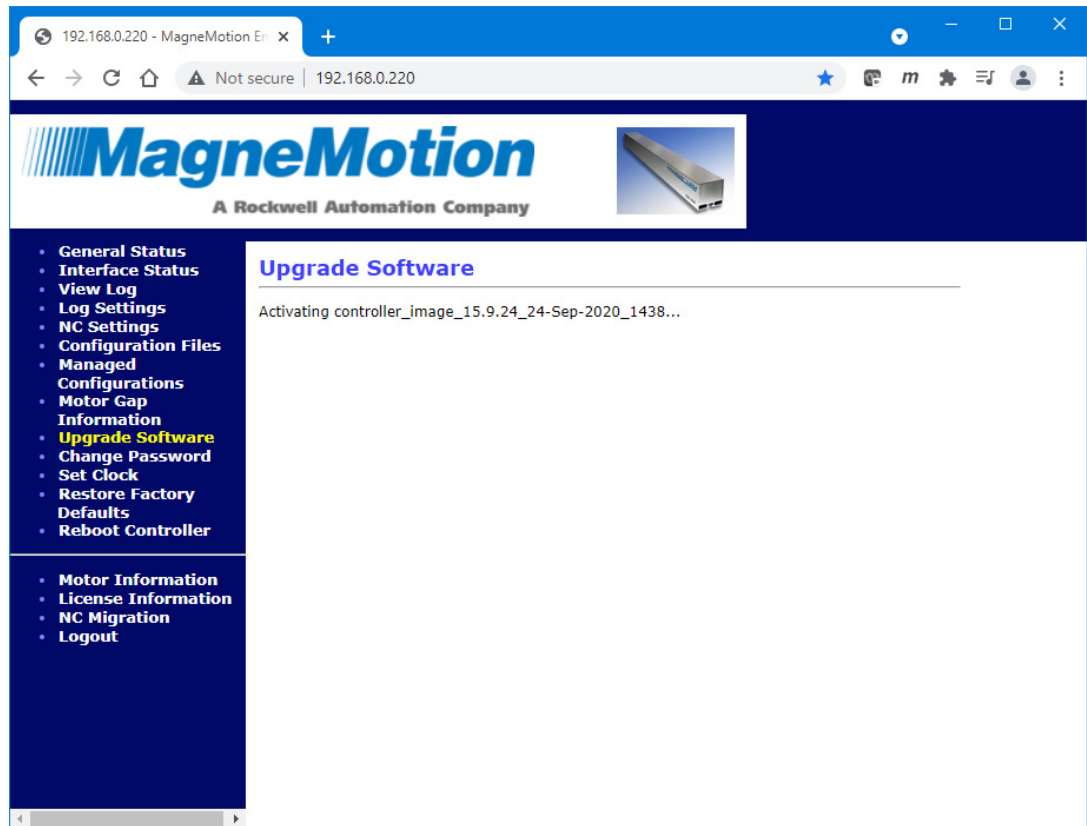
---

1. Select **Upgrade Software** on the Main Menu (see [Upgrade Software on page 218](#) for detailed descriptions of all items).

*The **Upgrade Software** page, which is shown in [Figure 2-45](#), is displayed showing all versions of controller software currently on the node controller and identifying the active version.*

2. Identify the Node Controller Software Image to be activated, and select **Activate** for that file.

*The file is activated and the file upgrade status is temporarily displayed as shown in [Figure 2-50](#).*



*Figure 2-50: Node Controller Software Image Activation*

*The **Upgrade Software** page is redisplayed as shown in [Figure 2-51](#) showing the selected Node Controller Software Image as being active. A reminder is displayed to reboot the node controller.*



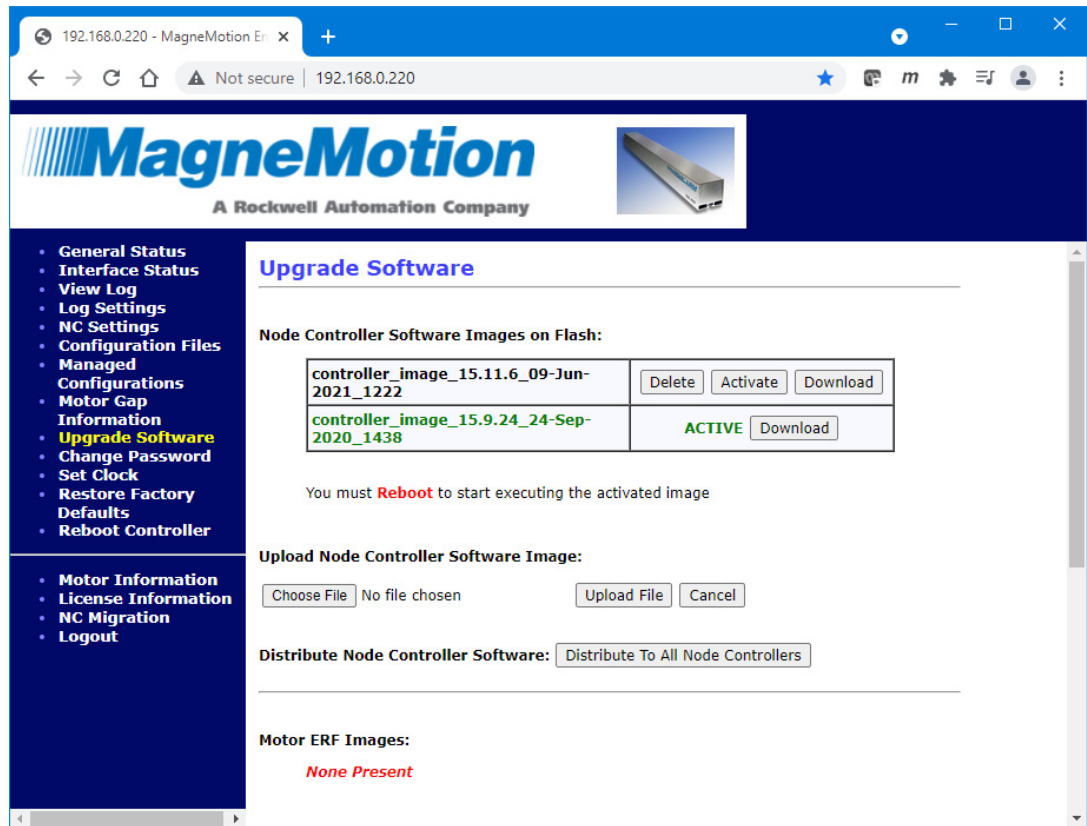


Figure 2-51: New Node Controller Software Image Active

3. Reboot the node controller to use the new controller software (see [Reboot One Node Controller on page 128](#)).

**NOTE:** It may be necessary to clear the browsers cache to make sure that any changes to the user interface are properly displayed.

## Distribute the Node Controller Software Image File to the Node Controllers

This section describes how to distribute and activate another version of the controller software (Node Controller Software Image) to all node controllers in the transport system.

1. Run the web interface on the node controller that is assigned as the HLC (see [Run the Node Controller Web Interface on page 31](#)).
2. Select **Upgrade Software** on the Main Menu (see [Upgrade Software on page 218](#) for detailed descriptions of all items).

*The **Upgrade Software** page, which is shown in [Figure 2-45](#), is displayed showing all versions of controller software currently loaded on the node controller and identifying the active version.*

3. Select **Distribute To All Node Controllers**.

**NOTE:** File distribution writes the updated file to the nonvolatile memory in each node controller. Distribution can interrupt normal operations and should only be done during transport system maintenance when there are no active vehicle commands.

Files are only distributed to those node controllers identified in the Node Controller Configuration File.

*All Node Controller Software Image files are distributed to all node controllers in the transport system. The existing Node Controller Software Image files that are installed on the node controllers receiving the new files are deleted. Following the transfer, the image that is active on the HLC is activated on each node controller.*

*The **Upgrade Software** page is redisplayed as shown in Figure 2-52 showing the request to distribute the Node Controller Software Image files to all node controllers. A reminder is displayed to review the log for the HLC to verify the distribution status.*

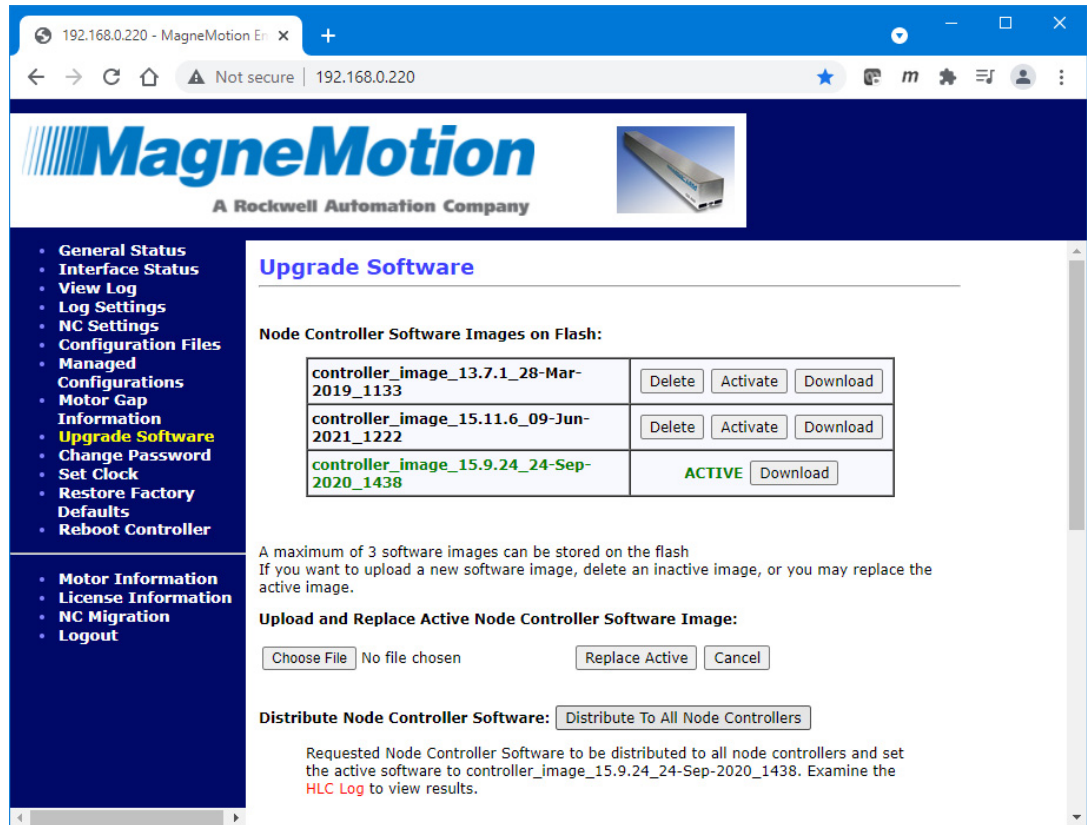


Figure 2-52: Software Image File Distribution Complete

4. Select **View Log** from the Main Menu (see [Log Files](#) on page 35).

*The Node Controller Log page is displayed.*

5. Select **View High Level Controller Log**.

*The **Node Controller Log** page is updated to display the HLC log. The last lines in the log show the distribution of the Node Controller Software Image files and the distribution status as shown in [Figure 2-53](#).*

```
Feb 26 14:51:09.955428 SYSTEM,CRITICAL: CONF DIST: Sending Delete Files request
for type: Node Controller Software Image to NC @ 192.168.110.228
Feb 26 14:51:10.486588 SYSTEM,CRITICAL: CONF DIST: SUCCESS: NC acknowledged re-
quest
Feb 26 14:51:10.486893 SYSTEM,CRITICAL: CONF DIST: Sending File: controller_im-
age_4.1.25_09-Jan-2014_1111 of type: Node Controller Software Image to NC @
192.168.110.228
Feb 26 14:51:14.762540 SYSTEM,CRITICAL: CONF DIST: SUCCESS: Transfer Reported
Complete.
Feb 26 14:51:14.762739 SYSTEM,CRITICAL: CONF DIST: Sending activate software im-
age request for: controller_image_4.1.25_09-Jan-2014_1111 to NC @ 192.168.110.228
Feb 26 14:51:16.185404 SYSTEM,CRITICAL: CONF DIST: SUCCESS: NC acknowledged re-
quest
```

*Figure 2-53: HLC Log Entries Showing NC Software Image File Distribution and Activation*

6. Reboot all node controllers (see [Reboot All Node Controllers on page 130](#)).

## Delete a Node Controller Software Image File

This section describes how to delete an existing Node Controller Software Image file from the node controller. Old files must be deleted if the maximum number of Node Controller Software Image files is already stored on the node controller and another needs to be uploaded.

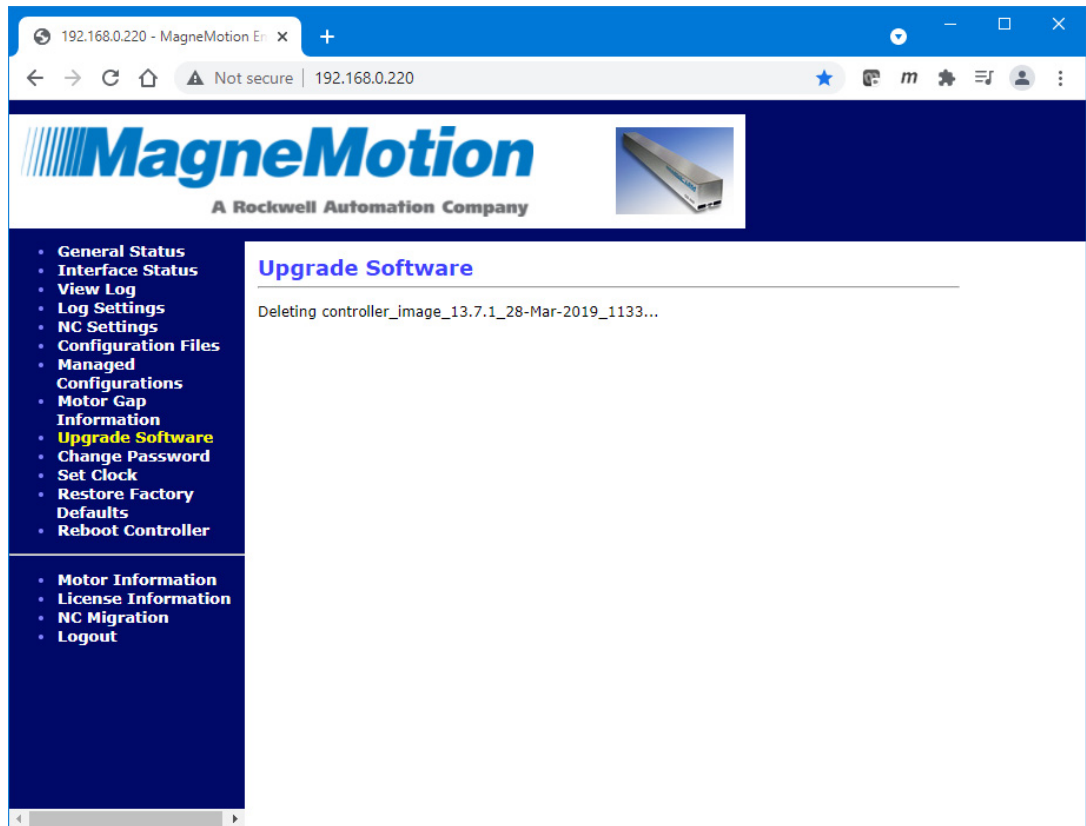
**NOTE:** The active Node Controller Software Image file cannot be deleted.

1. Select **Upgrade Software** on the Main Menu (see [Upgrade Software on page 218](#) for detailed descriptions of all items).

*The **Upgrade Software** page, which is shown in [Figure 2-45](#), is displayed showing all versions of controller software currently on the node controller and identifying the active version.*

2. Identify the Node Controller Software Image to be deleted, and select **Delete** for that file.

*The file is deleted and the file deletion status is temporarily displayed as shown in [Figure 2-54](#).*



*Figure 2-54: Node Controller Software Image Deletion*

*The **Upgrade Software** page is redisplayed showing the selected Node Controller Software Image has been deleted.*

## Motor ERF Image Files

This section describes how to identify the existing motor software version and download that software or upload new motor software to the node controller. This section also describes motor programming (see [Programming the Motors on page 106](#)). The Motor ERF Image file (*motor\_image.erf*) is the software for the individual motors. When new motor software (Motor ERF Image file) is provided, it must be uploaded to each node controller in the transport system.

See [Identify the Current Motor ERF Image File Version on page 100](#) to determine the version of the motor software currently installed on the node controller. See [Upload a New Motor ERF Image File on page 102](#) for the motor software upload directions. Once the software is uploaded to the node controllers, the motors must be reprogrammed with the new software (see [Programming the Motors on page 106](#)).

### Identify the Current Motor ERF Image File Version

This section describes how to determine the current version of the Motor ERF Images on the node controller.

1. Select **Upgrade Software** on the Main Menu (see [Upgrade Software on page 218](#) for detailed descriptions of all items).

*The **Upgrade Software** page, which is shown in [Figure 2-45](#), is displayed.*

2. Scroll down to the **Motor ERF Images** section as shown in [Figure 2-55](#).

*The current motor software is listed under **Motor ERF Images**.*

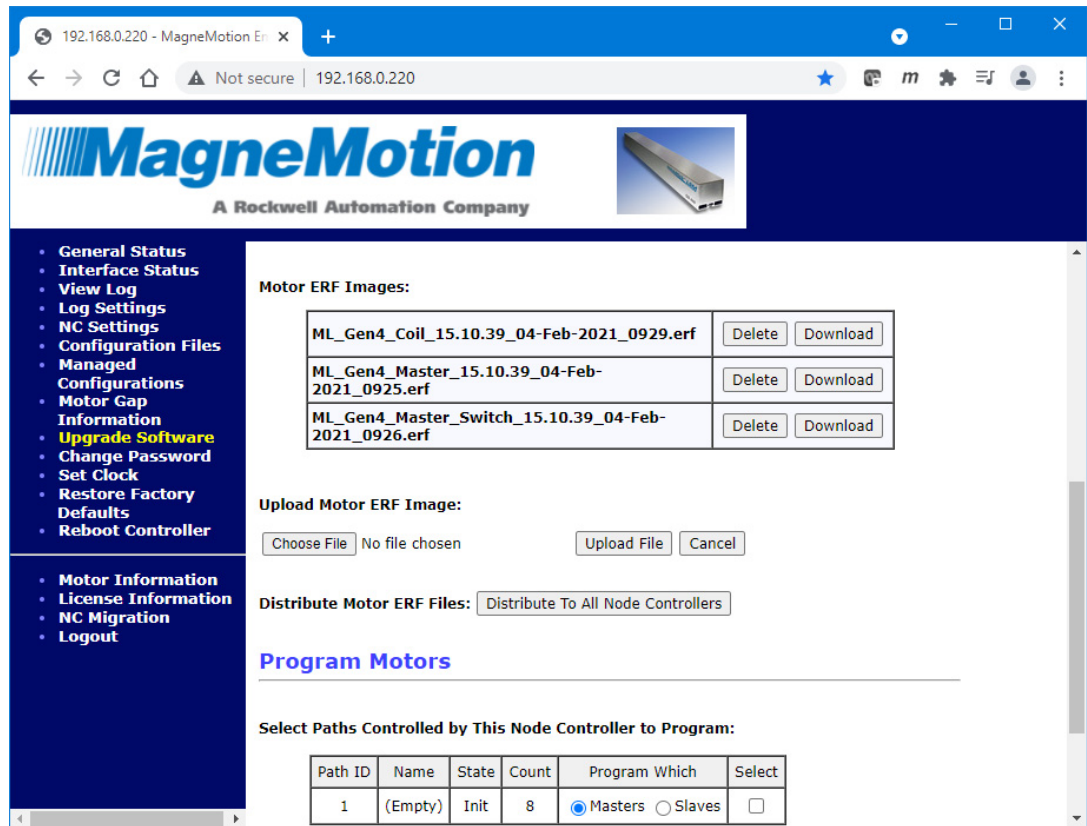


Figure 2-55: Upgrade Software Page, Motor ERF Images

The version is included in file name as shown in Figure 2-56.

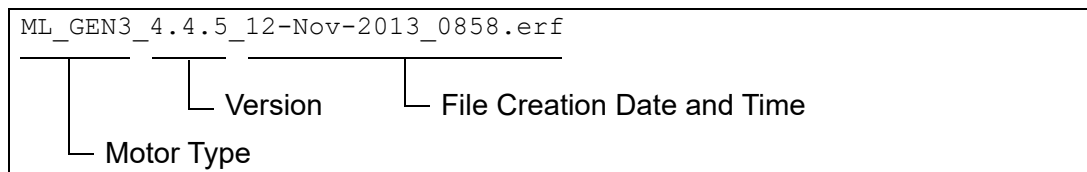


Figure 2-56: Motor ERF Image File Version

**NOTE:** This review only identifies the software version that is stored on the node controller, it does not verify the version of the software the motors are actually running. To identify the software version that is loaded on the motors see [Motor Information on page 134](#) or review the beginning of the NC log where each motor reports its current software version.

## Download the Existing Motor ERF Image File

This section describes how to download the existing Motor ERF Image files from the node controller.

1. Select **Upgrade Software** on the Main Menu (see [Upgrade Software on page 218](#) for detailed descriptions of all items).

*The **Upgrade Software** page, which is shown in [Figure 2-45](#), is displayed.*

2. Scroll down the page to the **Motor ERF Images** section as shown in [Figure 2-55](#).

3. Under **Motor ERF Images**, select **Download** for the file to be downloaded.

*The file is downloaded as determined by the browser. The options for saving or opening this file vary by web browser.*

## Upload a New Motor ERF Image File

This section describes how to upload new Motor ERF Image files to the node controller. These software image files must be uploaded to every node controller in the transport system during initial setup and when updated files are supplied.

**NOTE:** If the Motor ERF files are changed, the motors must be programmed with the new software before it takes effect.

1. If the transport system has multiple node controllers, run the web interface on the HLC (see [Run the Node Controller Web Interface on page 31](#)).

2. Select **Upgrade Software** on the Main Menu (see [Upgrade Software on page 218](#) for detailed descriptions of all items).

*The **Upgrade Software** page, which is shown in [Figure 2-45](#), is displayed.*

3. Scroll down the page to the **Motor ERF Images** section as shown in [Figure 2-55](#).

4. Under **Upload Motor ERF Image**, select **Browse**.

*The **Choose File to Upload** dialog box is displayed.*

5. Use the dialog box controls to select the appropriate motor software file (*motor\_image.erf*) and select **Open**.

*The file name is displayed in the **Browse** text field.*

6. Select **Upload File**.

*The file upload status is temporarily displayed when the file is uploaded as shown in [Figure 2-57](#).*



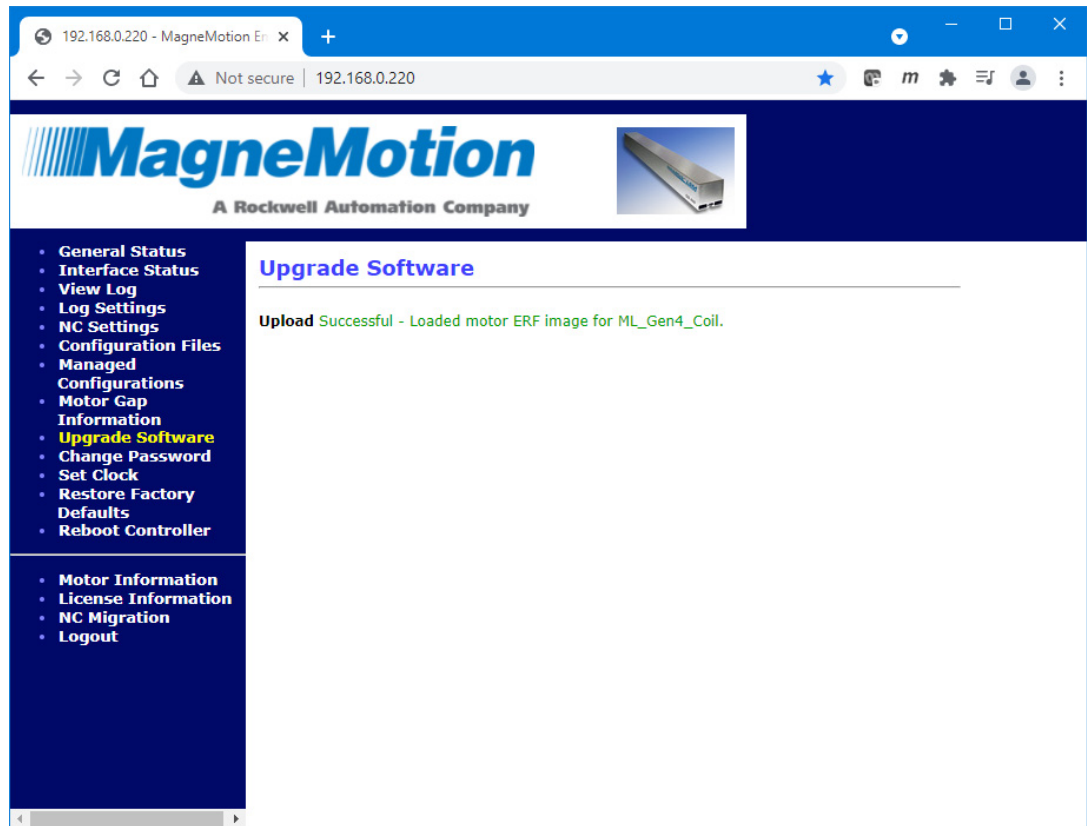


Figure 2-57: Motor Software Image Successful Upload

The **Upgrade Software** page is redisplayed showing the new Motor ERF Image file.

7. For transport systems with multiple node controllers, select **Distribute To All Node Controllers**.

**NOTE:** File distribution writes the updated files to the nonvolatile memory in each node controller. Distribution can interrupt normal operations and should only be done during transport system maintenance when there are no active vehicle commands.

Files are only distributed to those node controllers identified in the Node Controller Configuration File.

The Motor ERF file is distributed to all node controllers in the transport system. The **Upgrade Software** page is redisplayed as shown in [Figure 2-58](#) showing the request to distribute the Motor ERF file to all node controllers. A reminder is displayed to review the log for the HLC to verify the distribution status.

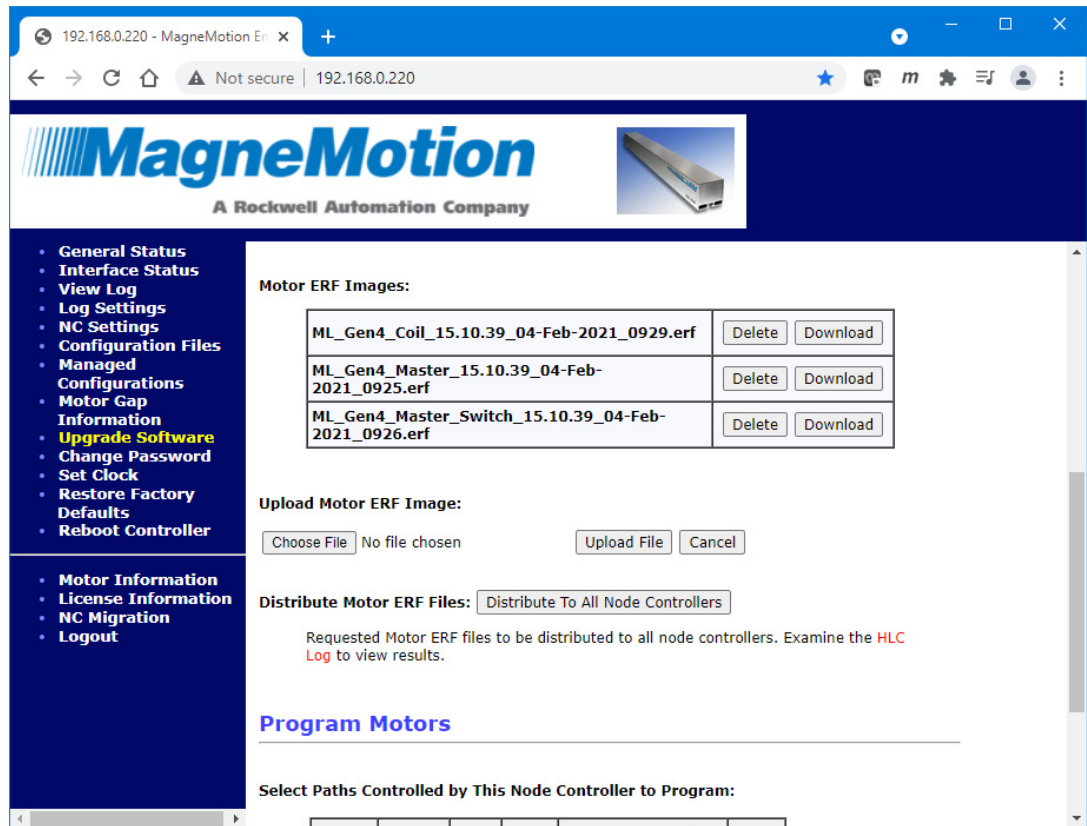


Figure 2-58: Motor ERF Image File Distribution Complete

8. Select **View Log** from the Main Menu (see [Log Files on page 35](#)).

*The Node Controller Log page is displayed.*

9. Select **View High Level Controller Log**.

*The Node Controller Log page is updated to display the HLC log. The last lines in the log show the distribution of the motor software image files and the distribution status as shown in [Figure 2-59](#).*

```
Feb 24 16:57:38.422347 SYSTEM,CRITICAL: CONF DIST: Sending Delete Files request
for type: Motor ERF Software Image to NC @ 192.168.110.228
Feb 24 16:57:38.575325 SYSTEM,CRITICAL: CONF DIST: SUCCESS: NC acknowledged re-
quest
Feb 24 16:57:38.575662 SYSTEM,CRITICAL: CONF DIST: Sending File: ML_GEN3_4.4.5_
12-Nov-2013_0858.erf of type: Motor ERF Software Image to NC @ 192.168.110.228
Feb 24 16:57:38.799003 SYSTEM,CRITICAL: CONF DIST: SUCCESS: Transfer Reported
Complete.
```

Figure 2-59: HLC Log Entries Showing Motor ERF Image File Distribution

**NOTE:** Once the upload is complete, the motors must be programmed with the new software before it takes effect (see [Programming the Motors on page 106](#)).

## Delete an Existing Motor ERF Image File

This section describes how to delete existing Motor ERF Image files from the node controller.

**NOTE:** Once the existing Motor ERF Image files on the node controller are deleted, new Motor ERF Image files must be uploaded to the node controller to enable programming the motors.

1. Select **Upgrade Software** on the Main Menu (see [Upgrade Software on page 218](#) for detailed descriptions of all items).

*The **Upgrade Software** page, which is shown in [Figure 2-45](#), is displayed.*

2. Scroll down the page to the **Motor ERF Images** section as shown in [Figure 2-55](#).

3. Under **Motor ERF Images**, identify the Motor ERF Image file to be deleted and select **Delete** for that file.

*The file is deleted and the file deletion status is temporarily displayed as shown in [Figure 2-60](#).*

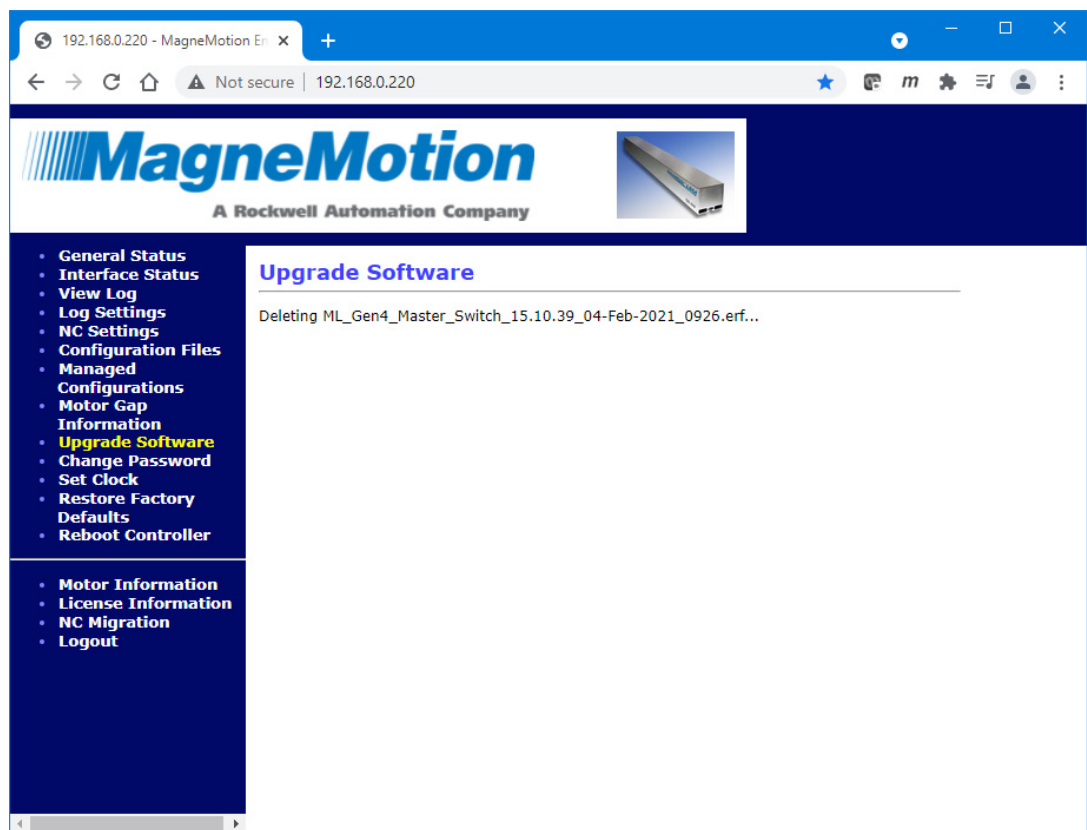


Figure 2-60: Node Controller Motor ERF Image Deletion

*The **Upgrade Software** page is redisplayed showing the selected Motor ERF Image file has been deleted.*

## Programming the Motors

This section describes how to program the motors with the Motor ERF Images on the node controller. Motors must be programmed with the Motor ERF Image files that are supplied with the transport system software (see [Upload a New Motor ERF Image File on page 102](#)). Motors must be programmed during the initial installation of the transport system or when a new motor is installed in an existing transport system.

### Program Motors on Multiple Node Controllers

This section describes how to program all motors in the transport system. Programming is typically done when using new ERF files.

1. If the transport system has multiple node controllers, run the web interface on the HLC (see [Run the Node Controller Web Interface on page 31](#)). If the transport system has only one node controller, see [Program New Motors on page 110](#).
2. Select **Upgrade Software** on the Main Menu (see [Upgrade Software on page 218](#) for detailed descriptions of all items).

*The **Upgrade Software** page, which is shown in [Figure 2-45](#), is displayed.*

3. Scroll down the page as necessary to display the **Program Motors** section as shown in [Figure 2-61](#), which shows the motors on all paths that are controlled by the node controller.

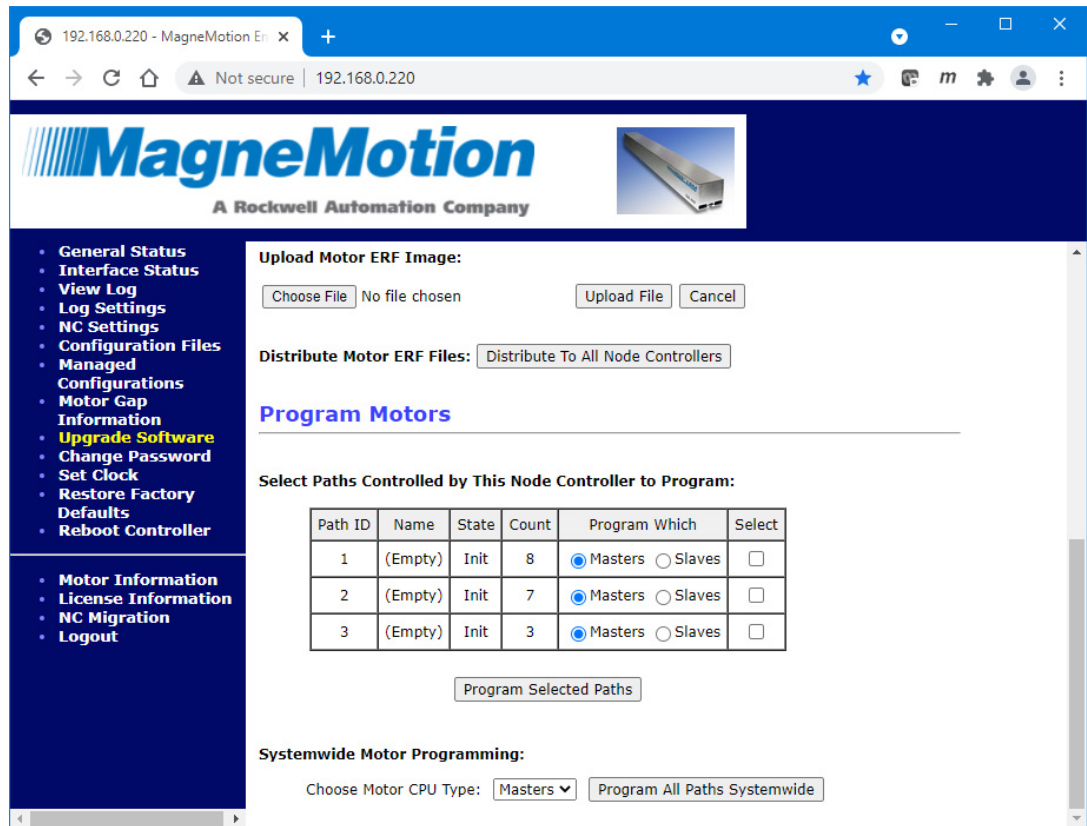


Figure 2-61: Upgrade Software Page, Program Motors

4. Under **Systemwide Motor Programming**, select **Masters** from the **Choose Motor CPU Type** drop-down menu.
5. Select **Program All Paths Systemwide**.

**NOTE:** File distribution writes the Motor ERF Images to the nonvolatile memory in each motor. Distribution can only be done while the paths with motors being programmed are in the **Init** state.

Files are only distributed to those motors identified in the Node Controller Configuration File.

The **Upgrade Software** page is redisplayed as shown in [Figure 2-62](#) showing the request to program all motors and instructions to review the log for the HLC to verify the status of the programming.

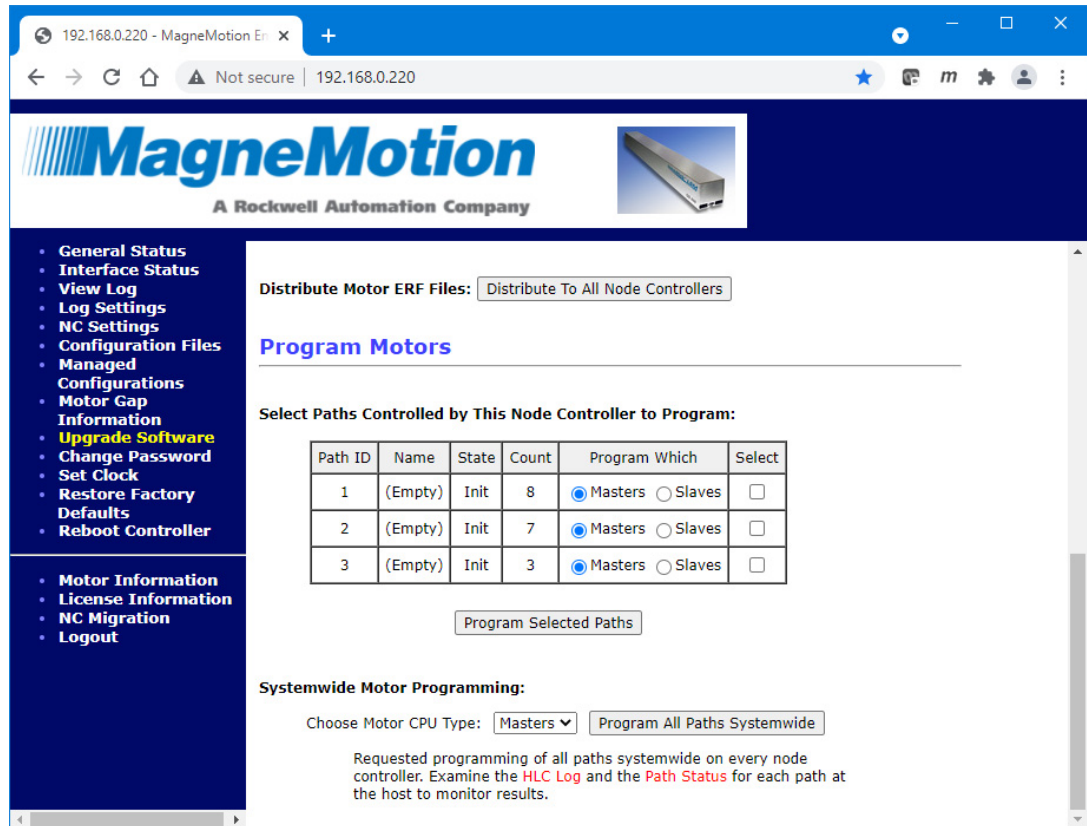


Figure 2-62: Upgrade Software Page, Program All Motors Status

6. Select **View Log** from the Main Menu (see [Log Files on page 35](#)).

*The Node Controller Log page is displayed.*

7. Select **View High Level Controller Log**.

*The Node Controller Log page is updated to display the HLC log. The end of the log shows the distribution of the Motor ERF Image files and the distribution status as shown in [Figure 2-63](#).*

```
Mar 08 09:49:53.455787 SYSTEM,CRITICAL: CONF DIST: Sending Program All Paths request to NC @ 192.168.110.228
Mar 08 09:49:53.597406 SYSTEM,CRITICAL: CONF DIST: SUCCESS: NC acknowledged request
Mar 08 09:50:17.586131 HLC,CRITICAL: host_handle_hlc_programming_complete_msg: NC: 192.168.110.225 Path: 8 Programming result: Programming succeeded
Mar 08 09:51:29.186365 HLC,CRITICAL: host_handle_hlc_programming_complete_msg: NC: 192.168.110.228 Path: 3 Programming result: Programming succeeded
Mar 08 10:03:34.566110 HLC,CRITICAL: host_handle_hlc_programming_complete_msg: NC: 192.168.110.225 Path: 1 Programming result: Programming succeeded
Mar 08 10:03:52.804452 HLC,CRITICAL: host_handle_hlc_programming_complete_msg: NC: 192.168.110.228 Path: 4 Programming result: Programming succeeded
```

Figure 2-63: HLC Log Entries Showing Motor Programming

8. Restart all node controllers (see [Restart All Node Controllers on page 133](#)).
9. Select **Upgrade Software** on the Main Menu.  
*The **Upgrade Software** page, which is shown in [Figure 2-45](#), is displayed.*
10. Scroll down the page as necessary to display the **Program Motors** section.
11. Under **Systemwide Motor Programming**, select **Slaves** from the **Choose Motor CPU Type** drop-down menu if the motors have subordinate controllers. If the motors do not have subordinate controllers, motor programming is complete.
12. Select **Program All Paths Systemwide**.  
*The **Upgrade Software** page is redisplayed as shown in [Figure 2-62](#) showing the request to program all motors and instructions to review the log for the HLC to verify the status of the programming.*
13. Select **View Log** from the Main Menu (see [Log Files on page 35](#)).  
*The **Node Controller Log** page is displayed.*
14. Select **View High Level Controller Log**.  
*The **Node Controller Log** page is updated to display the HLC log. The end of the log shows the distribution of the Motor ERF Image files and the distribution status as shown in [Figure 2-63](#).*
15. Restart all node controllers (see [Restart All Node Controllers on page 133](#)).  
**NOTE:** The motors may operate if the node controller is not restarted. However, proper operation is not guaranteed, and incorrect motor data is displayed through the **Motor Information** page.
16. Using the Host Application, or the MagneMotion NCHost TCP Interface Utility, connect to the HLC and issue a Reset command to all paths just programmed.



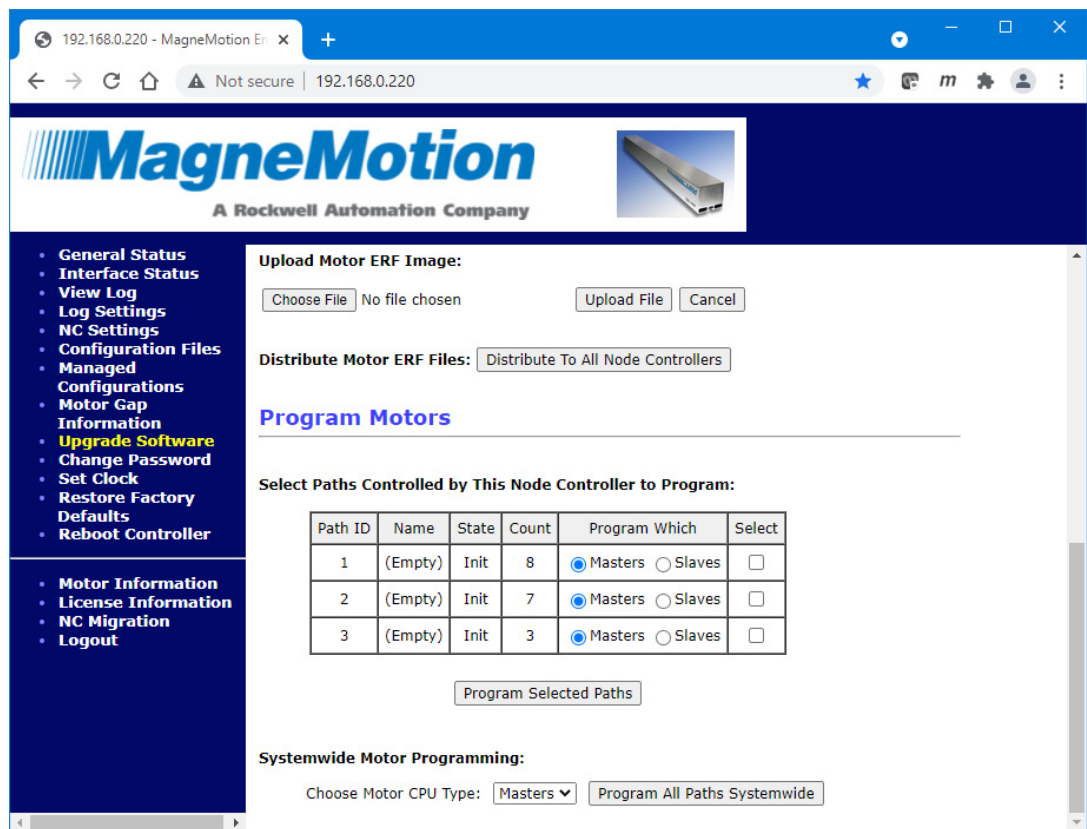
## Program New Motors

This section describes how to program the motors using the Motor ERF Image on specific paths that are controlled by one node controller. Programming is typically done when installing a new motor.

1. Run the web interface on the node controller that controls the path where the motor was added (see [Run the Node Controller Web Interface on page 31](#)).
2. Select **Upgrade Software** on the Main Menu (see [Upgrade Software on page 218](#) for detailed descriptions of all items).

The *Upgrade Software* page, which is shown in [Figure 2-45](#), is displayed.

3. Scroll down the page to display the **Program Motors** section as shown in [Figure 2-64](#), which shows all paths with motors that are controlled by the node controller.



The screenshot shows the MagneMotion web interface. The sidebar on the left contains the following links: General Status, Interface Status, View Log, Log Settings, NC Settings, Configuration Files, Managed Configurations, Motor Gap Information, **Upgrade Software**, Change Password, Set Clock, Restore Factory Defaults, Reboot Controller, Motor Information, License Information, NC Migration, and Logout. The main content area has a header with the MagneMotion logo and a product image. Below the header, there are sections for 'Upload Motor ERF Image' (with 'Choose File' and 'Upload File' buttons), 'Distribute Motor ERF Files' (with 'Distribute To All Node Controllers' button), and 'Program Motors'. The 'Program Motors' section includes a table with columns: Path ID, Name, State, Count, Program Which, and Select. The table lists three paths, all with 'Init' state and 'Masters' selected under 'Program Which'. Below the table is a 'Program Selected Paths' button. At the bottom, there is a 'Systemwide Motor Programming' section with a 'Choose Motor CPU Type' dropdown set to 'Masters' and a 'Program All Paths Systemwide' button.

Path ID	Name	State	Count	Program Which	Select
1	(Empty)	Init	8	<input checked="" type="radio"/> Masters <input type="radio"/> Slaves	<input type="checkbox"/>
2	(Empty)	Init	7	<input checked="" type="radio"/> Masters <input type="radio"/> Slaves	<input type="checkbox"/>
3	(Empty)	Init	3	<input checked="" type="radio"/> Masters <input type="radio"/> Slaves	<input type="checkbox"/>

Figure 2-64: Upgrade Software Page, Program Motors

4. For all motor types, under **Program Which**, make sure that **Masters** is selected.
5. For all paths listed, under **Select**, select the paths where the motors to be programmed are located.
6. Select **Program Selected Paths**.

The **Program MagneMotion Motors** page, which is shown in [Figure 2-65](#), is displayed and tracks the programming progress by path and the number of motors.

**NOTE:** Navigating away from the **Program MagneMotion Motors** page while programming is taking place causes loss of the programming status displays, which cannot be redisplayed.

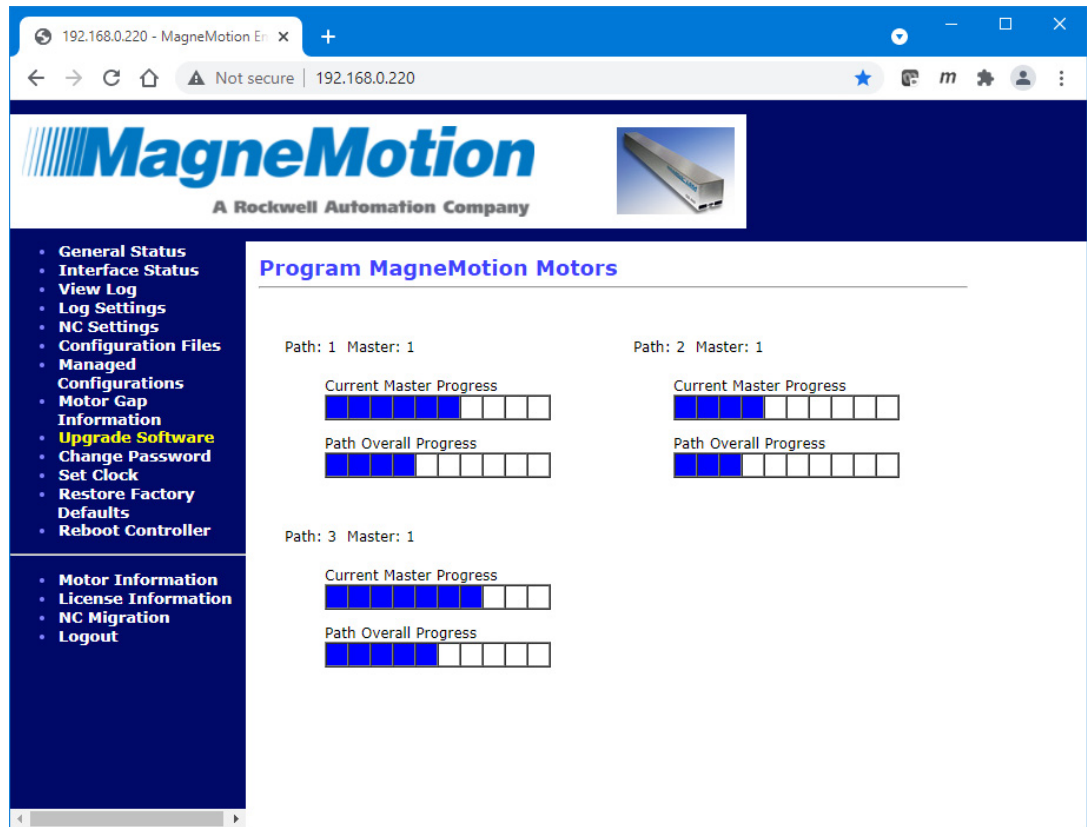
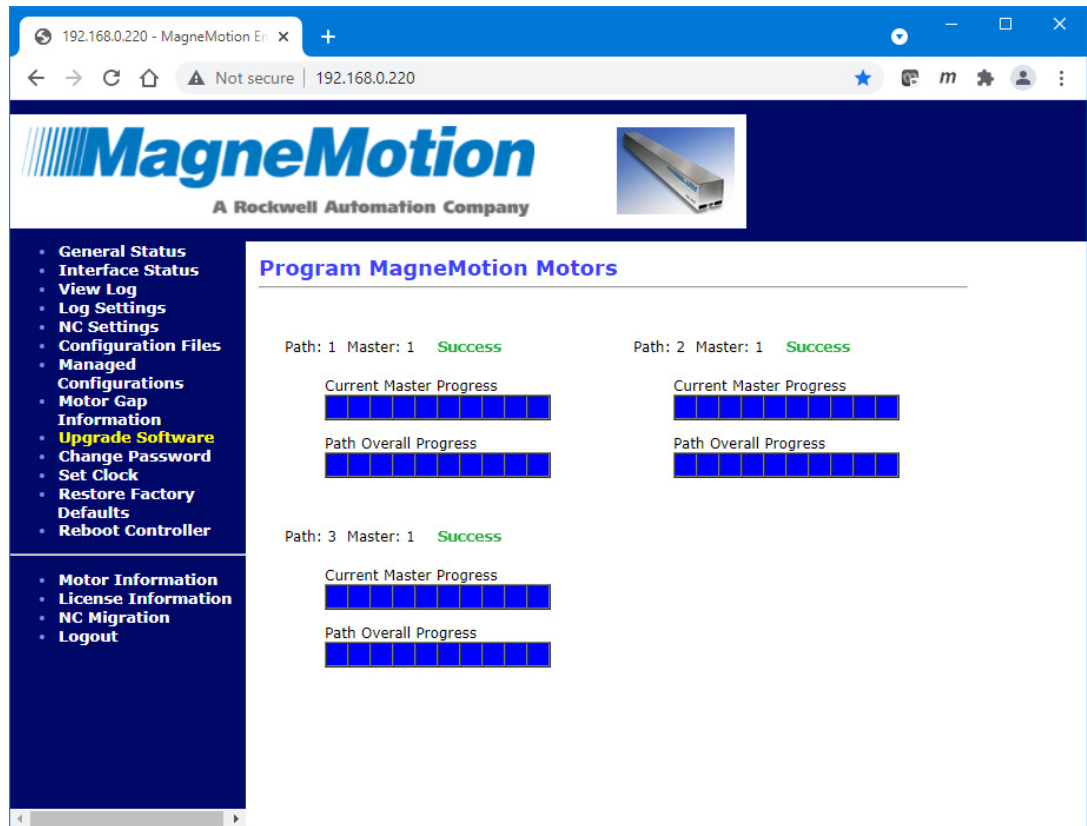


Figure 2-65: Upgrade Software Page, Program Motors Status

Once programming is complete the **Program MagneMotion Motors** page, which is shown in [Figure 2-66](#), displays the final status of the programming and a message indicating that programming is complete.

7. Select **OK** to acknowledge the message.



*Figure 2-66: Upgrade Software Page, Program Motors Successful*

8. Restart the node controller (see [Restart One Node Controller on page 131](#)).
9. Using the Host Application (or the MagneMotion NCHost TCP Utility or the Host TCP Utility), connect to the HLC and issue a Reset command to all paths that were programmed.
10. Repeat [Step 4](#) through [Step 9](#), but under Program, make sure that **Slaves** is selected (if available).

## Password Management

This section describes how to identify the current transport system users, add users, delete users, change user passwords, and distribute user information to all node controllers in the transport system.

### Change the Password for Current the User

This section describes how to change the node controller password for the current user of that node controller (this is not the admin account). Passwords can be changed either for increased security or to use the password convention at the facility where the system is installed. If there are multiple node controllers in the transport system, changing the password as described in this procedure only changes it on the node controller where this procedure is performed.

---

<b>NOTICE</b>	The only way to recover from a lost Administrator password is to reset the node controller to the factory defaults.
---------------	---

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1. Log in to the node controller where the password will be changed using the account that will be updated.
2. Select **Change Password** on the Main Menu (see [Change Password on page 222](#) for detailed descriptions of all items).

*The **Password Change** page, which is shown in [Figure 2-67](#), is displayed.*

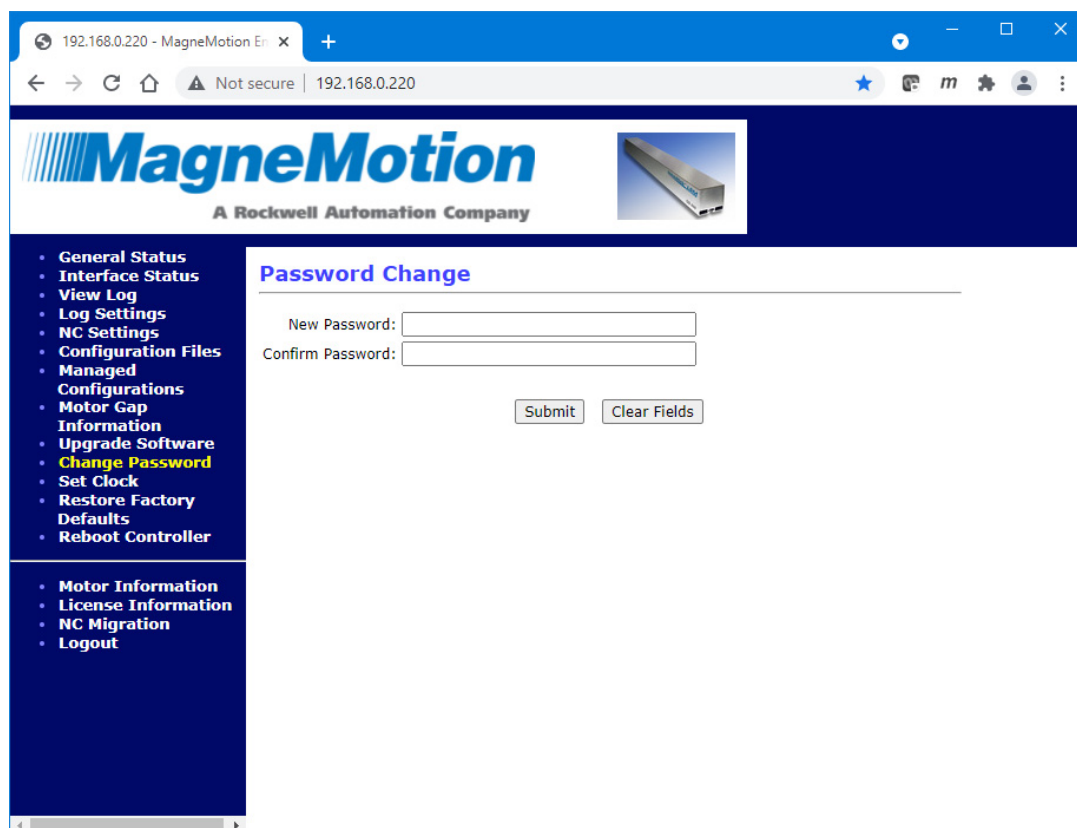
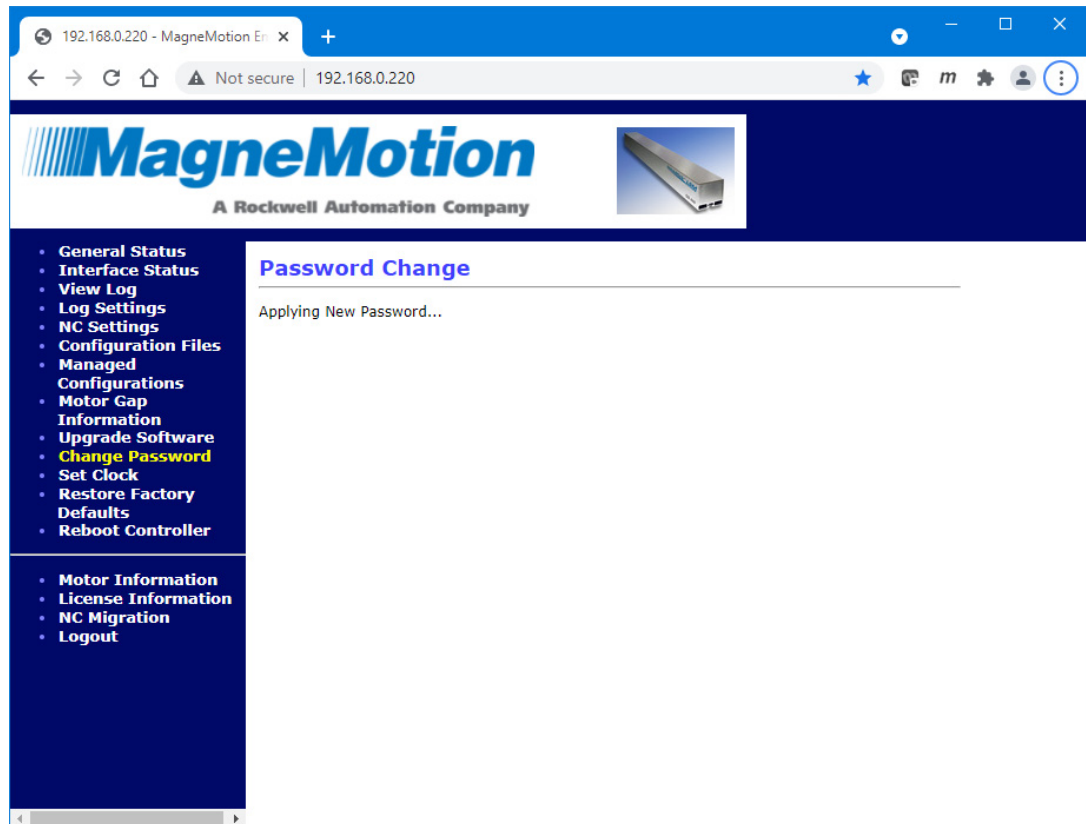


Figure 2-67: Change Current User Password Page

3. Enter a password in the **New Password** text field (passwords are case-sensitive).  
*The text field displays a bullet for each character entered.*
4. Enter the password again in the **Confirm Password** text field.  
*The text field displays a bullet for each character entered.*
5. Select **Submit**.  
*The password change status is temporarily displayed as shown in Figure 2-68.*



*Figure 2-68: Change Password Status*

*Once the password is successfully changed, the password required dialog box opens.*

6. Log in to the node controller using the new password.  
*The **Change Password** page, which is shown in [Figure 2-67](#), is redisplayed.*
7. To update all node controllers in the transport system with the password change, see [Distribute User Information on page 121](#).

## Change User Passwords

This section describes how to use the administrator account to change the node controller password for a selected user. Passwords can be changed either for increased security or to use the password convention at the facility where the system is installed.

**NOTE:** Only the administrator can change the password for users other than the user that is logged in.

Only change passwords on the HLC as this permits distributing the updated user credentials to all other node controllers in the transport system.

Changing the password for a user on a specific node controller only provides access for that user to that node controller (see [Change the Password for Current the User](#)).

---

<b>NOTICE</b>	The only way to recover from a lost Administrator password is to reset the node controller to the factory defaults.
---------------	---

---

1. Log in to the HLC using the Administrator account.
2. Select **Change Password** on the Main Menu (see [Change Password on page 222](#) for detailed descriptions of all items).

*The **Administer Users/Passwords** page, which is shown in [Figure 2-69](#), is displayed.*



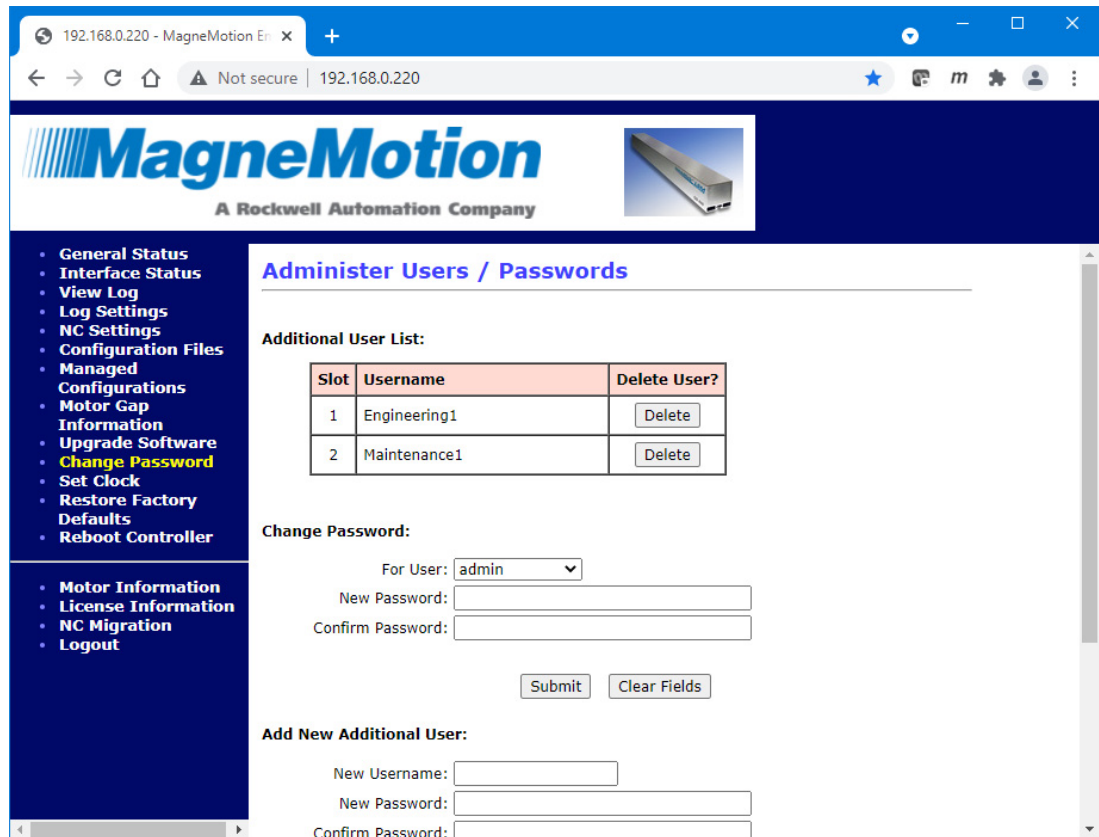


Figure 2-69: Administer Users/Password Page, Change Password

3. In the **Change Password** section, select the user to be updated from the **For User** drop-down menu.
4. Enter the new password in the **New Password** text field (passwords are case-sensitive).  
*The text field displays a bullet for each character entered.*
5. Enter the password again in the **Confirm Password** text field.  
*The text field displays a bullet for each character entered.*
6. Select **Submit**.  
*The password for the user is updated and the password change status is temporarily displayed as shown in Figure 2-68.*  
*The Administer Users/Passwords page, which is shown in Figure 2-69, is redisplayed.*
7. To update all node controllers in the transport system with the password change, see [Distribute User Information on page 121](#).

## Add New Users

This section describes how to add new users to the node controller. Only the administrator can add new users and should only add them on the HLC as this permits distributing the new user credentials to all other node controllers in the transport system. Adding new users to a specific node controller only provides access for that user to that node controller.

1. Log in to the HLC using the Administrator account.
2. Select **Change Password** on the Main Menu (see [Change Password on page 222](#) for detailed descriptions of all items).

*The **Administer Users/Passwords** page, which is shown in [Figure 2-69](#), is displayed.*

3. Scroll down to the **Add New Additional User** section as shown in [Figure 2-70](#).

The screenshot shows the MagneMotion web interface for user management. The left sidebar lists various system settings, with 'Change Password' highlighted. The main content area includes a 'Change Password' section for the 'admin' user, an 'Add New Additional User' section with fields for username and password, and a 'Centralized Authentication Management' section with a button to distribute credentials.

*Figure 2-70: Administer Users/Password Page, Add New Users*

4. In the **New Username** section, enter the user name for the new user.
5. Enter the password for the new user in the **New Password** text field (passwords are case-sensitive).

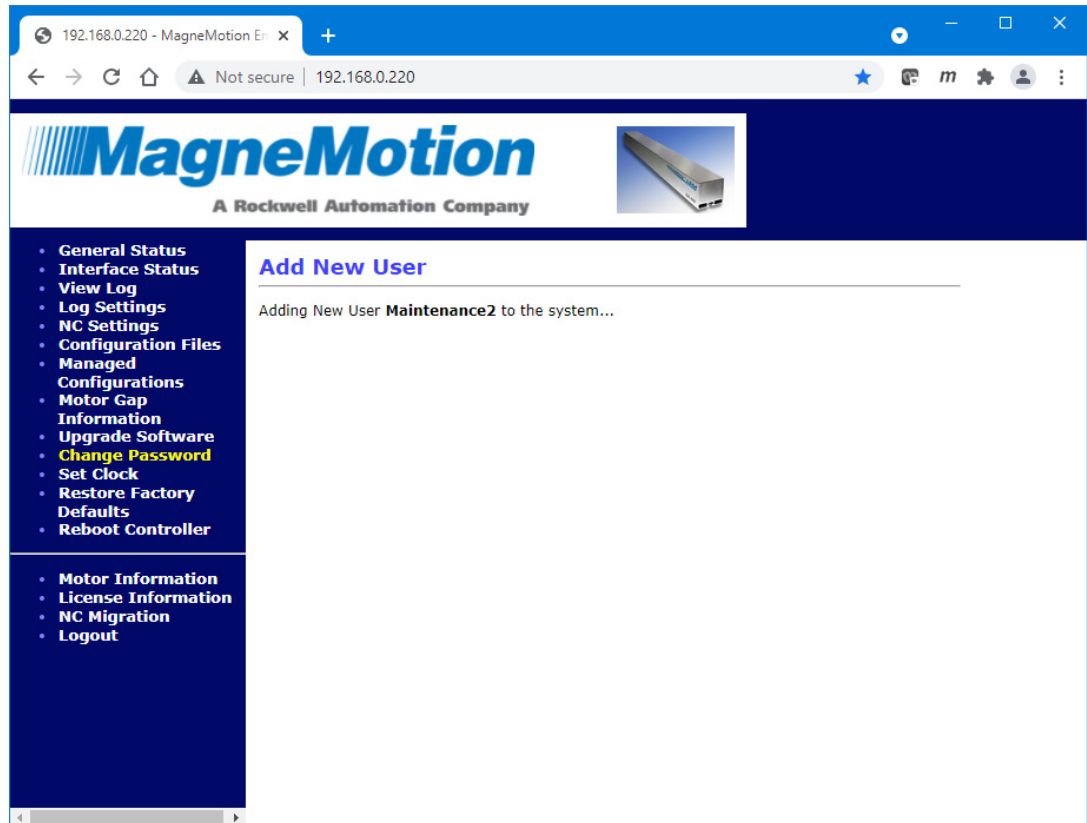
*The text field displays a bullet for each character entered.*

6. Enter the password again in the **Confirm Password** text field.

*The text field displays a bullet for each character entered.*

7. Select **Submit**.

*The new user is created and the Add New User status is temporarily displayed as shown in [Figure 2-71](#).*



*Figure 2-71: New User Status*

*The **Administer Users/Passwords** page, which is shown in [Figure 2-69](#), is redisplayed showing the new user in the **Additional User List**.*

8. To update all node controllers in the transport system with the new user, see [Distribute User Information](#) on page 121.

## Remove Existing Users

This section describes how to remove existing users from the node controller. Only the administrator can remove users and should only remove them from the HLC as this permits distributing the change in credentials to all other node controllers in the transport system. Removing a user from a specific node controller only removes access for that user to that node controller.

1. Log in to the HLC using the Administrator account.
2. Select **Change Password** on the Main Menu (see [Change Password on page 222](#) for detailed descriptions of all items).

*The **Administer Users/Passwords** page, which is shown in [Figure 2-69](#), is displayed.*

3. From the **Additional User List**, select **Delete** on the row for the user to be removed.  
*The user is removed and the delete user status is temporarily displayed as shown in [Figure 2-72](#).*

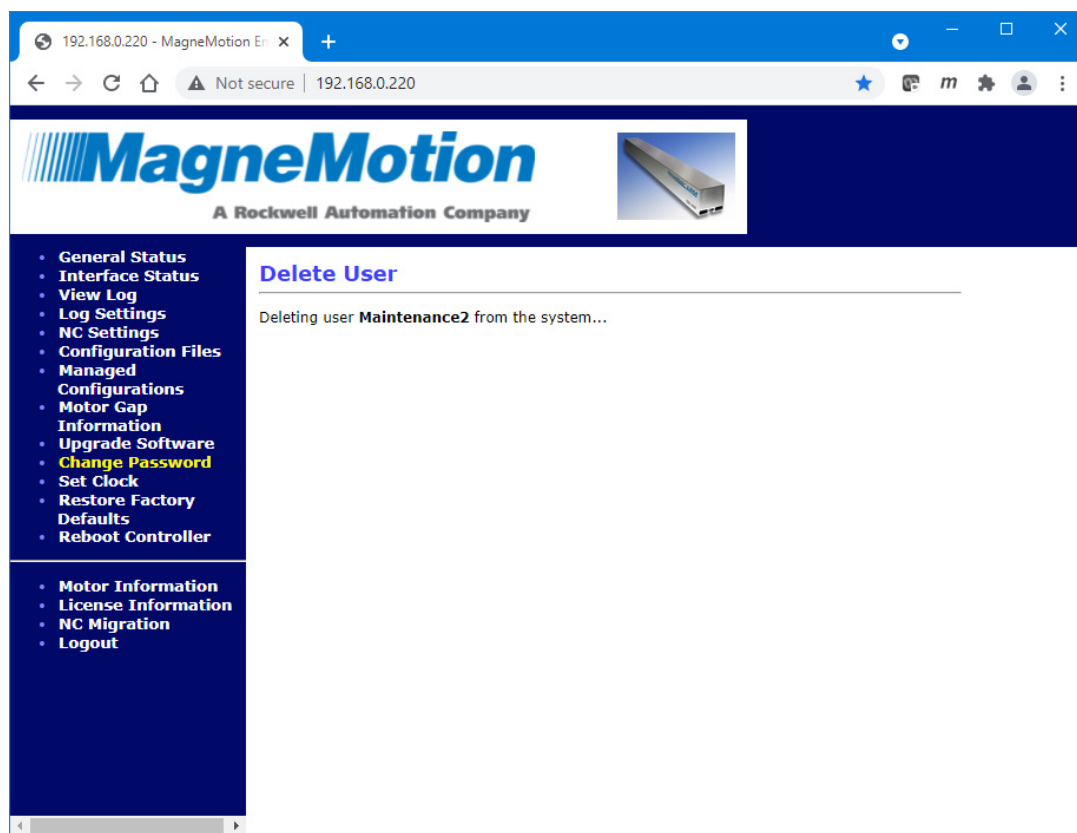


Figure 2-72: Delete User Status

*The **Administer Users/Passwords** page, which is shown in [Figure 2-69](#), is redisplayed showing the user has been removed from the **Additional User List**.*

4. To update all node controllers in the transport system with the user change, see [Distribute User Information on page 121](#).

## Distribute User Information

This section describes how to distribute changes to user accounts to all node controllers in the transport system. Only the administrator can distribute user information and is only required if there are multiple node controllers in the transport system.

1. Log in to the HLC using the Administrator account.
2. Select **Change Password** on the Main Menu (see [Change Password](#) on page 222 for detailed descriptions of all items).

*The **Administer Users/Passwords** page, which is shown in [Figure 2-69](#), is displayed.*

3. Scroll down to the **Centralized Authentication Management** section as shown in [Figure 2-73](#).

The screenshot shows a web browser window with the URL 192.168.0.220. The page is titled "MagneMotion A Rockwell Automation Company". On the left is a navigation menu with items like General Status, Interface Status, View Log, Log Settings, NC Settings, Configuration Files, Managed Configurations, Motor Gap Information, Upgrade Software, Change Password (highlighted), Set Clock, Restore Factory Defaults, Reboot Controller, Motor Information, License Information, NC Migration, and Logout. The main content area has three sections: "Change Password:" with fields for "For User:" (admin), "New Password:", and "Confirm Password:", and "Submit" and "Clear Fields" buttons; "Add New Additional User:" with fields for "New Username:", "New Password:", and "Confirm Password:", and "Submit" and "Clear Fields" buttons; and "Centralized Authentication Management:" with a text block explaining the function and a "Distribute Authentication Credentials" button.

*Figure 2-73: Administer Users/Password Page, Centralized Authentication Management*

4. Select **Distribute Authentication Credentials**.

**NOTE:** File distribution writes the updated files to the nonvolatile memory in each node controller. Distribution can interrupt normal operations and should only be done during transport system maintenance when there are no active vehicle commands.

Files are only distributed to those node controllers identified in the Node Controller Configuration File.

*The user account information is distributed to all node controllers in the transport system. The Centralized Authentication Management status is temporarily displayed as shown in [Figure 2-74](#) with instructions to review the log for the HLC to verify the distribution status.*

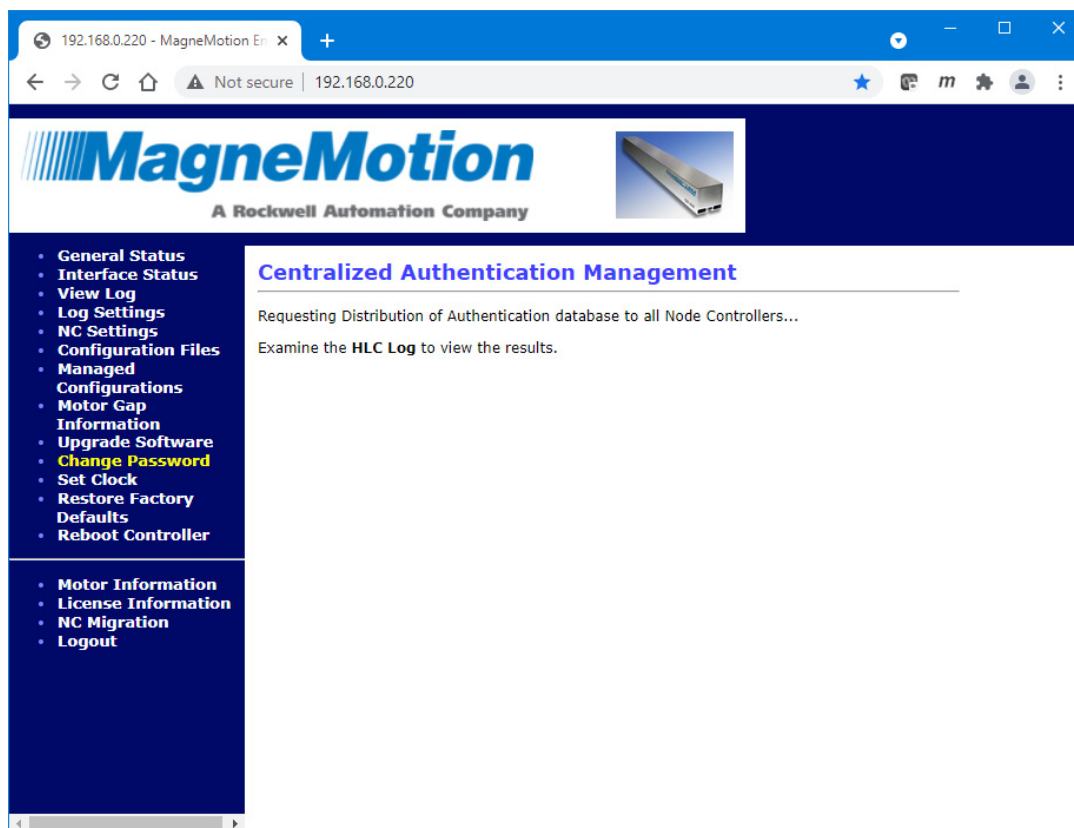


Figure 2-74: Centralized Authentication Management Status

*The Administer Users/Passwords page is redisplayed as shown in [Figure 2-69](#).*

5. Select **View Log** from the Main Menu (see [Log Files on page 35](#)).

*The Node Controller Log page is displayed.*

6. Select **View High Level Controller Log**.

*The last lines in the log show the distribution of the Authentication Credentials and the distribution status as shown in [Figure 2-75](#).*

```
Feb 24 15:02:54.263679 SYSTEM,CRITICAL: CONF DIST: Sending Authentication Data Portion to NC @ 192.168.110.228
Feb 24 15:02:54.289096 SYSTEM,CRITICAL: CONF DIST: SUCCESS: Transfer Reported Complete.
```

Figure 2-75: Log Entries Showing Authentication Credential Distribution

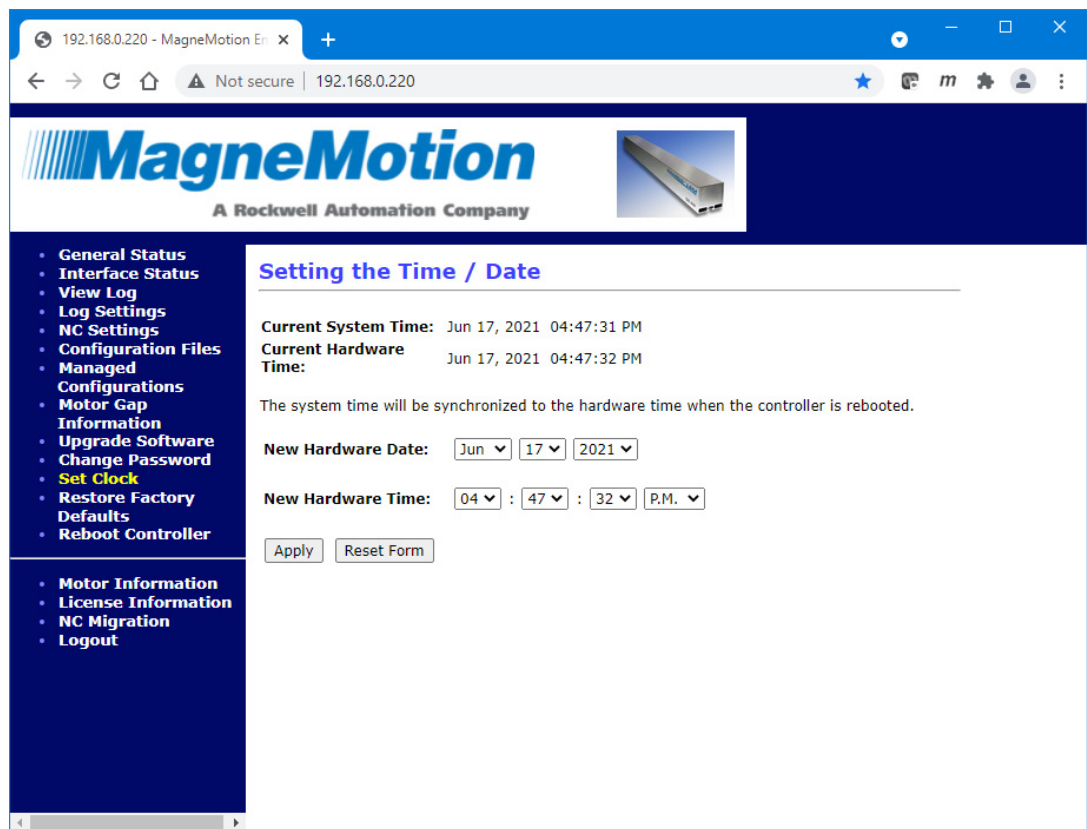


## Set the Clock Time and Date

This section describes how to change the date and time settings for the node controller to make sure the clocks on all node controllers in the transport system match. Changing the time can also be used to account for a change in Time Zone, Daylight Saving Time, Leap Year, and so on.

1. Log in to the HLC using the Administrator account.
2. Select **Set Clock** on the Main Menu (see [Set Clock on page 224](#) for detailed descriptions of all items).

The *Setting the Time/Date* page, which is shown in [Figure 2-76](#), is displayed.



The screenshot shows a web browser window with the URL 192.168.0.220. The page header features the MagneMotion logo and a Rockwell Automation Company tagline. A left sidebar contains a navigation menu with items like General Status, Interface Status, View Log, Log Settings, NC Settings, Configuration Files, Managed Configurations, Motor Gap Information, Upgrade Software, Change Password, Set Clock (highlighted), Restore Factory Defaults, and Reboot Controller. Below this is a section for Motor Information, License Information, NC Migration, and Logout. The main content area is titled 'Setting the Time / Date'. It shows 'Current System Time: Jun 17, 2021 04:47:31 PM' and 'Current Hardware Time: Jun 17, 2021 04:47:32 PM'. A note states: 'The system time will be synchronized to the hardware time when the controller is rebooted.' Below this, there are input fields for 'New Hardware Date' (Jun 17, 2021) and 'New Hardware Time' (04:47:32 P.M.). At the bottom of the form are 'Apply' and 'Reset Form' buttons.

Figure 2-76: Set Clock Page

3. Set the new date and time for the hardware clock on the node controller using the menus available, and select **Apply**.

The *Setting the Time/Date* page shows the new Hardware date and time as shown in [Figure 2-77](#).



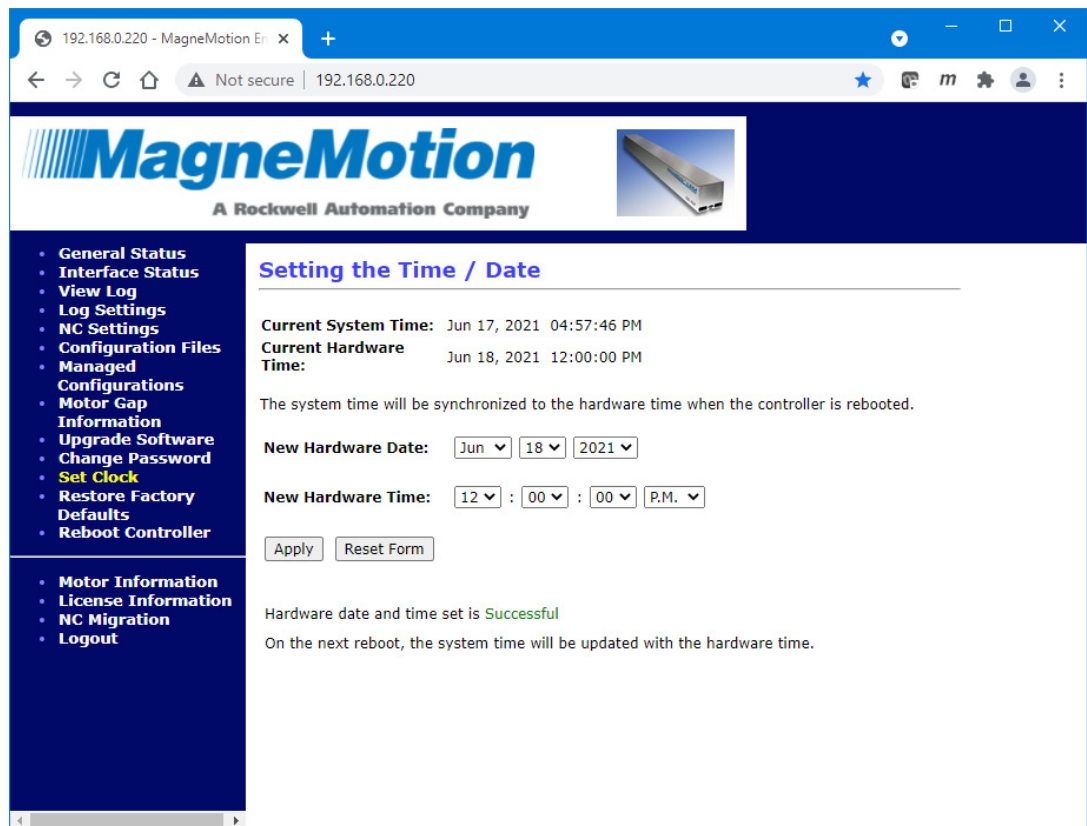


Figure 2-77: Set Clock Page Showing New Time

4. For transport systems with one node controller, reboot the node controller (see [Reboot One Node Controller on page 128](#)).
5. For transport systems with multiple node controllers, reboot all node controllers to distributed the new date and time information from the HLC (see [Reboot All Node Controllers on page 130](#)).

**NOTE:** File distribution writes the updated files to the nonvolatile memory in each node controller. Distribution can interrupt normal operations and should only be done during transport system maintenance when there are no active vehicle commands.

Files are only distributed to those node controllers identified in the Node Controller Configuration File.

## Restore Factory Defaults

This section describes how to reset the node controller to an unprogrammed state. Restoring the factory defaults makes sure that only the Node Controller Software Image files remain on the node controller, but all other files and information are removed, including:

- Node Controller Configuration Files (*node\_configuration.xml*).
- Motor Type files (*motor\_type.xml*).
- Magnet Array Type files (*magnet\_array\_type.xml*).
- Motor ERF Image files (*motor\_image.erf*).
- Configuration settings, such as designating the node controller as the HLC.
- IP settings are reset to the factory default.

---

<b>NOTICE</b>	To avoid losing any information, download all node controller files and record all settings before restoring the Factory Defaults.
---------------	--

---

Once the node controller has been reset all node controller files and settings can be restored. Restore from the files that were previously downloaded from the node controller. Or, restore from files that are downloaded from another node controller, which makes sure both node controllers contain the same files.

1. Download all files using the NC File Retrieval Tool. To download the files individually, see:
  - [Download the Existing Node Controller Configuration File on page 53](#)
  - [Download the Existing MICS File on page 59](#)
  - [Download Existing Motor Type Files on page 62](#)
  - [Download Existing Magnet Array Type Files on page 66](#)
  - [Download the Existing Managed Node Controller Configuration Files on page 73](#)
  - [Download an Existing Node Controller Software Image File on page 89](#)
  - [Download the Existing Motor ERF Image File on page 102](#)
  - [Download Log Files on page 37](#)
2. Select **Restore Factory Defaults** on the Main Menu (see [Restore Factory Defaults on page 225](#) for detailed descriptions of all items).

*The **Restore Factory Defaults** page, which is shown in [Figure 2-78](#), is displayed.*

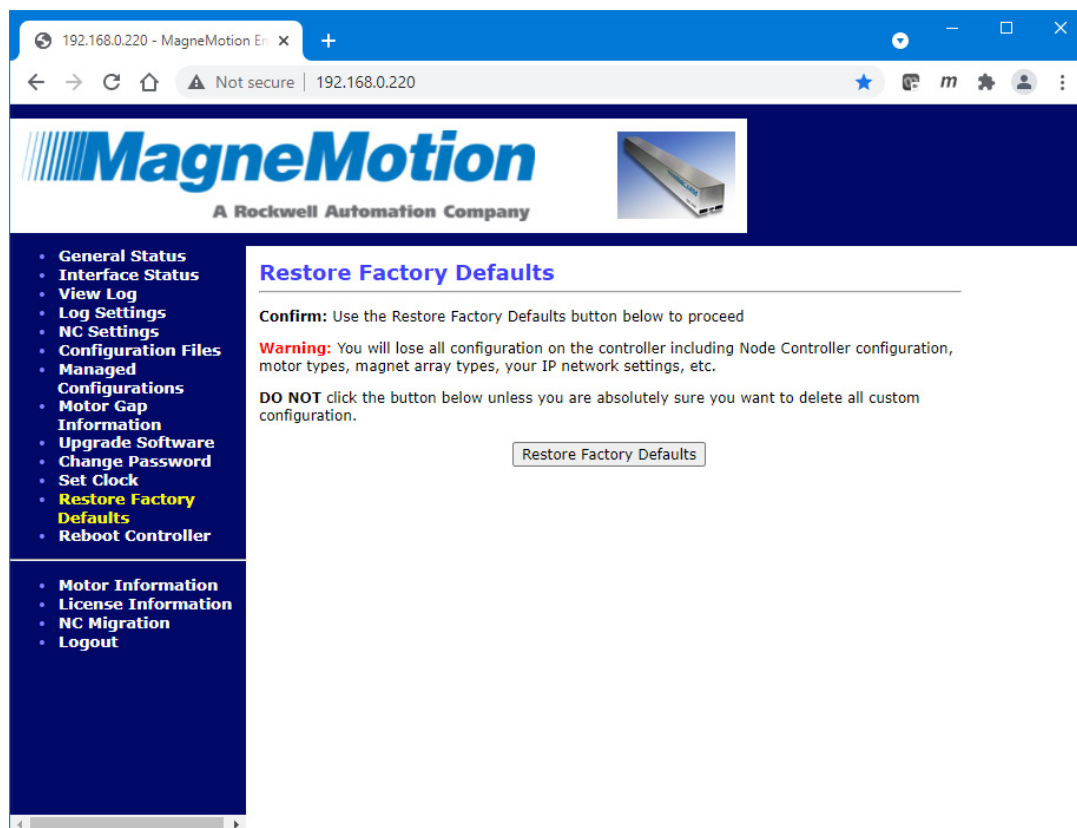


Figure 2-78: Restore Factory Defaults Page

3. Select **Restore Factory Defaults**.  
*The Factory Defaults are restored, and all custom configurations are removed.*
4. Reboot the node controller (see [Reboot One Node Controller on page 128](#)).

## Reboot the Node Controller

This section describes how to reboot the node controller. Rebooting is required after:

- Making any changes to the IP address (see [Configuring Node Controller Settings on page 39](#)).
- Configuring a node controller to be the HLC (see [Node Controller Function Assignment on page 45](#)) or a high-level controller Simulator (see [Configure the Simulator Function on page 46](#)).
- Configuring a node controller for remote logging using syslog (see [Configuring Remote Logging on page 48](#)).
- Activating a new Node Controller Software Image file (see [Upload a New Node Controller Software Image File on page 90](#)).
- Changing the Clock (see [Set the Clock Time and Date on page 123](#)).
- Restoring Factory Default settings (see [Restore Factory Defaults on page 125](#)).

**NOTE:** Each time the node controller is rebooted the old log file is erased and a new log file is created. Download the existing file before rebooting to make sure no log history is lost (see [Download Log Files on page 37](#)).

Only reboot the node controller during transport system maintenance when there are no active commands as all normal operations are interrupted.

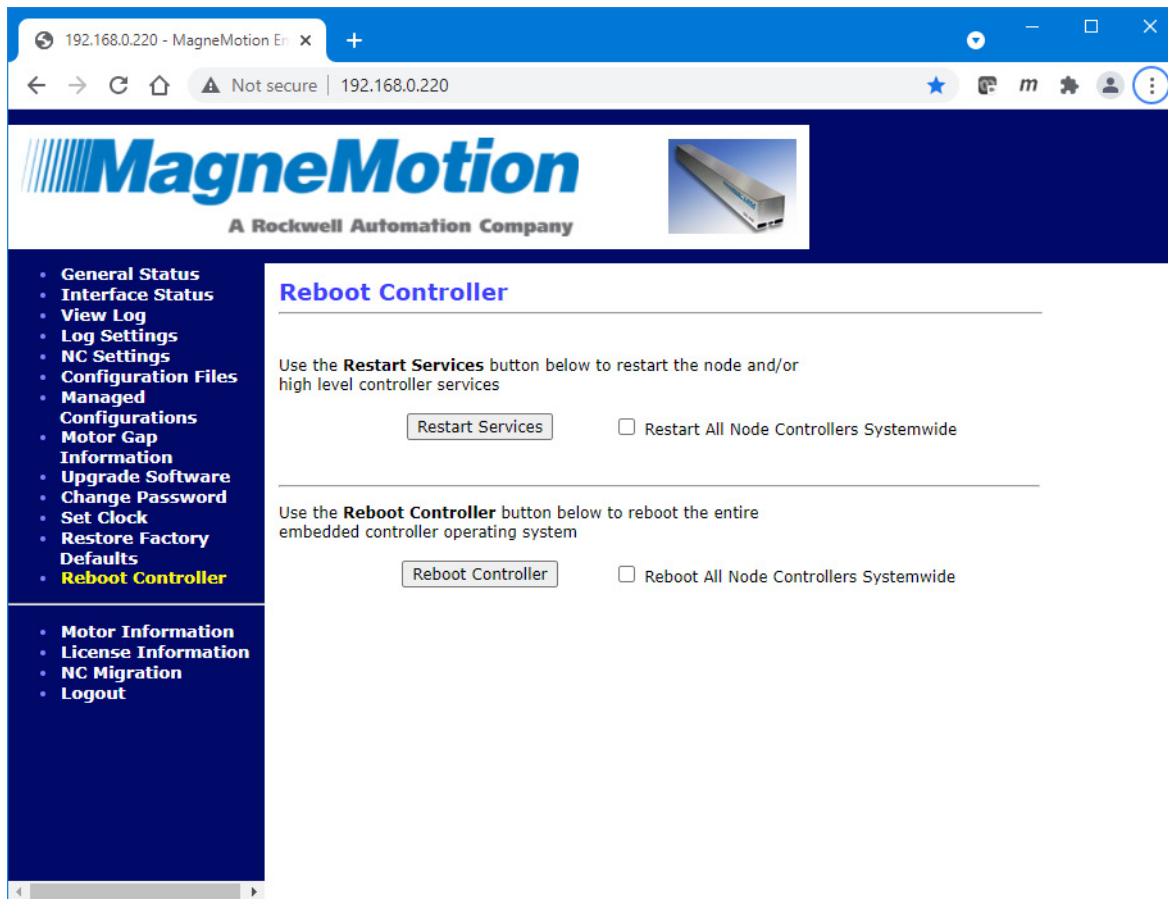


Figure 2-79: Reboot Controller Page

## Reboot One Node Controller

This process is used if there is only one node controller in the transport system or if one node controller was serviced and the other node controllers do not need to be rebooted.

1. Select **Reboot Controller** on the Main Menu (see [Reboot Controller on page 226](#) for detailed descriptions of all items).

*The **Reboot Controller** page, which is shown in [Figure 2-79](#), is displayed.*

2. Select **Reboot Controller**.

The reboot status is temporarily displayed as shown in [Figure 2-80](#). Then the **General Status** page is displayed.

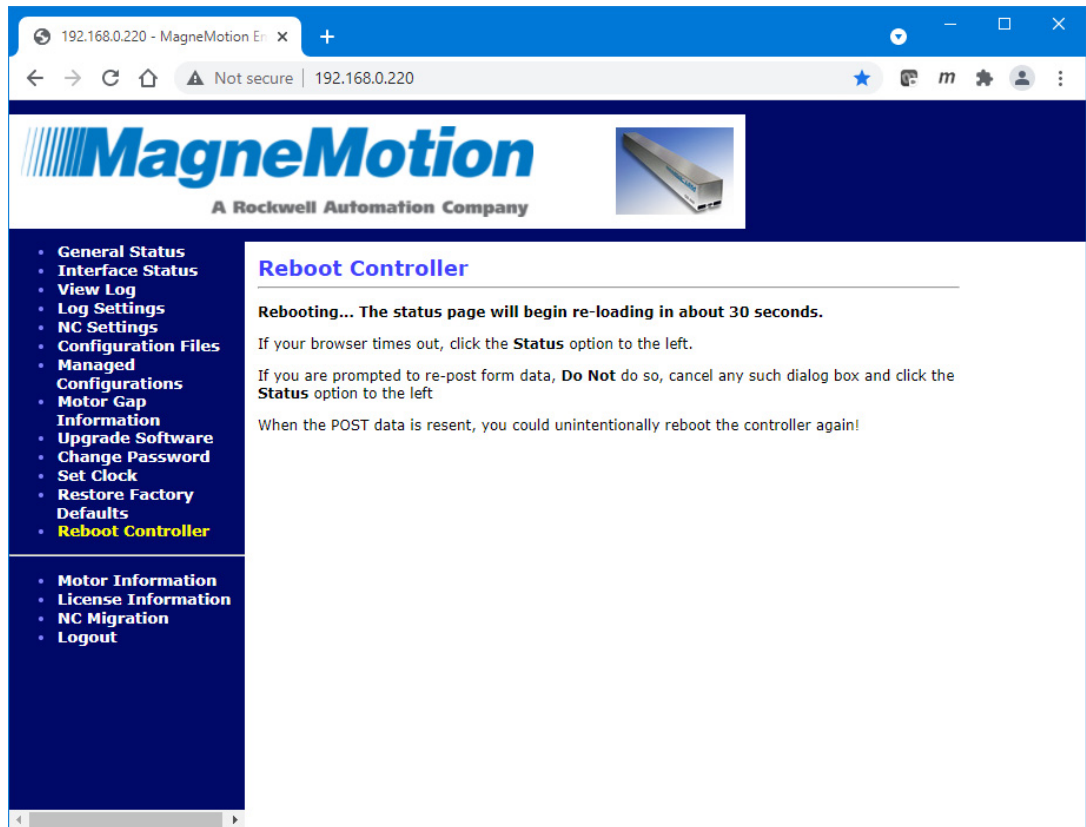


Figure 2-80: Rebooting Controller Status Page, Reboot Node Controller

**NOTE:** Wait about one minute, then select **General Status** on the Main Menu (or press <F5> if the **General Status** page is not automatically displayed).

If the browser displays an error message indicating that it cannot connect to the node controller, select refresh on the browser (or press <F5>).

If the factory defaults have been restored, the browser cannot reconnect to the node controller since the IP address has changed to the factory default.

## Reboot All Node Controllers

This process is used when there are multiple node controllers in the transport system and they all need to be rebooted.

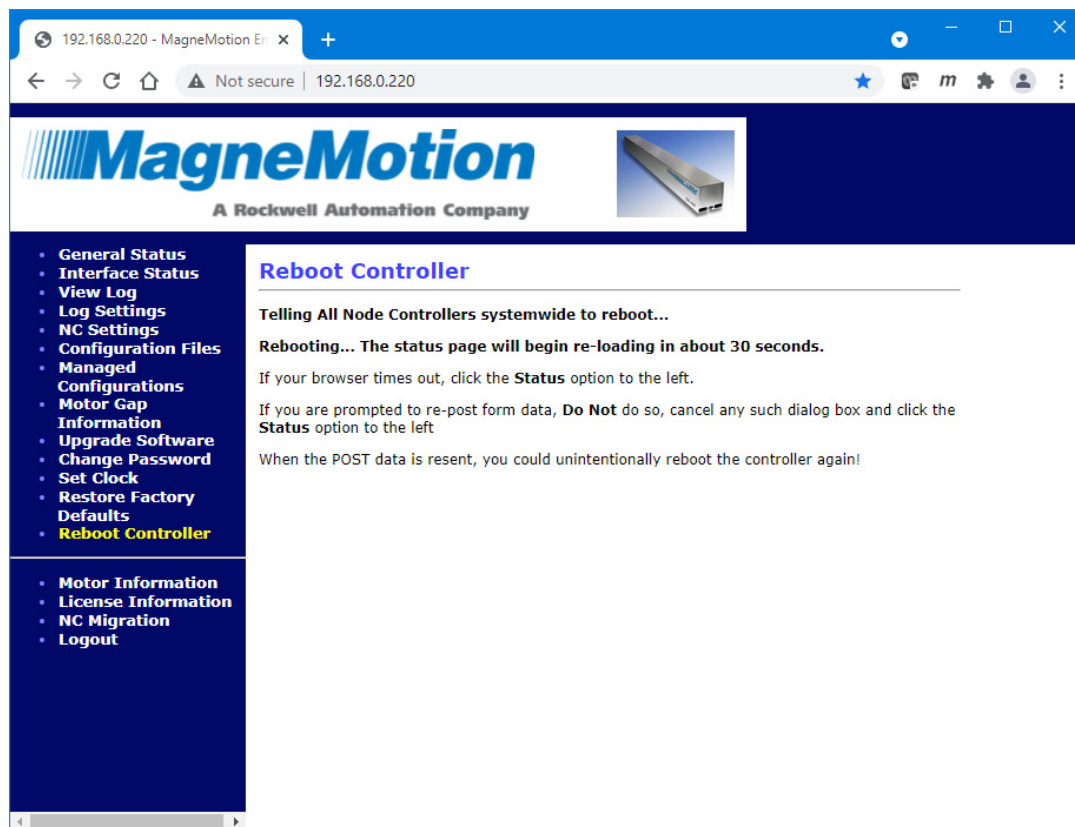
**NOTE:** Rebooting all node controllers always distributes the clock setting from the HLC.

1. Select **Reboot Controller** on the Main Menu (see [Reboot Controller on page 226](#) for detailed descriptions of all items).

*The **Reboot Controller** page, which is shown in [Figure 2-79](#), is displayed.*

2. Select (check) **Reboot All Node Controllers Systemwide**.
3. Select **Reboot Controller**.

*The system-wide reboot status is temporarily displayed as shown in [Figure 2-81](#). Then the **General Status** page is displayed.*



*Figure 2-81: Rebooting Controller Status Page, Reboot All Node Controllers*

**NOTE:** Wait about one minute, then select **General Status** on the Main Menu (or press <F5> if the **General Status** page is not automatically displayed).

If the browser displays an error message indicating that it cannot connect to the node controller, select refresh on the browser (or press <F5>).



## Restart the Node Controller

This section describes how to restart the node controller. Restarting is required after:

- Uploading a new Node Controller Configuration File (see [Node Controller Configuration File on page 51](#)).
- Adding or deleting type files (see [Motor Type Files on page 61](#) and [Magnet Array Type Files on page 65](#)).
- Programming the motors (see [Programming the Motors on page 106](#)).
- Distributing configuration information to any new motors on a path.
- To clear the log files.

**NOTE:** Each time the node controller is restarted the old log file is erased and a new log file is created. Download the existing file before rebooting to make sure no log history is lost (see [Download Log Files on page 37](#)).

Only restart the node controller during transport system maintenance when there are no active commands as all normal operations are interrupted.

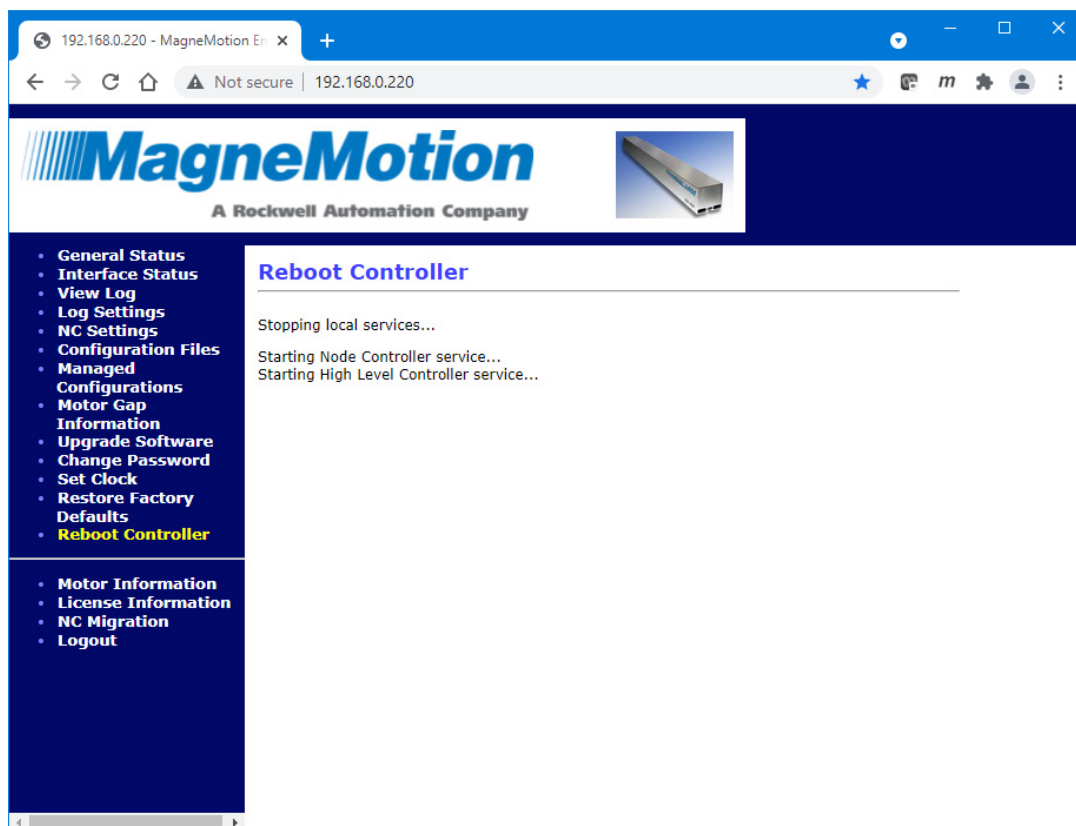
### Restart One Node Controller

1. Select **Reboot Controller** on the Main Menu (see [Reboot Controller on page 226](#) for detailed descriptions of all items).

*The **Reboot Controller** page, which is shown in [Figure 2-79](#), is displayed.*

2. Select **Restart Services**.

*The restart status is temporarily displayed as shown in [Figure 2-82](#) and then the **General Status** page is displayed.*



*Figure 2-82: Reboot Controller Status Page, Restart Node Controller*

**NOTE:** Wait about 30 seconds, then select **General Status** on the Main Menu (or press <F5> if the **General Status** page is not automatically displayed).

If the browser displays an error message indicating that it cannot connect to the node controller, select refresh on the browser (or press <F5>).

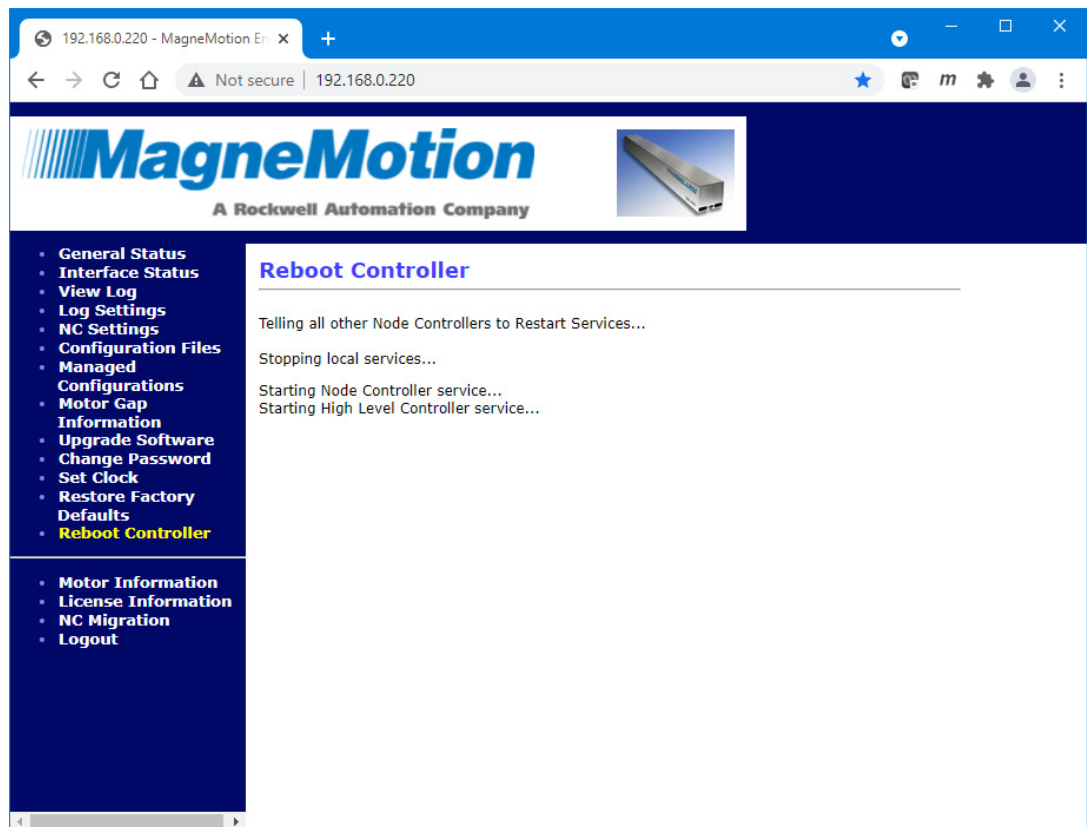
## Restart All Node Controllers

1. Select **Reboot Controller** on the Main Menu (see [Reboot Controller on page 226](#) for detailed descriptions of all items).

*The **Reboot Controller** page, which is shown in [Figure 2-79](#), is displayed.*

2. Select (check) **Restart All Node Controllers Systemwide**.
3. Select **Restart Services**.

*The system-wide restart status is temporarily displayed as shown in [Figure 2-83](#) and then the **General Status** page is displayed.*



*Figure 2-83: Reboot Controller Status Page, Restart All Node Controllers*

**NOTE:** Wait about 30 seconds, then select **General Status** on the Main Menu (or press <F5> if the **General Status** page is not automatically displayed).

If the browser displays an error message indicating that it cannot connect to the node controller, select refresh on the browser (or press <F5>).

# Motor Information

This section describes how to display the manufacturing data for the motor, including software version information.

1. Select **Motor Information** on the Main Menu.

*The **Motor Information** page, which is shown in [Figure 2-84](#), is displayed listing all motors that are connected to the node controller. Use the scroll bars to display text that is not shown.*

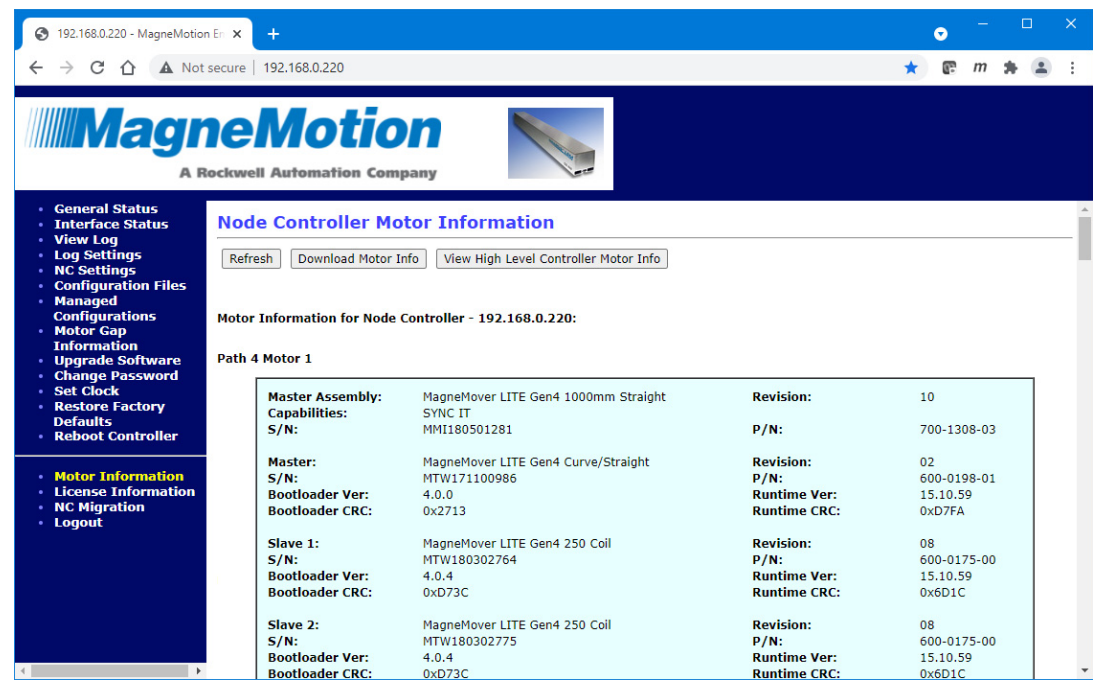


Figure 2-84: Motor Information Page

2. If there are multiple node controllers in the transport system and the web interface is running on the HLC, select **View High Level Controller Motor Info** to display data for all motors in the system.
3. Review the motor information as required (see [Motor Information on page 227](#) for detailed descriptions of all items).
4. Download the motor information as an HTML file if necessary. The file can then be reviewed later in any browser or text editor.
  - A. Select **Download Motor Info**.

*The file is downloaded as determined by the browser. The options for saving or opening this file vary by web browser.*

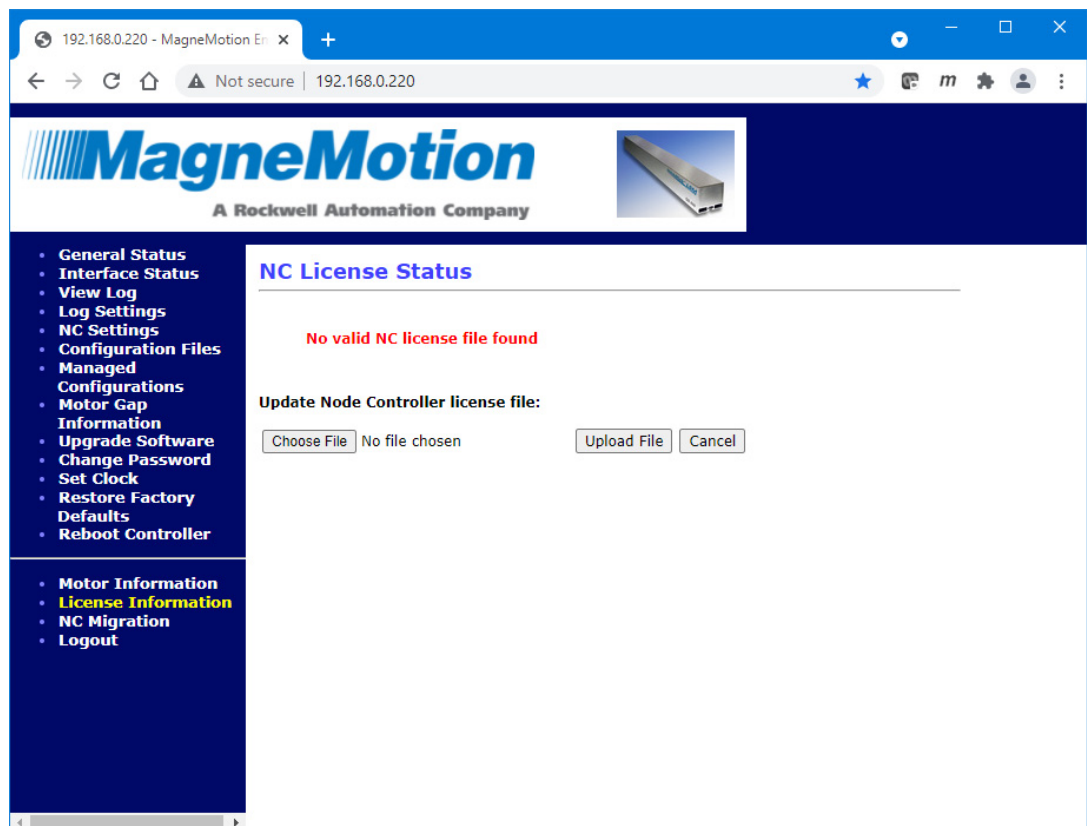
## License Information

This section describes how to validate and upload the software license for the node controller. The license is used to validate the software running on the node controller. Legacy node controllers (NC-12, NC LITE) use a hardware key. The Next Gen node controllers (NC-E, NC-S, and so on) use a software key to validate the software. All Next Gen node controllers ship with the key pre-installed. The only time installing a software license is required is when directed by the [Rockwell Automation Support](#), who will supply a new license file. The license mechanism works on all node controller units.

**NOTE:** If the USB hardware dongle security key fails on a node controller that has the license page depicted in [Figure 2-85](#), capturing a screenshot of this NC license status web page can be helpful in the support process. If needed, contact [Rockwell Automation Support](#) for more information.

1. Select **License Information** on the Main Menu (see [License Information on page 237](#) for detailed descriptions of all items).

*The NC License Status page, which is shown in [Figure 2-85](#), is displayed.*



*Figure 2-85: License Information Page – No License*

2. Under **Upload Node Controller license file Image**, select **Browse**.

*The **Choose File to Upload** dialog box is displayed.*

3. Use the dialog box controls to select the appropriate Node Controller Software Image file (controller\_image) and select **Open**. The file must be a valid embedded controller firmware upgrade image.

*The file name is displayed in the **Browse** text field.*

4. Select **Upload File**.

*If a valid license file is uploaded, the page is redisplayed with green text showing that the license file is valid.*

*If an invalid license file is uploaded, an error message is displayed describing the problem encountered.*

5. After a valid license is uploaded, reboot the node controller or restart services to make sure the node controller code starts up and validates against the new license file.

## NC Migration

This section describes how to update the node controllers with a new kernel, which is part of the Node Controller Software Image on the node controller. All future releases of the node controller software will use this Next Gen format Software Image. This new Software Image includes the following features:

- New kernel.
- Provides increased node controller reliability.
- Supports future safety & security updates.
- Supports future support of newer hardware.
- Supports multiple cores.
- Supports en masse migration of all node controllers in system.
- Preserves all the node controller's configuration information during migration, including IP settings, NC/HLC function, syslog settings, XML config, type files, and so on.
- Changes to the data displayed on the General Status page.
  - Shows the instant CPU load from 0% to 100%.
  - Shows the actual CPU usage instead of load averages, where 0.0 is no load and 1.0 is 100% load. It shows this usage as 1, 5, and 10 minute exponential moving averages (EMAs).
  - Shows the CPU temperature for node controllers that support this feature.

The legacy format Software Image is not forward compatible with the new Next Gen format Software Image. The use of different signatures prevents installing and activating a Next Gen format Software Image using the Upgrade Software page on a node controller that is using the legacy format Software Image. To install a Next Gen format Software Image on a node controller using a legacy format Software Image, the NC Migration page must be used, see [Upgrading to the Next Gen Node Controller Software on page 138](#).

The new Next Gen format Software Image is not backward compatible with the legacy format Software Image. The use of different signatures prevents installing and activating a legacy format Software Image using the Upgrade Software page on a node controller that is using the Next Gen format Software Image. To install a legacy format Software Image on a node controller using a Next Gen format Software Image, the NC Migration page must be used, see [Downgrading to the Legacy Node Controller Software on page 150](#).

## Upgrading to the Next Gen Node Controller Software

In all current Node Controller Software Image releases, there is a section on the **Upgrade Software** page called **Node Controller Upgrade to New Image Format**. This section is not



used for the upgrade to the Next Gen format Software Image and these releases cannot be used to perform the upgrade. To upgrade a node controller to the Next Gen format Software Image, a release that includes the **NC Migration** option on the main menu as shown in [Figure 2-86](#) must be installed on the node controller.

The upgrade process references the node controllers identified in the Node Controller Configuration File. When multiple node controllers are referenced, the **NC Migration** page automatically displays the option to upgrade all node controllers at the same time.

Once a Next Gen format Software Image is installed, the node controller will not permit installation of a legacy format Software Image using the **Upgrade Software** page. The **NC Migration** page must be used to restore a legacy version Software Image.

---

**IMPORTANT** This process reformats the flash memory and installs a new bootloader. DO NOT TURN OFF POWER during the upgrade or the node controller must be returned to Rockwell Automation to be reimaged.

---

## Upgrade Requirements

- Supported for the NC-LITE, NC-12, NC-E, and NC-S node controllers.
- All node controllers being upgraded must be running a Software Image that supports performing the upgrade.
- The node controller must have a minimum of 1 GB flash memory installed to perform this upgrade.
- Make sure that the transport system is stopped before upgrading. Performing this procedure causes all processes running on the node controllers and all communication with the host controller to halt.
- All node controllers in a transport system must be upgraded at the same time and must be running the same Software Image on a version that supports migration.

## Upgrade Cautions

- Power to all node controllers being upgraded must not be turned off during the upgrade process.

## Upgrade a Single Node Controller

One node controller that is functioning as both the high-level controller and the transport system node controller can be easily upgraded to the Next Gen format Software Image. The upgrade process references the node controller identified in the Node Controller Configuration File. If there are multiple node controllers in the transport system, they are identified, use the [Upgrade All Node Controllers in a Transport System](#) process on [page 145](#).

1. Make sure that the transport system is stopped. Performing this procedure causes all processes running on the node controller and all communication with the host controller to halt.
2. Connect a browser to the node controller and log in using the Admin account.  
*The **General Status** page is displayed.*
3. Verify that the node controller has a minimum of 1 GB flash memory installed.  

Memory information is displayed as **Flash Memory Total** in the **Resource Usage** section of the **General Status** page. If the flash memory is not large enough, the upgrade cannot be supported.
4. If the node controller is not running a Software Image that can be upgraded to the Next Gen format (the menu option shown in [Figure 2-86](#) is not available), install one of the legacy format Node Controller Software Images listed in [Table 2-1](#) (available from [rok.auto/PCDC](http://rok.auto/PCDC)). See [Changing Node Controller Software Image Files](#) on page 88.

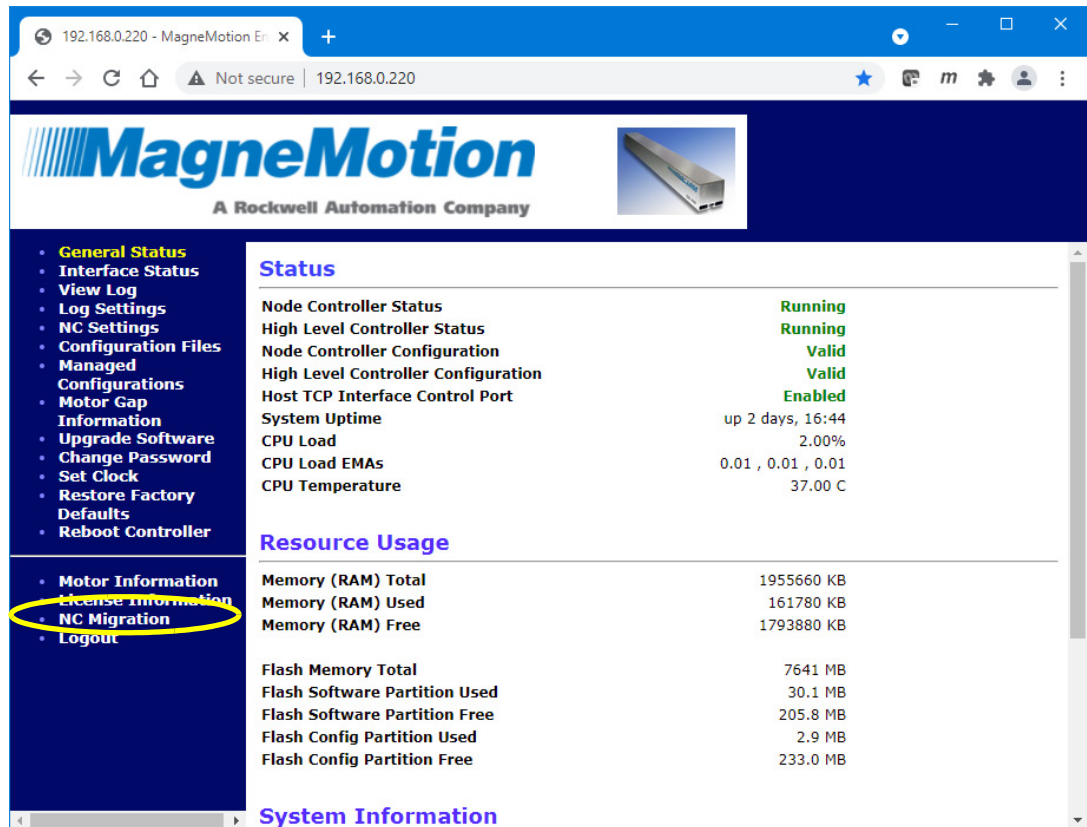


Figure 2-86: Node Controller with NC Migration Option

Table 2-1: Legacy Format Software Images that Support Upgrades

Image Name	Description
controller_image_15.11.nn_22-Apr-2021_154	Legacy Format

- Once the node controller is running the Software Image with upgrade support, clear the cache in the browser being used to access the node controller and refresh the screen to make sure that the menu is displayed properly.

The **General Status** page is displayed with the new **NC Migration** option on the main menu as shown in [Figure 2-86](#).

- Select **NC Migration** to upgrade the node controller from the legacy format Software Image to the Next Gen format.

The **NC Migration** page configured for upgrade is displayed as shown in [Figure 2-87](#).

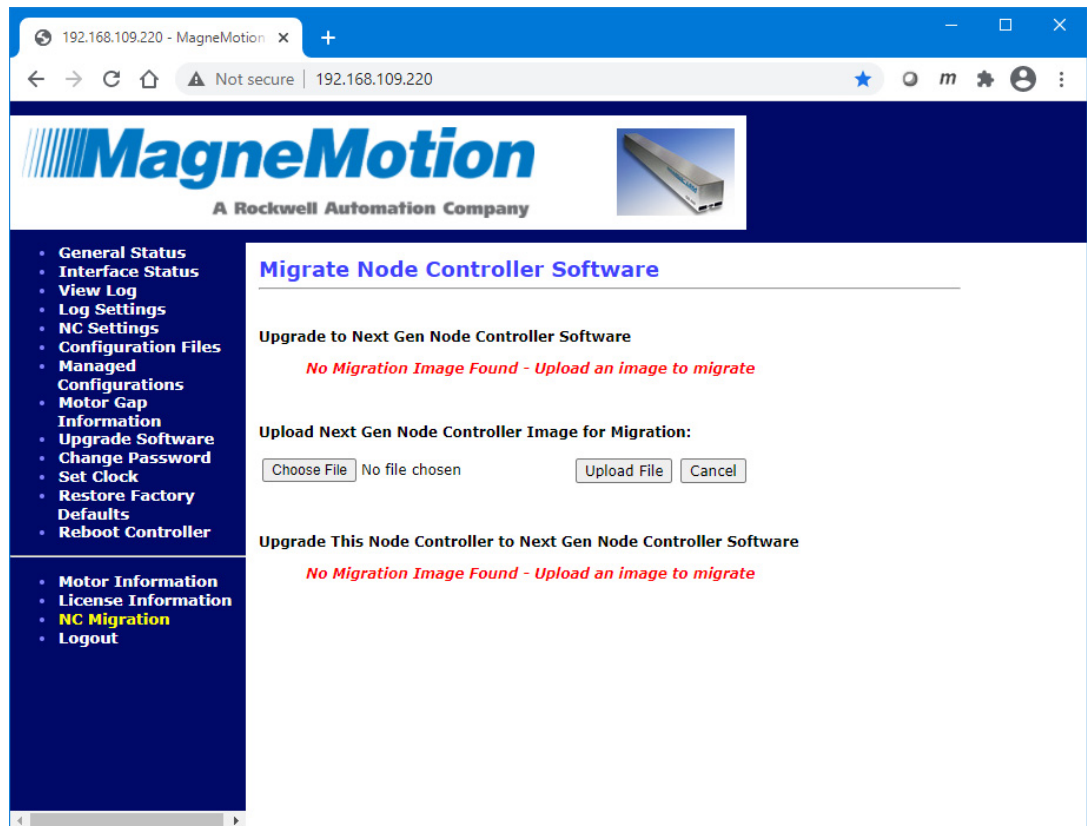


Figure 2-87: NC Migration Page for Upgrade

On the **NC Migration** page, select **Choose File** and select one of the Next Gen format Node Controller Software Images listed in [Table 2-2](#).

*Table 2-2: Next Gen Software Images*

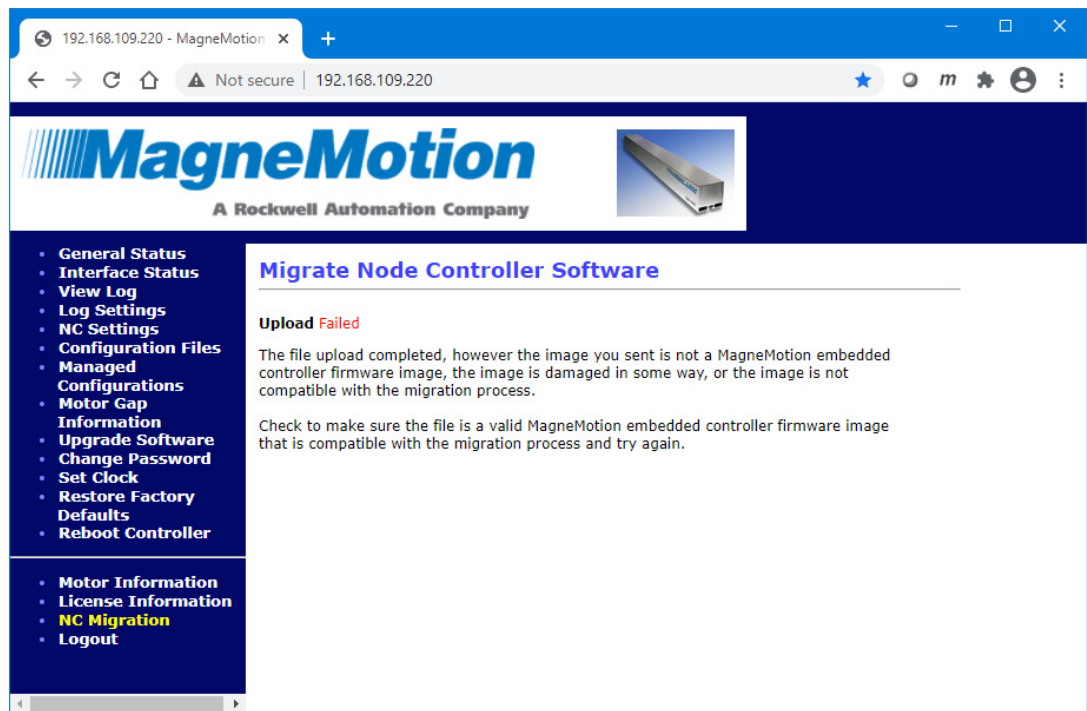
Image Name	Description
controller_image_15.11.nn_22-Apr-2021_154_32bit	Next Gen Format

- Use the dialog box controls to select the appropriate Node Controller Software Image (Next Gen format Software Images always end in “\_32bit”) and select **Open**.

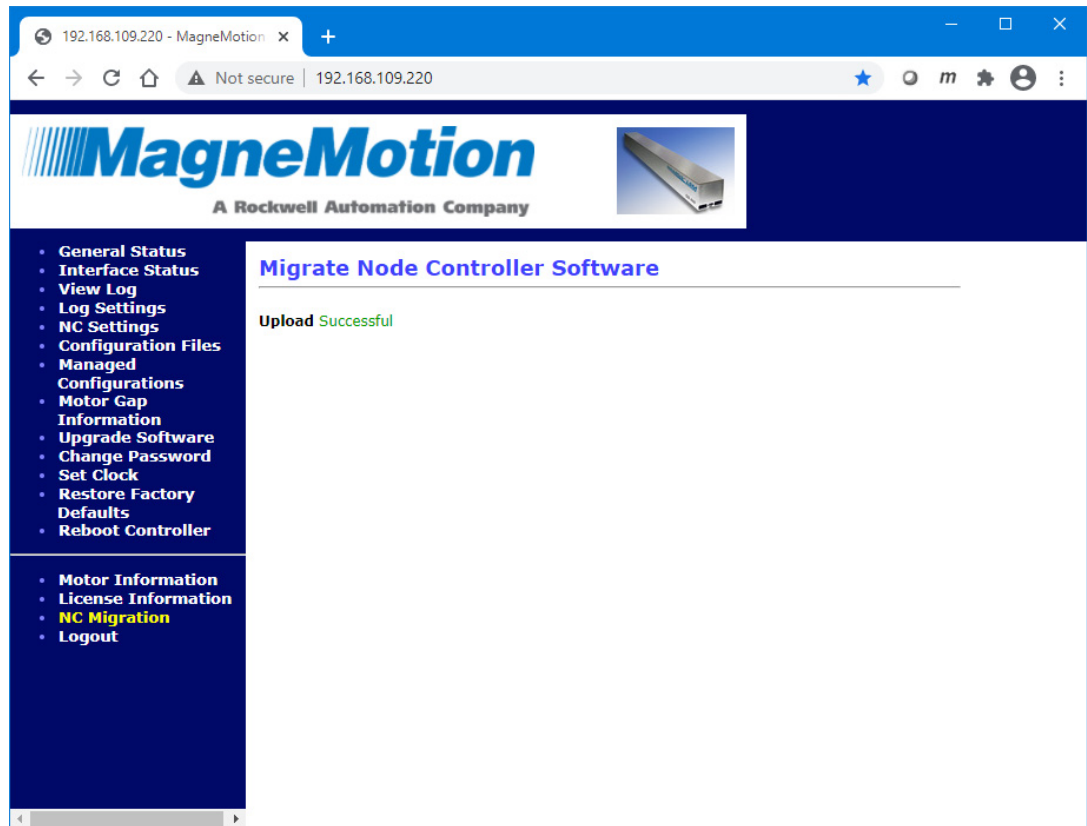
*The file name is displayed next to the **Choose File** button.*

- Select **Upload File**.

*If the file selected cannot be used for upgrade, the Upload Failed notice shown in [Figure 2-88](#) is displayed when the file is uploaded. If the file selected can be used for upgrade, the file upload status is displayed when the file is uploaded as shown in [Figure 2-89](#).*



*Figure 2-88: Upload Failed*



*Figure 2-89: Upload Successful*

Once the file upload is complete, the **NC Migration** page is redisplayed showing the Software Image uploaded and identifying it as a Next Gen Image as shown in [Figure 2-90](#).

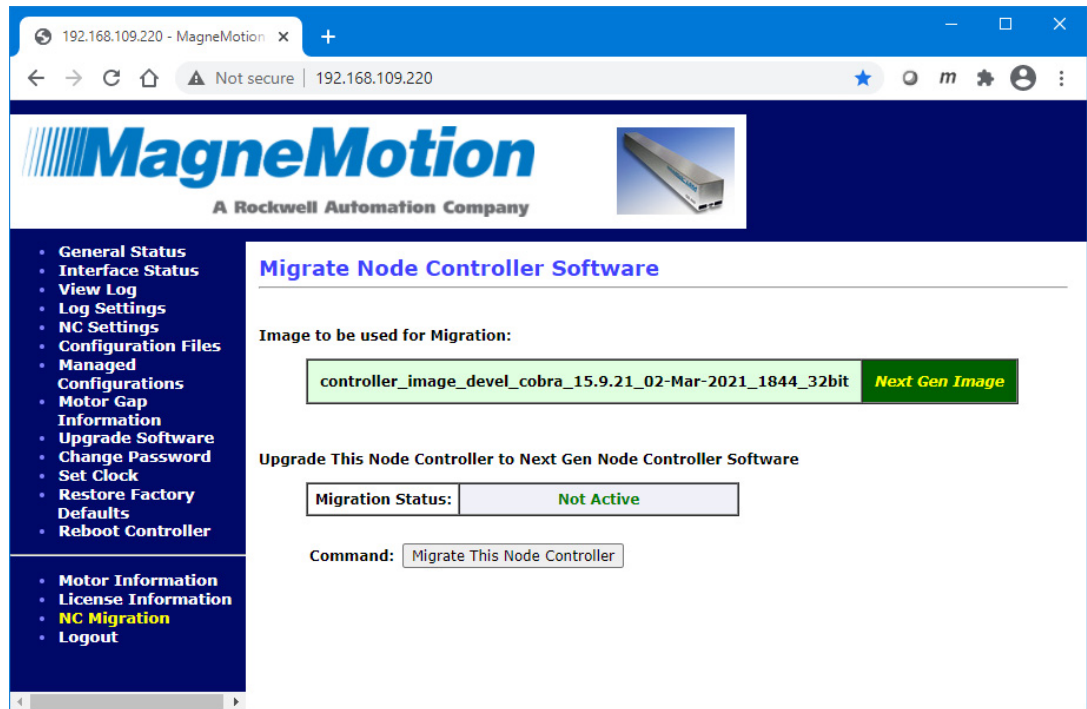


Figure 2-90: Next Gen Image Ready for Upgrade

9. Select **Migrate This Node Controller** to start the upgrade process.

**IMPORTANT DO NOT TURN OFF THE POWER**

The web interface displays the alert shown in [Figure 2-91](#).

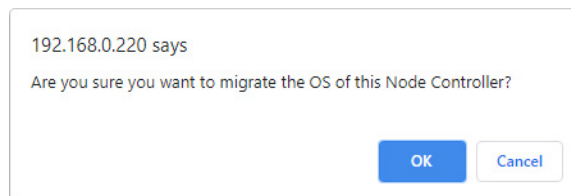


Figure 2-91: Migration Alert, Single Node Controller

10. Select **OK** on the alert.

The node controller starts the upgrade process and updates the **NC Migration** page with the status as shown in [Figure 2-92](#).



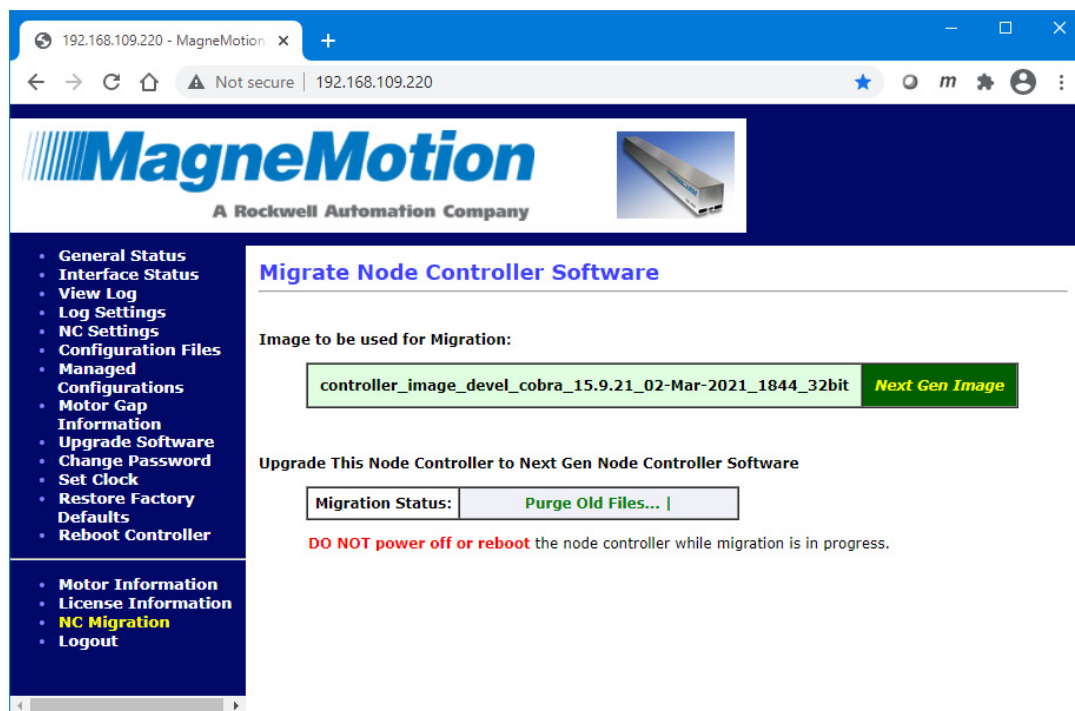


Figure 2-92: Upgrade Status, Single Node Controller

Once the upgrade is complete, the node controller reboots as shown in Figure 2-93.

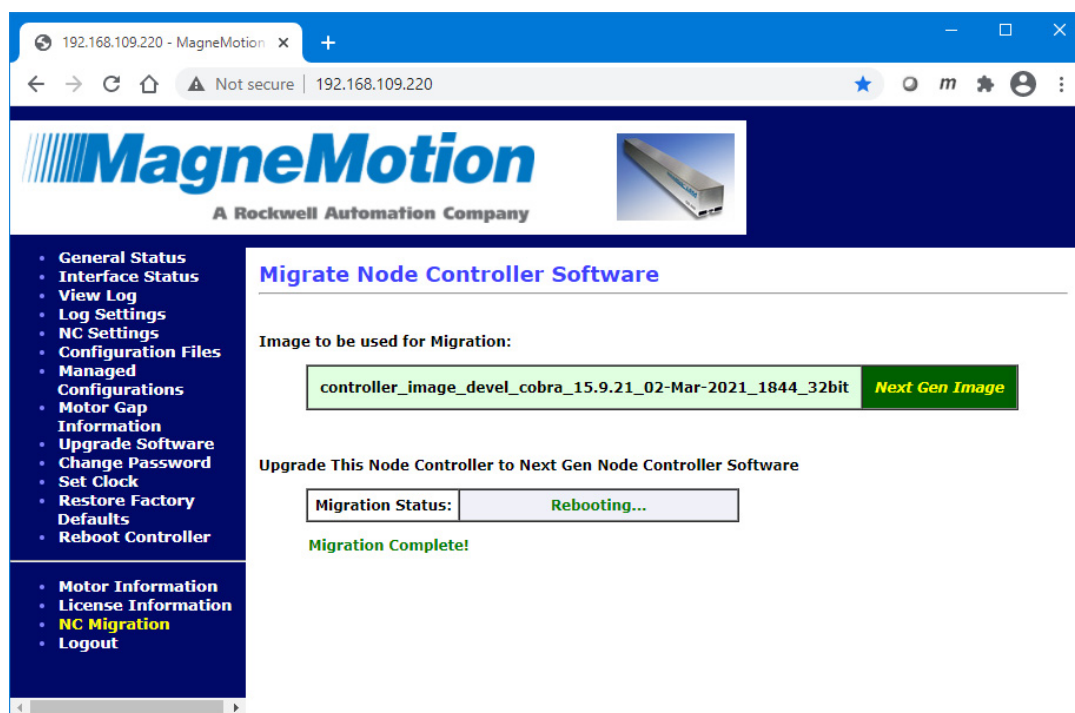


Figure 2-93: Upgrade Complete, Single Node Controller

**NOTE:** Once the node controller starts rebooting, it disconnects from the browser displaying the web interface.



11. Wait one minute to make sure the reboot is complete then select any menu option in the web interface.

*The browser reconnects to the node controller and the login screen is displayed.*

12. Log in using the default Admin account and password (admin/admin).

---

<b>NOTICE</b>	The admin account password is reset to the default, which is “admin” and any additional users that were added are deleted.
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13. Update any user accounts on the node controller as required.
14. Return the transport system to normal operation.

### Upgrade All Node Controllers in a Transport System

All node controllers in a transport system can be easily upgraded to the Next Gen format Software Image. The upgrade process references the node controllers identified in the Node Controller Configuration File. All node controllers being upgraded must have at least 1 GB flash memory installed and be running Software Images that can upgrade.

1. Make sure that the transport system is stopped. Performing this procedure causes all processes running on the node controllers and all communication with the host controller to halt.
2. Connect a browser to the HLC and log in using the Admin account.
3. Verify that each node controller has a minimum of 1 GB flash memory installed. Memory information is displayed as **Flash Memory Total** in the **Resource Usage** section of the **General Status** page for each node controller as shown in [Figure 2-86 on page 139](#). If the flash memory on a node controller is not large enough, upgrade cannot be supported on that node controller.

4. Verify that each node controller is running a Software Image that can be upgraded to the Next Gen format. All Software Images that support upgrade to the Next Gen format have an **NC Migration** option on the main menu as shown in [Figure 2-86](#).

If the node controller is not running a Software Image that can be upgraded to the Next Gen format (the menu option shown in [Figure 2-86](#) is not available), install one of the legacy format Node Controller Software Images listed in [Table 2-1](#) (available from [rok.auto/PCDC](http://rok.auto/PCDC)). See [Step 4](#) and [Step 5](#) in the [Upgrade a Single Node Controller](#) process on [page 138](#) to update the Software Image on the node controller.

5. To update the node controllers, install one of the legacy format Node Controller Software Images listed in [Table 2-1 on page 140](#) (available from [rok.auto/PCDC](http://rok.auto/PCDC)). See [Changing Node Controller Software Image Files on page 88](#).

6. Once all node controllers are running the Software Image with upgrade support, clear the cache in the browser being used to access the node controllers and refresh the screen to make sure that the menu is displayed properly.

*The **General Status** page is displayed with the new **NC Migration** option on the main menu as shown in Figure 2-86.*

7. Connect the browser to the HLC and log in using the Admin account.
8. Select **NC Migration** to upgrade all node controllers from the legacy format Software Image to the Next Gen format.

*The **NC Migration** page configured for upgrade is displayed as shown in Figure 2-94. This page also includes a list of all the node controllers in the transport system as defined in the Node Controller Configuration File.*

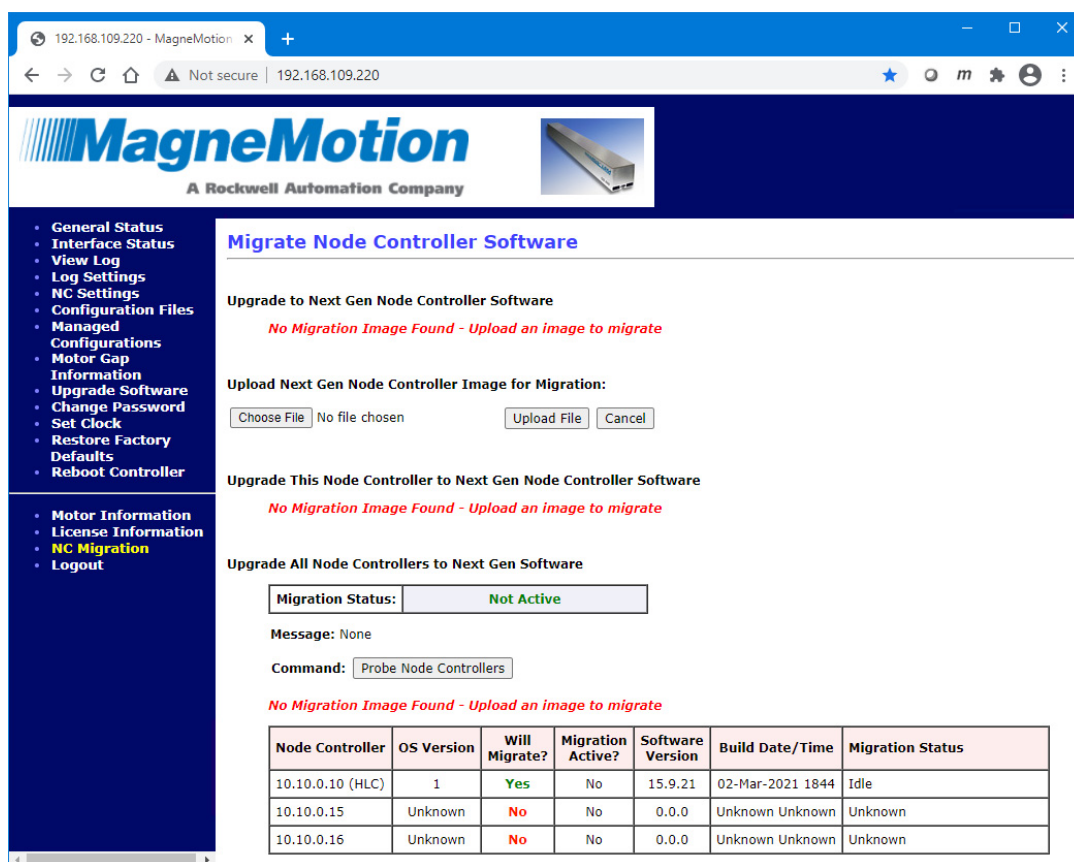


Figure 2-94: NC Migration Page for Multiple Node Controller Upgrade

9. On the **NC Migration** page, select **Choose File** and select one of the Next Gen format Node Controller Software Images listed in Table 2-2 on page 141.
10. Use the dialog box controls to select the appropriate Node Controller Software Image (Next Gen format Software Images always end in “\_32bit”) and select **Open**.

*The file name is displayed next to the **Choose File** button.*

11. Select **Upload File**.

If the file selected cannot be used for upgrade, the Upload Failed notice shown in Figure 2-88 is displayed when the file is uploaded. If the file selected can be used for upgrade, the file upload status is displayed when the file is uploaded as shown in Figure 2-89

Once the file upload is complete, the **NC Migration** page is redisplayed showing the Software Image uploaded and identifying it as a Next Gen Image as shown in Figure 2-95.

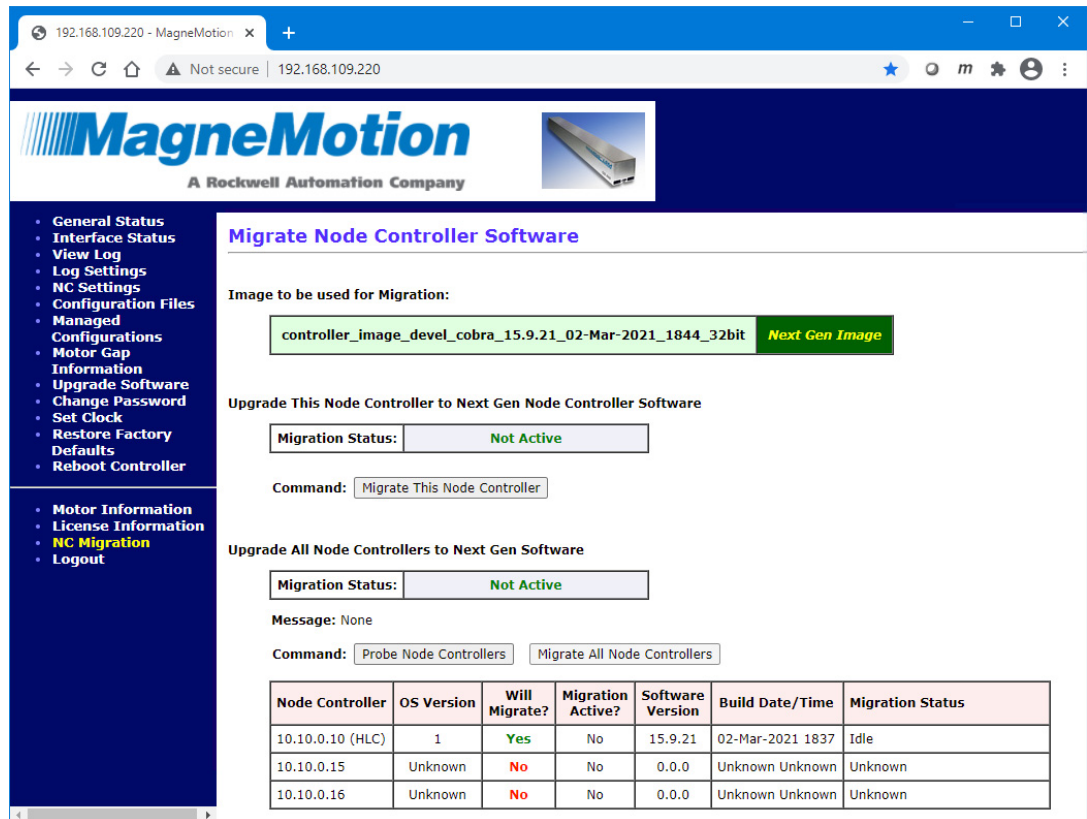


Figure 2-95: Next Gen Image Ready for Multiple Node Controller Upgrade

## 12. Select Probe Node Controllers to verify that all node controllers are ready for the upgrade.

The node controller list is updated with the status of all node controllers as shown in Figure 2-96.

**NOTICE**

If the **Will Migrate** status of any node controllers is **No**, make sure that node controller is communicating with the HLC and running the correct Software Image.

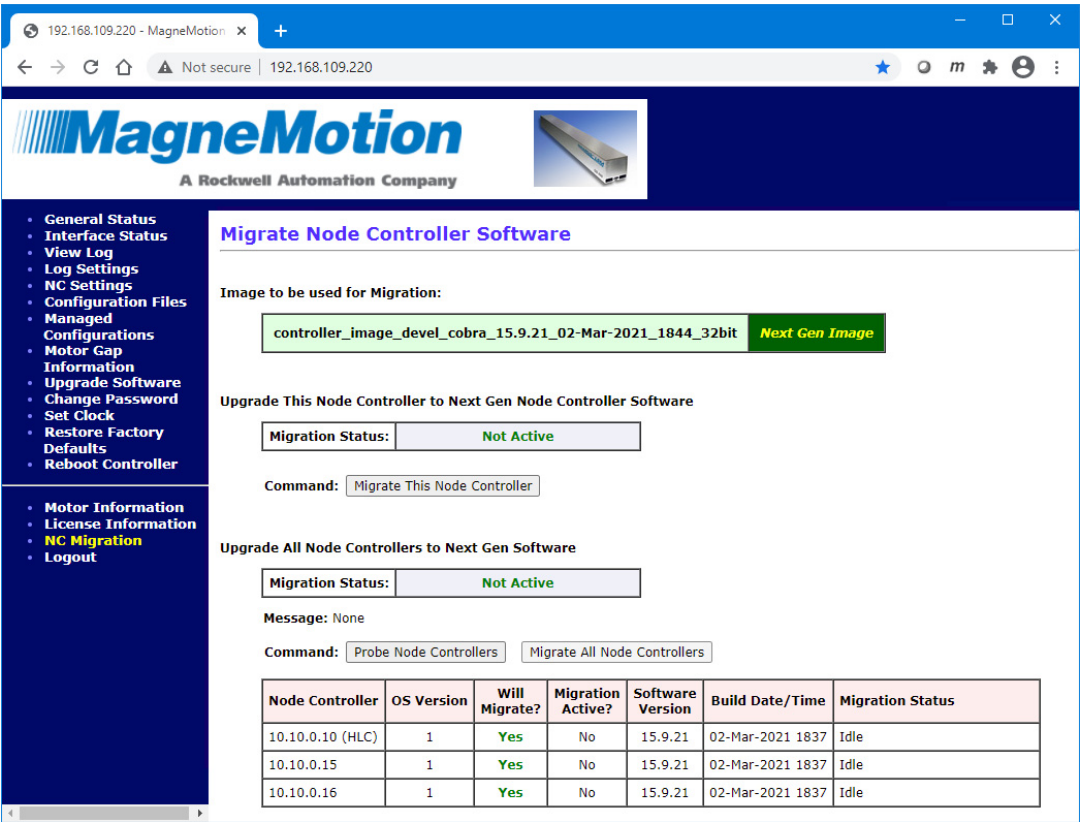


Figure 2-96: All Node Controllers Ready for Upgrade

13. Select **Migrate All Node Controllers** to start the upgrade process.

**IMPORTANT DO NOT TURN OFF THE POWER**

The web interface displays the alert shown in [Figure 2-97](#).

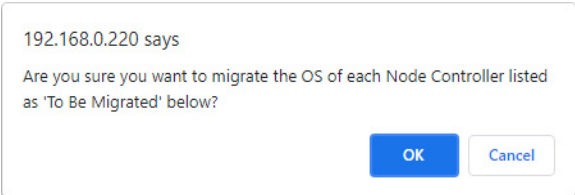


Figure 2-97: Migration Alert, Multiple Node Controllers

14. Select **OK** on the alert.

The node controller starts the upgrade process and updates the **NC Migration** page with the status of each node controller as shown in [Figure 2-98](#).

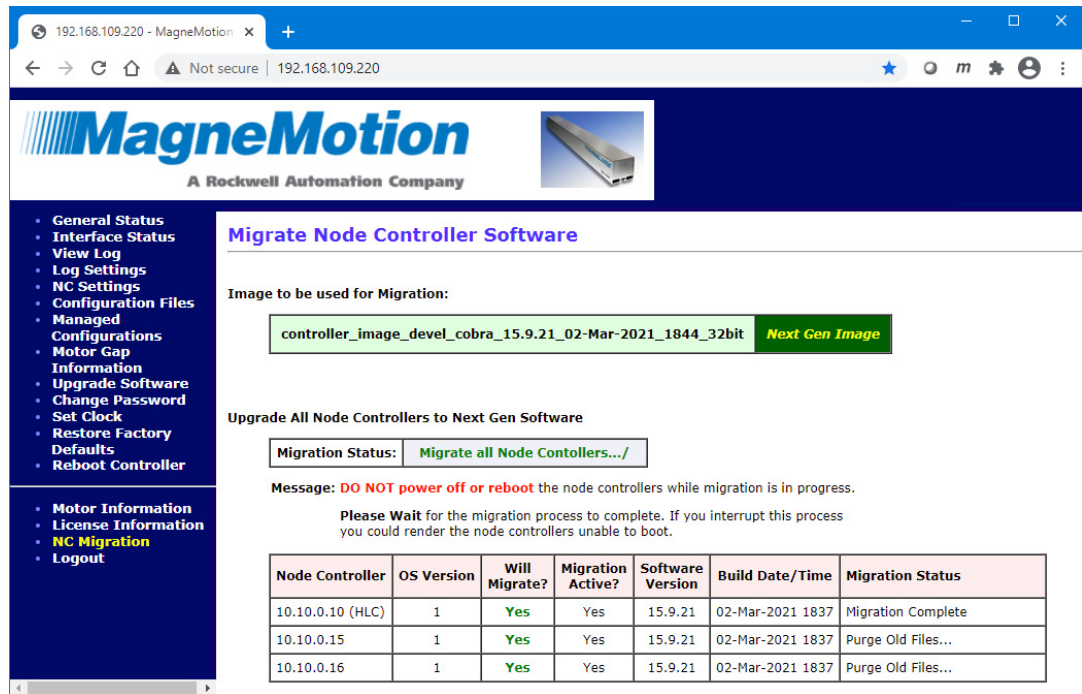


Figure 2-98: Upgrade Status, Multiple Node Controllers

Once the upgrade is complete, the node controller reboots as shown in Figure 2-99.

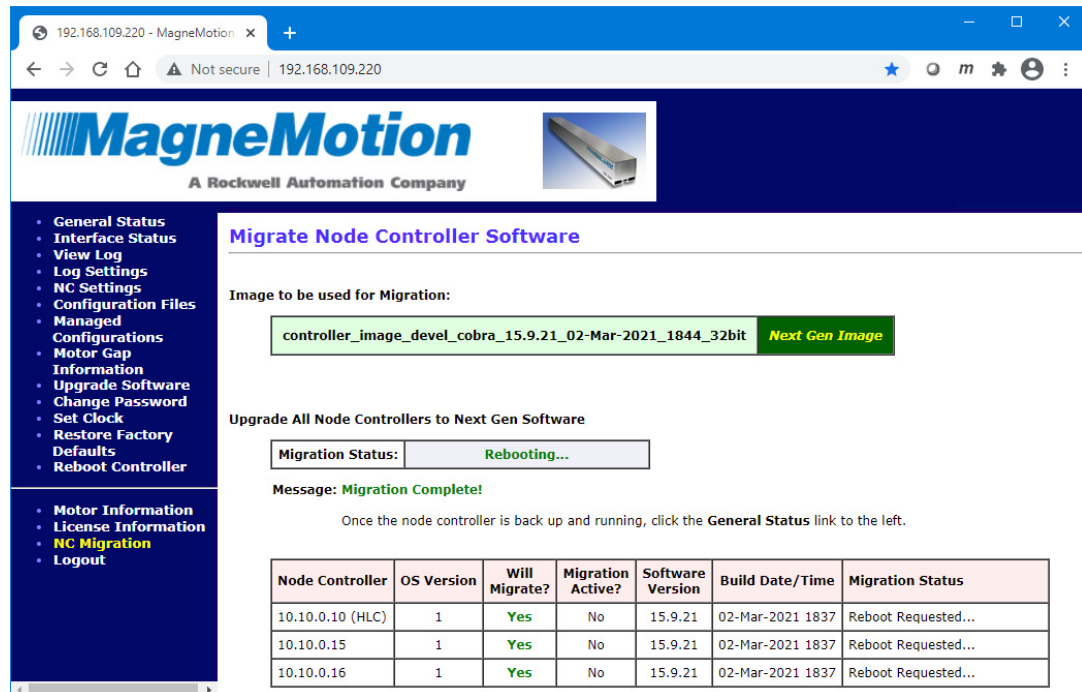


Figure 2-99: Upgrade Complete, Multiple Node Controllers

**NOTE:** Once the high-level controller starts rebooting, it disconnects from the browser displaying the web interface.

15. Wait one minute to make sure the reboot is complete then select any menu option in the web interface.  
*The browser reconnects to the high-level controller and the login screen is displayed.*
16. Log in using the default Admin account and password (admin/admin).

---

<b>NOTICE</b>	The admin account password is reset to the default, which is “admin” and any additional users that were added are deleted.
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17. Update any user accounts on the node controller as required.
18. Return the transport system to normal operation.

## Downgrading to the Legacy Node Controller Software

To return a node controller to the legacy format Software Image, the node controller must be running a Next Gen format Software Image. All Next Gen Software Images include the **NC Migration** option on the main menu as shown in [Figure 2-100](#).

The downgrade process references the node controllers identified in the Node Controller Configuration File. When multiple node controllers are referenced, the **NC Migration** page automatically displays the option to downgrade all node controllers at the same time.

Once a legacy format Software Image is installed, the node controller will not permit installation of a Next Gen format Software Image using the **Upgrade Software** page. The procedures in [Upgrading to the Next Gen Node Controller Software on page 138](#) must be used to install a Next Gen version Software Image.

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<b>IMPORTANT</b>	This process reformats the flash memory and installs a new bootloader. DO NOT TURN OFF POWER during the downgrade or the node controller must be returned to Rockwell Automation to be reimaged.
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### Downgrade Requirements

- Supported for the NC-LITE, NC-12, NC-E, and NC-S node controllers.
- All node controllers being downgraded must be running a Software Image that supports performing the downgrade.
- The node controller must have a minimum of 1 GB flash memory installed to perform this downgrade.



- Make sure that the transport system is stopped before downgrading. Performing this procedure causes all processes running on the node controllers and all communication with the host controller to halt.
- All node controllers in a transport system must be downgraded at the same time and must be running the same Software Image on a version that supports migration.

## Downgrade Cautions

- Power to all node controllers being downgraded must not be turned off during the upgrade process.

## Downgrade a Single Node Controller

One node controller that is functioning as both the high-level controller and the system node controller can be easily downgraded to the legacy format Software Image. If there are multiple node controllers in the transport system, they are identified and the process to [Downgrade All Node Controllers in a Transport System on page 156](#) is available.

1. Make sure that the transport system is stopped. Performing this procedure causes all processes running on the node controller and all communication with the host controller to halt.
2. Connect a browser to the node controller and log in using the Admin account.

The **General Status** page is displayed with the NC Migration option on the main menu as shown in [Figure 2-100](#).

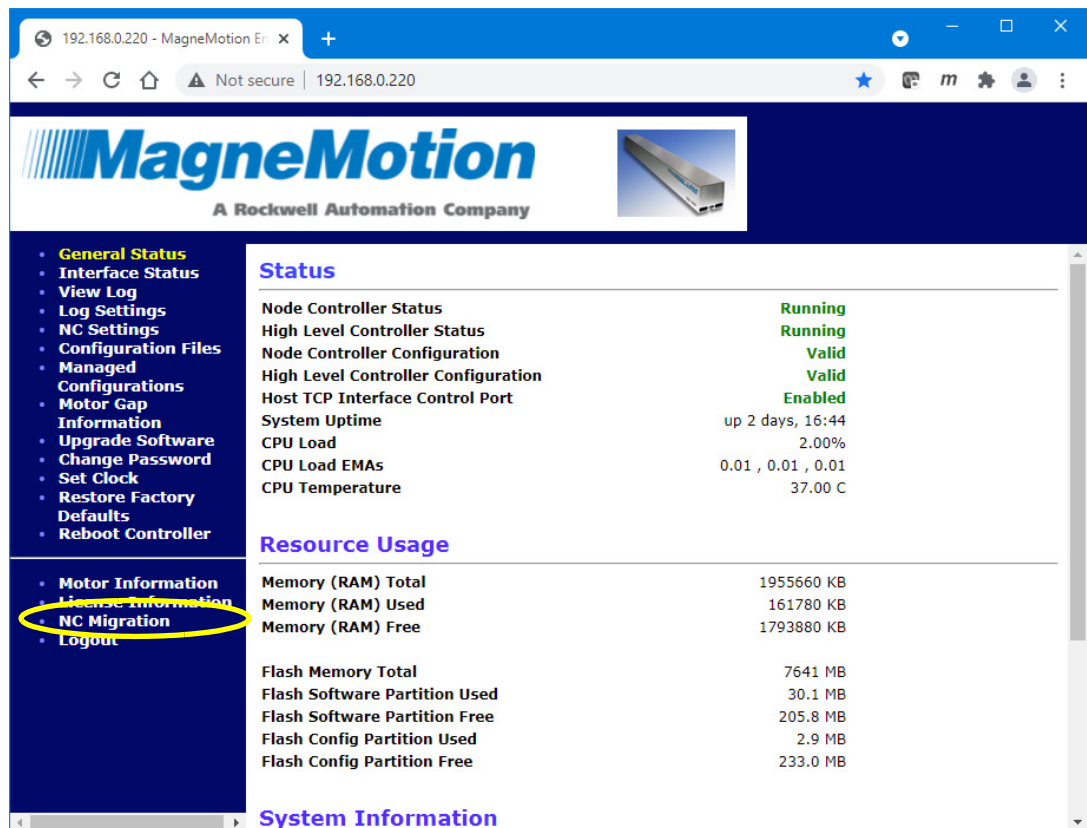
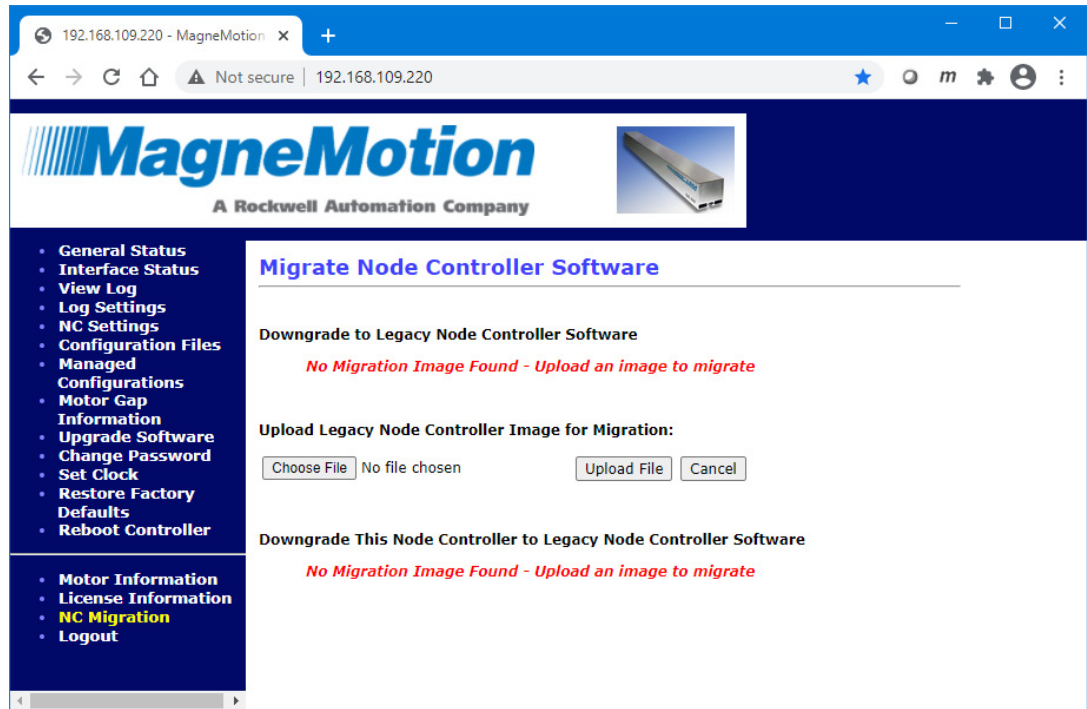


Figure 2-100: Node Controller with NC Migration Option



3. Select **NC Migration** to downgrade the node controller from the Next Gen format to the legacy format Software Image.

*The NC Migration page configured for downgrade is displayed as shown in Figure 2-101.*



*Figure 2-101: NC Migration Page for Downgrade*

4. On the **NC Migration** page, select **Choose File** to select the legacy format Software Image to downgrade to.
5. Use the dialog box controls to select the appropriate Node Controller Software Image and select **Open**.

*The file name is displayed next to the **Choose File** button.*

## 6. Select Upload File.

If the file selected cannot be used for downgrade, the **Upload Failed** notice shown in [Figure 2-102](#) is displayed when the file is uploaded. If the file selected can be used for downgrade, the file upload status is displayed as shown in [Figure 2-103](#).

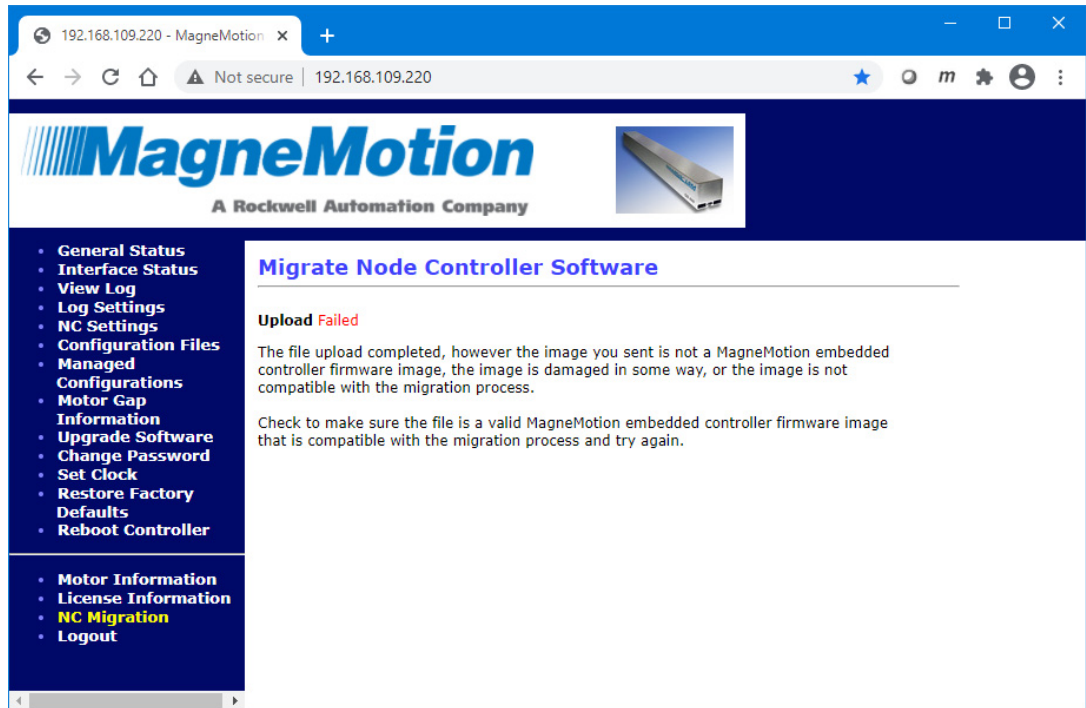


Figure 2-102: Upload Failed

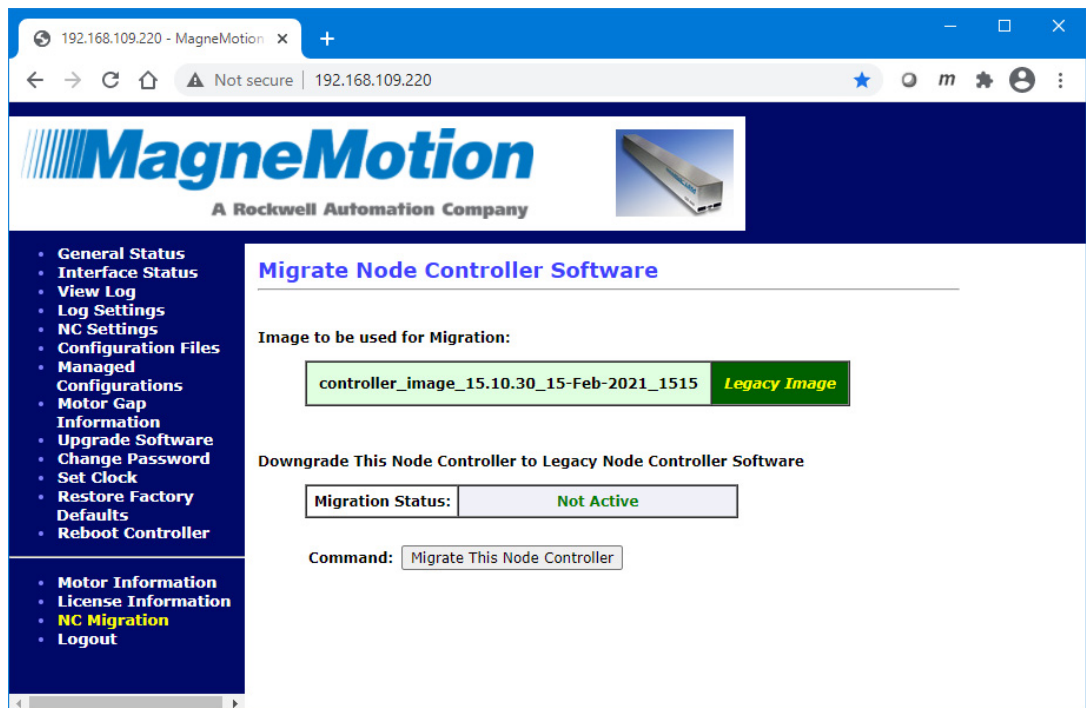


Figure 2-103: Legacy Image Ready for Downgrade

7. Select **Migrate This Node Controller** to start the downgrade process.

**IMPORTANT DO NOT TURN OFF THE POWER**

The web interface displays the alert shown in [Figure 2-104](#).

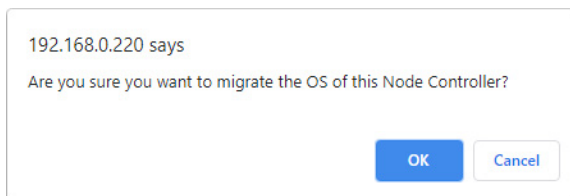


Figure 2-104: Migration Alert, Single Node Controller

8. Select **OK** on the alert.

The node controller starts the downgrade process and updates the **NC Migration** page with the status as shown in [Figure 2-105](#).

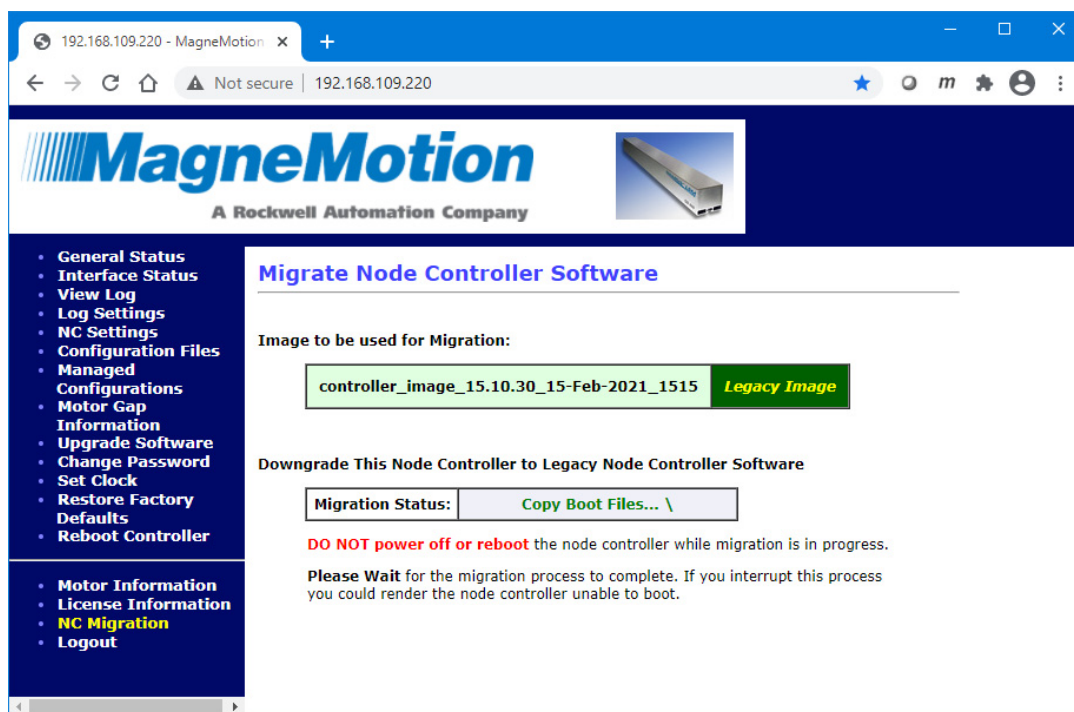


Figure 2-105: Downgrade Status, Single Node Controller

Once the downgrade is complete, the node controller reboots as shown in [Figure 2-106](#).

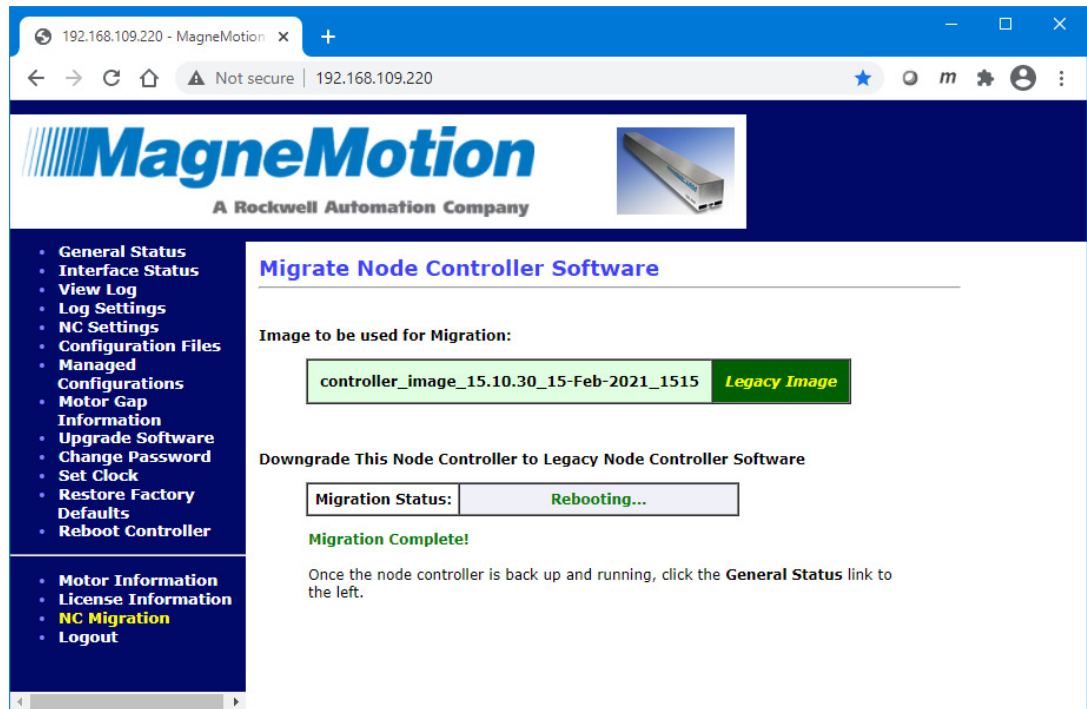


Figure 2-106: Downgrade Complete, Single Node Controller

**NOTE:** Once the node controller starts rebooting, it disconnects from the browser displaying the web interface.

9. Wait one minute to make sure the reboot is complete then select any menu option in the web interface.

*The browser reconnects to the node controller and the login screen is displayed.*

10. Log in using the default Admin account and password (admin/admin).

<b>NOTICE</b>	The admin account password is reset to the default, which is “admin” and any additional users that were added are deleted.
---------------	--

11. Update any user accounts on the node controller as required.
12. Once the node controller is running the legacy Software Image, clear the cache in the browser being used to access the node controller and refresh the screen to make sure that the menu is displayed properly.
13. Return the transport system to normal operation.

## Downgrade All Node Controllers in a Transport System

All node controllers in a transport system can be easily downgraded to the legacy format Software Image. The downgrade process references the node controllers identified in the Node Controller Configuration File. All node controllers being downgraded must have at least 1 GB flash memory installed and be running Software Images that can downgrade.

1. Make sure that the transport system is stopped. Performing this procedure causes all processes running on the node controllers and all communication with the host controller to halt.
2. Connect a browser to the HLC and log in using the Admin account.
3. Select **NC Migration** to downgrade all node controllers from the Next Gen format Software Image to the legacy format Software Image.

*The NC Migration page configured for downgrade is displayed as shown in Figure 2-107. This page also includes a list of all the node controllers in the transport system as defined in the Node Controller Configuration File.*

The screenshot shows the MagneMotion web interface for the 'Migrate Node Controller Software' page. The left sidebar contains a navigation menu with options like General Status, Interface Status, View Log, Log Settings, NC Settings, Configuration Files, Managed Configurations, Motor Gap Information, Upgrade Software, Change Password, Set Clock, Restore Factory Defaults, Reboot Controller, Motor Information, License Information, NC Migration (highlighted), and Logout. The main content area has the title 'Migrate Node Controller Software' and several sections: 'Downgrade to Legacy Node Controller Software' with a red message 'No Migration Image Found - Upload an image to migrate'; 'Upload Legacy Node Controller Image for Migration:' with a 'Choose File' button and 'No file chosen' text; 'Downgrade This Node Controller to Legacy Node Controller Software' with another red message; and 'Downgrade All Node Controllers to Legacy Software' with a 'Migration Status' box showing 'Not Active', a 'Message: None', and a 'Command: Probe Node Controllers' button. Below this is another red message and a table listing node controllers.

Node Controller	OS Version	Will Migrate?	Migration Active?	Software Version	Build Date/Time	Migration Status
10.10.0.10 (HLC)	1	Yes	No	15.9.21	02-Mar-2021 1844	Idle
10.10.0.15	Unknown	No	No	0.0.0	Unknown Unknown	Unknown
10.10.0.16	Unknown	No	No	0.0.0	Unknown Unknown	Unknown

Figure 2-107: NC Migration Page for Multiple Node Controller Downgrade

4. On the **NC Migration** page, select **Choose File** to select a legacy format Software Image to downgrade to.

5. Use the dialog box controls to select the appropriate Node Controller Software Image and select **Open**.

The file name is displayed next to the **Choose File** button.

6. Select **Upload File**.

If the file selected cannot be used for downgrade, the Upload Failed notice shown in Figure 2-102 is displayed when the file is uploaded. If the file selected can be used for downgrade, the file upload status is displayed.

Once the file upload is complete, the **NC Migration** page is redisplayed showing the Software Image uploaded and identifying it as a Legacy Image as shown in Figure 2-108.

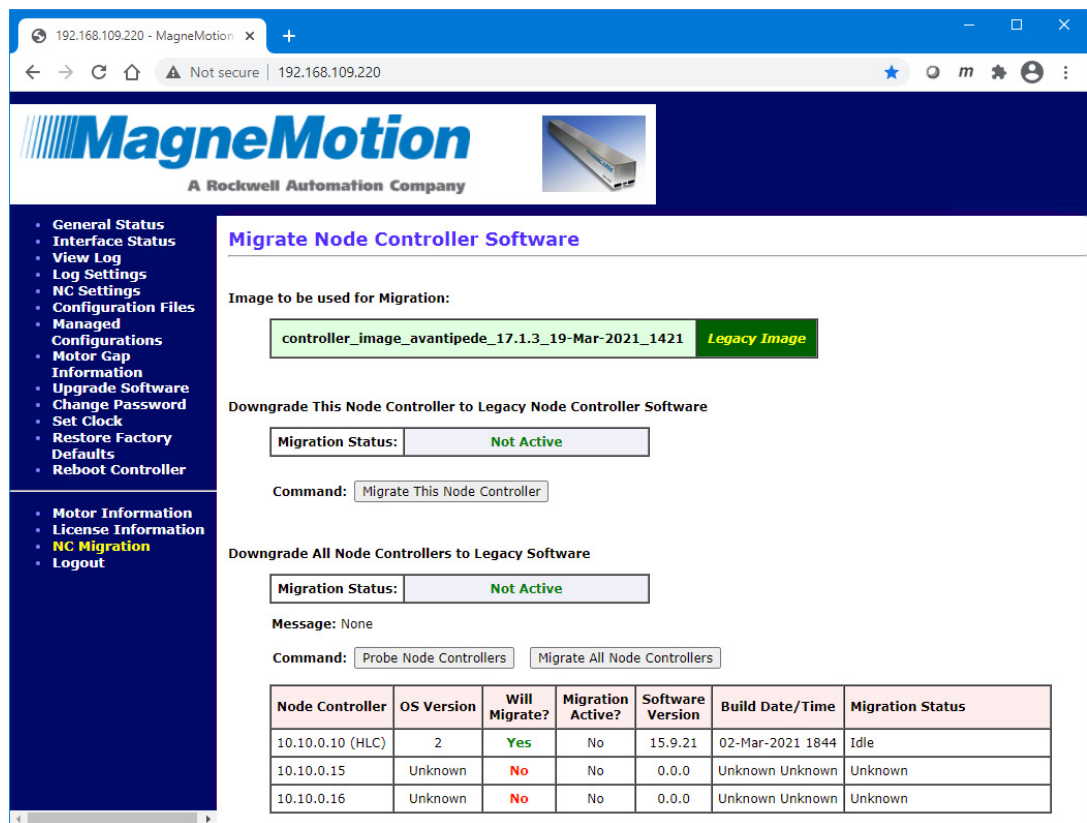


Figure 2-108: Legacy Image Ready for Multiple Node Controller Downgrade

7. Select **Probe Node Controllers** to verify all that node controllers are ready for the downgrade.

The node controller list is updated with the status of all node controllers as shown in Figure 2-109.

#### NOTICE

If the **Will Migrate** status of any node controllers is **No**, make sure that node controller is communicating with the HLC and running the correct Software Image.



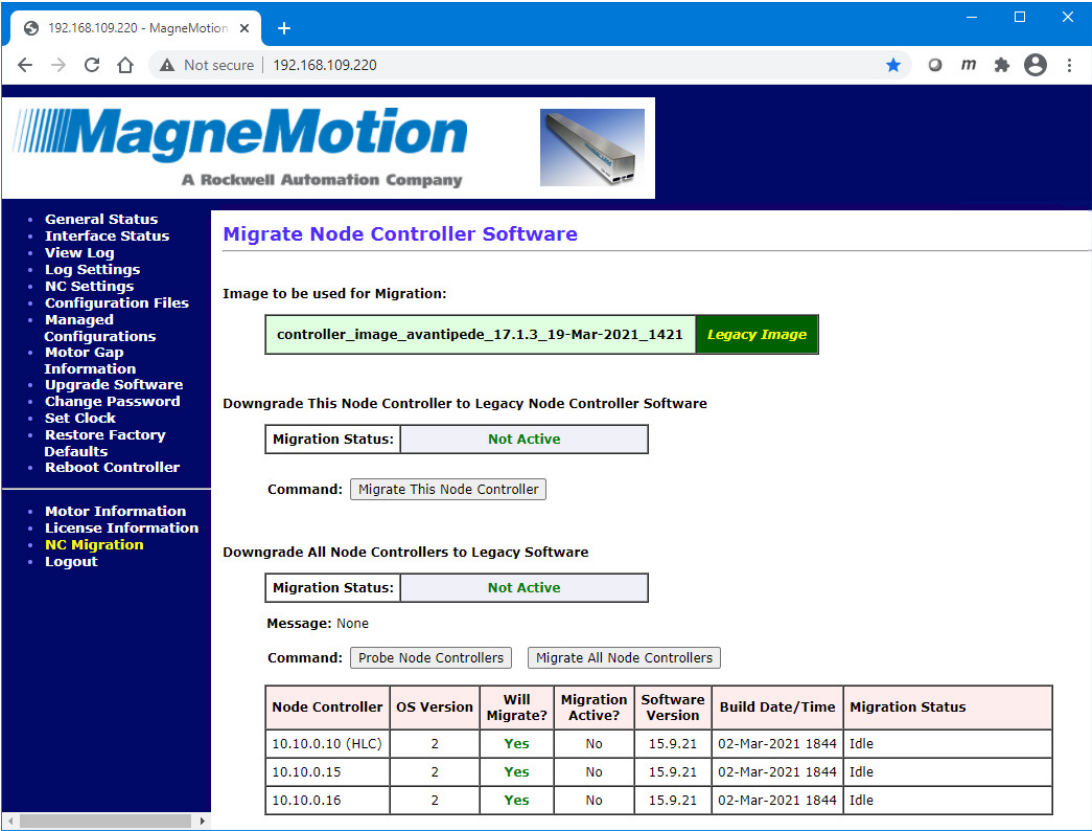


Figure 2-109: Legacy Image Ready for Multiple Node Controller Downgrade

8. Select **Migrate All Node Controllers** to start the downgrade process.

**IMPORTANT DO NOT TURN OFF THE POWER**

The web interface displays the alert shown in [Figure 2-110](#).

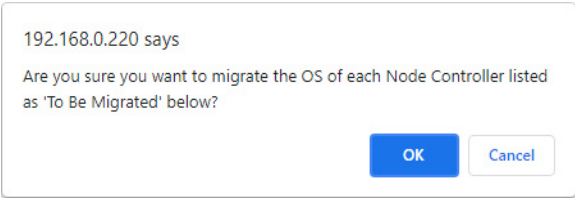


Figure 2-110: Migration Alert, Multiple Node Controllers

9. Select **OK** on the alert.

The node controller starts the downgrade process and updates the **NC Migration** page with the status of each node controller as shown in [Figure 2-111](#).



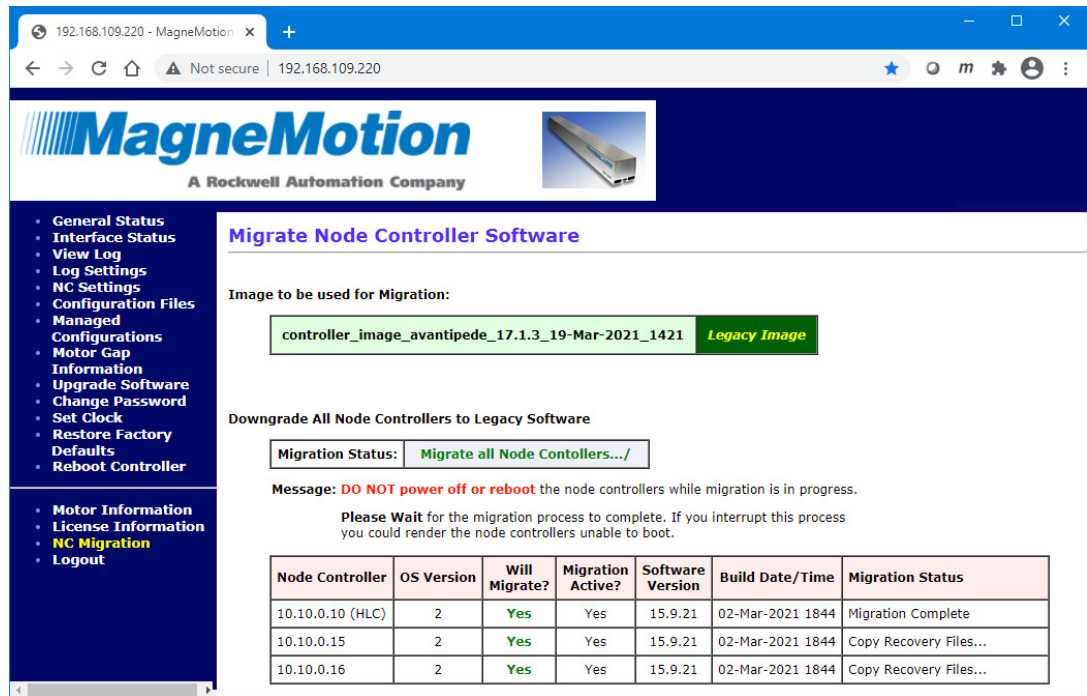


Figure 2-111: Downgrade Status, Multiple Node Controllers

Once the downgrade is complete, the node controller starts rebooting as shown in Figure 2-112.

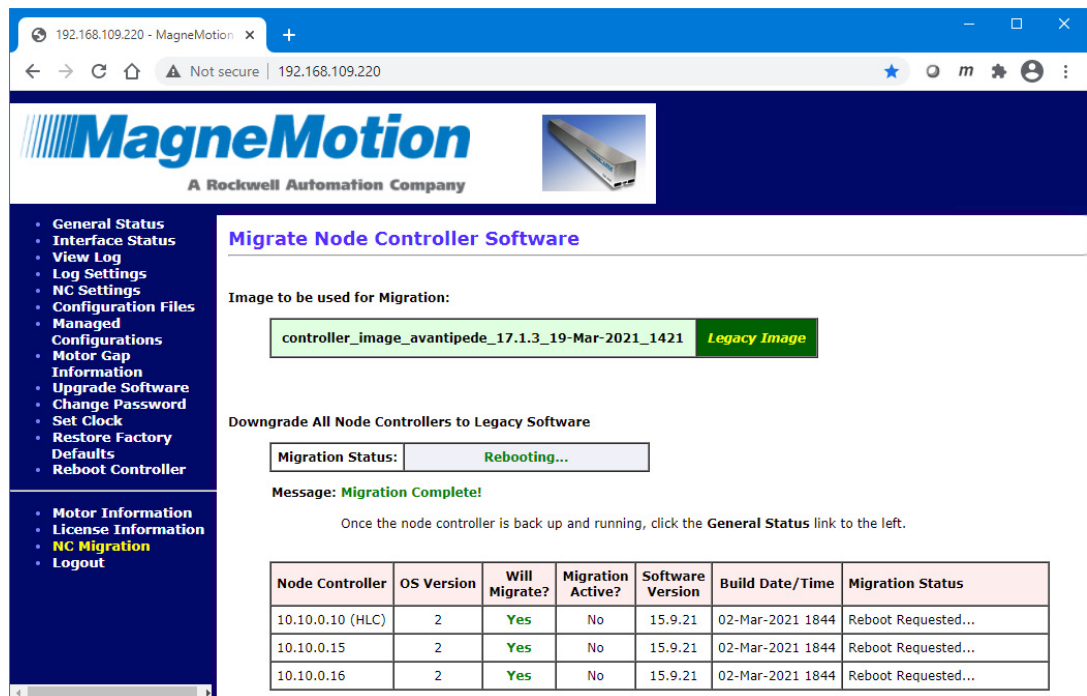


Figure 2-112: Downgrade Complete, Multiple Node Controllers

**NOTE:** Once the high-level controller starts rebooting, it disconnects from the browser displaying the web interface.

10. Wait one minute to make sure the reboot is complete then select any menu option in the web interface.

*The browser reconnects to the node controller and the login screen is displayed.*

11. Log in using the default Admin account and password (admin/admin).

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<b>NOTICE</b>	The admin account password is reset to the default, which is “admin” and any additional users that were added are deleted.
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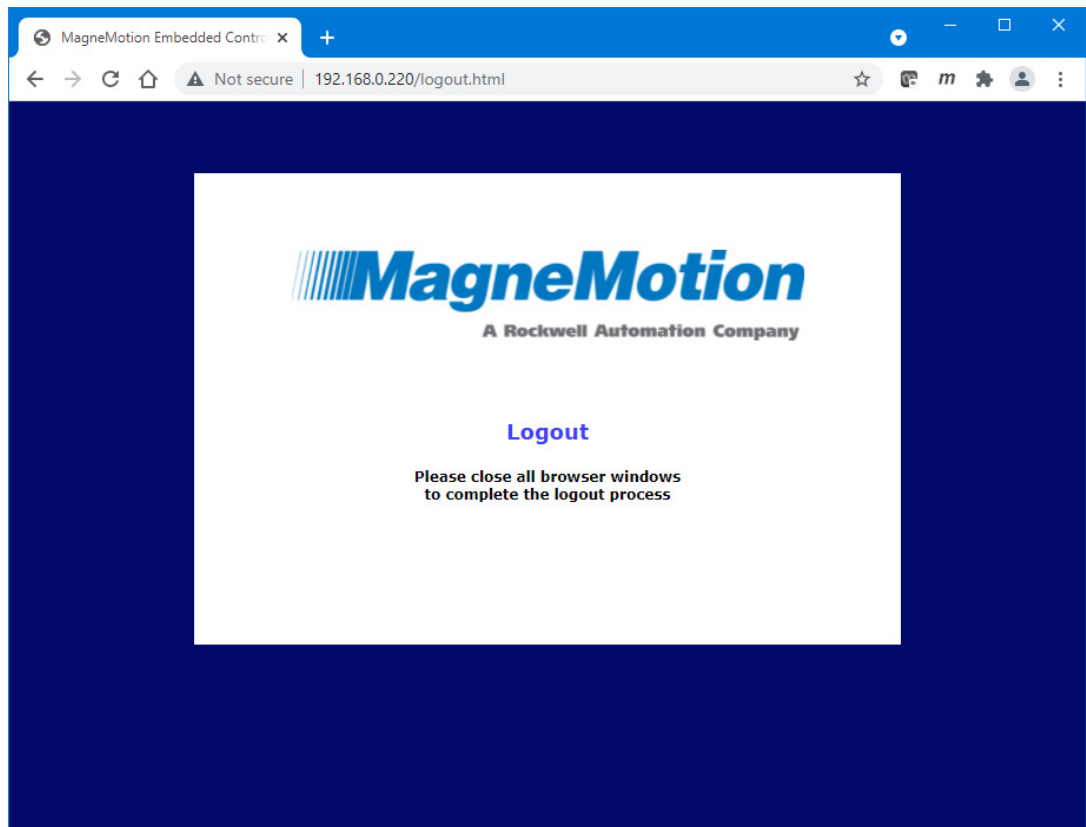
12. Update any user accounts on the node controller as required.
13. Once the node controller is running the legacy Software Image, clear the cache in the browser being used to access the node controller and refresh the screen to make sure that the menu is displayed properly.
14. Return the transport system to normal operation.

## Logout

This section describes how to close the web interface on the node controller. Logging out of the web interface does not stop the node controller.

1. Make sure that any tasks that have been started have completed.
2. Select **Logout** on the Main Menu.

*The Node Controller Logout page, which is shown in [Figure 2-113](#), is displayed.*



*Figure 2-113: Logout Page*

3. Close the web browser.

**NOTE:** The logout is not complete until the browser is closed.

*This page intentionally left blank.*

## Overview

This chapter provides examples and step-by-step procedures for administration of the node controller using the console interface that is supplied with the node controller. Administration tasks include configuring the IP address, setting the date and time, and other related functions. This administration is per node controller, for systems with multiple node controllers each node controller must be administered separately.

Included in this chapter are:

- Running the console interface.
- Setting the node controller IP address.
- Changing the date and time.
- Viewing the node controller and HLC log files.
- View node controller statistics.
- Restoring the factory default settings.
- Rebooting the node controller.

## Node Controller Console Administration Overview

Some administrative tasks for the node controllers in the transport system can be performed through the console interface. This procedure provides the basic steps for administration of each node controller in the transport system (with a reference to the detailed procedure):

1. Run the console interface for the node controller on a service computer connected to the node controller (see [Run the Console Interface on page 165](#)).
2. Set the IP address for the node controller (see [Use an RS-232 Connection to Set the IP Address on page 167](#)).
3. Set the date and time (see [Set the Clock Time and Date on page 172](#)).
4. Review the node controller and HLC log files to verify proper operation (see [Log Files on page 173](#)).
5. Review the System Statistics for the node controller to verify proper operation (see [System Statistics on page 175](#)).
6. Restore Factory Defaults if instructed by the Rockwell Automation Technical Support Center (see [Restore Factory Defaults on page 177](#)).
7. Reboot the node controller as necessary if changes were made to the configuration (see [Reboot the Node Controller on page 179](#)).

## Run the Console Interface

Some administrative tasks for node controllers may be performed through the console interface. Since it is a serial communications interface, any terminal emulator application can be used for communication. Use a Null Modem RS-232 cable to connect a service computer to the Console port on the node controller. All examples that are provided in this manual use Windows 7 and PuTTY<sup>®</sup> (a free SSH and telnet client for Windows).

### Configure and Run the Terminal Emulator

1. Make sure that the node controller is plugged in and has completed booting up.
2. Connect the service computer to the Console port on the node controller with a null modem RS-232 cable.
3. Configure the terminal emulator for communications. The Console port settings are:
  - Speed: 115,200 bps
  - Data bits: 8
  - Parity: None
  - Stop bits: 1
  - Flow control: None
4. On the service computer, use a terminal emulator such as PuTTY to open a session (see the documentation that is supplied with PuTTY for operating information) as shown in [Figure 3-1](#).



*Figure 3-1: Terminal Emulator Window*



5. Once the connection is established, log in to the node controller.
  - User Name: admin
  - Password: admin (for a new node controller, or the recorded password for an installed node controller)

The console interface **Main Menu**, which is shown in [Figure 3-2](#), is displayed.

**NOTE:** The menu options that are presented may differ from the options that are shown in [Figure 3-2](#) depending on the version of the Node Controller Software Image file, but all main functions are always available.



```
COM5 - PuTTY
MagneMotion, Inc. Embedded Controller
embedded-controller login: admin
Password:

=====
      MagneMotion Embedded Controller
      Version: 15.11.6  09-Jun-2021 1234
=====

-- Main Menu --

n - Network Settings
d - Set System Date/Time
lh - View the HLC Log file
ln - View the NC Log file
s - System Statistics
b - Set terminal backspace character
f - Factory: Reset Config to Factory Defaults

x - Exit
rb - Reboot Controller

Jun 10, 2021 15:52:01 Selection: _
```

*Figure 3-2: Console Interface Main Menu*

6. Enter the function code at the **Selection** prompt to access the functions. Expand the window and use the scroll bars to see additional information as needed.

## Configuring IP Settings

The Network Settings are used to configure the network address of the node controller. Typically, configuring the network settings is only required for a new node controller or for a node controller that has been reset to the factory defaults.

### Setting Node Controller IP Addresses

All new node controllers are shipped with the factory default IP address of 192.168.0.1. To function properly as part of the transport system, the address must be changed to a unique address that matches the addressing structure of the network for the transport system. The entry for each node controller must be updated in the Node Controller Configuration File to match (see the *MagneMotion System Configurator User Manual*, publication [MMI-UM046](#)).

Once all node controllers on the network have unique addresses, administration of the transport system can begin. Administration includes uploading the configuration and software image files to the node controllers as described in [Node Controller Web Administration Overview on page 30](#).

#### Use a Network Connection to Set the IP Address

The IP address of the node controller can be changed by connecting a service computer to the transport system network and adding the node controllers to the network (see [Use a Network Connection to Set the IP Address on page 39](#)).

#### Use an RS-232 Connection to Set the IP Address

The IP address of the node controller can be changed by connecting a service computer with a terminal emulator directly to the Console Port on the node controller. This connection requires a null modem RS-232 cable. The IP address for the node controller must be changed from the factory default to an address appropriate for use with the network at the facility where the transport system is installed.

**NOTE:** These instructions apply to Windows and PuTTY. When using another version of Windows or another terminal emulator, the figures and steps may be different.

The IP addresses shown in these examples are for reference only. Consult the IT department for the facility for specific IP address information.

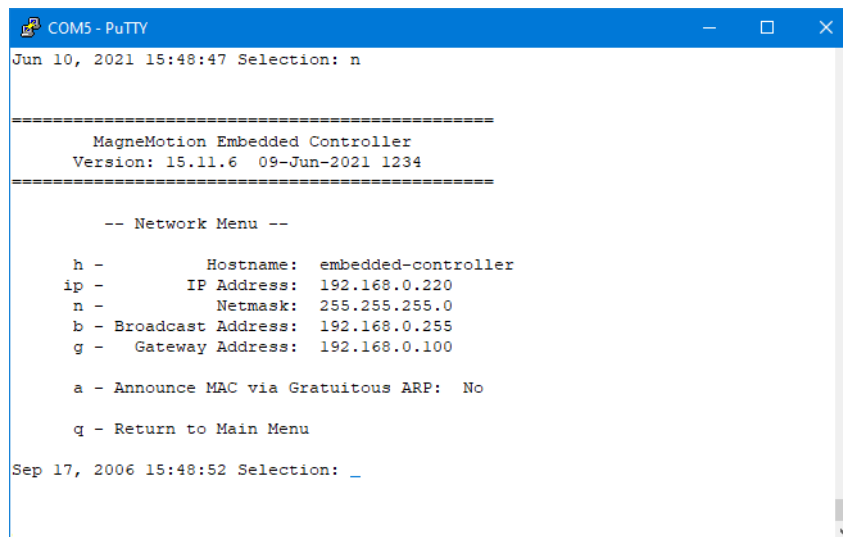
The keyboard translation of some terminal emulators does not properly recognize the backspace key. When entering a backspace, verify that the node controller has accepted the new values for keyboard entry. If the entry is not recognized, a message indicating an invalid entry is displayed or when selecting a menu item, it may not actually change to the desired menu. If you encounter this issue, see [Step 5 in the Change the IP Address of the Node Controller](#) section for more information.

## Change the IP Address of the Node Controller

**NOTE:** Any changes made to the IP address configuration must be saved by using the “w” option (displayed after changes are made) as shown in [Step 8](#).

1. At the **Selection** prompt, enter “n” and press <Enter> (see [Main Menu on page 247](#) for detailed descriptions of all items).

*The console interface **Network Menu**, which is shown in [Figure 3-3](#), is displayed. This menu shows the current IP address configuration.*



```
COM5 - PuTTY
Jun 10, 2021 15:48:47 Selection: n

=====
MagneMotion Embedded Controller
Version: 15.11.6 09-Jun-2021 1234
=====

-- Network Menu --

h -      Hostname:  embedded-controller
ip -      IP Address:  192.168.0.220
n -      Netmask:    255.255.255.0
b - Broadcast Address: 192.168.0.255
g - Gateway Address:  192.168.0.100

a - Announce MAC via Gratuitous ARP: No

q - Return to Main Menu

Sep 17, 2006 15:48:52 Selection: _
```

Figure 3-3: Network Menu

2. To change the internal name of the node controller, at the **Selection** prompt, enter “h” and press <Enter> (see [Network Settings Menu on page 249](#) for detailed descriptions of all items).

*The **New Hostname** prompt is displayed.*

Enter a name for the node controller and press <Enter>.

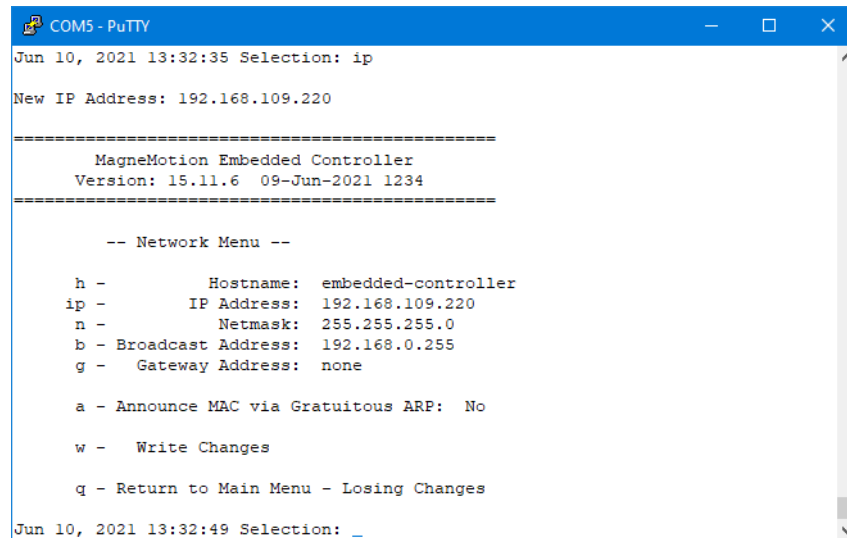
*The console interface **Network Menu**, which is shown in [Figure 3-4](#), is redisplayed and the menu is updated to show the new name for the node controller.*

3. To change the IP address, at the **Selection** prompt, enter “ip” and press <Enter> (see [Network Settings Menu on page 249](#) for detailed descriptions of all items).

*The **New IP Address** prompt is displayed.*

Enter an IP address to match the network for the system and press <Enter>.

*The console interface **Network Menu**, which is shown in [Figure 3-4](#), is redisplayed and the menu is updated to show the new IP address for the node controller.*



```
COM5 - PuTTY
Jun 10, 2021 13:32:35 Selection: ip
New IP Address: 192.168.109.220

=====
MagneMotion Embedded Controller
Version: 15.11.6 09-Jun-2021 1234
=====

-- Network Menu --

h -      Hostname:  embedded-controller
ip -     IP Address: 192.168.109.220
n -      Netmask:   255.255.255.0
b - Broadcast Address: 192.168.0.255
g -      Gateway Address: none

a - Announce MAC via Gratuitous ARP: No

w - Write Changes

q - Return to Main Menu - Losing Changes

Jun 10, 2021 13:32:49 Selection: _
```

Figure 3-4: New IP Address

4. To change the Netmask, at the **Selection** prompt, enter “n” and press <Enter>.

*The New Netmask prompt is displayed.*

Enter the **Netmask** to match the network for the system and press <Enter>.

*The console interface **Network Menu**, which is shown in Figure 3-4, is redisplayed and the menu is updated to show the new Netmask for the node controller.*

5. To change the Broadcast address, at the **Selection** prompt, enter “b” and press <Enter>.

*The New Broadcast Address prompt is displayed.*

Enter the **Broadcast Address** to match the network for the system and press <Enter>.

*The console interface **Network Menu**, which is shown in Figure 3-4, is redisplayed and the menu is updated to show the new Broadcast address for the node controller.*

6. To change the Gateway address, at the **Selection** prompt, enter “g” and press <Enter>.

*The New Gateway Address prompt is displayed.*

Enter the **Gateway Address** to match the network for the system and press <Enter>.

*The console interface **Network Menu**, which is shown in Figure 3-4, is redisplayed and the menu is updated to show the new Gateway address for the node controller.*

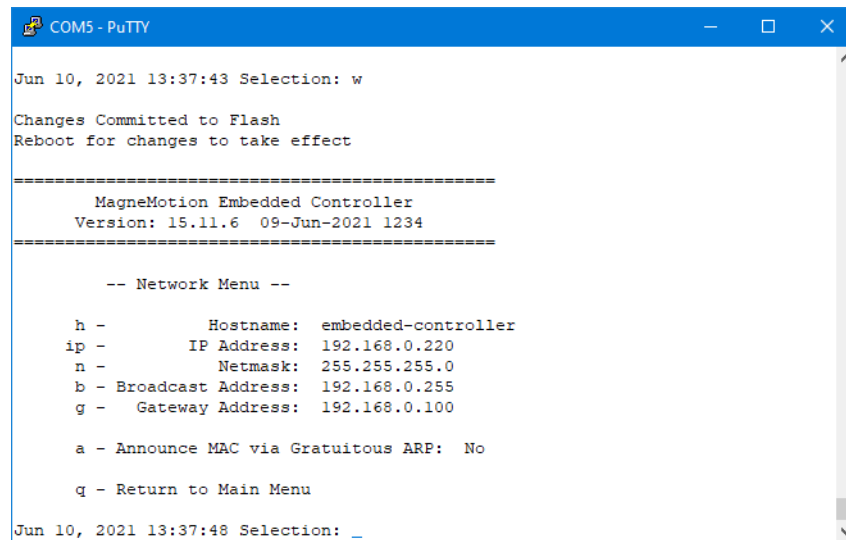
7. To change the **Gratuitous ARP** setting, at the **Selection** prompt, enter “a” and press <Enter>.

*The console interface **Network Menu**, which is shown in Figure 3-4, is redisplayed and the menu is updated to show the new Gratuitous ARP setting.*

8. At the **Selection** prompt, enter “w” and press <Enter> to write the changes to the non-volatile memory in the node controller.

*The console interface displays the write status and the **Network Menu** is redisplayed as shown in [Figure 3-5](#).*

**NOTE:** We recommend recording the IP address of the node controller in the transport system documentation.



```
COM5 - PuTTY
Jun 10, 2021 13:37:43 Selection: w

Changes Committed to Flash
Reboot for changes to take effect

=====
MagneMotion Embedded Controller
Version: 15.11.6 09-Jun-2021 1234
=====

-- Network Menu --

h -      Hostname:  embedded-controller
ip -     IP Address: 192.168.0.220
n -      Netmask:   255.255.255.0
b -     Broadcast Address: 192.168.0.255
g -     Gateway Address: 192.168.0.100

a - Announce MAC via Gratuitous ARP: No

q - Return to Main Menu

Jun 10, 2021 13:37:48 Selection: _
```

*Figure 3-5: Network Changes Saved to Flash*

9. At the **Selection** prompt, enter “q” and press <Enter> to return to the Main Menu.  
*The console interface **Main Menu** is displayed.*
10. At the **Selection** prompt, enter “rb” and press <Enter> to reboot the node controller (see [Reboot the Node Controller on page 179](#)).  
*The node controller prompts for verification of the reboot request.*
11. At the prompt, enter “y” and press <Enter>.  
*The node controller is rebooted and the network changes are activated.*
12. Once the **Login** prompt is redisplayed, close the terminal emulator.

## Verify the Node Controller IP Address

1. Run the web interface from a general-purpose computer that can access the network for the transport system using the IP address assigned (see [Run the Node Controller Web Interface on page 31](#)).
2. Select **NC Settings** on the Main Menu.  
*The NC Settings page is displayed as shown in [Figure 2-10, NC Settings Page Showing Factory IP Address, on page 43](#).*
3. In the **IP Settings** section, verify the settings and make any changes necessary (see [Verify the Node Controller IP Address on page 44](#)).

## Set the Clock Time and Date

This section describes how to change the date and time settings for the node controller to make sure that the clock on the node controller is accurate. Changing the time can also be used to account for a change in Time Zone, Daylight Saving Time, Leap Year, and so on.

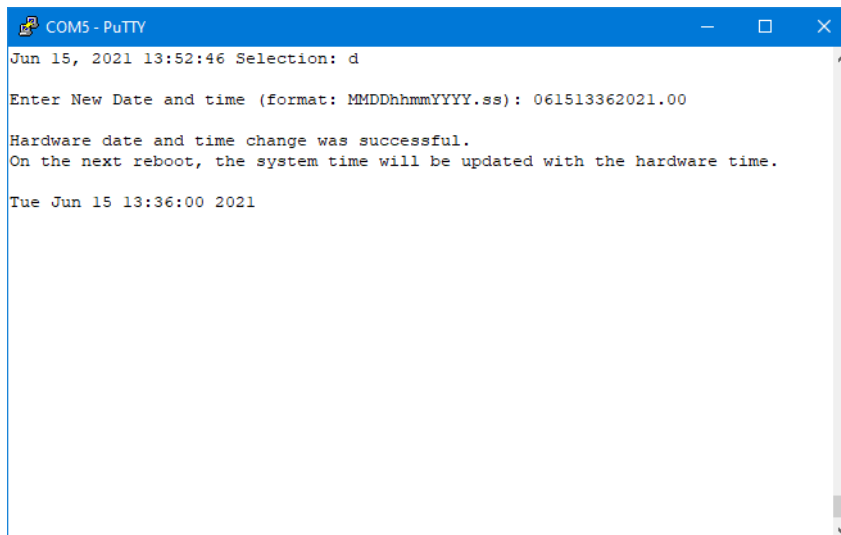
1. At the **Selection** prompt, enter “d” and press <Enter> (see [Main Menu on page 247](#) for detailed descriptions of all items).

*The console interface prompts for the new date and time to be entered.*

**NOTE:** Both the date and time must be specified.

2. Enter the date and time in the MMDDhhmmYYYY.ss format using a 24-hour clock and press <Enter>.

*The console interface displays the status of the change as shown in [Figure 3-6](#).*



*Figure 3-6: New Clock Settings*

3. At the **Selection** prompt, enter “rb” and press <Enter> to reboot the node controller (see [Reboot the Node Controller on page 179](#)).

*The node controller prompts for verification of the reboot request.*

4. At the prompt, enter “y” and press <Enter>.

*The node controller is rebooted and the system time is updated.*



## Log Files

This section describes how to view the log files for the node controller. The log files are used to monitor the status of the node controller and to determine if there is a problem with the operation of the node controller. See [Log Message Troubleshooting on page 258](#) for descriptions of typical log messages.

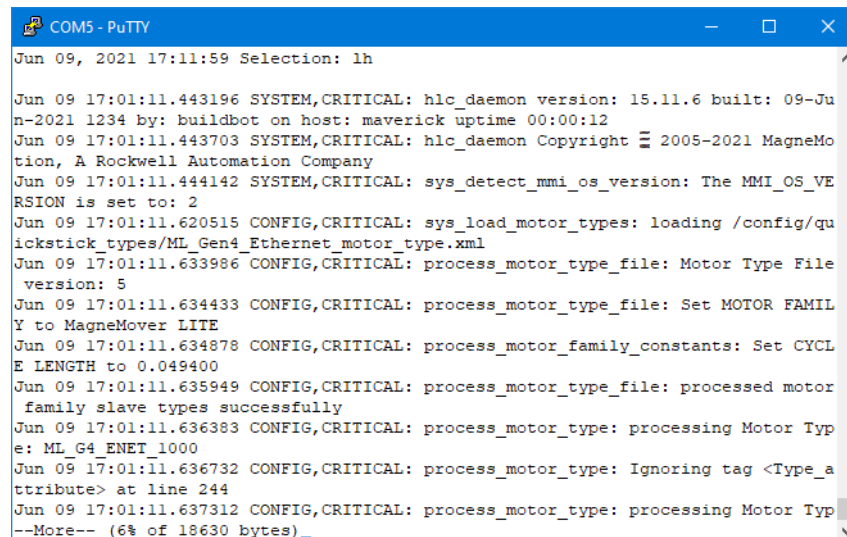
**NOTE:** Whenever the node controller is rebooted, restarted, or power is cycled the old log files are deleted and new log files are created.

The file size limit of the log file (node controller or HLC) is 12 MB. Once the log file reaches this limit, the oldest log information is over-written in 4 MB chunks.

### High-Level Controller Log File

1. At the **Selection** prompt, enter “lh” and press <Enter>.

*If the node controller is configured as an HLC or a high-level controller simulator, the console interface displays the first lines of the HLC log file as shown in [Figure 3-7](#). If the node controller is not configured as an HLC, a message stating “There is no HLC log file” is displayed.*



```
COM5 - PuTTY
Jun 09, 2021 17:11:59 Selection: lh

Jun 09 17:01:11.443196 SYSTEM,CRITICAL: hlc_daemon version: 15.11.6 built: 09-Jun-2021 1234 by: buildbot on host: maverick uptime 00:00:12
Jun 09 17:01:11.443703 SYSTEM,CRITICAL: hlc_daemon Copyright © 2005-2021 MagneMotion, A Rockwell Automation Company
Jun 09 17:01:11.444142 SYSTEM,CRITICAL: sys_detect_mmi_os_version: The MMI_OS_VERSION is set to: 2
Jun 09 17:01:11.620515 CONFIG,CRITICAL: sys_load_motor_types: loading /config/quicksilver_types/ML_Gen4_Ethernet_motor_type.xml
Jun 09 17:01:11.633986 CONFIG,CRITICAL: process_motor_type_file: Motor Type File version: 5
Jun 09 17:01:11.634433 CONFIG,CRITICAL: process_motor_type_file: Set MOTOR FAMILY to MagneMover LITE
Jun 09 17:01:11.634878 CONFIG,CRITICAL: process_motor_family_constants: Set CYCLE LENGTH to 0.049400
Jun 09 17:01:11.635949 CONFIG,CRITICAL: process_motor_type_file: processed motor family slave types successfully
Jun 09 17:01:11.636383 CONFIG,CRITICAL: process_motor_type: processing Motor Type: ML_G4_ENET_1000
Jun 09 17:01:11.636732 CONFIG,CRITICAL: process_motor_type: Ignoring tag <Type_attribute> at line 244
Jun 09 17:01:11.637312 CONFIG,CRITICAL: process_motor_type: processing Motor Type
--More-- (6% of 18630 bytes)_
```

Figure 3-7: HLC Log File

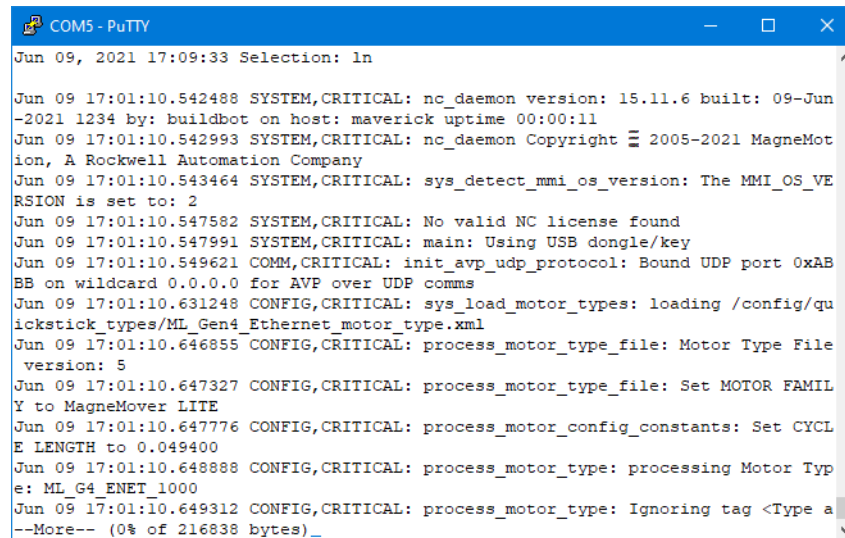
2. Press <Enter> to display the next line of the log.
3. Press <q> to stop the log display, then press <Enter> to return to the Main Menu.

*The console interface **Main Menu** is displayed.*

## Node Controller Log File

1. At the **Selection** prompt, enter “ln” and press <Enter>.

*If the node controller is configured as a node controller, the console interface displays the first lines of the NC log file as shown in [Figure 3-8](#). If the node controller is not configured as a node controller (configured as an HLC or a high-level controller simulator), a message stating “There is no NC log file” is displayed.*



```
COM5 - PuTTY
Jun 09, 2021 17:09:33 Selection: ln

Jun 09 17:01:10.542488 SYSTEM,CRITICAL: nc_daemon version: 15.11.6 built: 09-Jun
-2021 1234 by: buildbot on host: maverick uptime 00:00:11
Jun 09 17:01:10.542993 SYSTEM,CRITICAL: nc_daemon Copyright © 2005-2021 MagneMot
ion, A Rockwell Automation Company
Jun 09 17:01:10.543464 SYSTEM,CRITICAL: sys_detect_mmi_os_version: The MMI_OS_VE
RSION is set to: 2
Jun 09 17:01:10.547582 SYSTEM,CRITICAL: No valid NC license found
Jun 09 17:01:10.547991 SYSTEM,CRITICAL: main: Using USB dongle/key
Jun 09 17:01:10.549621 COMM,CRITICAL: init_avp_udp_protocol: Bound UDP port 0xAB
BB on wildcard 0.0.0.0 for AVP over UDP comms
Jun 09 17:01:10.631248 CONFIG,CRITICAL: sys_load_motor_types: loading /config/qu
ickstick_types/ML_Gen4_Ethernet_motor_type.xml
Jun 09 17:01:10.646855 CONFIG,CRITICAL: process_motor_type_file: Motor Type File
version: 5
Jun 09 17:01:10.647327 CONFIG,CRITICAL: process_motor_type_file: Set MOTOR FAMIL
Y to MagneMover LITE
Jun 09 17:01:10.647776 CONFIG,CRITICAL: process_motor_config_constants: Set CYCL
E LENGTH to 0.049400
Jun 09 17:01:10.648888 CONFIG,CRITICAL: process_motor_type: processing Motor Typ
e: ML_G4_ENET_1000
Jun 09 17:01:10.649312 CONFIG,CRITICAL: process_motor_type: Ignoring tag <Type a
--More-- (0% of 216838 bytes)_
```

Figure 3-8: NC Log File

2. Press <Enter> to display the next line of the log.
3. Press <q> to stop the log display, then press <Enter> to return to the Main Menu.

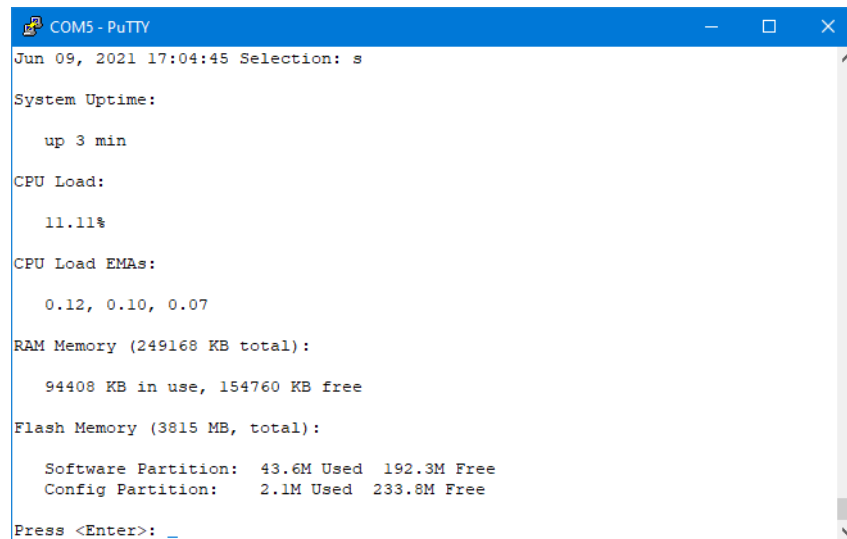
*The console interface **Main Menu** is displayed.*

## System Statistics

This section describes how to view the operating statistics for the node controller.

1. At the **Selection** prompt, enter “s” and press <Enter> (see [System Statistics on page 251](#) for detailed descriptions of all items).

*The console displays the node controller statistics as shown in [Figure 3-9](#).*



```
COM5 - PuTTY
Jun 09, 2021 17:04:45 Selection: s

System Uptime:
    up 3 min

CPU Load:
    11.11%

CPU Load EMAs:
    0.12, 0.10, 0.07

RAM Memory (249168 KB total):
    94408 KB in use, 154760 KB free

Flash Memory (3815 MB, total):
    Software Partition: 43.6M Used 192.3M Free
    Config Partition:   2.1M Used 233.8M Free

Press <Enter>: _
```

*Figure 3-9: NC Statistics*

2. Press <Enter> to return to the Main Menu.

*The console interface **Main Menu** is displayed.*

## Set Terminal Backspace Character

This section describes how to change the backspace character used by the console interface to the character appropriate for the terminal emulator being used.

1. At the **Selection** prompt, enter “b” and press <Enter> (see [Set Terminal Backspace Character on page 252](#) for detailed descriptions of all items).

*The console displays the set terminal backspace character option as shown in Figure 3-10.*



*Figure 3-10: Set Terminal Backspace Character*

2. Enter the appropriate option for the terminal emulator being used and press <Enter>. If option 3 is entered, enter the appropriate key code at the prompt and press <Enter>. *The console interface **Main Menu** is displayed.*

## Restore Factory Defaults

This section describes how to reset the node controller to an unprogrammed state. Restoring factory defaults makes sure that only the Node Controller Software Image files remain on the node controller, but all other files and information are removed, including:

- Node Controller Configuration Files (*node\_configuration.xml*).
- Motor Type files (*motor\_type.xml*).
- Magnet Array Type files (*magnet\_array\_type.xml*).
- Motor ERF Image files (*motor\_image.erf*).
- Configuration settings, such as designating the node controller as the HLC.
- IP settings are reset to the factory default.

---

<b>NOTICE</b>	To avoid losing any information, download all node controller files using the web interface and record all settings before restoring the Factory Defaults.
---------------	--

---

Once the node controller has been reset, all node controller files and settings can be restored using the web interface. Restore either from the files that were downloaded from the node controller or from files that are downloaded from another node controller, which makes sure both node controllers contain the same files.

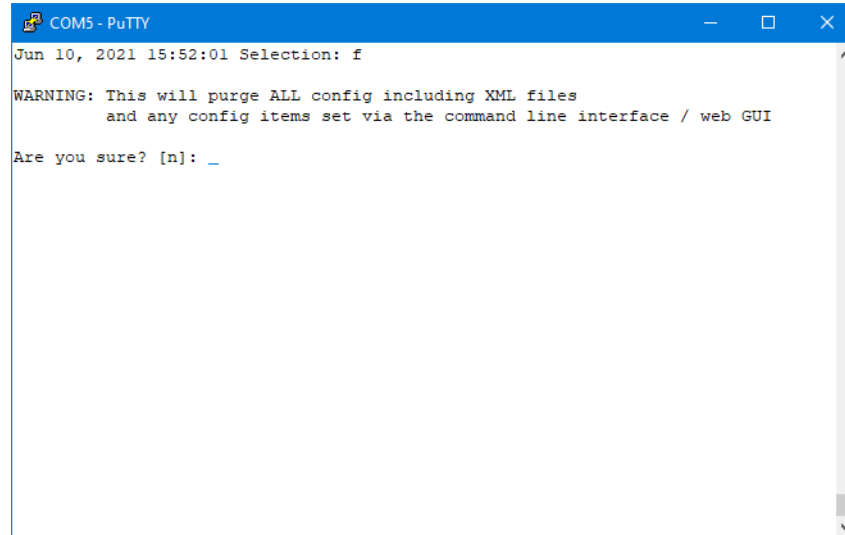
1. Download all files.

See:

- [\*Download the Existing Node Controller Configuration File on page 53\*](#)
- [\*Download Existing Motor Type Files on page 62, Download Existing Magnet Array Type Files on page 66\*](#)
- [\*Download an Existing Node Controller Software Image File on page 89\*](#)
- [\*Download the Existing Motor ERF Image File on page 102\*](#) and
- [\*Download Log Files on page 37\*](#)

2. At the **Selection** prompt, enter “f” and press <Enter> (see [Main Menu on page 247](#) for detailed descriptions of all items).

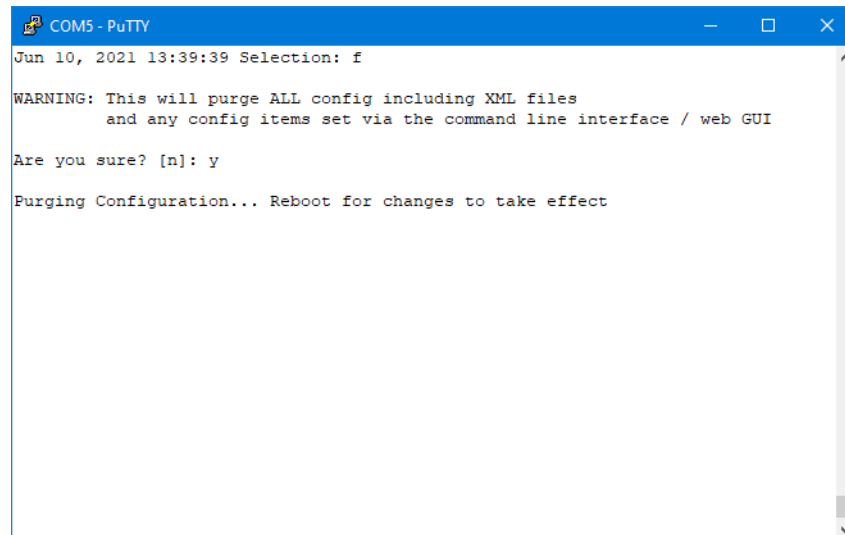
*The console interface displays the reset warning as shown in [Figure 3-11](#).*



*Figure 3-11: Factory Reset Warning*

3. At the prompt, enter “y” and press <Enter>.

*The Factory Defaults are restored, all custom configurations are removed, and the node controller prompts for a reboot as shown in [Figure 3-12](#).*



*Figure 3-12: Factory Reset*

4. Reboot the node controller (see [Reboot the Node Controller on page 179](#)).

## Reboot the Node Controller

This section describes how to reboot the node controller. Rebooting is required after:

- Making changes to the IP address (see [Configuring IP Settings on page 167](#)).
- Changing the Clock (see [Set the Clock Time and Date on page 172](#)).
- Restoring the Factory Default settings (see [Restore Factory Defaults on page 177](#)).

**NOTE:** Each time the node controller is rebooted the old log file is erased and a new log file is created. It may be desirable to download the existing file before rebooting (see [Download Log Files on page 37](#)).

This interrupts normal operation and should only be done during transport system maintenance when there are no active commands.

1. At the **Selection** prompt, enter “rb” and press <Enter> (see [Main Menu on page 247](#) for detailed descriptions of all items).

*The console interface displays the reboot verification as shown in [Figure 3-13](#).*

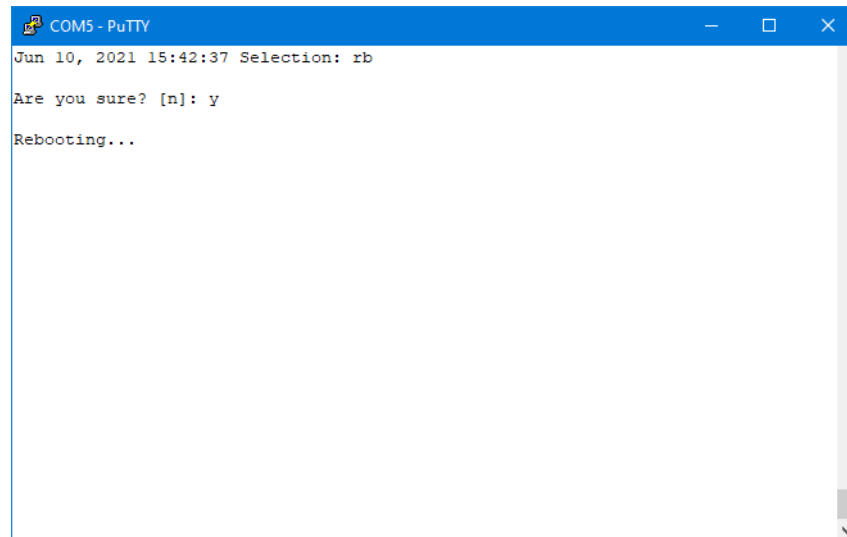


*Figure 3-13: Node Controller Reboot Verification*



2. At the prompt, enter “y” and press <Enter>.

*The node controller reboots as shown in [Figure 3-14](#).*



*Figure 3-14: Start of Node Controller Rebooting*

## Exit

This section describes how to exit the console interface. Exiting the console interface does not stop the node controller.

1. Make sure that any tasks that have been started have completed.
2. At the **Selection** prompt, enter “x” and press <Enter> (see [Main Menu on page 247](#) for detailed descriptions of all items).

*The console interface exits. The terminal emulator continues to run until it is shut down.*

*This page intentionally left blank.*

## Overview

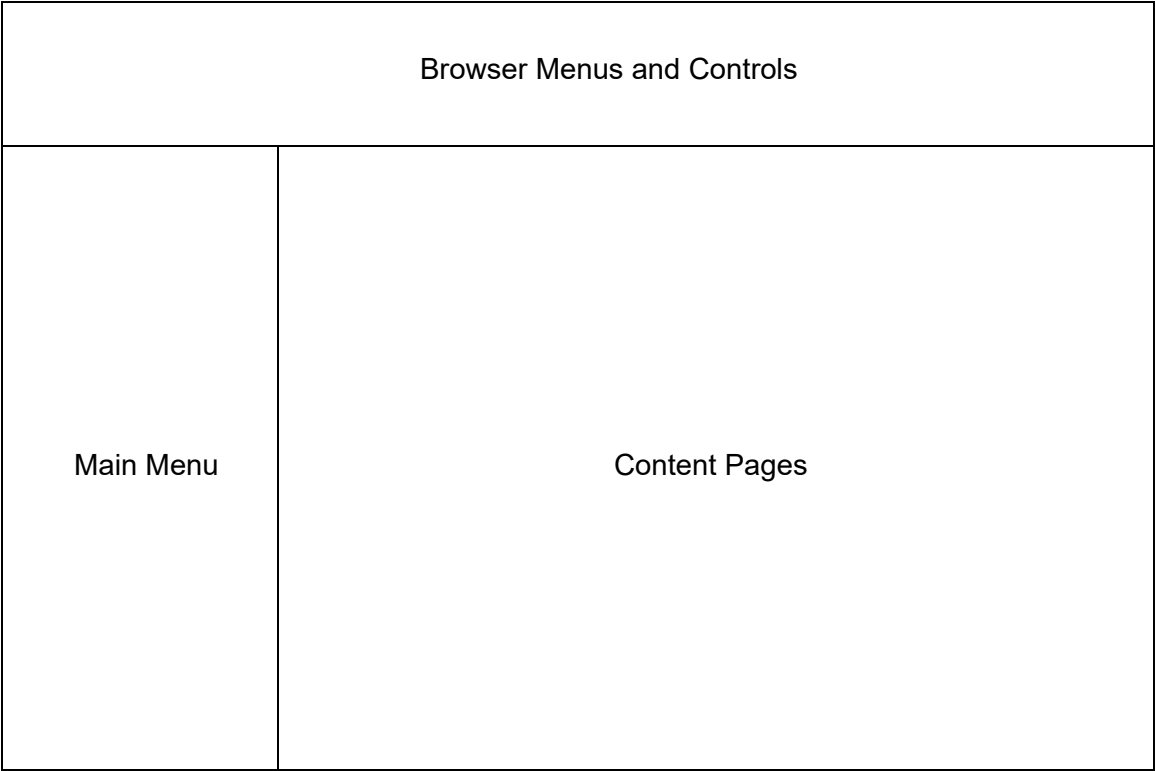
This chapter provides an overview of the user interface (UI) for the node controller web interface with examples of each window, page, and dialog box in the UI and a complete description of their features. The following parts of the user interface are covered:

- User interface window layout.
- User interface features.
- Window and dialog box reference.

**NOTE:** This user interface reference reflects the version of the software that is indicated in [Changes on page 9](#). Specific builds of the Node Controller Software Image file may not implement all features that are described in this manual. See the Release Notes supplied with this application for more information.

# Window Layout

All user interface elements presented through the web interface window follow the guidelines described below and consist of three main areas that are always visible, as shown in [Figure 4-1](#), as well as temporary dialog boxes that open over the main UI window.



*Figure 4-1: Window Layout*

## Window Behavior

- **Window Size** – The web interface does not control the size of the browser window. The browser window can be sized as required, it opens at the browser defaults for size and location each time the browser is run.
- **Pane Size** – None of the sections of the window may be moved or resized.

# User Interface Features

## Dialog Boxes

Dialog boxes, which are shown in [Figure 4-2](#), are used to select options, input information, and start operations. Dialog boxes open when certain functions (for example, buttons that allow user input) are selected in the current window or dialog box. The dialog box that opens depends on the type of input that is required.

To close a dialog box and save the selection, select the button for the dialog box action (**Open**, **OK**, etc.). To close a dialog box without saving, select **Cancel**.

**NOTE:** When dialog boxes are open, no actions are permitted until the dialog box is closed.

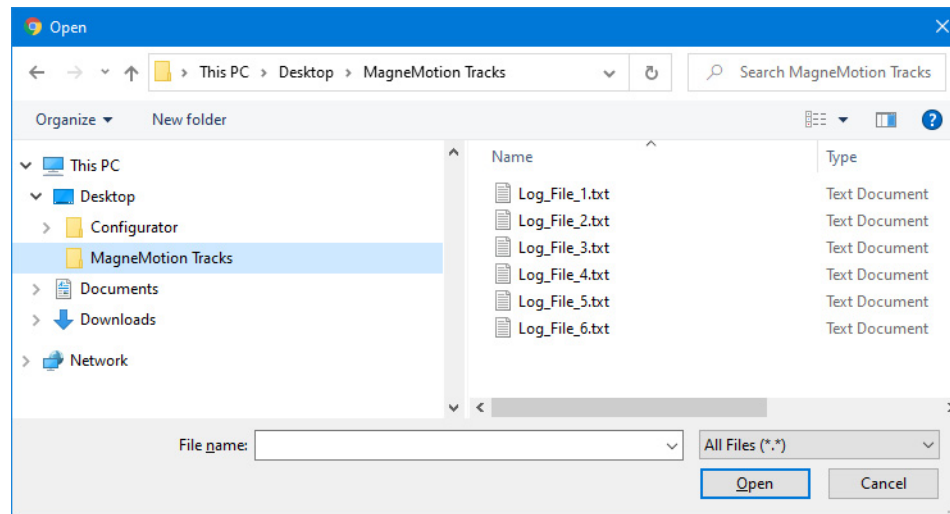


Figure 4-2: Dialog Box Example

## Messages

Messages, which are shown in [Figure 4-3](#), are displayed on the current page. These messages are used to display information, to confirm user input, or to warn of user input that is disallowed. Messages are displayed automatically by the web interface when a restricted operation is attempted, or when some important operational information must be conveyed.

This box is a Node Controller ☒
This box is the High Level Controller ☒
This box is a High Level Controller Simulator ☐

Apply Changes
Reset Form

Changes **Not** applied! Please correct the fields highlighted in Red

When configuring this box as an HLC simulator, it **cannot** be configured as a node controller or regular high level controller at the same time.

Figure 4-3: Message Example

## Dialog Box and Window Elements

Checkboxes, which are shown in [Figure 4-4](#), are used to turn on or off an option by selecting (checking) or clearing (unchecking) the box. In those areas where multiple checkboxes are presented, more than one checkbox can be selected.

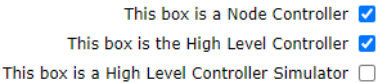


Figure 4-4: Checkbox Example

Option Buttons, which are shown in [Figure 4-5](#), are used to select one of a group of mutually exclusive options by selecting the appropriate option.



Figure 4-5: Option Button Example

A drop-down, which is shown in [Figure 4-6](#), is a type of list box that is used when an option that requires selection of one item from a list of available options is selected.

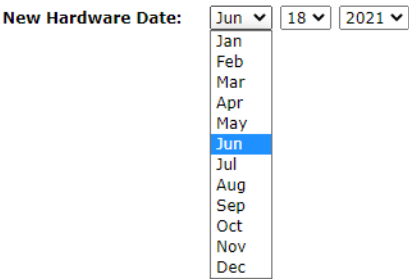


Figure 4-6: Drop-Down Menu Example

Text fields, which are shown in [Figure 4-7](#), are used to enter variable information, such as names, set-points, and position values. Display fields, which are shown in [Figure 4-7](#), are used to display fixed and variable information, such as property names and values returned from the controlled components.

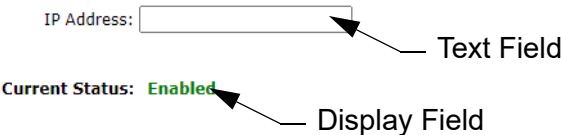
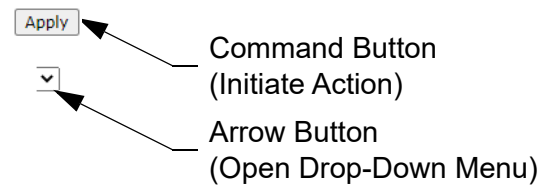


Figure 4-7: Text and Display Field Example



Each window, dialog box, and message contains graphical buttons, which are shown in [Figure 4-8](#), that are used to perform a variety of actions, including:

- Initiating an action.
- Changing displays.
- Opening dialog boxes, menus, or windows.



*Figure 4-8: Button Example*

## Window and Dialog Box Reference

This reference provides a detailed description of each page that is displayed by the web interface. All windows, menus, and dialog boxes that are shown in this reference are listed in functional order.

The web interface is the software tool that is used to configure and monitor the node controllers. The node controllers are the controllers that are used to monitor vehicles and control the motors and other components of the transport system.

## Main Window

The Main Window for the web interface is a web browser as shown in [Figure 4-9](#). All window functions are described after the figure. All functions that are accessed through this window are described after the figure.

The Main Window provides access to the Main Menu at the left of the window and to the items displayed in the Content pages. The function of each menu item and the Content page for those items are described in this chapter.

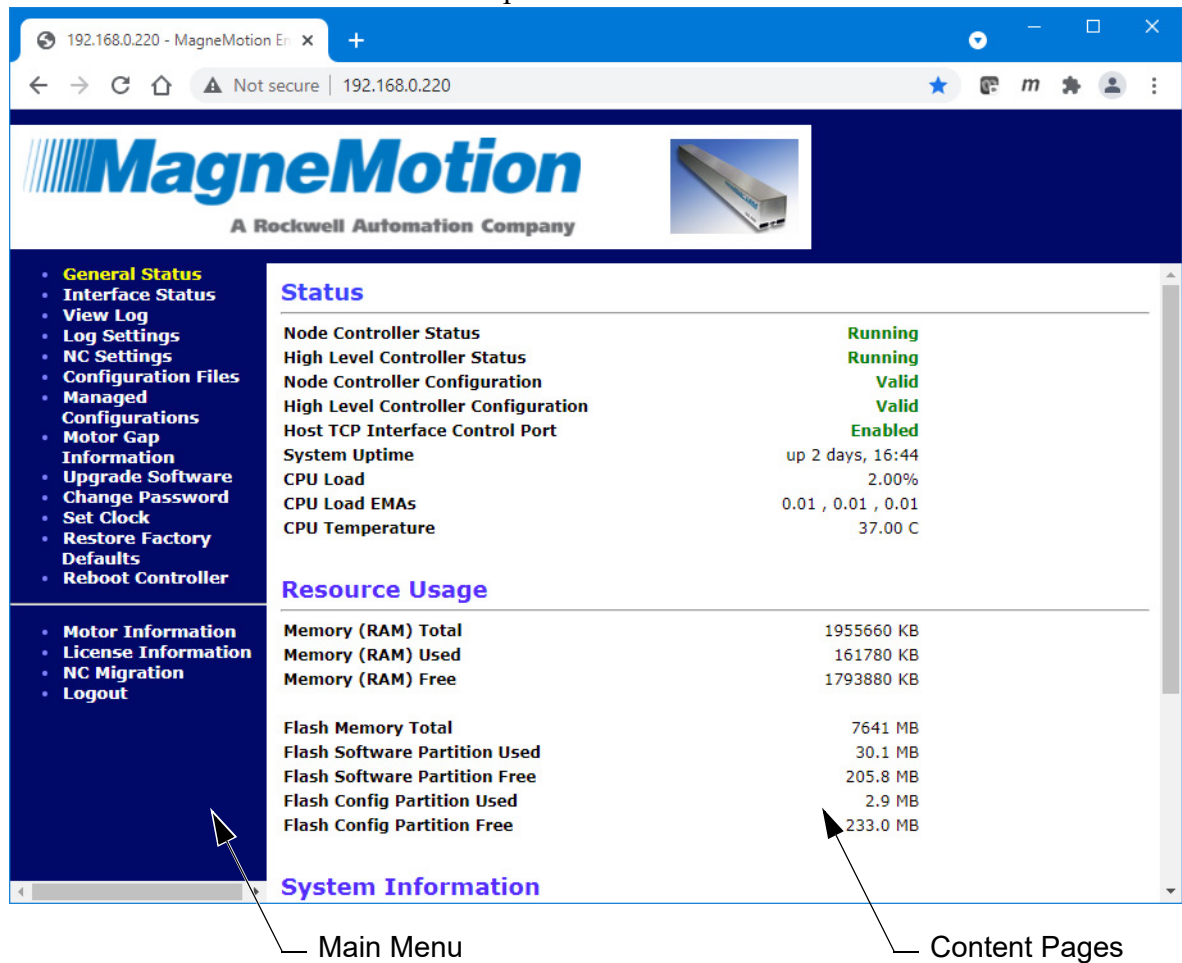


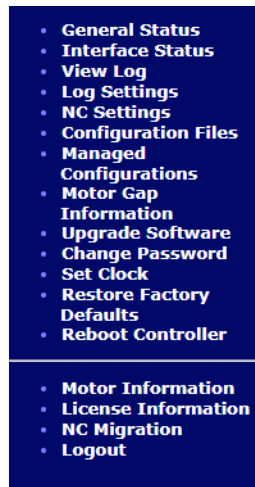
Figure 4-9: Browser Window Overview

- **Browser Menu and Controls** – Provides access to common functions.
- **Main Menu** – Displays a list of the available functions.
- **Content Pages** – Displays the page of properties that are associated with the item that is selected in the menu.

## Main Menu

The Main Menu for the web interface is always displayed on the left side of the window, as shown in [Figure 4-10](#). All menu functions are described after the figure. The function of each menu item is described in this chapter (see [Node Controller Administration – Web](#) on page 29 for use details).

**NOTE:** The menu options that are presented may differ from the options that are shown in [Figure 4-10](#) depending on the Node Controller Software Image version, but all main functions are always available.



*Figure 4-10: Web Interface Main Menu Details*

- **General Status** – Displays the status of the node controller and the version of the installed software.
- **Interface Status** – Displays the status of all communication ports on the node controller.
- **View Log** – Displays the node controller or high-level controller log file.
- **Log Settings** – Provides a tool for selection of the types of messages to be recorded in the node controller or high-level controller log files.
- **NC Settings** – Displays the IP address and configured functions of the node controller.
- **Configuration Files** – Displays the configuration files (Node Controller Configuration File, Motor Type files, and Magnet Array Type files) currently loaded on the node controller.
- **Managed Configurations** – Provides a tool to manage up to 20 Node Controller Configuration Files stored on the high-level controller.
- **Motor Gap Information** – Displays motor downstream gap data for all motors that are connected to the node controller.
- **Upgrade Software** – Provides tools for uploading new software (Node Controller Software Image file and Motor ERF Image files) to the node controller and the motors.

- **Change Password** – Provides a tool for administering users and changing passwords.
- **Set Clock** – Provides a tool for setting the clock on the node controller.
- **Restore Factory Defaults** – Provides a tool for resetting the node controller to the factory defaults.
- **Reboot Controller** – Provides tools for restarting and rebooting the node controller.
- **Motor Information** – Displays the manufacturing data for all motors that are connected to the node controller or the high-level controller.
- **License Information** – Provides a tool for administering the node controller software license.
- **NC Migration** – Provides a tool for uploading Next Gen format Software Images that contain a new kernel to the node controller.
- **Logout** – Shuts down the web interface. The browser must be completely closed to complete the logout process.

## General Status

The General Status page provides an overview of the status, memory usage, and software version information for the node controller. The **General Status** page, which is shown in [Figure 4-11](#), is accessed by selecting **General Status** on the Main Menu (see [View General Status on page 33](#) for use details).

**MagneMotion**  
A Rockwell Automation Company

**General Status**

- General Status
- Interface Status
- View Log
- Log Settings
- NC Settings
- Configuration Files
- Managed Configurations
- Motor Gap Information
- Upgrade Software
- Change Password
- Set Clock
- Restore Factory Defaults
- Reboot Controller
- Motor Information
- License Information
- NC Migration
- Logout

**Status**

High Level Controller Status	Running Simulator
High Level Controller Configuration	Valid
Host TCP Interface Control Port	Enabled
System Uptime	up 0 min
Load Average	0.23, 0.04, 0.01
CPU Temperature	42.00 C

**Resource Usage**

Memory (RAM) Total	903060 KB
Memory (RAM) Used	80472 KB
Memory (RAM) Free	822588 KB
Flash Memory Total	8012 MB
Flash Software Partition Used	18.6 MB
Flash Software Partition Free	224.4 MB
Flash Config Partition Used	1.1 MB
Flash Config Partition Free	241.9 MB

**System Information**

Node Controller Software Version	15.12.5
Build Date/Time	15-Dec-2022 1333
Built By	buildbot
Built on Host	nc-buildbot-vm
BIOS Version	MXE-M200iRW106
Kernel	2.4.29-ampro-550-700 32bit
Boot Mode	Legacy-PC
Model	NC-E
Hardware Version	01
Assembly Serial Number	I9H6NS6003
Motherboard Serial Number	1812NB7002
Eth0 MAC Address	00:30:64:57:F5:00

Refresh

Figure 4-11: General Status Page Details

## Status

This section displays the general status information for the node controller.

- **Node Controller Status** – Displays the current status of the node controller. Only displayed when the **Configured Functions** includes *This box is a Node Controller*.
  - **Running** – The node controller is running correctly.
  - **Down** – The node controller is not running.

- **High Level Controller Status** – Displays the status of the high-level controller. Only displayed when the **Configured Functions** includes *This box is the High Level Controller* or *This box is a High Level Controller Simulator*.
  - **Running** – The high-level controller is running correctly.
  - **Running Simulator** – The high-level controller simulator is running correctly.
  - **Down** – The high-level controller is not running.
- **Node Controller Configuration** – Displays the status of the node controller configuration file (node\_configuration.xml). Only displayed when the **Configured Functions** includes *This box is a Node Controller*.
  - **Valid** – The XML in the file is structured correctly.
  - **Invalid** – The XML in the file is not structured correctly. Review the file using the Configurator and make corrections as needed.
- **High Level Controller Configuration** – Displays the status of the configuration files on the high-level controller, the status options and descriptions are the same as those for the **Node Controller Configuration**. Only displayed when the **Configured Functions** includes *This box is the High Level Controller* or *This box is a High Level Controller Simulator*.
  - **Valid** – The XML in the file is structured correctly.
  - **Invalid** – The XML in the file is not structured correctly. Review the file using the Configurator and make corrections as needed.
- **Host TCP Interface Control Port** – Displays the status of the console interface port for use with a terminal emulator. Only displayed when the **Configured Functions** includes *This box is a the High Level Controller* or *This box is a High Level Controller Simulator*.
  - **Enabled** – The TCP Control Port (console interface) is enabled.
  - **Disabled** – The TCP Control Port (console interface) is disabled.
  - **Unknown** – The Node Controller Configuration File is invalid and the setting for the control port cannot be determined.
- **System Uptime** – Displays the amount of time the node controller has been running since the last reboot.
- **CPU Load** – Displays the average load on the node controller CPU (100.00% is fully loaded, 0.00% is no load). Loads greater than 100.00% indicate an error condition.
- **CPU Load EMAs** – Displays the load on the node controller CPU as exponential moving averages for the last 5, 10, and 15 minutes (1.00 is fully loaded, 0.00 is no load). Loads greater than 1.0 indicate an error condition.
- **CPU Temperature** – Displays the temperature of the node controller CPU. Not provided on some legacy node controllers (for example, NC LITE).

## Resource Usage

This section displays the memory usage information for the node controller.

- **Memory (RAM) Total** – The amount of volatile memory on the node controller.
- **Memory (RAM) Used** – Displays the amount of volatile memory being used.
- **Memory (RAM) Free** – Displays the amount of volatile memory not used.
- **Flash Memory Total** – Displays the amount of nonvolatile memory on the node controller.
- **Flash Software Partition Used** – Displays the amount of nonvolatile memory used for the Node Controller Software Image.
- **Flash Software Partition Free** – Displays the amount of nonvolatile memory in the software partition not used.
- **Flash Config Partition Used** – Displays the amount of nonvolatile memory used for the Node Controller Configuration File, Motor ERF Images, Motor Type files, and Magnet Array Type files.
- **Flash Config Partition Free** – Displays the amount of nonvolatile memory in the configuration partition not used.

## System Information

This section displays the software and hardware version information for the node controller.

- **Node Controller Software Version** – Displays the version of the Node Controller Software Image file currently running on the node controller, provided as *major.minor.patch*.
- **Build Date/Time** – Displays the date and time the software version was created.
- **Built By** – Displays the engineer that created the software version.
- **Built on Host** – Displays the computer that was used to create the software version.
- **Bios Version** – Displays the version of the BIOS on the node controller. Not provided on some legacy node controllers (for example, NC LITE).
- **Kernel** – Displays the version of the OS kernel installed on the node controller mother board.
- **Boot Mode** – Displays the boot mode being used by the node controller software.
  - **Legacy PC** – Identifies the Node Controller Software Image file as belonging to the node controller software format that uses the standard boot mode.
- **Model** – Displays the type of hardware being used for the node controller.
  - **NC-LITE** – Node controller with one network port and four RS-422 ports.
  - **NC-12** – Node controller with one network port, two RS-232 ports, 12 RS-422 ports, 16 digital inputs, and 16 digital outputs.



- **NC-E** – Node controller with one active network port.
  - **Series A** – Has four digital inputs, and four digital outputs. Displays as “Hardware Version 01”.
  - **NC-E Series B** – Has eight digital inputs, and eight digital outputs. Displays as “Hardware Version 02”.
- **NC-S** – Node controller with one active network port and eight RS-422 ports.
- **Hardware Version** – Displays the version of the hardware **Model**.
- **Assembly Serial Number** – Displays the embedded serial number of the NC-E Series and B node controller chassis. Not provided on some legacy node controllers (for example, NC-12, NC LITE, NC-S).
- **Motherboard Serial Number** – Displays the serial number of the node controller mother board. Not provided on some legacy node controllers (for example, NC-12, NC LITE).
- **Eth0 MAC Address** – Displays the MAC ID of the node controller.
- **Refresh** button – Updates all displayed statistics to the current values.

## Interface Status

The Interface Status page provides an overview of the communication status for the node controller, including Ethernet and Serial I/O. The **Interface Status** page, which is shown in [Figure 4-12](#), is accessed by selecting **Interface Status** on the Main Menu (see [View Interface Status on page 34](#) for use details).

### Node Controller Interface Statistics

Displays the status of all I/O connections for the node controller.

Node Controller Interface Statistics										
RS-422 Ports:										
Port	Tx Bytes	Tx Msgs	Rx Bytes	Rx Msgs	Rx Error Bytes	Framing Errors	Overruns	Rx Break Count	Buf Overrun	
1	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	
3	35211	2336	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	0	0	
8	0	0	0	0	0	0	0	0	0	
9	0	0	0	0	0	0	0	0	0	
10	0	0	0	0	0	0	0	0	0	
11	0	0	0	0	0	0	0	0	0	
12	0	0	0	0	0	0	0	0	0	
Ethernet AVPs:										
NC Port	Dest IP Address	Dest AVP	Path ID	Motor #	Path End	Tx Bytes	Tx Msgs	Rx Bytes	Rx Msgs	
7182	192.168.2.1	P2A	3	1	Upstream	231	12	0	0	
6555	192.168.2.1	N2A	3	1	Upstream	0	0	0	0	
12264	192.168.3.2	N1B	3	2	Upstream	0	0	0	0	
12972	192.168.2.7	N1B	3	3	Upstream	0	0	0	0	
					Upstream	507	24	0	0	
10922	192.168.2.1	N2B	3	1	Downstream	0	0	0	0	
7385	192.168.3.2	N1A	3	2	Downstream	0	0	0	0	
413	192.168.2.7	N1A	3	3	Downstream	0	0	0	0	
RS-232 Ports:										
Port	Tx Bytes	Tx Msgs	Rx Bytes	Rx Msgs	Rx Error Bytes	Framing Errors	Overruns	Rx Break Count	Buf Overrun	
1	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	
Ethernet TCP Connections:										
Type	Remote IP	Tx Bytes	Tx Msgs	Rx Bytes	Rx Msgs	Connected Count	Connect Attempts	Accepted Count	Dropped Count	
HLC	192.168.0.220	27945	4606	27536	4589	0	0	1	0	
NC	192.168.0.221	0	0	0	0	0	406	0	0	

Figure 4-12: Interface Status Page, Node Controller Section Details

## RS-422 Ports

This section displays the status of the RS-422 ports that are used to communicate with the motors. Only displayed when the Configured Functions includes *This box is a Node Controller*.

- **Port** – The Serial I/O connector on the node controller.
- **Tx Bytes** – The number of bytes transmitted to the device connected to the port since the node controller started running.
- **Tx Msgs** – The number of valid messages transmitted to the device connected to the port since the node controller started running.
- **Rx Bytes** – The number of bytes received from the device that is connected to the port since the node controller started running.
- **Rx Msgs** – The number of valid messages received from the device that is connected to the port since the node controller started running.
- **Rx Error Bytes** – The number of bytes received with an error.
- **Framing Errors** – The number bytes with framing errors where the data cannot be decoded.
- **Overruns** – The number of bytes that could not be received because no input buffer space was available.
- **Rx Break Count** – The number of break signals received (typically during path reset sequencing).
- **Buf Overrun** – The number of bytes that could not be received because no memory buffer space was available.

## Ethernet AVPs

This section displays the status of each node controller port that is used to communicate with the ABBA Virtual Ports in the Ethernet motors. Only displayed when the Configured Functions includes *This box is a Node Controller* and motors using Ethernet communication are defined in the Node Controller Configuration File.

- **NC Port** – The port on the node controller being used for communication with the motor.
- **Dest IP Address** – The IP address of the motor connected to the **NC Port**.
- **Dest AVP** – The ABBA Virtual Port used by the motor defined as *VPnEnd*, where:  
**VP** is the virtual Port.
  - **P** – Path virtual port, primarily used for motor to motor communications. Path port messages are designed to flow up or down a path.

- **N** – Node controller virtual port, used as a direct network link to/from a motor and its parent node controller. This AVP eliminates data relaying through the entire path.
- **S** – Serial virtual port, included for legacy support. When provisioned with a network address they allow connections from legacy serial tracks to an Ethernet connected track.

***n*** is the motor index.

- For straight or curve motors this will always be 1. For switches, the curve motor is 1 and the straight motor is 2.

**End** is the motor end of the physical connection to the motor.

- **A** – Power connector end of motor.
- **B** – Non-power connector end of motor.
- **Path ID** – The ID number of the path where the motor is located.
- **Motor #** – The number (location) of the motor on the path.
- **Path End** – The end of the motor that is connected to the port.
  - **Upstream** – The upstream end of the motor. This end of the motor is typically where vehicles enter.
  - **Downstream** – The downstream end of the motor. This end of the motor is typically where vehicles exit.
- **Tx Bytes** – The number of bytes transmitted to the motor that is connected to the port since the node controller started running.
- **Tx Msgs** – The number of valid messages transmitted to the motor that is connected to the port since the node controller started running.
- **Rx Bytes** – The number of bytes received from the motor that is connected to the port since the node controller started running.
- **Rx Msgs** – The number of valid messages received from the motor that is connected to the port since the node controller started running.

## RS-232 Ports

This section displays the status of the RS-232 ports that are used to communicate with external devices. The fields and descriptions are the same as those for the RS-422 Ports. Only displayed when the Configured Functions includes *This box is a Node Controller*.

## Ethernet TCP Connections

This section displays the status of the Ethernet connections that are used by the node controller to communicate with other devices on the network.

- **Type** – The type of device being communicated with.

- **HLC** – The connection from this node controller to the high-level controller.
- **NC** – The connection from this node controller to a peer node controller.
- **Remote IP** – The IP address of the device communicating with the node controller.
- **Tx Bytes** – The number of bytes transmitted to the device connected to the port since the node controller started running.
- **Tx Msgs** – The number of valid messages transmitted to the device connected to the port since the node controller started running.
- **Rx Bytes** – The number of bytes received from the device that is connected to the port since the node controller started running.
- **Rx Msgs** – The number of valid messages received from the device that is connected to the port since the node controller started running.
- **Connected Count** – The number of successfully made connections to the remote IP address when the node controller acts as the client.
- **Connect Attempts** – The number of connection attempts to the remote IP address when the node controller acts as the client.
- **Accepted Count** – The number of successfully accepted connections from the remote IP address when the node controller acts as the server.
- **Dropped Count** – The number of previously successful connections from the remote IP address that became disconnected when the node controller acts as the server.

### High Level Controller Interface Statistics

The HLC information, shown in [Figure 4-13](#), is only shown if the node controller has been configured as the high-level controller or high-level controller simulator. Displays the status of the Ethernet TCP/IP connections for the HLC.

High Level Controller Interface Statistics									
Ethernet TCP Connections:									
Type	Remote IP	Tx Bytes	Tx Msgs	Rx Bytes	Rx Msgs	Connected Count	Connect Attempts	Accepted Count	Dropped Count
HOST	None	0	0	0	0	0	0	0	0
HOST ST	None	0	0	0	0	0	0	0	0
HOST ST	None	0	0	0	0	0	0	0	0
HOST ST	None	0	0	0	0	0	0	0	0
HOST ST	None	0	0	0	0	0	0	0	0
SYSMON	None	0	0	0	0	0	0	0	0
SCOPE	None	0	0	0	0	0	0	0	0
NC	192.168.0.220	476	79	885	96	1	1	0	0
NC	192.168.0.221	0	0	0	0	0	7	0	0
ENET IP	None	0	0	0	0	0	0	0	0
ENET IP	None	0	0	0	0	0	0	0	0
ENET IP	None	0	0	0	0	0	0	0	0
ENET IP	None	0	0	0	0	0	0	0	0
ENET IP	None	0	0	0	0	0	0	0	0
ENET IP	None	0	0	0	0	0	0	0	0
ENET IP	None	0	0	0	0	0	0	0	0
ENET IP	None	0	0	0	0	0	0	0	0
ENET IP	None	0	0	0	0	0	0	0	0

Figure 4-13: Interface Status Page, High-Level Controller Section Details

## Ethernet TCP Connections

This section displays the status of the Ethernet connections that are used by the high-level controller to communicate with other devices on the network. Only displayed when the Configured Functions includes *This box is the High Level Controller*.

- **Type** – The type of device being communicated with through the port.
  - **HOST** – The Host Control Session connection from the host controller (or the NCHost TCP Interface Utility).
  - **HOST ST** – The Host Status Session connection from the host controller (or the NCHost TCP Interface Utility).
  - **SYSMON** – The System Monitoring connection from the host controller.
  - **SCOPE** – The status connection from the MagneMotion Virtual Scope.
  - **NC** – The connection from this high-level controller to the node controllers. One line is displayed for each node controller connection.
  - **ENET IP** – The EtherNet/IP connection between this high-level controller and the host controller.

The first ENET IP connection that is listed is reserved for the connection the HLC initiates with the host controller. The next 8 connections are “slots” that get used dynamically when the host controller initiates connections to the HLC. The host controller can multiplex up to 8 EtherNet/IP connected messaging sessions to the HLC before the HLC starts dropping them.

- **Remote IP** – The IP address of the devices communicating with the high-level controller.
- **Tx Bytes** – The number of bytes transmitted to the device connected to the port since the high-level controller started running.
- **Tx Msgs** – The number of valid messages transmitted to the device connected to the port since the high-level controller started running.
- **Rx Bytes** – The number of bytes received from the device that is connected to the port since the high-level controller started running.
- **Rx Msgs** – The number of valid messages received from the device that is connected to the port since the high-level controller started running.
- **Connected Count** – The number of successfully made connections to the remote IP address when the high-level controller acts as the server.
- **Connect Attempts** – The number of connection attempts to the remote IP address when the high-level controller acts as the server.
- **Accepted Count** – The number of successfully accepted connections from the remote IP address when the high-level controller acts as the client.
- **Dropped Count** – The number of previously successful connections from the remote IP address that became disconnected when the high-level controller acts as the client.

## Network Interface Statistics

Displays the current status of the Network Interface for the node controller as shown in [Figure 4-14](#).

Network Interface Statistics			
Wired Interface eth0			
<b>IP Address:</b>	192.168.0.220	<b>MAC Address:</b>	00:0D:B9:21:59:C8
<b>Netmask:</b>	255.255.255.0	<b>Broadcast:</b>	192.168.0.255
<b>MTU:</b>	1500	<b>Metric:</b>	1
<b>RX Packets:</b>	3147	<b>TX Packets:</b>	3523
<b>RX Bytes:</b>	1179865	<b>TX Bytes:</b>	1184092
<b>RX Errors:</b>	0	<b>TX Errors:</b>	0
<b>RX Dropped:</b>	0	<b>TX Dropped:</b>	0
<b>RX Overruns:</b>	0	<b>TX Overruns:</b>	0
<b>RX Frame Errors:</b>	0	<b>TX Carrier Error:</b>	0
<b>Collisions:</b>	0	<b>TX Queue Length:</b>	1000
<b>Speed:</b>	100Mb/s	<b>Duplex:</b>	Full
<b>Auto Negotiation:</b>	on	<b>Link Detected:</b>	yes

*Figure 4-14: Interface Status Page, Network Section Details*

- **IP Address** – Displays the IPv4 address that is assigned to the node controller.
- **MAC Address** – Displays the MAC ID of the Ethernet adapter in the node controller.
- **Net Mask** – Displays the mask for the subnet where the node controller is located.

- **Broadcast** – Displays the network address that is used to send information to all node controllers on the network.
- **MTU** – Displays the size (in bytes) of the largest protocol data unit that can be transmitted/received.
- **Metric** – Displays hop count for the routing interface metric.
- **RX/TX Packets** – Displays the number of packets received/transmitted since the node controller started running.
- **RX/TX Bytes** – Displays the number of bytes received/transmitted since the node controller started running.
- **RX/TX Errors** – Displays the number of receive/transmit errors since the node controller started running.
- **RX/TX Dropped** – Displays the number of receive/transmit packets dropped since the node controller started running.
- **RX/TX Overruns** – Displays the number of receive/transmit buffer errors since the node controller started running.
- **RX Frame Errors** – Displays the number of CRC failures on receipt of a frame.
- **TX Carrier Error** – Displays the number of errors with the modulation of the Ethernet signal. This could indicate either a duplex mismatch, or a problem with the physical cable/connector.
- **Collisions** – Displays the number of packet collisions (when two or more node controllers attempt to transmit a packet across the network simultaneously) since the node controller started running.
- **TX Queue Length** – Displays the number of packets that can be held in the transmit queue before performing a data transfer.
- **Speed** – Displays the current hardware configuration for the connection speed.
- **Duplex** – Displays the current communication type.
  - **Full** – Simultaneous two-way communication.
  - **Half** – One direction at a time communication.
- **Auto Negotiation** – Displays the current setting for automatic selection of common transmission parameters, such as speed, duplex mode, and flow control.
  - **on** – Indicates the node controller is using auto negotiation.
  - **off** – Indicates the node controller is not using auto negotiation.
- **Link Detected** – Displays the status of the Ethernet connection to the node controller.
  - **no** – No connection detected.
  - **yes** – Connection detected.



## View Log

The View Log page is used to review the log files for the node controller. The log files that are recorded, and can be viewed, are determined by the **Configured Functions** settings *This box is a Node Controller* and *This box is a High Level Controller*. If multiple functions are configured, the log for each function is available. If the **Configured Functions** setting is *This box is a High Level Controller Simulator*, only the high-level controller logs are available. The **Node Controller Log** page, which is shown in Figure 4-15, is accessed by selecting **View Log** on the Main Menu (see [Log Files](#) on page 35 for use details).

**NOTE:** The file size limit of the log file (node controller or HLC) is 12 MB. Once the log file reaches this limit, the oldest log information is over-written. The log is over-written in 4 MB chunks, meaning the first 4 MB of the log are lost when the node controller starts to over-write information.

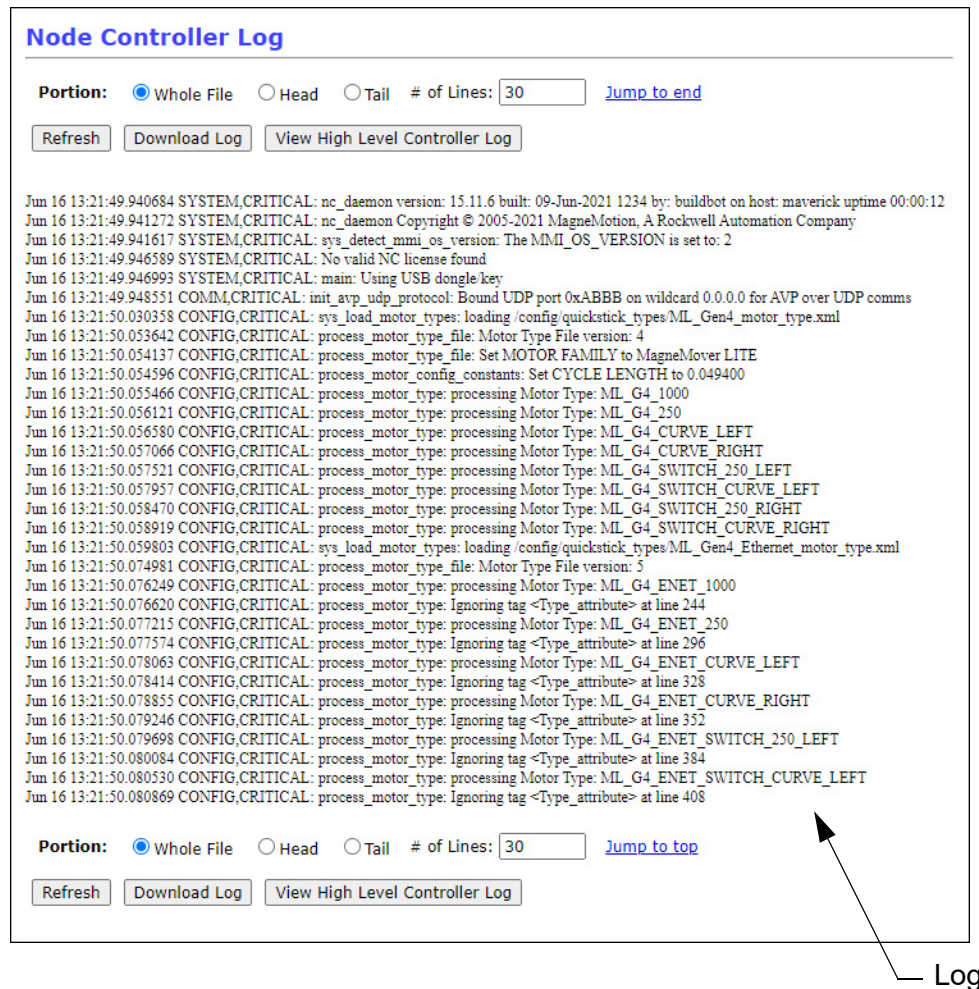


Figure 4-15: View Log Page Details

## Node Controller Log

Displays the log of node controller actions and issues.

- **Portion** – Identifies the section of the log file to be displayed (oldest entries at the top).
  - **Whole File** – Select to display the entire log file ignoring the **# of Lines** setting.
  - **Head** – Select to display the oldest entries in the log file.
  - **Tail** – Select to display the most recent entries to the log file.
  - **# of Lines** – Identifies the number of log entries that are displayed from either the Head or Tail of the log depending on what is selected.
  - **Jump to end** – Displays the bottom of the log page (only available at the top of the page).
  - **Jump to top** – Displays the top of the log page (only available at the bottom of the page).
- **Refresh** – Redisplays the page based on the **Portion** setting.
- **Download Log** – Downloads a copy the log file to the browser-specified download location as an unformatted text file.
- **View High Level Controller Log/View Node Controller Log** – Toggles between View High Level Controller Log and View Node Controller Log. Only displayed if the node controller has been configured as both the high-level controller and a node controller.
  - **View High Level Controller Log** – Select to display the HLC log file.
  - **View Node Controller Log** – Select to display the node controller log file.
- **Log** – Each line in the log represents one event and provides the date and time of the event from the node controller clock and a brief description. See [Log Message Troubleshooting on page 258](#) for descriptions of the log messages.

## Log Settings

The Log Settings Page is used to specify the information that is recorded in the log files for the node controller. The log files that are recorded are determined by the **Configured Functions** settings *This box is a High Level Controller* and *This box is a Node Controller*. The **Node Controller Log Settings** page, which is shown in [Figure 4-16](#), is accessed by selecting **Log Settings** on the Main Menu (see [Log Files](#) on page 35 for use details).

Log Module Name	Log Levels			
	OFF	INFO	WARNING	CRITICAL
SYSTEM	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
XML	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
CONFIG	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
COMM	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
TIMERS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
STARTUP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
HLC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
VEHICLE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
DIO	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
PEER	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
HOST	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
ENET_IP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
FAULTS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
NODE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Apply Changes Revert Changes

Node Controller Persistent Log Settings:  
Status: Active Save Log Settings Delete Saved Settings

Figure 4-16: Log Settings Page Details

## Node Controller Log Settings

Displays the **Log Settings** for the NC log and allows changing the **Log Levels** as required as shown in [Figure 4-16](#). Only shown if the node controller has been configured as a node controller.

- **Log Module Name** – The various hardware and software modules in the transport system that are related to the node controller that can generate log messages.

**NOTE:** Some log modules are only available on certain custom configurations.

- **SYSTEM** – Provides information about HLC/NC states, programming, and HLC Control Groups.
- **XML** – Provides information about parsing the XML configuration files (Magnet Array Type file, Motor Type file, and Node Controller Configuration File).
- **CONFIG** – Provides information about configuration processing.

- **COMM** – Provides information about the communications infrastructure and message content logging (can overload the node controller processor if set to INFO).
- **TIMERS** – Provides information about the node controller timers.
- **STARTUP** – Provides information about startup processing.
- **HLC** – Provides information about HLC/NC communications processing.
- **VEHICLE** – Provides information about vehicle and node processing (can overload node controller processor if set to INFO or Warning).
- **DIO** – Provides information about the node controller digital I/O if the NC has Digital I/O.
- **PEER** – Provides information about the connections and critical faults on HLC/NC sockets.
- **HOST** – Provides information about the Host/HLC interface.
- **ENET\_IP** – Provides information about EtherNet/IP communication (can overload node controller processor if set to INFO or Warning).
- **FAULTS** – Provides information about Motor faults.
- **NODE** – Provides information about node faults.
- **Log Levels** – The types of messages recorded in the log. The default setting for all modules is **CRITICAL**. Rebooting or restarting the node controller resets the Log Level for all modules to **CRITICAL**.
  - **OFF** – Does not display any messages from the specified log module.
  - **INFO** – Displays all info, warning, and critical messages from the specified log module. Selecting this option generates a large amount of log entries.
  - **WARNING** – Displays warning and critical messages from the specified log module.
  - **CRITICAL** – Displays only critical messages from the specified log module.
- **Apply Changes** – Applies any changes that are made to the log settings.
- **Revert Changes** – Resets the page to the current log settings. This does not undo any changes that were made before selecting **Apply Changes**.
- **Node Controller Persistent Log Settings** – Saves choices in persistent memory, preventing them from getting overwritten after the node controller reboots. If this option is not selected at the time of a reboot, all settings are reset to “Critical.”

## High Level Controller Log Settings

Displays the **Log Settings** for the HLC log and allows changing the **Log Levels** as required as shown in [Figure 4-16](#). The fields are the same as the fields for the node controller. Only shown if the node controller has been configured as the high-level controller.

## NC Settings

The NC Settings page is used to set the network address for the node controller and configure other functions. The **NC Settings** page, which is shown in [Figure 4-17](#), is accessed by selecting **NC Settings** on the Main Menu (see [Configuring Node Controller Settings on page 39](#) for use details).

The screenshot displays the NC Settings web interface, which is organized into four main sections:

- IP Settings:** This section contains four text input fields for network configuration:
  - IP Address: 192.168.0.220
  - Netmask: 255.255.255.0
  - Broadcast Address: 192.168.0.255
  - Default Gateway: 192.168.0.100
 Below these fields are two buttons: "Apply Changes" and "Reset Form".
- Configured Functions:** This section includes three checkboxes:
  - "This box is a Node Controller" (checked)
  - "This box is the High Level Controller" (checked)
  - "This box is a High Level Controller Simulator" (unchecked)
 At the bottom of this section are "Apply Changes" and "Reset Form" buttons.
- Remote Logging:** This section features an "Enable Syslog" checkbox (unchecked), followed by three input fields:
  - IP Address: (empty)
  - Severity: 5 Notice (dropdown menu)
  - Facility: 1 User (dropdown menu)
 At the bottom are "Apply Changes", "Reset Form", and "Distribute To All Node Controllers" buttons.
- Host TCP Interface Control Port:** This section shows the "Current Status" as "Enabled" in green text, with a "Disable" button next to it.

Figure 4-17: NC Settings Page Details

## IP Settings

Displays the current IP settings for the node controller and provides tools to update them as required.

- **IP Address** – The IPv4 address that is assigned to the node controller. The factory assigned default IP address is 192.168.0.1.
- **Netmask** – The mask used for the subnet where the node controller is located.
- **Broadcast Address** – The network address used to send information to all node controllers on the network.

- **Default Gateway** – The address on the network that is used as an access point to another network.
- **Apply Changes** – Applies any changes that are made to the IP settings.  
**NOTE:** Any changes made to the IP settings do not take effect until the node controller is rebooted.
- **Reset Form** – Resets the IP settings to the current settings. This does not undo any changes that were made before selecting **Apply Changes**.

## Configured Functions

Displays the current node controller configuration and provides tools to update it as required.

- **This box is a Node Controller** – Select to indicate that the node controller is being used as a node controller. Cleared to indicate that the node controller is only being used as a high-level controller (not a typical configuration).
- **This box is the High Level Controller** – Select to indicate that the node controller is being used as the high-level controller (**This box is a Node Controller** remains selected).
- **This box is a High Level Controller Simulator** – Select to use the node controller for development. Only use this function with instruction from the Rockwell Automation Technical Support Center.
- **Apply Changes** – Applies any changes that are made to the configured functions.  
**NOTE:** At least one option must be selected. Any changes made to the configured functions do not take effect until the node controller is rebooted.
- **Reset Form** – Resets the configured functions to the current settings. This does not undo any changes that were made before selecting **Apply Changes**.

## Remote Logging

Displays the current syslog remote logging configuration and provides tools to update it as required. This function is available starting with Node Controller Software Image Version 7.2.12.

- **Enable Syslog** – Select to enable forwarding of log messages to the syslog server specified in **IP Address**.
- **IP Address** – The IP address of the syslog server computer. The software always sends messages via UDP, port 514.
- **Severity** – The severity level assigned to all log messages sent to the remote syslog server computer. For most situations, the setting of Level 5 - Notice is appropriate.
- **Facility** – The facility level assigned to all log messages sent to the remote syslog server computer. For most situations, the setting of Level 1 - User is appropriate.
- **Apply Changes** – Applies any changes that are made to the remote logging settings.

**NOTE:** Any changes made to the remote logging settings do not take effect until the node controller is rebooted.

- **Reset Form** – Resets the remote logging settings to the current settings. This does not undo any changes that were made before selecting **Apply Changes**.
- **Distribute To All Node Controllers** – Copies the current remote logging settings to all node controllers in the transport system. Only displayed when the **Configured Functions** includes *This box is the High Level Controller*.

## Host TCP Interface Control Port

Displays the current TCP/IP Interface Control Port configuration for the node controller and provides a tool to update it as required. Only displayed when the **Configured Functions** includes *This box is the High Level Controller*.

- **Current Status** – Displays the current status of the TCP/IP interface configuration.
  - **Enabled** – Allows both TCP/IP control and status connections to the node controller.
  - **Disabled** – Only allows a TCP/IP status connection.
- **Disable/Enable** – Toggles between Disable and Enable.
  - **Disable** – Disables the Host TCP Interface Control Port.
  - **Enable** – Enables the Host TCP Interface Control Port.



## Configuration Files

The Configuration Files page is used to identify the Node Controller Configuration File, Motor Type files, and Magnet Array Type files that are currently installed on the node controller and to upload different files to the node controller if required. The **Configuration Files** page, which is shown in [Figure 4-18](#), is accessed by selecting **Configuration Files** on the Main Menu (see [Configuration Files on page 51](#) for use details).

### Configuration Files

---

**Node Controller Configuration File:**

<code>node_configuration.xml</code>	16330 bytes	2021-06-16 15:03:27	<a href="#">View</a>	<a href="#">Download</a>	<a href="#">Delete</a>
-------------------------------------	-------------	---------------------	----------------------	--------------------------	------------------------

**Upload Node Controller Configuration File:**

[Choose File](#) No file chosen [Upload File](#) [Cancel](#)

**Distribute Node Controller Configuration File:** [Distribute To All Node Controllers](#)

---

**Restricted Parameters File:**

<code>restricted_parameters.xml</code>	3700 bytes	2021-06-16 15:06:13	<a href="#">View</a>	<a href="#">Download</a>	<a href="#">Delete</a>
--	------------	---------------------	----------------------	--------------------------	------------------------

**Upload Restricted Parameters File:**

[Choose File](#) No file chosen [Upload File](#) [Cancel](#)

---

**MagneMotion Information and Configuration Service (MICS) File:**

<code>MICS_motor_data.xml</code>	5566 bytes	2021-06-11 17:02:11	<a href="#">View</a>	<a href="#">Download</a>	<a href="#">Delete</a>
----------------------------------	------------	---------------------	----------------------	--------------------------	------------------------

**Upload MICS Motor Data File:**

[Choose File](#) No file chosen [Upload File](#) [Cancel](#)

**Distribute MICS Motor Data File:** [Distribute To All Node Controllers](#)

---

**Motor Type Files:**

<code>QS_Gen2_HT_motor_type.xml</code>	17687 bytes	2021-06-16 15:15:22	<a href="#">View</a>	<a href="#">Download</a>	<a href="#">Delete</a>
<code>QS_HT_K57_motor_type.xml</code>	17659 bytes	2021-06-16 15:15:08	<a href="#">View</a>	<a href="#">Download</a>	<a href="#">Delete</a>

**Upload Motor Type File:**

[Choose File](#) No file chosen [Upload File](#) [Cancel](#)

**Distribute Motor Type Files:** [Distribute To All Node Controllers](#)

---

**Magnet Array Type Files:**

<code>QS_HT_magnet_array_type.xml</code>	4544 bytes	2021-06-16 15:15:34	<a href="#">View</a>	<a href="#">Download</a>	<a href="#">Delete</a>
--	------------	---------------------	----------------------	--------------------------	------------------------

**Upload Magnet Array Type File:**

[Choose File](#) No file chosen [Upload File](#) [Cancel](#)

**Distribute Array Type Files:** [Distribute To All Node Controllers](#)

Figure 4-18: Configuration Files Page Details



## Configuration Files

### Node Controller Configuration File:

Displays information about the current Node Controller Configuration File (always displayed as `node_configuration.xml`). Also provides tools to manage the Node Controller Configuration Files.

- **File Information** – The name of the file on the node controller. Also provides the file size, date, and time uploaded. When there is a number in parenthesis displayed after the file name, it indicates that Managed Configurations is being used and provides the ID of the configuration file in use.
  - **View** – Displays the contents of the Node Controller Configuration File. Some browsers may not display the file correctly, if this occurs the file should be downloaded and viewed in the Configurator.
  - **Download** – Downloads a copy of the Node Controller Configuration File to the browser-specified download location.
  - **Delete** – Deletes the Node Controller Configuration File from the node controller.
- **Upload Node Controller Configuration File** – Provides a tool to locate and upload to the node controller the Node Controller Configuration File.
  - **Choose File** – Opens a dialog box to locate the Node Controller Configuration File to be uploaded. Once selected the file name is displayed in the text field.
  - **Upload File** – Uploads the selected Node Controller Configuration File to the node controller. If the node controller already has a Node Controller Configuration File, this file replaces it.
  - **Cancel** – Clears the **Browse** text field.
- **Distribute Node Controller Configuration File** – Provides a tool to distribute the current Node Controller Configuration File to all node controllers. Only displayed when the **Configured Functions** includes *This box is the High Level Controller* and Managed Configurations is not being used.
  - **Distribute To All Node Controllers** – Copies the current Node Controller Configuration File to all node controllers in the transport system.

### MagneMotion Information and Configuration Service (MICS) File:

Displays information about the current MICS file (always displayed as `MICS_motor_data.xml`). Also provides tools to manage the MICS file.

- **File Information** – The name of the file on the node controller. Also provides the file size, date, and time uploaded.

- **View** – Displays the contents of the MICS file. Some browsers may not display the file correctly, if this occurs the file should be downloaded and viewed in a text editor.
- **Download** – Downloads a copy of the MICS file to the browser-specified download location.
- **Delete** – Deletes the MICS file from the node controller.
- **Upload MICS Motor Data File** – Provides a tool to locate and upload to the node controller the MICS File.
  - **Choose File** – Opens a dialog box to locate the MICS file to be uploaded. Once selected the file name is displayed in the text field.
  - **Upload File** – Uploads the selected MICS file to the node controller. If the node controller already has a MICS File, this file replaces it.
  - **Cancel** – Clears the **Browse** text field.
- **Distribute MICS Motor Data File** – Provides a tool to distribute the current MICS file to all node controllers. Only displayed when the **Configured Functions** includes *This box is the High Level Controller*.
  - **Distribute To All Node Controllers** – Copies the current MICS file to all node controllers in the transport system.

### Motor Type Files:

Displays information about the current Motor Type files (*motor\_type.xml*). Also provides tools to manage the Motor Type files.

- **File Information** – The name of the file. Also provides the file size, date, and time uploaded.
  - **View** – Displays the contents of the selected Motor Type file. Some browsers may not display the file correctly, if this occurs the file should be downloaded and viewed in a text editor.
  - **Download** – Downloads a copy of the Motor Type file to the browser-specified download location.
  - **Delete** – Deletes the selected Motor Type file from the node controller.
- **Upload Motor Type File** – Provides a tool to locate and upload to the node controller the Motor Type files.
  - **Choose File** – Opens a dialog box to locate the Motor Type file to be uploaded. Once selected the file name is displayed in the text field.
  - **Upload File** – Uploads the selected Motor Type file to the node controller.
  - **Cancel** – Clears the **Browse** text field.

- **Distribute Motor Type Files** – Provides a tool to distribute the current Motor Type files to all node controllers. Only displayed when the **Configured Functions** includes *This box is the High Level Controller*.
  - **Distribute To All Node Controllers** – Copies the current Motor Type files to all node controllers in the transport system.

### Magnet Array Type Files:

Displays information about the current Magnet Array Type file (*magnet\_array\_type.xml*). Also provides tools to manage the Magnet Array Type files.

- **File Information** – The name of the file. Also provides the file size, date, and time uploaded.
  - **View** – Displays the contents of the selected Magnet Array Type file. Some browsers may not display the file correctly, if this occurs the file should be downloaded and viewed in a text editor.
  - **Download** – Downloads a copy of the Magnet Array Type file to the browser-specified download location.
  - **Delete** – Deletes the selected Magnet Array Type file from the node controller.
- **Upload Magnet Array Type File** – Provides a tool to locate and upload to the node controller the Magnet Array Type files.
  - **Choose File** – Opens a dialog box to locate the Magnet Array Type file to be uploaded. Once selected the file name is displayed in the text field.
  - **Upload File** – Uploads the selected Magnet Array Type file to the node controller.
  - **Cancel** – Clears the **Browse** text field.
- **Distribute Array Type Files** – Provides a tool to distribute the current Magnet Array Type file to all node controllers. Only displayed when the **Configured Functions** includes *This box is the High Level Controller*.
  - **Distribute To All Node Controllers** – Copies the current Magnet Array Type file to all node controllers in the transport system.

## Managed Configurations

The Managed Configurations page is used to manage up to 20 Node Controller Configuration Files stored on the high-level controller. The **Managed Configurations** page, which is shown in [Figure 4-19](#), is accessed by selecting **Managed Configurations** on the Main Menu (see [Managed Configurations on page 71](#) for use details).

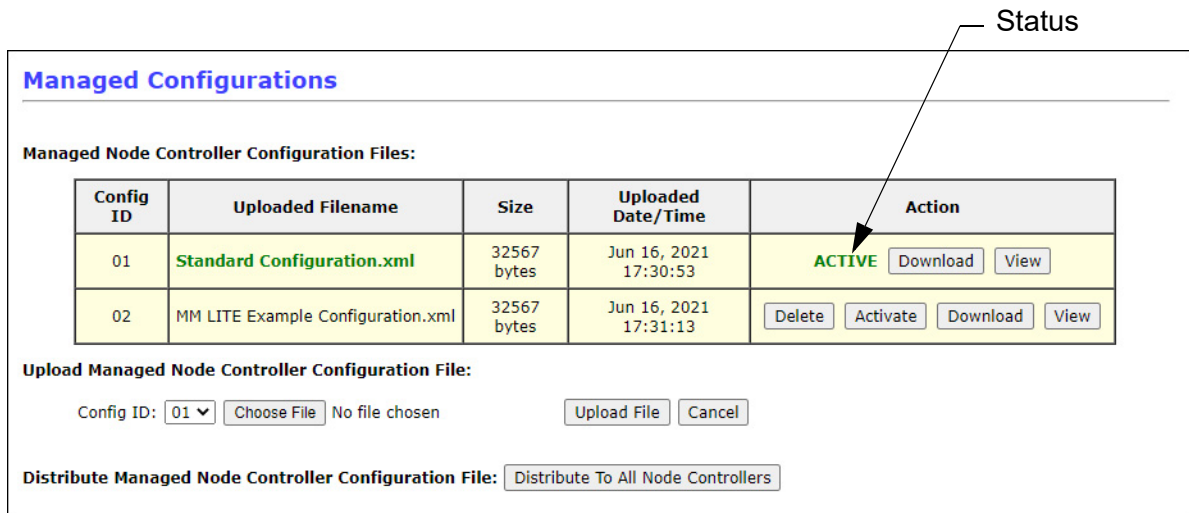


Figure 4-19: Managed Configurations Page Details

## Managed Configurations

### Managed Node Controller Configuration Files:

Displays information about all Node Controller Configuration Files loaded on the node controller when using Managed Configurations and identifies the active configuration. Also provides tools to manage the Managed Node Controller Configuration Files.

A maximum of 20 configuration files can be stored in the nonvolatile memory on the node controller. If there are 20 configuration files already on the node controller, one of the unused files must be deleted to allow uploading a new Node Controller Configuration File.

- **File Information** – The name of each Managed Node Controller Configuration File on the node controller. Also provides the file size, date, and time uploaded, and actions that are available for that file.
  - **Config ID** – The identification numbers assigned to specific configuration files.
  - **Uploaded Filename** – The names of the Node Controller Configuration Files currently stored on the node controller. The name that is displayed in green is the active configuration and does not have the **Delete** and **Activate** buttons available.
  - **Size** – The size of each configuration file.
  - **Uploaded Date/Time** – The date and time the configuration file was uploaded.

- **Action** – Tools to identify and modify the status of each Managed Node Controller Configuration File.
  - **Status** – Identifies the Node Controller Configuration File as ACTIVE (the file name is also displayed in green).
  - **Delete** – Deletes the Node Controller Configuration File for that **Config ID** from the node controller. Only displayed for Node Controller Configuration Files that are not active.
  - **Activate** – Activates the Node Controller Configuration File for that **Config ID**. This also deactivates the currently active configuration file. Only displayed for Node Controller Configuration Files that are not active.
  - **Download** – Downloads a copy of the Node Controller Configuration File to the browser-specified download location.
  - **View** – Displays the contents of the Node Controller Configuration File for that **Config ID**. Some browsers may not display the file correctly, if this occurs the file should be downloaded and viewed in the Configurator.
- **Upload Managed Node Controller Configuration File** – Provides a tool to locate and upload to the node controller multiple Node Controller Configuration Files.
  - **Config ID** – Provides a menu listing all configuration IDs.
  - **Choose File** – Opens a dialog box to locate the Node Controller Configuration File to be uploaded. Once selected the file name is displayed in the text field.
  - **Upload File** – Uploads the selected Node Controller Configuration File to the node controller and assigns the specified **Config ID** to it.
  - **Cancel** – Clears the **Browse** text field.
- **Distribute Managed Node Controller Configuration File** – Provides a tool to distribute the active Node Controller Configuration File to all node controllers. Only displayed when the **Configured Functions** includes *This box is the High Level Controller*.
  - **Distribute To All Node Controllers** – Copies the active Node Controller Configuration File to all node controllers in the transport system.

## Motor Gap Information

The Motor Gap Information page displays motor downstream gap data (distance between motors) for all motors that are connected to the node controller or for all motors in the transport system if the node controller is also the high-level controller when the **Configured Functions** settings are *This box is a Node Controller* or *This box is a High Level Controller* respectively. The **Motor Gap Information** page, which is shown in Figure 4-20 is accessed by selecting **Motor Gap Information** on the Main Menu (see [Motor Gap Information on page 85](#) for use details).

**NOTE:** The Motor Gap Information page is always available. However, only QS and QSHT motors that support the measuring of motor gaps report measured gap values.

## Motor Gap Information

Download CSV File

Refresh

Path ID: 1

Motor #	Gap #	Configured Gap	Nominal Gap	Gap Error	Time Reported
1	1	0.000000	Unknown	Unknown	No Report
1	2	0.060000	0.058253	-0.001747	Jul 02 01:51:29.089876
2	1	0.000000	Unknown	Unknown	No Report
2	2	0.112031	0.114009	0.001978	Jul 02 01:51:29.806558
3	1	0.000000	Unknown	Unknown	No Report
3	2	0.047344	0.044707	-0.002637	Jul 02 01:51:30.497050

Path ID: 2

Motor #	Gap #	Configured Gap	Nominal Gap	Gap Error	Time Reported
1	1	0.000000	Unknown	Unknown	No Report
1	2	0.112031	Unknown	Unknown	No Report

Figure 4-20: Motor Gap Information Page Details

### Motor Gap Information

Displays information about the space between motors.

- **Download CSV File** – Downloads all displayed motor gap information as a comma separated values (CSV) file to the browser-specified download location.
- **Refresh** – Refreshes the display.
- **Path ID *n*** – Displays the motor gap data for the motors located on the specified path.
  - **Motor #** – Displays the position of the motor on the path. Depending on the motor type, multiple lines are used to display the motor gap information.
  - **Gap #** – Displays the Downstream Gap that data is being reported for.
    - **1** – Displays data for downstream gap #1 (the physical gap between this motor and the next motor downstream).

- **2** – Displays data for downstream gap #2 (the physical gap between this motor and the next motor downstream). This is only used by certain QSHT motors in place of downstream gap #1.
- **Configured Gap** – Displays the Downstream Gap in meters as defined in the Node Controller Configuration File. This value includes both the physical gap and the internal gaps (the additional distance inside the upstream motor from the end of the stator to the end of the motor housing and the additional distance inside the downstream motor from the end of the motor housing to the end of the stator).
  - **0.000000** – No Downstream Gap is configured.
  - **value** – Displays the total Downstream Gap value.
- **Nominal Gap** – Displays the Downstream Gap in meters as measured when a vehicle crosses the gap. This value includes both the physical gap and the internal gaps (the additional distance inside the upstream motor from the end of the stator to the end of the motor housing and the additional distance inside the downstream motor from the end of the motor housing to the end of the stator).

**NOTE:** Due to measuring discrepancies based on differences in the vehicles crossing the gap and the speed of the vehicles crossing the gap the **Nominal Gap** measurement may continuously vary by a small amount (typically less than  $\pm 2$  mm).

  - **Unknown** – No Downstream Gap is measured. This typically occurs when there is no gap to measure because the last motor on the path is not connected through a Node to a motor on another path.
  - **value** – Displays the measured Downstream Gap value.
- **Gap Error** – Displays the difference between the **Configured Gap** and the **Nominal Gap**.
- **Time Reported** – Displays the time the **Nominal Gap** was last measured. Displays No Report if there is no data for a specific gap.

## Upgrade Software

The Upgrade Software page is used to identify the Node Controller Software Image and Motor ERF Image files that are currently installed on the node controller and to upload different files to the node controller if required. The **Upgrade Software** page, which is shown in [Figure 4-21](#), is accessed by selecting **Upgrade Software** on the Main Menu (see [Upgrading Node Controller Software on page 88](#) for use details).

### Upgrade Software

Node Controller Software Images on Flash:

controller_image_15.11.6_09-Jun-2021_1234_32bit	ACTIVE <input type="button" value="Download"/>
controller_image_devel_cobra_15.9.21_02-Mar-2021_1844_32bit	<input type="button" value="Delete"/> <input type="button" value="Activate"/> <input type="button" value="Download"/>

Upload Node Controller Software Image:

No file chosen

Distribute Node Controller Software:

---

Motor ERF Images:

ML_Gen4_Coil_15.10.39_04-Feb-2021_0929.erf	<input type="button" value="Delete"/> <input type="button" value="Download"/>
ML_Gen4_Master_15.10.39_04-Feb-2021_0925.erf	<input type="button" value="Delete"/> <input type="button" value="Download"/>
ML_Gen4_Master_Switch_15.10.39_04-Feb-2021_0926.erf	<input type="button" value="Delete"/> <input type="button" value="Download"/>

Upload Motor ERF Image:

No file chosen

Distribute Motor ERF Files:

---

### Program Motors

Select Paths Controlled by This Node Controller to Program:

Path ID	Name	State	Count	Program Which	Select
1	(Empty)	Init	8	<input checked="" type="radio"/> Masters <input type="radio"/> Slaves	<input type="checkbox"/>

Systemwide Motor Programming:

Choose Motor CPU Type:

Status

Figure 4-21: Upgrade Software Page Details



## Upgrade Software

### Node Controller Software Images on Flash:

Displays information about the current Node Controller Software Image files (controller\_image), identifying the active image. A maximum of 3 software images can be stored in the nonvolatile memory on the node controller. If there are 3 software images already on the node controller, one of the inactive images must be deleted to allow uploading a new software image file.

- **File Information** – The name of each Node Controller Software Image file on the node controller. Also provides the actions that are available for that file.
  - **File Name** – The names of the Node Controller Software Image files currently stored on the node controller. The name that is displayed in green is the active image and does not have the **Delete** and **Activate** buttons available.
  - **Status** – Identifies the Node Controller Software Image file as ACTIVE (the file name is also displayed in green).
  - **Delete** – Removes the specified Node Controller Software Image file from the node controller. Only available for inactive Image files if there are multiple Image files.
  - **Activate** – Activates the specified Node Controller Software Image file. Only displayed for Node Controller Software Image files that are not active.
  - **Download** – Downloads a copy of the Node Controller Software Image file to the browser-specified download location.
- **Upload Node Controller Software Image/Upload and Replace Active Node Controller Software Image** – Provides a tool to locate and upload Node Controller Software Image files to the node controller. Toggles between the two options shown depending on the number of software images currently on the node controller (3 max).
  - **Choose File** – Opens a dialog box to locate the Node Controller Software Image file to be uploaded. Once selected the file name is displayed in the text field.
  - **Upload File/Replace Active** – If there are less than three Node Controller Software Images on the node controller, uploads the selected Image file to the node controller. If there are already three Node Controller Software Images on the node controller, uploads the selected Image file to the node controller and replaces the active Image with the new Image file.
  - **Cancel** – Clears the **Browse** text field.
- **Distribute Node Controller Software** – Provides a tool to distribute the current Node Controller Software Image file to all node controllers. Only displayed when the **Configured Functions** includes *This box is the High Level Controller*.
  - **Distribute To All Node Controllers** – Copies the current Node Controller Software Image file to all node controllers in the transport system.

## Motor ERF Images:

Displays information about the current Motor ERF Image files (*motor\_image.erf*).

- **File Name** – Names of the Motor ERF Image files currently stored on the node controller.
- **Delete** – Removes the specified Motor ERF Image file from the node controller.
- **Download** – Downloads a copy of the Motor ERF Image file to the browser-specified download location.
- **Upload Motor ERF Image** – Provides a tool to locate and upload to the node controller the motor ERF files.
  - **Choose File** – Opens a dialog box to locate the Motor ERF Image file to be uploaded. Once selected the file name is displayed in the text field.
  - **Upload File** – Uploads the selected Image file to the node controller.
  - **Cancel** – Clears the **Browse** text field.
- **Distribute Motor ERF Files** – Provides a tool to distribute the current Motor ERF Image files to all node controllers. Only displayed when the **Configured Functions** includes *This box is the High Level Controller*.
  - **Distribute To All Node Controllers** – Copies the current Motor ERF Image files to all node controllers in the transport system.

## Program Motors

Provides a tool for programming the motors with the uploaded motor ERF Image files. Only displayed when the **Configured Functions** includes *This box is the High Level Controller* or *This box is a Node Controller*.

- **Select Paths Controlled by This Node Controller to Program** – Displays all paths in the transport system and the number of motors on the paths.
  - **Path ID** – The ID number assigned to each path in the Node Controller Configuration File associated with the node controller.
  - **Name** – The name assigned to each path in the Node Controller Configuration File associated with the node controller. If no name is assigned this displays “(Empty)”.
  - **State** – The current state of the path.
    - **Init** – All motors on the path are initialized.
    - **Operational** – All motors on the path are running.
    - **Programming** – All motors on the path are being programmed.
    - **Reset** – All motors on the path are being reset.

- **Startup** – All motors on the path are being started.
- **Count** – The number of motors on the path.
- **Program Which** – Provides selection of Master or Slave if the motor type incorporates subordinate controllers.
  - **Masters** – Select the motor supervisory controllers for programming.
  - **Slaves** – Select the motor subordinate controllers for programming.
- **Select** – Check to program the motors on the path.
- **Program Selected Paths** – Programs the motors on the selected paths with the appropriate motor ERF files.
- **Systemwide Motor Programming** – Provides a tool for programming all motors in the transport system with the latest motor ERF files. Only displayed when the **Configured Functions** includes *This box is the High Level Controller*.
  - **Choose Motor CPU Type** – Provides a menu for selection of either Master or Slave (if the motor type incorporates subordinate controllers) for programming.
  - **Program All Paths Systemwide** – Programs the motors on all paths in the transport system with the appropriate motor ERF files.

## Change Password

The Change Password page is used to change the current node controller password. The **Password Change** page, which is shown in [Figure 4-22](#), is accessed by selecting **Change Password** on the Main Menu (see [Password Management on page 113](#) for use details).

**Administer Users / Passwords**

**Additional User List:**

Slot	Username	Delete User?
1	Engineering1	<input type="button" value="Delete"/>
2	Maintenance1	<input type="button" value="Delete"/>

**Change Password:**

For User:

New Password:

Confirm Password:

**Add New Additional User:**

New Username:

New Password:

Confirm Password:

**Centralized Authentication Management:**

Use the button below to send the user database on this Node Controller (which is running as system wide High Level Controller) to all configured Node Controllers in your system. This allows Web services authentication to any of your node controllers using the usernames and passwords configured on this [Master Node Controller](#). Examine the HLC log to view the results.

*Figure 4-22: Change Password Page Details*

### Administer Users/Passwords

Displays information about all current users. Also provides tools to manage the users.

- **Additional User List** – Displays the list of user accounts on the node controller. Also provides the actions that are available for that user. If there are no additional users, **None Present** is displayed. Up to five additional users may be defined.
  - **Slot** – Provides a counter for the number of users defined.
  - **Username** – The assigned user name for the user.
  - **Delete User?** – Select to remove the specified user from the node controller.
- **Change Password** – Provides a tool for administering passwords for existing users.
  - **For User** – Provides a menu listing all users on the node controller.

- **New Password** – Text field for entry of new password (32 characters maximum, valid characters are: a-z, A-Z, 0-9, !#\$%&'\*+,-/=^\_`{|}~"(),,;@[\] and space).
- **Confirm Password** – Text field for re-entry of new password to verify correct entry.
- **Submit** – Applies the new password to the specified user.
- **Clear Fields** – Clears all Change Password fields.
- **Add New Additional User** – Provides a tool for adding new users to the node controller.
  - **New Username** – Text field for entry of new user name (16 characters maximum, valid characters are: a-z, A-Z, and 0-9).
  - **New Password** – Text field for entry of new password (32 characters maximum, valid characters are: a-z, A-Z, 0-9, !#\$%&'\*+,-/=^\_`{|}~"(),,;@[\] and space).
  - **Confirm Password** – Text field for re-entry of new password to verify correct entry.
  - **Submit** – Applies the change to the password.
  - **Clear Fields** – Clears the password fields.
- **Centralized Authentication Management** – Provides distribution of the user accounts to all node controllers in the transport system. Only displayed when the **Configured Functions** includes *This box is the High Level Controller*.
  - **Distribute Authentication Credentials** – Copies the current user accounts to all node controllers in the transport system.

## Set Clock

The Set Clock page is used to change the current date and time on the node controller. The **System Time/Date** page, which is shown in [Figure 4-23](#), is accessed by selecting **Set Clock** on the Main Menu (see [Set the Clock Time and Date on page 123](#) for use details).



**Setting the Time / Date**

**Current System Time:** Jun 16, 2021 04:42:28 PM  
**Current Hardware Time:** Jun 16, 2021 04:42:29 PM

The system time will be synchronized to the hardware time when the controller is rebooted.

**New Hardware Date:** Jun ▼ 16 ▼ 2021 ▼

**New Hardware Time:** 04 ▼ : 42 ▼ : 29 ▼ P.M. ▼

*Figure 4-23: Set Clock Page Details*

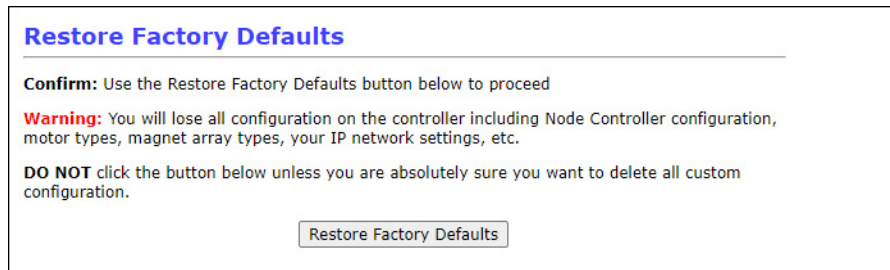
### Setting the Time/Date

Displays the node controller clock, showing the current date and time. Also provides tools to manage the clock.

- **Current System Time** – Displays the current date and time of the node controller operating system clock.
- **Current Hardware Time** – Displays the current date and time of the hardware clock on the node controller.
- **New Hardware Date** – Provides menus for selecting the month, day, and year.
- **New Hardware Time** – Provides menus for selecting the time (using a 12-hour clock).
- **Apply** – Applies any changes that are made to the time and date settings. If these changes are made on the high-level controller, they are distributed to all node controllers during the next reboot.
- **Reset Form** – Resets the page to the default time and date settings.

## Restore Factory Defaults

The Restore Factory Defaults page is used to reset the node controller to an unconfigured state equivalent to the state it was in when shipped from the factory. The **Restore Factory Defaults** page, which is shown in [Figure 4-24](#), is accessed by selecting **Restore Factory Defaults** on the Main Menu (see [Restore Factory Defaults on page 125](#) for use details).



*Figure 4-24: Restore Factory Defaults Page Details*

### Restore Factory Defaults

Provides a tool to reset the node controller to the factory defaults.

- **Restore Factory Defaults** – Resets the node controller to the state it was in when shipped from the factory.

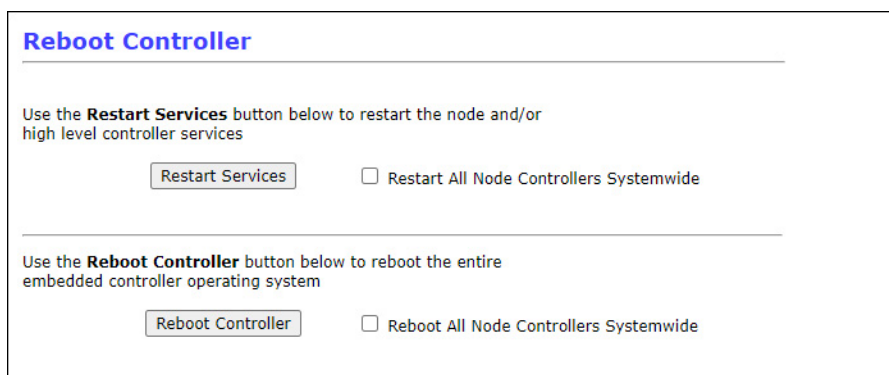
---

<b>NOTICE</b>	Restoring factory defaults resets the password to the default and all configuration information is deleted from the controller including the Node Controller Configuration File, Motor Type files, Magnet Array Type files, and IP network settings.
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## Reboot Controller

The Reboot Controller page is used to restart or reboot the node controller. The **Reboot Controller** page, which is shown in [Figure 4-25](#), is accessed by selecting **Reboot Controller** on the Main Menu (see [Reboot the Node Controller on page 127](#) and [Restart the Node Controller on page 131](#) for use details).



The screenshot shows the 'Reboot Controller' web interface. It has a title 'Reboot Controller' at the top. Below the title, there are two main sections. The first section is titled 'Restart Services' and contains a button labeled 'Restart Services' and a checkbox labeled 'Restart All Node Controllers Systemwide'. The second section is titled 'Reboot Controller' and contains a button labeled 'Reboot Controller' and a checkbox labeled 'Reboot All Node Controllers Systemwide'. Both sections have a brief instruction text above their respective buttons.

*Figure 4-25: Reboot Controller Page Details*

### Reboot Controller

Provides tools to restart or reboot the node controller. This is used after uploading new files to the node controller to activate them.

- **Restart Services** – Restarts the node controller (and high-level controller if applicable).
  - **Restart All Node Controllers Systemwide** – Provides restart of all node controllers in the transport system when selected. Only displayed when the **Configured Functions** includes *This box is the High Level Controller*.
- **Reboot Controller** – Reboots the node controller (and high-level controller if applicable).
  - **Reboot All Node Controllers Systemwide** – Provides reboot of all node controllers in the transport system when selected. Only displayed when the **Configured Functions** includes *This box is the High Level Controller*.



## Motor Information

The Motor Information page displays manufacturing data for all motors that are connected to the node controller or all motors in the transport system if the node controller is also the high-level controller. When the **Configured Function** is *This box is a High Level Controller Simulator*, place-holders are displayed. The **Motor Information** page, which is shown in Figure 4-26 through Figure 4-32 is accessed by selecting **Motor Information** on the Main Menu (see [Motor Information on page 134](#) for use details).

### Page Controls

Provides tools to control the displaying of motor information.

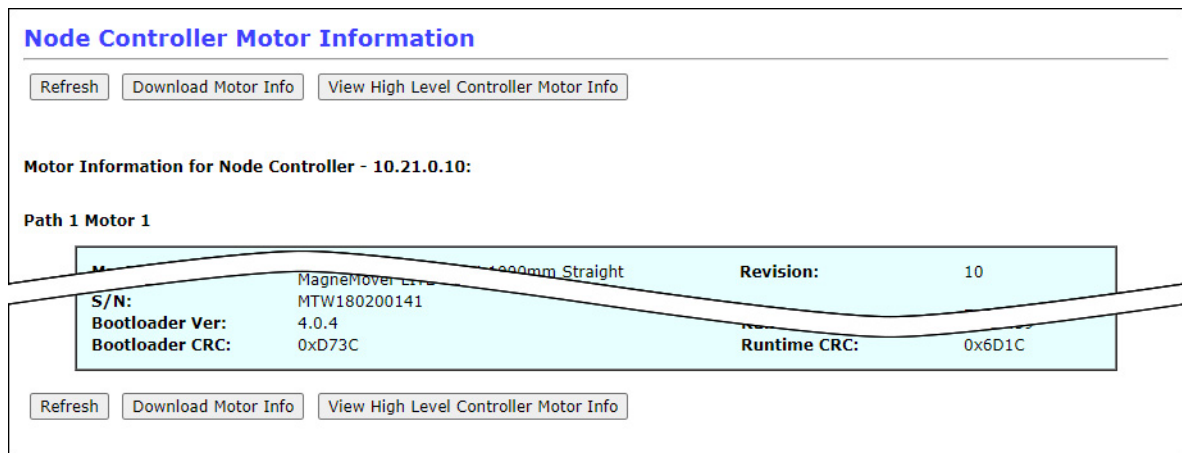


Figure 4-26: Motor Information Page Controls Details

- **Refresh** – Refreshes the display.
- **Download Motor Info** – Downloads all displayed motor information as an HTML file to the browser-specified download location retaining the displayed format.
- **View High Level Controller Motor Info/View Node Controller Motor Info** – Toggles between View High Level Controller Motor Info and View Node Controller Motor Info. Only displayed when the **Configured Functions** are *This box is the High Level Controller* and *This box is a Node Controller*.
  - **View High Level Controller Motor Info** – Displays motor information for the high-level controller (all motors on all paths in the transport system).
  - **View Node Controller Motor Info** – Displays motor information for the node controller (all motors on the paths that are controlled by this node controller).
- **Motor Information for High Level Controller - x.x.x.x:/Motor Information for Node Controller - x.x.x.x:** – The IP address of the node controller or HLC responsible for the motors listed.
- **Path *n* Motor *n*** – Displays the motor manufacturing data for the motor that is located at the specified path and location. For QuickStick® G1 HT motors this data is only for the motor controller and for the QuickStick G2 HT motors this data is for both the motor controller and the motor stator.

## MagneMover LITE Motors

Displays the motor information for the MagneMover<sup>®</sup> LITE<sup>™</sup> motors. The different MM LITE motor types report different information as shown in [Figure 4-27](#) and [Figure 4-28](#).

**Node Controller Motor Information**

Refresh

Download Motor Info

View High Level Controller Motor Info

**Motor Information for Node Controller - 10.21.0.10:**

**Path 1 Motor 1**

<b>Master Assembly:</b>	MagneMover LITE Gen4 125mm Curve	<b>Revision:</b>	10
<b>Capabilities:</b>	SYNC IT		
<b>S/N:</b>	MMI180500156	<b>P/N:</b>	700-1308-43
<b>Master:</b>	MagneMover LITE Gen4 Curve/Straight	<b>Revision:</b>	02
<b>S/N:</b>	MTW180100150	<b>P/N:</b>	600-0198-01
<b>Bootloader Ver:</b>	4.0.0	<b>Runtime Ver:</b>	15.11.3
<b>Bootloader CRC:</b>	0x2713	<b>Runtime CRC:</b>	0xBD54
<b>Slave 1:</b>	MagneMover LITE Gen4 Curve Coil	<b>Revision:</b>	10
<b>S/N:</b>	MTW171101663	<b>P/N:</b>	600-0176-00
<b>Bootloader Ver:</b>	4.0.4	<b>Runtime Ver:</b>	15.11.3
<b>Bootloader CRC:</b>	0xD73C	<b>Runtime CRC:</b>	0xE3B

**Path 1 Motor 2**

<b>Master Assembly:</b>	MagneMover LITE Gen4 1000mm Straight	<b>Revision:</b>	10
<b>Capabilities:</b>	SYNC IT		
<b>S/N:</b>	MMI180501281	<b>P/N:</b>	700-1308-03
<b>Master:</b>	MagneMover LITE Gen4 Curve/Straight	<b>Revision:</b>	02
<b>S/N:</b>	MTW171100986	<b>P/N:</b>	600-0198-01
<b>Bootloader Ver:</b>	4.0.0	<b>Runtime Ver:</b>	15.10.59
<b>Bootloader CRC:</b>	0x2713	<b>Runtime CRC:</b>	0xD7FA
<b>Slave 1:</b>	MagneMover LITE Gen4 250 Coil	<b>Revision:</b>	08
<b>S/N:</b>	MTW180302764	<b>P/N:</b>	600-0175-00
<b>Bootloader Ver:</b>	4.0.4	<b>Runtime Ver:</b>	15.10.59
<b>Bootloader CRC:</b>	0xD73C	<b>Runtime CRC:</b>	0x6D1C
<b>Slave 2:</b>	MagneMover LITE Gen4 250 Coil	<b>Revision:</b>	08
<b>S/N:</b>	MTW180302758	<b>P/N:</b>	600-0175-00
<b>Bootloader Ver:</b>	4.0.4	<b>Runtime Ver:</b>	15.10.59
<b>Bootloader CRC:</b>	0xD73C	<b>Runtime CRC:</b>	0x6D1C

**Path 4 Motor 1**

<b>Master Assembly:</b>	MagneMover LITE Gen4 Right Switch	<b>Revision:</b>	03
<b>S/N:</b>	MMI170900381	<b>P/N:</b>	700-1308-60
<b>Master:</b>	MagneMover LITE Gen4 Switch	<b>Revision:</b>	02
<b>S/N:</b>	MTW170300819	<b>P/N:</b>	600-0198-00
<b>Ethernet Address:</b>	C0:6C:6D:01:08:71	<b>Runtime Ver:</b>	15.11.3
<b>Bootloader Ver:</b>	4.0.0	<b>Runtime CRC:</b>	0x6DB6
<b>Bootloader CRC:</b>	0x2713		
<b>Slave 1:</b>	MagneMover LITE Gen4 Right Switch Coil	<b>Revision:</b>	03
<b>S/N:</b>	MTW170800288	<b>P/N:</b>	700-1401-00
<b>Bootloader Ver:</b>	4.0.4	<b>Runtime Ver:</b>	15.11.3
<b>Bootloader CRC:</b>	0xD73C	<b>Runtime CRC:</b>	0xE3B

Refresh

Download Motor Info

View High Level Controller Motor Info

Figure 4-27: Motor Information Page, MagneMover LITE G4 RS-422 Details

### Node Controller Motor Information

Refresh
Download Motor Info
View High Level Controller Motor Info

**Motor Information for Node Controller - 10.21.0.10:**

**Path 1 Motor 1**

<b>Master Assembly:</b>	MagneMover LITE Gen4 Ethernet 125mm Curve	<b>Revision:</b>	01
<b>Capabilities:</b>	SYNC IT		
<b>S/N:</b>	ENG170512345	<b>P/N:</b>	123-4567-89
<b>Master:</b>	MagneMover LITE Gen4 Ethernet Master	<b>Revision:</b>	01
<b>S/N:</b>	ADV170590203	<b>P/N:</b>	600-0209-00
<b>Ethernet Address:</b>	C0:6C:6D:E0:00:43		
<b>Bootloader Ver:</b>	13.3.0	<b>Runtime Ver:</b>	15.11.3
<b>Bootloader CRC:</b>	0x6097	<b>Runtime CRC:</b>	0xBD54
<b>Slave 1:</b>	MagneMover LITE Gen4 Curve Coil	<b>Revision:</b>	09
<b>S/N:</b>	MTW150700739	<b>P/N:</b>	600-0176-00
<b>Bootloader Ver:</b>	4.0.2	<b>Runtime Ver:</b>	15.11.3
<b>Bootloader CRC:</b>	0x2D1A	<b>Runtime CRC:</b>	0x2E3B

**Path 1 Motor 2**

<b>Master Assembly:</b>	MagneMover LITE Gen4 Ethernet 250mm Straight	<b>Revision:</b>	10
<b>Capabilities:</b>	SYNC IT		
<b>S/N:</b>	MMI170500576	<b>P/N:</b>	700-1708-23
<b>Master:</b>	MagneMover LITE Gen4 Ethernet Master	<b>Revision:</b>	01
<b>S/N:</b>	ADV170590206	<b>P/N:</b>	600-0209-00
<b>Ethernet Address:</b>	C0:6C:6D:E0:00:4A		
<b>Bootloader Ver:</b>	13.3.0	<b>Runtime Ver:</b>	15.11.3
<b>Bootloader CRC:</b>	0x6097	<b>Runtime CRC:</b>	0xBD54
<b>Slave 1:</b>	MagneMover LITE Gen4 250 Coil	<b>Revision:</b>	08
<b>S/N:</b>	MTW170302255	<b>P/N:</b>	600-0175-00
<b>Bootloader Ver:</b>	4.0.2	<b>Runtime Ver:</b>	15.11.3
<b>Bootloader CRC:</b>	0x2D1A	<b>Runtime CRC:</b>	0x2E3B

**Path 1 Motor 3**

<b>Slave:</b>	0x2D1A	<b>Revision:</b>	10
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**Path 4 Motor 3**

<b>Master Assembly:</b>	MagneMover LITE Gen4 Ethernet 125mm Curve	<b>Revision:</b>	10
<b>Capabilities:</b>	SYNC IT		
<b>S/N:</b>	MMI180501338	<b>P/N:</b>	700-1708-43
<b>Master:</b>	MagneMover LITE Gen4 Ethernet Master	<b>Revision:</b>	02
<b>S/N:</b>	MTW180201311	<b>P/N:</b>	600-0209-00
<b>Ethernet Address:</b>	C0:6C:6D:03:06:AA		
<b>Bootloader Ver:</b>	13.3.0	<b>Runtime Ver:</b>	15.10.59
<b>Bootloader CRC:</b>	0x6097	<b>Runtime CRC:</b>	0xD7FA
<b>Slave 1:</b>	MagneMover LITE Gen4 Curve Coil	<b>Revision:</b>	09
<b>S/N:</b>	MTW180200141	<b>P/N:</b>	600-0176-00
<b>Bootloader Ver:</b>	4.0.4	<b>Runtime Ver:</b>	15.10.59
<b>Bootloader CRC:</b>	0xD73C	<b>Runtime CRC:</b>	0x6D1C

Refresh
Download Motor Info
View High Level Controller Motor Info

Figure 4-28: Motor Information Page, MagneMover LITE G4 Ethernet Details

- **Master Assembly** – Displays the type of motor.
- **Capabilities** – Displays the additional capabilities available on the motor. Only displayed if the motor has additional capabilities installed.
  - **SYNC IT** – The motor supports direct control of the motor by a host controller for synchronization with third party systems.
- **S/N** – Displays the serial number of the motor.
- **Revision** – Displays the revision of the motor.
- **P/N** – Displays the part number of the motor.
- **Master** – Displays the type of supervisory controller board.
- **S/N** – Displays the serial number of the supervisory controller board.
- **Ethernet Address** – Displays the MAC ID of the supervisory controller board. Only displayed if the motor uses Ethernet communications.
- **Bootloader Ver** – Displays the revision of the boot loader firmware on the supervisory controller board provided as *major.minor.patch*.
- **Bootloader CRC** – Displays the CRC of the boot loader firmware image on the supervisory controller board.
- **Revision** – Displays the revision of the supervisory controller board.
- **P/N** – Displays the part number of the supervisory controller board.
- **Runtime Ver** – Displays the revision of the Runtime firmware (ERF file) on the supervisory controller board provided as *major.minor.patch*. When the supervisory controller board is programmed with a new ERF image, this number typically changes along with the Runtime CRC.
- **Runtime CRC** – Displays the CRC of the Runtime firmware image on the supervisory controller board.
- **Slave *n*** – Displays the type of motor coil board for the motor. Some motors have more than one coil board, these are reported as additional slaves.
- **S/N** – Displays serial number for the coil board in the motor.
- **Bootloader Ver** – Displays the revision of the boot loader firmware on the coil board provided as *major.minor.patch*.
- **Bootloader CRC** – Displays the CRC of the boot loader firmware image on the coil board.
- **Revision** – Displays the revision of the coil board.
- **P/N** – Displays the part number of the coil.
- **Runtime Ver** – Displays the revision of the Runtime firmware (ERF file) on the coil board provided as *major.minor.patch*. When a coil board is programmed with a new ERF image, this number typically changes along with the Runtime CRC.
- **Runtime CRC** – Displays the CRC of the Runtime firmware image on the coil board.

## QuickStick Motors

Displays the motor information for the QuickStick motors. The different QuickStick motor types report different information as shown in [Figure 4-29](#) and [Figure 4-30](#).

### Node Controller Motor Information

Refresh
Download Motor Info
View High Level Controller Motor Info

**Motor Information for Node Controller - 192.168.110.209:**

**Path 1 Motor 1**

<b>Master Assembly:</b>	QuickStick Gen2 100 500mm	<b>Revision:</b>	0A
<b>Capabilities:</b>	SYNC IT	<b>P/N:</b>	700-1433-03
<b>S/N:</b>	130700227		
<b>Master:</b>	QuickStick Gen2 100 Master	<b>Revision:</b>	0A
<b>S/N:</b>	120805556	<b>P/N:</b>	600-0161-00
<b>Bootloader Ver:</b>	1.1.2	<b>Runtime Ver:</b>	15.10.3
<b>Bootloader CRC:</b>	0x4D3A	<b>Runtime CRC:</b>	0x0D3D
<b>Slave 1:</b>	Quickstick Gen2 100 Slave	<b>Revision:</b>	0J
<b>S/N:</b>	Not Available	<b>P/N:</b>	Not Available
<b>Bootloader Ver:</b>	1.1.0	<b>Runtime Ver:</b>	10015.3.5
<b>Bootloader CRC:</b>	0xE85F	<b>Runtime CRC:</b>	0x037E
<b>Slave 2:</b>	Quickstick Gen2 100 Slave	<b>Revision:</b>	0J
<b>S/N:</b>	Not Available	<b>P/N:</b>	Not Available
<b>Bootloader Ver:</b>	1.1.0	<b>Runtime Ver:</b>	10015.3.5
<b>Bootloader CRC:</b>	0xE85F	<b>Runtime CRC:</b>	0x037E
<b>Slave 3:</b>	Quickstick Gen2 100 Slave	<b>Revision:</b>	0J
<b>S/N:</b>	Not Available	<b>P/N:</b>	Not Available
<b>Bootloader Ver:</b>	1.1.0	<b>Runtime Ver:</b>	10015.3.5
<b>Bootloader CRC:</b>	0xE85F	<b>Runtime CRC:</b>	0x037E

**Path 1 Motor 2**

<b>Master Assembly:</b>	QuickStick Gen2 100 1000mm	<b>Revision:</b>	0D
<b>Capabilities:</b>	SYNC IT	<b>P/N:</b>	700-1433-02
<b>S/N:</b>	140800257		
<b>Master:</b>	QuickStick Gen2 100 Master	<b>Revision:</b>	0B
<b>S/N:</b>	150301983	<b>P/N:</b>	600-0161-00
<b>Bootloader Ver:</b>	1.1.2	<b>Runtime Ver:</b>	15.10.3
<b>Bootloader CRC:</b>	0x4D3A	<b>Runtime CRC:</b>	0x0D3D
<b>Slave 1:</b>	Quickstick Gen2 100 Slave	<b>Revision:</b>	04
<b>S/N:</b>	Not Available	<b>P/N:</b>	Not Available
<b>Bootloader Ver:</b>	1.1.0	<b>Runtime Ver:</b>	10015.3.5
<b>Bootloader CRC:</b>	0xE85F	<b>Runtime CRC:</b>	0x037E
<b>Slave 4:</b>	Quickstick Gen2 100 Slave	<b>Revision:</b>	04
<b>S/N:</b>	Not Available	<b>P/N:</b>	Not Available
<b>Bootloader Ver:</b>	1.1.0	<b>Runtime Ver:</b>	10015.3.5
<b>Bootloader CRC:</b>	0xE85F	<b>Runtime CRC:</b>	0x037E
<b>Slave 5:</b>	Quickstick Gen2 100 Slave	<b>Revision:</b>	04
<b>S/N:</b>	Not Available	<b>P/N:</b>	Not Available
<b>Bootloader Ver:</b>	1.1.0	<b>Runtime Ver:</b>	10015.3.5
<b>Bootloader CRC:</b>	0xE85F	<b>Runtime CRC:</b>	0x037E
<b>Slave 6:</b>	Quickstick Gen2 100 Slave	<b>Revision:</b>	04
<b>S/N:</b>	Not Available	<b>P/N:</b>	Not Available
<b>Bootloader Ver:</b>	1.1.0	<b>Runtime Ver:</b>	10015.3.5
<b>Bootloader CRC:</b>	0xE85F	<b>Runtime CRC:</b>	0x037E

Refresh
Download Motor Info
View High Level Controller Motor Info

Figure 4-29: Motor Information Page, QuickStick 100 Details



### Node Controller Motor Information

[Refresh](#)
[Download Motor Info](#)
[View High Level Controller Motor Info](#)

**Motor Information for Node Controller - 192.168.110.209:**

**Path 2 Motor 1**

<b>Master Assembly:</b>	QuickStick Gen2 100 Plus 1000mm	<b>Revision:</b>	01
<b>Capabilities:</b>	SYNC IT	<b>P/N:</b>	PN-581720
<b>S/N:</b>	78890281		
<b>Master:</b>	QuickStick Gen2 100 Master	<b>Revision:</b>	01
<b>S/N:</b>	200405621	<b>P/N:</b>	PN-580733
<b>Bootloader Ver:</b>	1.1.2	<b>Runtime Ver:</b>	15.10.3
<b>Bootloader CRC:</b>	0x4D3A	<b>Runtime CRC:</b>	0x0D3D
<b>Slave 1:</b>	Quickstick Gen2 100 Slave	<b>Revision:</b>	01
<b>S/N:</b>	Not Available	<b>P/N:</b>	Not Available
<b>Bootloader Ver:</b>	1.1.0	<b>Runtime Ver:</b>	10015.3.5
<b>Bootloader CRC:</b>	0xE85F	<b>Runtime CRC:</b>	0x037E
<b>Slave 2:</b>	Quickstick Gen2 100 Slave	<b>Revision:</b>	01
<b>S/N:</b>	Not Available	<b>P/N:</b>	Not Available
<b>Bootloader Ver:</b>	1.1.0	<b>Runtime Ver:</b>	10015.3.5
<b>Bootloader CRC:</b>	0xE85F	<b>Runtime CRC:</b>	0x037E
<b>Slave 3:</b>	Quickstick Gen2 100 Slave	<b>Revision:</b>	01
<b>S/N:</b>	Not Available	<b>P/N:</b>	Not Available
<b>Bootloader Ver:</b>	1.1.0	<b>Runtime Ver:</b>	10015.3.5
<b>Bootloader CRC:</b>	0xE85F	<b>Runtime CRC:</b>	0x037E
<b>Slave 4:</b>	Quickstick Gen2 100 Slave	<b>Revision:</b>	01
<b>S/N:</b>	Not Available	<b>P/N:</b>	Not Available
<b>Bootloader Ver:</b>	1.1.0	<b>Runtime Ver:</b>	10015.3.5
<b>Bootloader CRC:</b>	0xE85F	<b>Runtime CRC:</b>	0x037E
<b>Slave 5:</b>	Quickstick Gen2 100 Slave	<b>Revision:</b>	01
<b>S/N:</b>	Not Available	<b>P/N:</b>	Not Available
<b>Bootloader Ver:</b>	1.1.0	<b>Runtime Ver:</b>	10015.3.5
<b>Bootloader CRC:</b>	0xE85F	<b>Runtime CRC:</b>	0x037E
<b>Slave 6:</b>	Quickstick Gen2 100 Slave	<b>Revision:</b>	01
<b>S/N:</b>	Not Available	<b>P/N:</b>	Not Available
<b>Bootloader Ver:</b>	1.1.0	<b>Runtime Ver:</b>	10015.3.5
<b>Bootloader CRC:</b>	0xE85F	<b>Runtime CRC:</b>	0x037E

**Path 2 Motor 2**

<b>Master Assembly:</b>	QuickStick Gen2 100 Plus 1000mm	<b>Revision:</b>	01
<b>Capabilities:</b>	SYNC IT	<b>P/N:</b>	PN-581720
<b>S/N:</b>	78890282		
<b>Master:</b>	QuickStick Gen2 100 Master	<b>Revision:</b>	01
<b>S/N:</b>	200405621	<b>P/N:</b>	PN-580733
<b>Bootloader Ver:</b>	1.1.0	<b>Runtime Ver:</b>	15.10.3
<b>Bootloader CRC:</b>	0xE85F	<b>Runtime CRC:</b>	0x0D3D
<b>Slave 6:</b>	Quickstick Gen2 100 Slave	<b>Revision:</b>	01
<b>S/N:</b>	Not Available	<b>P/N:</b>	Not Available
<b>Bootloader Ver:</b>	1.1.0	<b>Runtime Ver:</b>	10015.3.5
<b>Bootloader CRC:</b>	0xE85F	<b>Runtime CRC:</b>	0x037E

[Refresh](#)
[Download Motor Info](#)
[View High Level Controller Motor Info](#)

Figure 4-30: Motor Information Page, QuickStick PLUS Details

- **Master Assembly** – Displays the type of supervisory controller board for the motor.
- **Capabilities** – Displays the additional capabilities available on the motor. Only displayed if the motor has additional capabilities installed.
  - **SYNC IT** – The motor supports direct control of the motor by a host controller for synchronization with third party systems.
- **S/N** – Displays the serial number of the supervisory controller board.
- **Revision** – Displays the revision of the supervisory controller board.
- **P/N** – Displays the part number of the motor.
- **Master** – Displays the type of supervisory controller board for the motor.
- **S/N** – Displays the serial number of the supervisory controller board.
- **Bootloader Ver** – Displays the revision of the boot loader firmware on the supervisory controller board provided as *major.minor.patch*.
- **Bootloader CRC** – Displays the CRC of the boot loader firmware image on the supervisory controller board.
- **Revision** – Displays the revision of the supervisory controller board.
- **P/N** – Displays the part number of the supervisory controller board.
- **Runtime Ver** – Displays the revision of the Runtime firmware (ERF file) on the supervisory controller board provided as *major.minor.patch*. When a motor is programmed with a new ERF image, this number typically changes along with the Runtime CRC.
- **Runtime CRC** – Displays the CRC of the Runtime firmware image on the supervisory controller board.
- **Slave *n*** – Displays the type of subordinate controller for the motor.
  - QS100 and QS Plus 500 mm motors have 1 subordinate controller board with 3 subordinate controller processors.
  - QS100 and QS Plus 1000 mm motors have 2 subordinate controller boards with 6 subordinate controller processors.
- **S/N** – Displays the serial number of the subordinate controller processor (currently not used).
- **Bootloader Ver** – Displays the revision of the boot loader firmware on the subordinate controller processor provided as *major.minor.patch*.
- **Bootloader CRC** – Displays the CRC of the boot loader firmware image on the subordinate controller processor.
- **Revision** – Displays the revision of the subordinate controller processor.
- **Runtime Ver** – Displays the revision of the Runtime firmware (ERF file) on the subordinate controller processor provided as *major.minor.patch*. When a motor is programmed with a new ERF image, this number typically changes along with the Runtime CRC.
- **Runtime CRC** – Displays the CRC of the Runtime firmware image on the subordinate controller processor.

## QuickStick High Thrust (HT) Motors

Displays the motor information for the QuickStick® HT™ motors and the QSMC drives as shown in [Figure 4-31](#).

### Node Controller Motor Information

RefreshDownload Motor Info

**Motor Information for Node Controller - 10.10.0.15:**

**Path 1 Motor 1**

<b>Master Assembly:</b>	QuickStick Gen2 HT Motor Controller	<b>Revision:</b>	07
<b>S/N:</b>	MTW160900215	<b>P/N:</b>	700-1563-00
<b>Master:</b>	QuickStick Gen2 HT Master	<b>Revision:</b>	04
<b>S/N:</b>	MTW160800527	<b>P/N:</b>	600-0198-02
<b>Ethernet Address:</b>	C0:6C:6D:03:00:E2		
<b>Bootloader Ver:</b>	4.0.0	<b>Runtime Ver:</b>	21126.15.37
<b>Bootloader CRC:</b>	0x2713	<b>Runtime CRC:</b>	0x9A1D
<b>Slave 1:</b>	QuickStick Gen2 HT Inverter	<b>Revision:</b>	01
<b>S/N:</b>	MTW160900020	<b>P/N:</b>	600-0206-00
<b>Bootloader Ver:</b>	0.1.0	<b>Runtime Ver:</b>	7.7.13
<b>Bootloader CRC:</b>	0xBB58	<b>Runtime CRC:</b>	0x634F
<b>Slave 2 Assembly:</b>	QuickStick Gen2 HT 1000mm Stator	<b>Revision:</b>	07
<b>S/N:</b>	MMI170100193	<b>P/N:</b>	700-1483-00
<b>Slave 2:</b>	QuickStick Gen2 HT HES	<b>Revision:</b>	05
<b>S/N:</b>	MTW161100493	<b>P/N:</b>	600-0172-00
<b>Bootloader Ver:</b>	1.0.2	<b>Runtime Ver:</b>	7.7.13
<b>Bootloader CRC:</b>	0xB0FD	<b>Runtime CRC:</b>	0x286B
<b>Slave 3:</b>	QuickStick Gen2 HT HES	<b>Revision:</b>	05
<b>S/N:</b>	MTW161100161	<b>P/N:</b>	600-0172-00
<b>Bootloader Ver:</b>	1.0.2	<b>Runtime Ver:</b>	7.7.13
<b>Bootloader CRC:</b>	0xB0FD	<b>Runtime CRC:</b>	0x286B

**Path 4 Motor 1**

<b>Master Assembly:</b>	QuickStick Gen2 HT Motor Controller	<b>Revision:</b>	07
<b>S/N:</b>	MTW161000371	<b>P/N:</b>	700-1563-00
<b>Master:</b>	QuickStick Gen2 HT Master	<b>Revision:</b>	04
<b>S/N:</b>	MTW160900394	<b>P/N:</b>	600-0198-02
<b>Ethernet Address:</b>	C0:6C:6D:03:01:E6		
<b>Bootloader Ver:</b>	4.0.0	<b>Runtime Ver:</b>	7.7.13
<b>Bootloader CRC:</b>	0x2713	<b>Runtime CRC:</b>	0x0DC4
<b>Slave 1:</b>	QuickStick Gen2 HT Inverter	<b>Revision:</b>	01
<b>S/N:</b>	MTW160900471	<b>P/N:</b>	600-0206-00
<b>Bootloader Ver:</b>	0.1.0	<b>Runtime Ver:</b>	7.7.13
<b>Bootloader CRC:</b>	0xBB58	<b>Runtime CRC:</b>	0x634F
<b>Slave 2 Assembly:</b>	QuickStick Gen2 HT 1000mm Stator	<b>Revision:</b>	03
<b>S/N:</b>	MMI140701630	<b>P/N:</b>	700-1483-00
<b>Slave 2:</b>	QuickStick Gen2 HT HES	<b>Revision:</b>	05
<b>S/N:</b>	B140400091	<b>P/N:</b>	600-0172-00
<b>Bootloader Ver:</b>	1.0.2	<b>Runtime Ver:</b>	7.7.13
<b>Bootloader CRC:</b>	0xB0FD	<b>Runtime CRC:</b>	0x286B
<b>Slave 3:</b>	QuickStick Gen2 HT HES	<b>Revision:</b>	05
<b>S/N:</b>	B140400168	<b>P/N:</b>	600-0172-00
<b>Bootloader Ver:</b>	1.0.2	<b>Runtime Ver:</b>	7.7.13
<b>Bootloader CRC:</b>	0xB0FD	<b>Runtime CRC:</b>	0x286B

RefreshDownload Motor InfoView High Level Controller Motor Info

Figure 4-31: Motor Information Page, QSMC with QuickStick HT Motors



Displays the motor information for the QuickStick High Thrust motors and the QSHT 5700 Inverters as shown in Figure 4-32.

### Node Controller Motor Information

Motor Information for Node Controller - 10.10.0.15:

Path 5 Motor 1

<b>Master Assembly:</b>	QuickStick HT 5700 1000mm	<b>Revision:</b>	00
<b>S/N:</b>	47297	<b>P/N:</b>	PN-531637
<b>Master:</b>	QuickStick HT 5700 Master	<b>Revision:</b>	03
<b>S/N:</b>	R47297	<b>P/N:</b>	PN-570264
<b>Ethernet Address:</b>	C0:6C:6D:03:19:4F	<b>Runtime Ver:</b>	21180.15.45
<b>Bootloader Ver:</b>	17.3.0	<b>Runtime CRC:</b>	0x76A9
<b>Bootloader CRC:</b>	0xAFAE		
<b>Slave 1:</b>	QuickStick HT 5700 Inverter	<b>Revision:</b>	03
<b>S/N:</b>	JA760758	<b>P/N:</b>	PN-279296
<b>Bootloader Ver:</b>	17.3.2	<b>Runtime Ver:</b>	17.3.9
<b>Bootloader CRC:</b>	0xE493	<b>Runtime CRC:</b>	0x22B8
<b>Slave 2 Assembly:</b>	QuickStick Gen2 HT 1000mm Stator	<b>Revision:</b>	07
<b>S/N:</b>	MMI140701633	<b>P/N:</b>	700-1483-00
<b>Slave 2:</b>	QuickStick Gen2 HT HES	<b>Revision:</b>	05
<b>S/N:</b>	B140400140	<b>P/N:</b>	600-0172-00
<b>Bootloader Ver:</b>	1.0.2	<b>Runtime Ver:</b>	7.7.13
<b>Bootloader CRC:</b>	0xB0FD	<b>Runtime CRC:</b>	0x286B
<b>Slave 3:</b>	QuickStick Gen2 HT HES	<b>Revision:</b>	05
<b>S/N:</b>	B140400057	<b>P/N:</b>	600-0172-00
<b>Bootloader Ver:</b>	1.0.2	<b>Runtime Ver:</b>	7.7.13
<b>Bootloader CRC:</b>	0xB0FD	<b>Runtime CRC:</b>	0x286B

Path 5 Motor 2

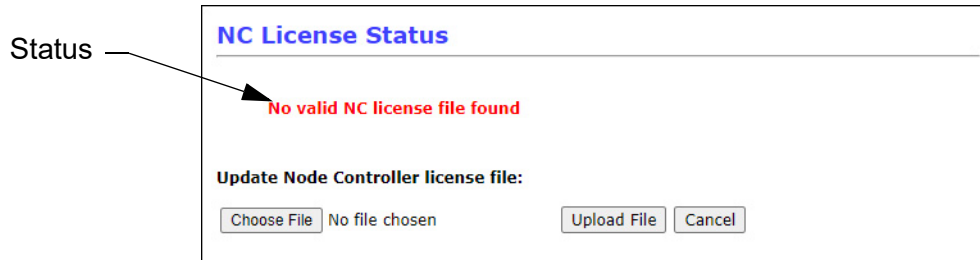
<b>Master Assembly:</b>	QuickStick HT 5700 Dual 500mm	<b>Revision:</b>	00
<b>S/N:</b>	47302	<b>P/N:</b>	PN-531637
<b>Master:</b>	QuickStick HT 5700 Master	<b>Revision:</b>	03
<b>S/N:</b>	R47302	<b>P/N:</b>	PN-570264
<b>Ethernet Address:</b>	C0:6C:6D:03:19:5D	<b>Runtime Ver:</b>	21180.15.45
<b>Bootloader Ver:</b>	17.3.0	<b>Runtime CRC:</b>	0x76A9
<b>Bootloader CRC:</b>	0xAFAE		
<b>Slave 1:</b>	QuickStick HT 5700 Inverter	<b>Revision:</b>	03
<b>S/N:</b>		<b>P/N:</b>	PN-279296
<b>Slave 2:</b>	QuickStick Gen2 HT HES	<b>Runtime Ver:</b>	17.3.9
<b>S/N:</b>	B140400089	<b>Runtime CRC:</b>	0x22B8
<b>Bootloader Ver:</b>	1.0.2	<b>Runtime Ver:</b>	7.7.13
<b>Bootloader CRC:</b>	0xB0FD	<b>Runtime CRC:</b>	0x286B
<b>Slave 3 Assembly:</b>	QuickStick Gen2 HT 500mm Stator	<b>Revision:</b>	05
<b>S/N:</b>	MMI150100769	<b>P/N:</b>	700-1483-01
<b>Slave 3:</b>	QuickStick Gen2 HT HES	<b>Revision:</b>	05
<b>S/N:</b>	MTW141000224	<b>P/N:</b>	600-0172-00
<b>Bootloader Ver:</b>	1.0.2	<b>Runtime Ver:</b>	7.7.13
<b>Bootloader CRC:</b>	0xB0FD	<b>Runtime CRC:</b>	0x286B

Figure 4-32: Motor Information Page, QSHT 5700 Inverter with QuickStick HT Motors

- **Master Assembly** – Displays the type of motor controller.
- **S/N** – Displays the serial number of the motor controller.
- **Revision** – Displays the revision of the motor controller.
- **P/N** – Displays the part number of the motor controller.
- **Master** – Displays the type of supervisory controller board in the motor controller.
- **S/N** – Displays the serial number of the supervisory controller board.
- **Ethernet Address** – Displays the MAC ID of the supervisory controller board.
- **Bootloader Ver** – Displays the revision of the boot loader firmware on the supervisory controller board provided as *major.minor.patch*.
- **Bootloader CRC** – Displays the CRC of the boot loader firmware image on the supervisory controller board.
- **Revision** – Displays the revision of the supervisory controller board for the motor.
- **P/N** – Displays the part number of the supervisory controller board.
- **Runtime Ver** – Displays the revision of the Runtime firmware (ERF file) on the supervisory controller board provided as *major.minor.patch*. When the supervisory controller board is programmed with a new ERF image, this number typically changes along with the Runtime CRC.
- **Runtime CRC** – Displays the CRC of the Runtime firmware image on the supervisory controller board.
- **Slave *n*** – Displays the type of inverter board in the motor controller or the type of HES board in the motor stator.
- **S/N** – Displays the serial number of the subordinate controller board.
- **Bootloader Ver** – Displays the revision of the boot loader firmware on the subordinate controller board provided as *major.minor.patch*.
- **Bootloader CRC** – Displays the CRC of the boot loader firmware image on the subordinate controller board.
- **Revision** – Displays the revision of the subordinate controller board.
- **P/N** – Displays the part number of the subordinate controller board.
- **Runtime Ver** – Displays the revision of the Runtime firmware (ERF file) on the subordinate controller board provided as *major.minor.patch*. When a motor is programmed with a new ERF image, this number typically changes along with the Runtime CRC.
- **Runtime CRC** – Displays the CRC of the Runtime firmware image on the subordinate controller board.
- **Slave 2 Assembly** – Displays information about the subordinate controller assembly that is located in the motor. The Slave 2 Assembly contains 2 subordinate controller boards and itself, Slaves 2 and 3.
- **S/N** – Displays the serial number of the subordinate controller assembly.
- **Revision** – Displays the revision of the subordinate controller assembly.
- **P/N** – Displays the part number of the subordinate controller assembly.

## License Information

The License Information page is used to administer node controller software licenses. The **License Information** page, which is shown in [Figure 4-33](#), is accessed by selecting **License Information** on the Main Menu (see [License Information on page 135](#) for use details).



*Figure 4-33: License Information Page Details*

### NC License Status

Displays the software license status and provides a tool to update the license if required.

- **Status** – Displays the status of the software license.
  - **NC license file found and validated** – The node controller is using a valid software license instead of a hardware key.
  - **No valid NC license file found** – The node controller is either using a hardware key or a license has not been installed.
- **Update Node Controller license file** – Provides a tool to locate and upload to Next Gen node controllers a new software license file.
  - **Choose File** – Opens a dialog box to locate the software license to be uploaded. Once selected the file name is displayed in the text field.
  - **Upload File** – Uploads the selected software license to the node controller.
  - **Cancel** – Clears the **Browse** text field.

## NC Migration

The NC Migration page is used to install a Next Gen format Software Image on a node controller using a legacy format Software Image or a legacy format Software Image on a node controller using a Next Gen Software Image. The **NC Migration** page, which is shown in [Figure 4-34](#) and [Figure 4-35](#), is accessed by selecting **NC Migration** on the Main Menu (see [NC Migration on page 137](#) for use details). It automatically displays either the upgrade or downgrade option based on the Software Image currently running on the node controller.

### Migrate Node Controller Software

---

**Upgrade to Next Gen Node Controller Software**

*No Migration Image Found - Upload an image to migrate*

**Upload Next Gen Node Controller Image for Migration:**

No file chosen

**Upgrade This Node Controller to Next Gen Node Controller Software**

*No Migration Image Found - Upload an image to migrate*

Single Node Controller

### Migrate Node Controller Software

---

**Upgrade to Next Gen Node Controller Software**

*No Migration Image Found - Upload an image to migrate*

**Upload Next Gen Node Controller Image for Migration:**

No file chosen

**Upgrade This Node Controller to Next Gen Node Controller Software**

*No Migration Image Found - Upload an image to migrate*

**Upgrade All Node Controllers to Next Gen Software**

**Migration Status:** Not Active

**Message:** None

**Command:**

*No Migration Image Found - Upload an image to migrate*

Node Controller	OS Version	Will Migrate?	Migration Active?	Software Version	Build Date/Time	Migration Status
10.10.0.10 (HLC)	1	Yes	No	15.9.21	02-Mar-2021 1844	Idle
10.10.0.15	Unknown	No	No	0.0.0	Unknown Unknown	Unknown
10.10.0.16	Unknown	No	No	0.0.0	Unknown Unknown	Unknown

Multiple Node Controllers **When Connected to the HLC**

*Figure 4-34: NC Migration Page Details*

## Upgrade to Next Gen Node Controller Software

This section displays the Software Image file being used for the upgrade. Once an image is selected, the title changes to **Image to be used for Migration** and the file information and image type (Next Gen Image) are displayed.

### Upload Next Gen Node Controller Image for Migration

This section provides a tool to locate and upload to the node controller the Software Image file being used for the upgrade. Once an image is uploaded, this section is no longer displayed.

**NOTE:** To upload a different image, reboot the node controller to restart the process.

- **Choose File** – Opens a dialog box to locate the Software Image file to be uploaded. Once selected the file name is displayed next to the button.
- **Upload File** – Uploads the selected Software Image file to the node controller.
- **Cancel** – Clears the Choose File text field.

### Upgrade This Node Controller to Next Gen Node Controller Software

Once a Software Image is uploaded, this section provides controls and status information for the migration of a single node controller. This section also allows upgrading just the HLC.

- **Migration Status:** – Displays the upgrade status.
- **Migrate This Node Controller** – Starts the upgrade process.

### Upgrade All Node Controllers to Next Gen Software

Once a Software Image is uploaded, this section provides controls and status information for the migration of multiple node controllers from the HLC. This section is only displayed if there are multiple node controllers in the transport system and the migration is being performed on the HLC.

- **Migration Status:** – Displays the upgrade status.
- **Message:** – Displays information about the upgrade process.
- **Probe Node Controllers** – Examines each node controller in the transport system to make sure that they can be upgraded and displays the results in the Node Controller Status table in this section.
- **Migrate All Node Controllers** – Starts the upgrade process.
- **Node Controller Status Table** – Provides the upgrade status of each node controller in the transport system. Displays Unknown in the status fields until the node controllers have been probed.
  - **Node Controller** – Displays the IP address of the node controller and identifies the HLC.

- **OS Version** – Displays the OS version of the Software Image on the node controller.  
**1** – Legacy format Software Image.  
**2** – Next Gen Software Image.
- **Will Migrate?** – Identifies those node controllers that can and cannot be migrated.
- **Migration Active?** – Displays the current state of the upgrade for the node controller.
- **Software Version** – Displays the version of the Software Image on the node controller.
- **Build Date/Time** – Displays the build date and time of the Software Image on the node controller.
- **Migration Status** – Displays the current upgrade task for the node controller.

### Migrate Node Controller Software

---

**Downgrade to Legacy Node Controller Software**

*No Migration Image Found - Upload an image to migrate*

**Upload Legacy Node Controller Image for Migration:**

No file chosen

**Downgrade This Node Controller to Legacy Node Controller Software**

*No Migration Image Found - Upload an image to migrate*

Single Node Controller

### Migrate Node Controller Software

---

**Downgrade to Legacy Node Controller Software**

*No Migration Image Found - Upload an image to migrate*

**Upload Legacy Node Controller Image for Migration:**

No file chosen

**Downgrade This Node Controller to Legacy Node Controller Software**

*No Migration Image Found - Upload an image to migrate*

**Downgrade All Node Controllers to Legacy Software**

**Migration Status:**

Not Active

**Message:** None

**Command:**

*No Migration Image Found - Upload an image to migrate*

Node Controller	OS Version	Will Migrate?	Migration Active?	Software Version	Build Date/Time	Migration Status
10.10.0.10 (HLC)	1	Yes	No	15.9.21	02-Mar-2021 1844	Idle
10.10.0.15	Unknown	No	No	0.0.0	Unknown Unknown	Unknown
10.10.0.16	Unknown	No	No	0.0.0	Unknown Unknown	Unknown

Multiple Node Controllers

Figure 4-35: NC Migration Page Details - Downgrade

## Downgrade to Legacy Node Controller Software

This section displays the Software Image file being used for the downgrade. Once an image is selected, the title changes to **Image to be used for Migration** and the file information and image type (Legacy Image) are displayed.

## Upload Legacy Node Controller Image for Migration

This section provides a tool to locate and upload to the node controller the Software Image file being used for the downgrade. Once an image is uploaded, this section is no longer displayed.

**NOTE:** To upload a different image, reboot the node controller to restart the process.

- **Choose File** – Opens a dialog box to locate the Software Image file to be uploaded. Once selected the file name is displayed next to the button.
- **Upload File** – Uploads the selected Software Image file to the node controller.
- **Cancel** – Clears the Choose File text field.

## Downgrade This Node Controller to Legacy Node Controller Software

Once a Software Image is uploaded, this section provides controls and status information for the migration of a single node controller. This section also allows downgrading just the HLC.

- **Migration Status:** – Displays the downgrade status.
- **Migrate This Node Controller** – Starts the downgrade process.

## Downgrade All Node Controllers to Legacy Software

Once a Software Image is uploaded, this section provides controls and status information for the migration of multiple node controllers from the HLC. This section is only displayed if there are multiple node controllers in the transport system and the migration is being performed on the HLC.

- **Migration Status:** – Displays the downgrade status.
- **Message:** – Displays information about the downgrade process.
- **Probe Node Controllers** – Examines each node controller in the transport system to make sure that they can be downgraded and displays the results in the Node Controller Status table in this section.
- **Migrate All Node Controllers** – Starts the downgrade process.
- **Node Controller Status Table** – Provides the downgrade status of each node controller in the transport system. Displays Unknown in the status fields until the node controllers have been probed.
  - **Node Controller** – Displays the IP address of the node controller and identifies the HLC.
  - **OS Version** – Displays the OS version of the Software Image on the node controller.
    - 1 – Legacy format Software Image.
    - 2 – Next Gen Software Image.



- **Will Migrate?** – Identifies those node controllers that can and can't be migrated.
- **Migration Active?** – Displays the current state of the downgrade for the node controller.
- **Software Version** – Displays the version of the Software Image on the node controller.
- **Build Date/Time** – Displays the build date and time of the Software Image on the node controller.
- **Migration Status** – Displays the current upgrade task for the node controller.

## Logout

The Logout page is used to exit the web interface. The **Logout** page, which is shown in [Figure 4-36](#), is accessed by selecting **Logout** on the Main Menu. The logout is not complete until the browser is closed (see [Logout on page 161](#) for use details).



*Figure 4-36: Logout Page Details*

## Overview

This chapter provides an overview of the user interface (UI) for the node controller console interface with examples of each menu in the UI and a complete description of their features. The following parts of the user interface are covered:

- Menu layout.
- Console interface features.

**NOTE:** This console interface reference reflects the version of the software that is indicated in [Changes on page 9](#). Specific builds of the Node Controller Software Image file may not implement all features described in this manual. See the Release Notes supplied with this application for more information.

## User Interface Features

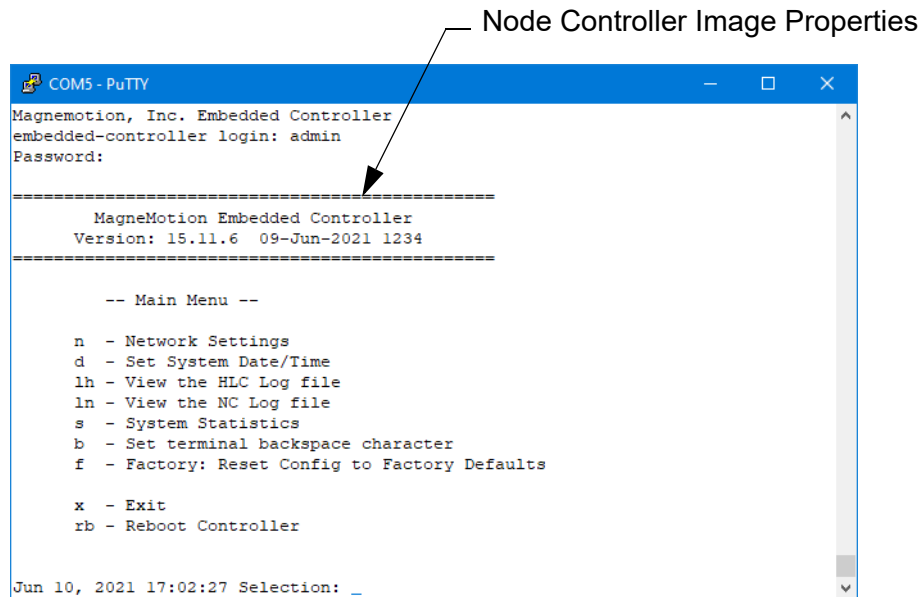
This reference provides a detailed description of each menu displayed by the console interface. All functions and menus shown in this reference are listed in functional order.

The console interface is used to configure the node controllers when they can't be accessed by the web interface. The node controllers are the controllers used to monitor vehicles and control the motors and other components of the transport system.

## Main Menu

The Main Menu for the console interface is displayed in a terminal emulator as shown in [Figure 5-1](#). All menu functions are described after the figure. This section describes the function of each menu item (see [Node Controller Administration – Console on page 163](#) for use details).

**NOTE:** The menu options presented may differ from the options shown in [Figure 5-1](#) depending on the Node Controller Software Image version, but all main functions are always available.



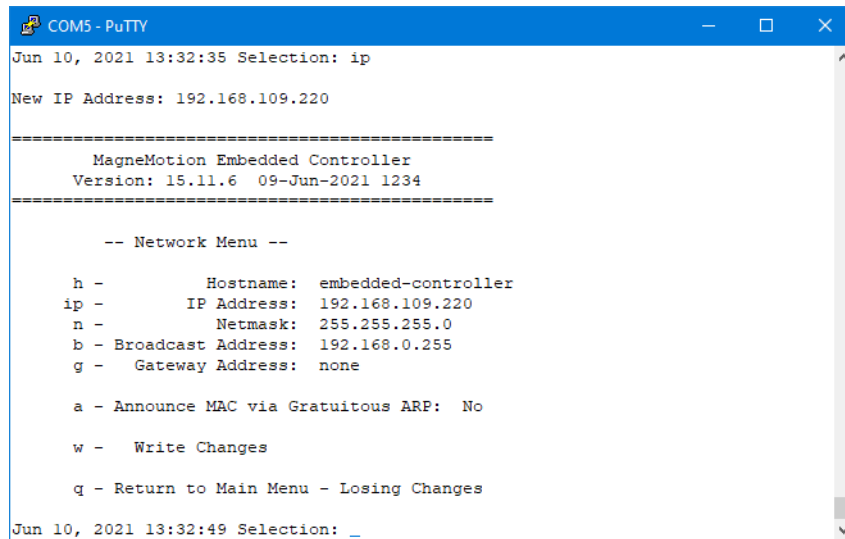
*Figure 5-1: Main Menu Details*

- **Node Controller Image Properties** – Displays the software version and build date and time.
- **n - Network Settings** – Provides access to the Network Menu, which is used to configure the IP address for the node controller.
- **d - Set System Date/Time** – Provides a method for setting the clock on the node controller using the MMDDhhmmss.YYYY format. The time is specified using a 24 hour clock.
- **lh - View the HLC Log File** – Provides a method for viewing the high-level controller log file. User <Enter> to display the next line. Use <q> to exit from the log display. Available on most configurations.
- **ln - View the NC Log File** – Provides a method for viewing the node controller log file. User <Enter> to display the next line. Use <q> to exit from the log display. Available on most configurations.
- **s - System Statistics** – Displays basic system statistics including uptime and memory available/used.

- **b** - Set terminal backspace character – Provides a method to change the backspace character to the character appropriate for the terminal emulator being used.
- **f - Factory: Reset Config to Factory Defaults** – Resets the node controller to the factory defaults. Requires confirmation before the node controller resets.
- **x - Exit** – Closes the console session.
- **rb - Reboot Controller** – Provides a method to reboot the node controller. Requires confirmation before the node controller reboots.
- **p - No Recovery partition detected: do safe repartitioning** – Provides a method to create a recovery partition with just the node controller software image for use by Rockwell Automation<sup>®</sup> support. Available on some versions of the legacy format Software Image.

## Network Settings Menu

The Network Settings menu is used to set the network address for the node controller. The **Network Settings** menu, which is shown in [Figure 5-2](#), is accessed by entering “n” at the Main Menu. This section describes the function of each menu item (see [Configuring IP Settings](#) on page 167 for use details).



```

COM5 - PuTTY
Jun 10, 2021 13:32:35 Selection: ip
New IP Address: 192.168.109.220

=====
MagneMotion Embedded Controller
Version: 15.11.6 09-Jun-2021 1234
=====

-- Network Menu --

h -      Hostname:  embedded-controller
ip -      IP Address: 192.168.109.220
n -      Netmask: 255.255.255.0
b -      Broadcast Address: 192.168.0.255
g -      Gateway Address: none

a - Announce MAC via Gratuitous ARP: No

w -      Write Changes

q - Return to Main Menu - Losing Changes

Jun 10, 2021 13:32:49 Selection: _
  
```

*Figure 5-2: Network Settings Menu Details*

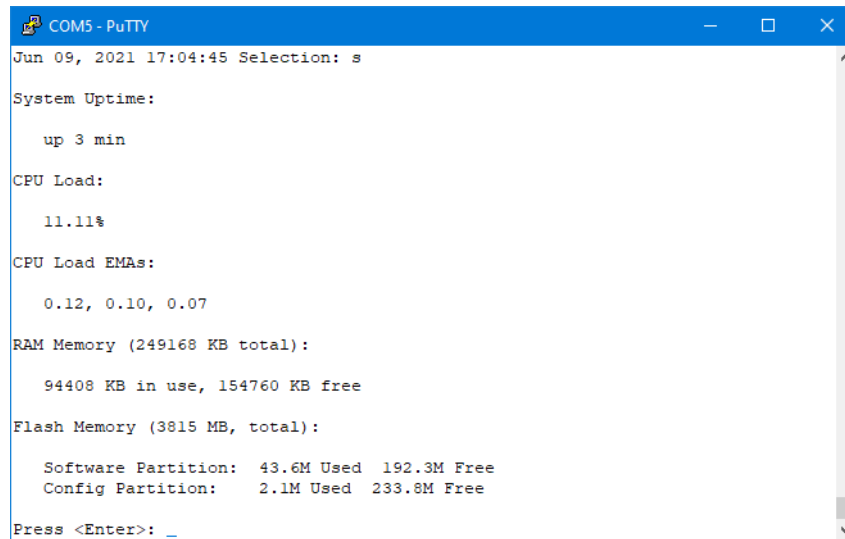
- **h - Hostname** – Provides a method for changing the host name of the node controller computer. This name is not referenced by any software and is not viewable.
- **ip - IP Address** – Provides a method for changing the IP address of the node controller.
- **n - Netmask** – Provides a method for changing the IP netmask of the node controller.
- **b - Broadcast Address** – Provides a method for changing IP Broadcast Address of the node controller.
- **g - Gateway Address** – Provides a method for changing the IP Gateway Address of the node controller.
- **a - Announce MAC via Gratuitous ARP** – Provides a method to distribute the MAC address and IP address of the node controller to make sure that ARP caches on other devices are updated. Selecting this option changes the setting from Yes to No or No to Yes.
  - **Yes** – The node controller sends gratuitous ARPs at boot, then every 30 seconds until the ARP table is not empty.
  - **No** – The node controller ARP is not sent.

- **w - Write Changes** – Writes any IP changes to the nonvolatile memory in the node controller. Only displayed if changes have been made. The node controller must be rebooted to activate the changes.
- **q - Return to Main Menu** – Exits the menu and returns to the Main Menu. Any changes that were made and not saved using the “w” option are discarded.



## System Statistics

The System Statistics provides an overview of the status and memory usage information for the node controller. The **System Statistics** page, which is shown in [Figure 5-3](#), is accessed by entering “s” at the Main Menu. This section describes each item on the page (see [System Statistics](#) on page 175 for use details).



```

COM5 - PuTTY
Jun 09, 2021 17:04:45 Selection: s
System Uptime:
    up 3 min
CPU Load:
    11.11%
CPU Load EMAs:
    0.12, 0.10, 0.07
RAM Memory (249168 KB total):
    94408 KB in use, 154760 KB free
Flash Memory (3815 MB, total):
    Software Partition: 43.6M Used 192.3M Free
    Config Partition: 2.1M Used 233.8M Free
Press <Enter>: _
  
```

*Figure 5-3: System Statistics Details*

- **System Uptime** – Displays the amount of time the node controller has been running.
- **CPU Load** – Displays the average load on the node controller CPU (100.00% is fully loaded, 0.00% is no load). Loads greater than 100.00 indicate an error condition.
- **CPU Load EMAs** – Displays the load on the node controller CPU as exponential moving averages for the last 5, 10, and 15 minutes (1.00 is fully loaded, 0.00 is no load). Loads greater than 1.0 indicate an error condition.
- **RAM Memory** – Displays the amount of volatile memory installed in the node controller and how much is used and free. The node controller RAM is used to run the flash images and for the log files.
- **Flash Memory** – Displays the amount of nonvolatile memory installed in the node controller and how much is used and free. The usage is shown for both the **Software Partition**, which is used to store the operating system and the Node Controller Software Images and the **Config Partition**, which is used to store the Node Controller Configuration File, Motor ERF Images, Motor Type files, and so on.

## Set Terminal Backspace Character

The **Set terminal backspace character** option provides the ability to change the backspace character to the character appropriate for the terminal emulator being used. The **Set terminal backspace character** option, which is shown in [Figure 5-4](#), is accessed by entering “b” at the Main Menu. This section describes each item on the page (see [Set Terminal Backspace Character](#) on page 176 for use details).



*Figure 5-4: Set Terminal Backspace Character*

- **Enter backspace key:** – Change the backspace emulation to the character appropriate for the terminal emulator being used.
  - 1 – Set the backspace character to <Ctrl-H>.
  - 2 – Set the backspace character to <Ctrl-?>.
  - 3 – Set the backspace character to any user-specified character.
- **Enter user defined backspace key:** – This prompt is displayed when option 3 is selected for entry of a user-specified character.

## Overview

This chapter describes the common difficulties that may be encountered when using the node controller interfaces. Included in this chapter are:

- General node controller troubleshooting.
- Communications troubleshooting.

## Node Controller Troubleshooting

### General Troubleshooting

[Table 6-1](#) briefly identifies common difficulties that may occur with the node controller interfaces, and general solutions.

*Table 6-1: Node Controller General Troubleshooting*

Symptom	Problem	Solution
The transport system is not behaving according to the Node Controller Configuration File uploaded to the node controller.	The Node Controller Configuration File was not distributed.	Distribute the Node Controller Configuration File file to all node controllers. See <a href="#">Configuration Files on page 51</a> .
	The Node Controller Configuration File was distributed, but the node controllers are not using the new file.	Restart the node controller through the web interface to start using the new file. See <a href="#">Restart the Node Controller on page 131</a> .
The Node Controller Configuration File was uploaded to the node controller and the node controller was restarted, but the transport system is not behaving as expected.	The motors are not running the updated configuration settings.	Reset the motors (either from the NCHost TCP Interface Utility or the host controller) for the new configuration settings to take effect.
	There may be an error in the Node Controller Configuration File.	Review the node controller log for an unexpected tag in the log. Update the Node Controller Configuration File using the Configurator.
	The node controller or motors may be unplugged.	Review the node controller log for a message about difficulty loading the Motor Type files. Then check all power and communication cable connections for the transport system components.
		Review the Motor Information page to determine the status of the motors.
	The node controller status is displayed as Invalid.	Review the node controller log for an unexpected tag in the log. Update the Node Controller Configuration File using the Configurator.

*Table 6-1: Node Controller General Troubleshooting (Continued)*

Symptom	Problem	Solution
The time on the node controller clock is wrong.	The node controller did not receive power for an extended period, and the internal battery was not able to maintain the time.	Reset the clock. See <a href="#">Set the Clock Time and Date on page 123</a> or <a href="#">Set the Clock Time and Date on page 172</a> .
		Manually correct the time each time the node controller is powered up or return the node controller to Rockwell Automation for repair.
Communications problems when using multiple node controllers (ping message dropped).	Either faulty network cables or a network switch that cannot keep up with the traffic.	Check all network wiring and hardware to make sure it is operating properly.
Unable to upload files to the node controller.	The file selected to upload is not the correct type of file.	Make sure the file that is selected is the correct type of file.

## Web Interface Troubleshooting

Table 6-2: Node Controller Web Interface Troubleshooting

Symptom	Problem	Solution
Cannot open the web interface for a node controller.	Use the appropriate IP address for each node controller.	When using a new node controller, change the IP address so that it matches the network. See <a href="#">Setting Node Controller IP Addresses on page 39</a> or <a href="#">Setting Node Controller IP Addresses on page 167</a> .
		Make sure that the node controller is connected to the network.
The factory defaults were restored, and now the node controller cannot be accessed through the web interface.	When restoring the factory defaults, the node controller IP address resets to 192.168.0.1.	Change the node controller IP address back to match the network. See <a href="#">Setting Node Controller IP Addresses on page 39</a> or <a href="#">Setting Node Controller IP Addresses on page 167</a> .
The web interface graphics are slow to load.	Network communications are slow.	Check all network hardware to make sure it is operating properly.
Cannot view the Node Controller Configuration File using the web interface.	XML file has incorrect characters in it.	Do not use an ampersand character (&) in any of the name elements of a Node Controller Configuration File.

## Console Interface Troubleshooting

*Table 6-3: Node Controller Console Interface Troubleshooting*

Symptom	Problem	Solution
Cannot open the console interface for a node controller.	No power or incorrect power being supplied.	Verify that the power cable from the power supply is fully seated and secured.
		Verify that the power supply for the node controller is the correct power rating.
	Bad Serial connection to the node controller.	Make sure that the node controller is connected to the service computer using a null modem RS-232 cable.
	Service computer is not configured correctly.	Verify that the correct port is specified in the terminal emulator and that it is configured as specified in <a href="#">Configure and Run the Terminal Emulator on page 165</a> .

## Log Message Troubleshooting

Additional troubleshooting can be performed by reviewing the node controller and high-level controller log files. See the descriptions in the table for identification of typical fault-related log messages, their cause, and corrective action. The messages are organized alphabetically by type.

**NOTE:** The file size limit of the log file (node controller or HLC) is 12 MB. Once the log file reaches this limit, the oldest log information is over-written in 4-MB chunks. This means the first 4 MB of the log is lost when the node controller starts to over-write information.

### Log Message Structure

All log messages are identified as coming from a specific source in the node controller. The most common message sources and their descriptions are provided in [Table 6-4](#) for the node controller (NC) and high-level controller (HLC) logs. All log message troubleshooting in this section is arranged by the Source and the Log Level. Log messages are generated based on the Log Level set in the **Log Settings** (see [Log Levels on page 206](#)).

*Table 6-4: Log Message Sources*

Source	Contents in NC Log	Contents in HLC Log
COMM	Messages that are related to the TCP connections out of the Ethernet port.	Messages that are related to the TCP connections out of the Ethernet port.
CONFIG	Success or description of configuration problem.	Success or description of configuration problem.
ENET_IP	None written to this log.	Reports on the EtherNet/IP connection to the host controller.
FAULTS	Motor faults set and cleared.	Path faults set and cleared.
HLC	Reports on communications connections.	Reports on communications connections.
HOST	None written to this log.	Reports on connection to Host.
PEER	Reports on connections to other node controllers.	Reports on connections to other node controllers.
STARTUP	Messages related to locating vehicles.	None written to this log.
SYSTEM	NC image version, general information that is not covered by other categories, and motor programming status.	NC image version, general information that is not covered by other categories.
VEHICLE	Vehicle status reports, excluding Jam reports.	Vehicle status reports, including Jam reports.



## COMM, CRITICAL:

comm\_connect\_socket: connect to x.x.x.x completed

**Explanation:** HLC connection to node controller x.x.x.x completed successfully.

comm\_connect\_socket: connect() failed w/ SO\_ERROR: 111 (Connection refused)

**Explanation:** HLC was not able to establish a connection due to the destination server/node controller refusing the connection.

comm\_connect\_socket: connect() failed w/ SO\_ERROR: 113 (No route to host)

**Explanation:** HLC was not able to establish a connection due to the destination server/node controller being unavailable.

comm\_receive: read() on port Scope Socket returned EOF

**Explanation:** The Virtual Scope application disconnected from the node controller.

comm\_receive: read() on port Host Socket returned EOF

**Explanation:** The host application disconnected from the node controller.

comm\_receive: readv() on port Host Status 1 Socket failed, errno: 104 (Connection reset by peer)

**Explanation:** The host application disconnected from the node controller.

unknown\_msg\_handler: unknown msg type: *message* len: *bytes* on port Host Socket dropped

**Explanation:** Unrecognized command *message* that is *bytes* long ignored.

## CONFIG, CRITICAL:

config\_load\_node\_configuration: processed configuration file *node\_config\_file* successfully

**Explanation:** The Node Controller Configuration File *node\_config\_file* was successfully loaded and processed.

handle\_manufacturing\_info\_report: completed interrogating Master ID: *motorID* on Path ID: *pathID* (*path\_name*) for 64 manufacturing data items

**Explanation:** Motor manufacturing data for motor *motorID* on path *pathID* (*path\_name*) was successfully collected.

handle\_master\_params: Ignoring tag <*tag\_name*> at line *n*

**Explanation:** The element *tag\_name* in the Node Controller Configuration file is ignored.

HLC daemon for configuration '*config\_name*' is initializing

**Explanation:** The Node Controller Configuration File *config\_name* is being initialized.

Path ID: *pathID*, Master ID: *motorID*, Board Type: *board\_type* Rev: *board\_rev*, Serial: *board\_sn*, Bootloader Ver: (*board\_bl*) CRC: *board\_bl\_crc*, Runtime Ver: (*board\_rt*) CRC: *board\_rt\_crc*

**Explanation:** Provides the motor manufacturing data for motor *motorID* on path *pathID*, where:

*board\_type* – The type of supervisory controller board.

*board\_rev* – The revision of the supervisory controller board.

*board\_sn* – The serial number of the supervisory controller board.

*board\_bl* – The boot loader firmware revision (major.minor.patch).

*board\_bl\_crc* – The boot loader firmware image CRC.

*board\_rt* – The Runtime firmware revision (major.minor.patch).

*board\_rt\_crc* – The Runtime firmware image CRC.

Path ID: *pathID* (*path\_name*) has NO responsible node controller, did you forget to define a node for it?

**Explanation:** The path *pathID* (*path\_name*) is defined, but is not connected to a node.

populate\_mfg\_assembly\_data: insufficient manufacturing assembly-level data for Master ID: *motorID* on Path ID: *pathID* (*path\_name*)

**Explanation:** Not able to collect sufficient assembly-level manufacturing data for motor *motorID* on path *pathID* (*path\_name*).

postprocess\_paths: Path ID: *pathID* length is *length*

**Explanation:** The length of path *pathID* has been identified as *length*.

process\_motor\_family\_constants: Set CYCLE LENGTH to *n*

**Explanation:** The cycle length for the motors in the transport system has been successfully set to *n*.

process\_motor\_type: processing Motor Type: *motor\_type*

**Explanation:** The motor information for *motor\_type* defined in the Motor Type file has been successfully processed.

process\_motor\_type\_file: Motor Type File version: *n*

**Explanation:** The version of the Motor Type file (*motor\_type.xml*) for the motors in the transport system is *n*.

process\_motor\_type\_file: processed motor assemblies successfully

**Explanation:** All motor information defined in the Motor Type file (*motor\_type.xml*) has been successfully processed.

process\_motor\_type\_file: processed motor family slave types successfully

**Explanation:** All motor subordinate controller information defined in the Motor Type file (*motor\_type.xml*) has been successfully processed.

process\_motor\_type\_file: Set MOTOR FAMILY to *motor\_family*

**Explanation:** The type of motors in the transport system has been successfully set to *motor\_family*.

process\_node\_controller\_config: Ignoring tag <tag\_name> at line *n*

**Explanation:** The element *tag\_name* in the Node Controller Configuration file is ignored.

process\_node\_controller\_config: Node Controller Configuration File version: *n*

**Explanation:** The Node Controller Configuration File is version *n*.

process\_node\_controller\_config: Setting Host TCP Control Port Timeout to *time* minutes

**Explanation:** Host TCP Control Port Timeout is set to *time* minutes. Zero indicates the timeout is disabled.

process\_node\_controller\_config: tag <version> at line *n*: is *old\_ver*, minimum supported Node Controller Configuration File version in this release is *cur\_ver*

**Explanation:** The Node Controller Configuration File is an old version (*old\_ver*).

**User Action:** The Node Controller Configuration File must be opened and saved using the latest version of the Configurator and then reloaded.

process\_node\_controller\_config: Using Minimum Vehicle ID: *min* / Maximum Vehicle ID: *max* for this system

**Explanation:** The node controller has set the minimum and maximum vehicle IDs as specified in the Node Controller Configuration File.

process\_path: Skipping Vehicle on line *lineNum* of Path: *pathID* (*path\_name*), not running as HLC simulator

**Explanation:** The Node Controller Configuration File defined a simulated vehicle, which is not used since the node controller is not running in simulation mode.

qs\_config\_verify\_configuration: Controller Assembly-Level Data invalid for Path ID: *pathID* (*path\_name*), Master ID: *motorID*

**Explanation:** Motor manufacturing data for motor *motorID* on path *pathID* (*path\_name*) was not valid.

sys\_load\_magnet\_array\_types: loading *magnet\_array\_type\_file*

**Explanation:** The node controller has loaded the Magnet Array Type file *magnet\_array\_type\_file*.

sys\_load\_motor\_types: loading *motor\_type\_file*

**Explanation:** The node controller has loaded the Motor Type file *motor\_type\_file*.

## ENET\_IP, CRITICAL:

enet\_ip\_connect\_socket: connect() failed w/ SO\_ERROR: 113 (No route to host)

**Explanation:** The host controller is off or not connected through the network to the high level controller.

enet\_ip\_connect\_socket: connect failed, errno 101 (Network is unreachable)

**Explanation:** The host controller is off or not connected through the network to the high level controller.

enet\_ip\_connect\_socket: connect to *x.x.x.x* completed

**Explanation:** The HLC has connected to the controller acting as Host at *x.x.x.x* using EtherNet/IP.

enet\_ip\_disconnect\_socket: CLOSED socket connection to PLC at IP: *x.x.x.x*

**Explanation:** The HLC has closed the link to the controller that is acting as Host at *x.x.x.x* using EtherNet/IP. This will occur if the host controller has not sent a command for 2 minutes, if the HLC cannot open a connection to the host controller, or if the HLC is unable to write a tag to the host controller memory due to insufficient array size.

This fault is reported to the host as a High-Level Controller Status (0xD1) message when using TCP/IP or in an MMI\_HLC\_status message when using EtherNet/IP.

**User Action:** Ensure that host controller is online and sending commands and that the status arrays are adequately sized. When the host controller sends a command or when the array size in the controller is corrected, the HLC will reconnect.

handle\_enet\_ip\_connect\_timeout: enet\_ip\_connect\_socket failed

**Explanation:** The host controller is off or not connected through the network to the high level controller.

handle\_enet\_ip\_connect\_timeout: retries exhausted waiting for connection to PLC @ IP address: *x.x.x.x* to complete

**Explanation:** The host controller at *x.x.x.x* is off or not connected through the network to the host controller.

enet\_ip\_host\_heartbeat\_callback: Ethernet/IP LINK UP

**Explanation:** The HLC is receiving a valid heartbeat from the controller acting as Host.

enet\_ip\_host\_kill\_link: Ethernet/IP LINK DOWN

**Explanation:** The HLC has closed the link to the controller that is using EtherNet/IP acting as Host.

handle\_cip\_msg\_router\_response: Tag: *tag\_name* Type: *type* Array Index: *index,element*  
Operation: *operation*, general status: *status*

**Explanation:** The HLC is unable to write to the tag *tag\_name* in the host controller.

**User Action:** Ensure that host controller is online and sending commands and that the response and status arrays are properly sized. When the host controller sends a command or when the array size in the controller is corrected, the HLC will reconnect.

enet\_ip\_host\_handle\_vehicle\_station\_order: REJECTING order for unknown vehicle ID: *vID*  
order number: *order\_num*

**Explanation:** The host controller is sending a vehicle order for vehicle ID *vID* and *vID* is not a valid vehicle ID.

**User Action:** Check the index on the vehicle ID number.

handle\_cip\_msg\_router\_request: Ignoring request for CIP class ID: 0x67, service code: 0x4b

**Explanation:** CIP message is attempting to send to host controller.

**User Action:** Check model of host controller to make sure this is supported.

handle\_enet\_ip\_connect\_timeout: enet\_ip\_connect\_socket failed

**Explanation:** The host controller is off or not connected to the high level controller.

## FAULTS, CRITICAL:

faults\_handle\_error\_status\_report: error status report from path ID: *pathID* (*path\_name*) master w/ Comm ID: *commID* but currently working with path ID: *pathID* (*path\_name*) master #*motorID* w/Comm ID: *commID*

**Explanation:** A motor is operating with a communications ID (motor number) that differs from its actual position in the path, where:

*pathID* – Path ID number.

*path\_name* – Optional path name.

*commID* – Motor position on path.

*motorID* – Motor ID.

**User Action:** Restart services on the NC to push a new configuration down to the motors. Send a Reset command to the path that contains the new motors so that they start using their new configuration.

faults\_handle\_error\_status\_2\_report: Path ID: *pathID (path\_name)* Master #*motorID* (Comm ID: *comm\_ID*) OK, fault status received

**Explanation:** This motor is now able to respond to requests from the node controller for its current fault status.

faults\_handle\_periodic\_timeout: Path ID: *pathID (path\_name)* Master #*motorID* (Comm ID: *comm\_ID*) NOT responding to polls for faults

**Explanation:** There is something preventing this motor from responding to requests from the node controller for its current fault status.

This fault is reported to the host as a Motor Status (0xD7) message when using TCP/IP or in an MMI\_path\_motorfamily\_faults\_status message when using EtherNet/IP.

**User Action:** Verify that the most upstream motor on the path that is not responding has logic power and that all communication cables are properly connected. Verify that the configuration file matches the physical configuration of the system. Attempt to program the supervisory controller board of the motor with a version of motor code compatible with the current node controller image. Reseat all cables if they appear to be connected correctly and there is power present at the power connector.

If none of the above actions are successful, replace the communications cables and motors one at a time. If a replacement does not resolve the issue, replace the removed component and exchange another, until the failed component is located and the motor responds.

## FAULTS, CRITICAL: FAULT ACTIVE:

Path ID: *pathID (path\_name)* master #*motorID*: Block *block\_num*: Over temperature fault

**Explanation:** The motor *motorID* temperature reached its maximum limit and the motor has shut down to protect itself from thermal damage.

This fault is reported to the host as a Motor Status (0xD7) message when using TCP/IP or in an MMI\_path\_motorfamily\_faults\_status message when using EtherNet/IP.

**User Action:** Make sure the motor is not overworked and the vehicle is not jammed. The fault clears automatically once the motor temperature is within safe limits.

Path ID: *pathID (path\_name)* master #*motorID*: Block *block\_num*: Under voltage fault

**Explanation:** The input propulsion power voltage to motor block *block\_num* has dropped more than 10% below the nominal input voltage. When this fault is reported on all blocks in a motor, it means that motor is not receiving propulsion power. When

it is reported on only one or more, but not all, blocks in a motor, it means that there is a disruption of propulsion power inside the motor.

This fault is reported to the host as a Motor Status (0xD7) message when using TCP/IP or in an MMI\_path\_motorfamily\_faults\_status message when using EtherNet/IP.

**User Action:** If the all blocks in the motor do not have propulsion power, check the power supply and wiring to make sure they are providing power to the motor. If some, but not all, blocks in a motor report this error, contact the Rockwell Automation Technical Support Center to determine if replacing the motor is required.

Path ID: *pathID (path\_name)* master #*motorID*: State: Movement suspended by Node Controller

**Explanation:** All movement on the path *pathID (path\_name)* and motor *motorID* has been suspended by the node controller. A Suspend command could be sent deliberately from the Host, a digital I/O based E-stop, an interlock, or as the result of “Suspend On Host Disconnect” being triggered if that option is enabled in the configuration file.

**User Action:** If the motor is not in the operational state, send a startup command to make it operational. If the motor is operational but suspended, make sure no digital I/O based E-stops or interlocks are active, then send a Resume command to the path containing the stopped motor. Once a Resume command is sent, any vehicles on that motor resume their commanded motion.

## FAULTS, CRITICAL: FAULT CLEARED:

Path ID: *pathID (path\_name)* master #*motorID*: Block *block\_num*: Over temperature fault

**Explanation:** The temperature of motor *motorID* is within the nominal input voltage range.

Path ID: *pathID (path\_name)* master #*motorID*: Block *block\_num*: Under voltage fault

**Explanation:** The input propulsion power voltage to motor block *block\_num* is within the nominal input voltage range.

Path ID: *pathID (path\_name)* master #*motorID*: State: Movement suspended by Node Controller

**Explanation:** All movement on the path *pathID (path\_name)* and motor #*motorID* has been resumed by the node controller.

## HLC, CRITICAL:

hlc\_send\_link\_status\_report: Path ID: *pathID* path end: *end* link status: *status*

**Explanation:** Provides the status for the communication link at the end of the path specified, where:

*pathID* – Path ID number.

*end* – DOWNSTREAM or UPSTREAM.  
*status* – FAILED or OK.

If this message reports link failed, the node controller cannot communicate with the motor. If this fault appears with a motor not responding fault, it can also indicate a motor not having power or a motor not present in the system. This error can also be caused by a motor running a version of runtime code that is incompatible with the runtime image on the node controller.

This fault is reported to the host as a Path Status (0xD4) message when using TCP/IP or in an MMI\_path\_status message when using EtherNet/IP.

**User Action:** If the upstream link is reported down, check that the cables are correctly connected and that the first motor in the path has power. If both are correct, make sure that the motor is running the correct version of runtime software.

If the downstream link is reported down, make sure that all motors in the path are responding to fault requests. If the motors are not responding, troubleshoot according to the motor not responding fault. If all motors are responding, verify that the connection between the NC and motor is correctly connected.

host\_handle\_hlc\_link\_status\_msg: Path ID: *pathID* path end: *end* link status: *status*

**Explanation:** Provides the status for the communication link at the end of the path that is specified, where:

*pathID* – Path ID number.  
*end* – DOWNSTREAM or UPSTREAM.  
*status* – FAILED or OK.

host\_handle\_hlc\_node\_status\_msg: Node ID: *nodeID* (*node\_name*) vehicle ID: *vID* EXITED, but no vehicle record exists to remove

**Explanation:** A RESET was issued while vehicle *vID* is exiting Terminus node *nodeID* (*node\_name*) and before the vehicle exits fully or before EXIT\_ALLOWED is set Low. This error occurs when the HLC gets a node status that shows a vehicle was navigating the node before the Reset but hadn't exited yet, and after the Reset it no longer sees the vehicle owning the node. It typically means that the vehicle in the Terminus node is gone, but it has no record of the vehicle (which happened due to the reset).

host\_handle\_hlc\_programming\_complete\_msg: NC: *x.x.x.x* Path: *pathID* Programming result: Programming succeeded

**Explanation:** The motors on path *pathID* controlled by the node controller with IP address *x.x.x.x* were successfully programmed.



## HOST, CRITICAL:

host\_handle\_host\_hlc\_extension\_msg: Rejecting Host Extension Command for unknown extension - type: *extension*, subtype: *message*, dropping request

**Explanation:** Unrecognized HLC command *extension message* ignored.

host\_handle\_vehicle\_extension\_cmd\_msg: Rejecting Host Extension Command for unknown extension - type: *extension*, subtype: *message*, dropping request

**Explanation:** Unrecognized vehicle command *extension message* ignored.

host\_throttle\_listen\_socket: NEW Host Socket TCP connection from *x.x.x.x*

**Explanation:** A new TCP connection has been established to the host controller with IP address *x.x.x.x*.

NEW Scope Socket TCP connection from *x.x.x.x*

**Explanation:** A new TCP connection for the Virtual Scope has been established from the host controller with IP address *x.x.x.x*.

## PEER, CRITICAL:

handle\_peer\_connect\_timeout: comm\_connect\_socket failed

**Explanation:** Attempt to establish a connection to a node controller failed due to a timeout.

handle\_peer\_connect\_timeout: retries exhausted waiting for connection to node controller @ IP address: *x.x.x.x* to complete *date time*

**Explanation:** The node controller is unable to establish a connection to the node controller with IP address *x.x.x.x* at *date* and *time*.

**User Action:** Verify the communication and power connections to the unresponsive node controller. Verify that the IP address of the node controller matches the setting in the configuration file. This fault clears when the node controllers can resume communication.

This fault is reported to the host as a Node Controller Status (0xD2) message when using TCP/IP or in an MMI\_node\_controller\_status message when using EtherNet/IP.

peer\_init: Setting connection to NC @ *x.x.x.x* to CONNECTED for HLC simulator functionality

**Explanation:** Message from the HLC that a simulated connection to the node controller at *x.x.x.x* is complete.

## STARTUP, CRITICAL:

startup\_handle\_boot\_report\_msg: path ID *pathID (path\_name)* unexpected RESET detected

**Explanation:** Power to a motor on path *pathID (path\_name)* was lost and then restored.

dump\_sensor\_map: Path ID: *pathID (path\_name)* sensor map: *path\_map*

**Explanation:** Provides the sensor map for path ID: *pathID (path\_name)* where:

“\_” – No magnet array detected.

“=” – Magnet array detected.

“V” – Vehicle determined.

“v” – Vehicle edge determined.

## SYSTEM, CRITICAL:

check\_erf\_file: detected candidate image file *motor\_image.erf* in ERF image file directory

**Explanation:** The Motor ERF Image file *motor\_image.erf* has been loaded on the node controller.

determine\_erf\_memory\_image: controller's board type: *n* selects ERF image for master ID: *motorID* on Path ID: *pathID (path\_name)*

**Explanation:** The type of motor *motorID* on path *pathID (path\_name)* matches the available Motor ERF Image.

free\_erf\_memory\_images: unloading ERF file: *motor\_image.erf* from memory

**Explanation:** The Motor ERF Image file *motor\_image.erf* is being unloaded from the node controller memory at the end of motor programming.

handle\_program\_paths\_req: Program all Masters on Path ID: *pathID (path\_name)*

**Explanation:** Command to program all motors on path *pathID (path\_name)*.

hlc\_daemon Copyright © *date* MagneMotion, A Rockwell Automation Company

**Explanation:** High-Level Controller Software Image copyright statement.

hlc\_daemon version: *x.x.x* built: *date\_time* by: *engineer* on host: *server* uptime *time*

**Explanation:** High-level controller software image version, build date and time, responsible engineer, the server where the file was built, and the amount of time since the HLC started.

load\_erf\_image\_into\_memory: ERF file *motor\_image.erf* address block base: *mem\_address*, size: *size*

**Explanation:** The Motor ERF Image file *motor\_image.erf* is being loaded into the node controller memory starting at location *mem\_address* and taking *size* blocks to support programming the motors.

load\_erf\_image\_into\_memory: ERF file *motor\_image.erf* load complete, *space* bytes total

**Explanation:** The Motor ERF Image file *motor\_image.erf* has been loaded into the node controller memory, using *space* bytes.

main: Configured as High-Level Controller Simulator

**Explanation:** The node controller is running as a simulator.

main: problems loading config, cannot exit hlc\_state\_init

**Explanation:** One of the following issues has been encountered:

- There is no Node Controller Configuration File loaded.
- The version of the Node Controller Configuration File is out of date.
- There are errors in the Node Controller Configuration File.
- There are no Motor Type files loaded.
- There are no Magnet Array Type files loaded.

**User Action:** Review the log for additional messages that describe the errors.

main: Using USB dongle/key

**Explanation:** The node controller software is using a hardware key.

nc\_daemon version: *x.x.x* built: *date\_time* by: *engineer* on host: *server*

**Explanation:** Node Controller Software Image version, build date and time, responsible engineer, and the server where the file was built.

nc\_daemon copyright © *date* MagneMotion, A Rockwell Automation Company

**Explanation:** Node Controller Software Image copyright statement.

No valid NC license found

**Explanation:** The node controller software is not using a software license instead of a hardware key.

port\_error\_monitor: Port *n* Dropped *b* bytes in the last 1 second period (Path ID: *pathID* (*path\_name*) *path\_end* comm)

**Explanation:** Communications error. If the number of bytes is large (> 500), this indicates a communication problem.

port\_error\_monitor: Port *n* Dropped *b* bytes in the last 1 second period (Path ID: *pathID* (*path\_name*) *path\_end* comm)

**Explanation:** Communications error. If the number of bytes is large (> 500), this indicates a communication problem.

qs\_programming\_handle\_28\_series\_info\_report\_msg: master *#motorID* on path ID: *pathID* (*path\_name*), INFO REPORT SUCCESSFUL

**Explanation:** Was able to collect motor *motorID* on path *pathID* information during programming.

qs\_programming\_handle\_bootloader\_exit\_timeout: ERF programming of path ID: *pathID* (*path\_name*) PROGRAMMING COMPLETED SUCCESSFULLY

**Explanation:** Programming of motors on path *pathID* (*path\_name*) has completed successfully.

qs\_programming\_handle\_bootloader\_ready: master *motorID* on path ID: *pathID* (*path\_name*), START INFO REPORT

**Explanation:** The bootloader for motor *motorID* on path *pathID* (*path\_name*) is ready.

qs\_programming\_handle\_program\_line\_response: master *motorID* on path ID: *pathID* (*path\_name*) programming successful

**Explanation:** Programming of motor *motorID* on path *pathID* (*path\_name*) has completed successfully.

send\_nc\_list\_to\_conf\_distribution: sent *n* NC IP addresses to configuration distribution daemon

**Explanation:** Sent the IP addresses of the node controllers in the transport system for configuration distribution.

simulator\_handle\_reset\_path\_timeout: Path ID: *pathID* (*path\_name*) RESET complete

**Explanation:** Shows the reset for the simulated path *pathID* (*path\_name*) is complete.

simulator\_handle\_startup\_path\_timeout: Path ID: *pathID* (*path\_name*) STARTUP complete

**Explanation:** Shows the startup for the simulated path *pathID* (*path\_name*) is complete.

simulator\_init: Path ID: *pathID* (*path\_name*) setting state to INIT, Suspend by command ON

**Explanation:** Shows the simulated path *pathID* (*path\_name*) is initialized and suspended.

simulator\_init: Path ID: *pathID* (*path\_name*) setting *end* Link Status OK

**Explanation:** Shows the simulated status for the communication link at the end of the path that is specified is OK, where:

*pathID* – Path ID number.

*path\_name* – Optional path name.

*end* – DOWNSTREAM or UPSTREAM.

simulator\_init: NC ID: *ncID* (*nc\_name*) setting software version to *swVer*, config id: *configID*, config valid: *configValid*, state: OPERATIONAL

**Explanation:** Node controller *ncID* (*nc\_name*) is simulated as operational, running software *swVer*, using config file *configID* (where *configID* is the ID of the managed configuration being used or 0 if a managed configuration is not being used), and *configValid* is the state of the config file.

simulator\_init: Node ID: *nodeID* (*node\_name*) setting device\_status to OPERATIONAL

**Explanation:** Shows the simulated node *nodeID* is operational.

simulator\_path\_suspend\_request: Path ID: *pathID* (*path\_name*) status

**Explanation:** Shows the simulated movement status for path *pathID* (*path\_name*) where *status* is either RESUME MOVEMENT or SUSPEND MOVEMENT

simulator\_reset\_path: Path ID: *pathID* (*path\_name*) entering state RESET

**Explanation:** Shows the simulated path *pathID* (*path\_name*) is reset.

simulator\_startup\_path: Path ID: *pathID* (*path\_name*) entering state STARTUP

**Explanation:** Shows the simulated path *pathID* (*path\_name*) is started (motion can be simulated).

simulator\_vehicle\_manager: profile period excessive: *period*

**Explanation:** Message is issued when uploading software to the node controller while running a simulation. This message is only seen when running the node controller as a simulator. This is a warning that vehicles might appear to “jump” from position to position since the node controller was starved for CPU time.

sys\_detect\_mmi\_os\_version: The MMI\_OS\_VERSION is set to: *n*

**Explanation:** Identifies the type of OS running on the node controller, where:

1 – Legacy format software image.

2 – Next Gen format software image.

## SYSTEM, CRITICAL: CONF DIST:

ERROR: Transfer did not complete!

**Explanation:** The file transfer that is specified in the previous message failed.

Sending activate software image request for: *file\_name* to NC @ *x.x.x.x*

**Explanation:** The HLC has requested the node controller with IP address *x.x.x.x* activate the file *file\_name*.

Sending Authentication Data Portion to NC @ *x.x.x.x*

**Explanation:** The HLC has initiated a file transfer to the node controller with IP address *x.x.x.x* of the User Authentication Credentials.

Sending Delete Files request for type: *file\_type* to NC @ *x.x.x.x*

**Explanation:** The HLC has requested the node controller with IP address *x.x.x.x* delete all files of *file\_type*.

Sending File: *file\_name* of type: *file\_type* to NC @ *x.x.x.x*

**Explanation:** The HLC has initiated a file transfer of the file *file\_name*, which is a *file\_type* file to the node controller with IP address *x.x.x.x*.

Sending Program All Paths request to NC @ *x.x.x.x*

**Explanation:** The HLC has requested the node controller with IP address *x.x.x.x* program all paths with the Motor ERF Image files that are stored on that node controller.

SUCCESS: NC acknowledged request

**Explanation:** The node controller that is specified in the previous request has acknowledged the request (activate software image, delete files, program motors, etc.).

SUCCESS: Transfer Reported Complete.

**Explanation:** The previously reported transfer has completed successfully.

## SYSTEM, CRITICAL: FATAL:

Hardware Diagnostic Code: 0x021a. Contact Rockwell Automation for assistance.

**Explanation:** Node controller internal hardware error.

**User Action:** The node controller must be returned to Rockwell Automation for repair.

Hardware Diagnostic Code: 0x0265. Contact Rockwell Automation for assistance.

**Explanation:** Node controller internal hardware error.

**User Action:** The node controller must be returned to Rockwell Automation for repair.

## VEHICLE, CRITICAL:

vehicle\_check\_for\_jam: Vehicle ID: *vehicleID* on path *pathID* (*path\_name*) @ position *position* target: *target status*

**Explanation:** The vehicle is not making progress moving towards the position it has most recently been granted permission to move to. This applies if either that position is on the way to its final destination or the actual final destination, where:

*vehicleID* – Vehicle ID number.

*pathID* – Path ID number.

*path\_name* – Optional path name.

*position* – Current vehicle position.

*target* – Target vehicle position.

*status* – JAMMED or NO LONGER JAMMED

**Explanation:** The vehicle is not making progress (traveling below the arrival velocity threshold that is specified in the configuration file) moving towards the position it has most recently been granted permission to move to. The position can be either an interim destination on the way to the final destination or the actual final destination. This can happen when a vehicle is obstructed by something external, the PID settings are not strong enough to move the vehicle, or propulsion power has been disabled. The motor continues to apply force on the vehicle to try to move it indefinitely.

This fault is reported to the host as a Vehicle Status (0xD5) message when using TCP/IP or in an MMI\_vehicle\_status message when using EtherNet/IP.

**User Action:** Remove the cause of the jam. If the vehicle is being held in place or blocked, remove the physical condition constraining the vehicle. Adjust PID settings if necessary. Make sure that the motor under the vehicle has propulsion power.

Hardware Troubleshooting

Table 6-5 briefly identifies common difficulties that may occur with the node controllers, and general solutions.

Table 6-5: Node Controller Troubleshooting

Symptom	Problem	Solution
The NC-12 node controller reports a hardware error (lost communication with PHY) and loses the link. The link lights on the NC go out.	Anomaly in the Intel Ethernet controller.	A script was added to the node controller to handle the anomaly. When the scripts see a link loss, it toggles the Ethernet link to 0.0.0.0 three times in case it is stuck due to the anomaly. If the link comes back, it restores the node controllers IP settings.
		Cycle power on the node controller.



## Communications Troubleshooting

The **Interface Status** page in the web interface can be used as a diagnostic tool. Increasing **Tx Bytes/Msgs** and **Rx Bytes/Msgs** values are normal. Increasing **Tx Bytes/Msgs** but no change with **Rx Bytes/Msgs** values indicates a problem.

### Node Controller Serial Communication

To determine if the node controller is having connectivity or communication problems with the RS-422 or RS-232 ports review the **Interface Status** page (see [Interface Status on page 196](#)), which shows the node controller connectivity statistics for the Serial I/O ports. [Table 6-6](#) provides an overview of the Serial communication functions that are displayed on the **Interface Status** page.

*Table 6-6: Node Controller Serial Communication Troubleshooting*

Function	Definition
Port	The RS-422 and RS-232 ports that connect the node controller to the motors and possibly other accessories.
Tx Bytes	<b>Normal function:</b> increasing number.
Tx Msgs	<b>Normal function:</b> increasing number, always a smaller number than <b>Tx Bytes</b> .
Rx Bytes	<b>Normal function:</b> increasing number.
Rx Msgs	<b>Normal function:</b> increasing number, always a smaller number than <b>Rx Bytes</b> .
Rx Error Bytes	<b>Normal function:</b> usually zero (0), but may be a few bytes infrequently. <b>Abnormal function:</b> this number increases but <b>Rx Bytes</b> does not increase, check link to port.
Framing Errors	<b>Normal function:</b> usually zero (0), but may be a few bytes infrequently. <b>Abnormal function:</b> this number increases but <b>Rx Bytes</b> does not increase, check link to port.
Overruns	<b>Normal function:</b> zero (0). <b>Abnormal function:</b> constantly increasing, contact Rockwell Automation.
Rx Break Count <sup>*</sup>	<b>Normal function:</b> not increasing. <b>Abnormal function:</b> constantly increasing, check link to port.
Buf Overrun	<b>Normal function:</b> zero (0). <b>Abnormal function:</b> constantly increasing, contact Rockwell Automation.

\* Resets can result in break count increases so small numbers can be considered OK.

## Node Controller Ethernet Communication

To determine if the node controller is having Ethernet connectivity problems, communication problems with the host controller, or connectivity problems between multiple node controllers review the **Interface Status** page (see [Interface Status on page 196](#)), which shows the node controller and high-level controller connectivity statistics for the Ethernet connection.

[Table 6-7](#) provides an overview of the Ethernet functions that are displayed on the **Interface Status** page.

*Table 6-7: Node Controller Ethernet Communication Troubleshooting*

Function	Definition
Type	HLC (high-level controller) or NC (node controller).
Remote IP	Local or Remote.
Tx Bytes	<b>Normal function:</b> incrementing numbers.
Tx Msgs	<b>Normal function:</b> incrementing number, always a smaller number than <b>Tx Bytes</b> .
Rx Bytes	<b>Normal function:</b> incrementing numbers.
Rx Msgs	<b>Normal function:</b> incrementing number, always a smaller number than <b>Rx Bytes</b> .
Connected Count	<b>Normal function:</b> constant number.
Connect Attempts	<b>Normal function:</b> constant number, when <b>Connected Count</b> is a constant number also.
Accepted Count	<b>Normal function:</b> constant number. <b>Abnormal function:</b> significantly incrementing number, check link to port.
Dropped Count	<b>Normal function:</b> constant number. <b>Abnormal function:</b> significantly incrementing number, check link to port.

# Appendix A

---

## Overview

The following appendices are included to provide the user with one location for additional information that is related to the node controller interfaces.

Included in this appendix are:

- Communications protocol.
- File maintenance.
- Additional documentation.
- Transport system configuration limits.

# Communications Protocol

## Communications Format

The high-level controller (HLC) supports communication with the host application that runs on a general-purpose computer via TCP/IP over Ethernet as defined in the OSI model. Each layer of network communication within the standard OSI (Open Systems Interconnect, ISO/IEC 7498-1) model is described here. Ethernet TCP/IP runs directly over the TCP and UDP layer 4 transport layers in the OSI model. The implementation of TCP/IP only uses the TCP transport layer.

## Ethernet TCP/IP

The standard OSI model for layers 1...4 are outlined here. The HLC application runs on top of the TCP transport layer. The standard 10/100/1000 Base-TX, half-duplex, or full-duplex twisted-pair Ethernet is used for all network communications.

### Physical Layer

The electrical interface that is supported for communication between the HLC software that runs on the node controller hardware and the host controller is twisted-pair Ethernet. This interface is based on the IEEE 802.3 and IEEE 802.3u Ethernet and Fast Ethernet communication standards.

The interface uses IEEE 802.3 and IEEE 802.3u standard signal levels for 10/100/1000 Base-TX. A standard Category 5 or better cable is used to connect the HLC directly to the host controller when a hub, switch, or router is not used for the connection.

### Data Link Layer

The data link layer is standard 802.3/802.3u Ethernet packet framing. This framing uses 6 byte destination and source MAC addresses, 2 byte protocol type, 1500 byte MTU (maximum transmission unit) of payload data, and 2 byte FCS (frame check sequence). 10 Mbps and 100 Mbps signaling rates in full-duplex and half-duplex modes are supported. It is expected that any standard Ethernet device that uses a twisted-pair physical layer will have no problems interoperating with the HLC computer at the physical and data link layers.

### Network Layer

The network layer communications for the HLC is Internet Protocol Version 4 (IPv4). For diagnostic purposes during initial setup and optional network layer health status checks, the HLC supports accepting Internet Control Message Protocol (ICMP) echo requests and supports responding to echo requests with ICMP echo responses. The HLC supports the additional ICMP messages that are required to support IPv4 fragmentation and redirection of network layer packets to the next hop IP router if customer provided networking equipment

requires the HLC to honor such IP fragmentation or packet routing redirection. It is expected that any standard modern IPv4 implementation will have no problems interoperating with the HLC computer.

The HLC does not support dynamic routing protocols and does not act as a router in the customer network. The HLC drops any packets that it receives via some other peer on the network that uses the HLC computer as its next hop IPv4 router.

The HLC supports configuration with a static IPv4 address, network mask, and gateway address of the next hop IP router.

The HLC supports IPv4 Address Resolution Protocol (ARP) to support the discovery of peer Ethernet data link layer MAC addresses.

## Transport Layer

The HLC uses a Transmission Control Protocol (TCP) stream over the IPv4 network layer to support an end to end connection.

The HLC is the server and the host controller is the client for TCP endpoint communication roles. The HLC listens for incoming TCP connections from the host controller (general-purpose computer) on the following ports:

- 799 for the Host Control connection.
- 800 for the Host Status connections.
- 801 for the System Monitoring connection.
- 8000 for the MagneMotion Virtual Scope connection.

When the HLC receives an invalid message on an established TCP connection (due to a framing error), the HLC software drops the connection.

The HLC throttles incoming TCP connections to ports 799 and 800 if a problem occurs in the host controller software that causes an excessive number of connections to be established. In extreme cases, the HLC is forced to drop the connection. In the event a connection is dropped, the HLC waits one second before allowing a new connection.

## Host Control Connection

The HLC supports one Host Control TCP connection from the host controller at a time. If a new TCP connection is made to TCP port 799 when the HLC already has an established connection, the established connection is dropped and the new connection is used. Even though TCP/IP supports a more or less arbitrary number of peers at the transport layer, for safety reasons, the HLC supports only one Host Control TCP connection at a time.

### Host Status Connection

The HLC supports up to four Host Status TCP connections at a time. If a new TCP connection is made to port 800 when the HLC already has four established connections, the oldest connection is dropped and the new connection is used.

**NOTE:** The Host Status connections can be used to monitor the status of the transport system using the various status request commands. Any other commands are dropped.

### System Monitoring Connection

The HLC supports one System Monitoring connection at a time. If a new TCP connection is made to port 801 when the HLC already has an established connection, the established connection is dropped and the new connection is used.

**NOTE:** The System Monitoring connection can be used to monitor the status of transport system components using the various monitoring request commands. Any other commands are dropped.

### Virtual Scope Connection

The HLC supports one Virtual Scope TCP connection at a time. If a new TCP connection is made to port 8000 when the HLC already has an established connection, the established connection is dropped and the new connection is used.

## **File Maintenance**

### **Backup Files**

Making regular backups of all files that have been changed is recommended. Keep copies of all original and backup files at a remote location for safety.

### **Creating Backup Files**

Backup files are not created automatically. It is the responsibility of the user to create backups of all files by copying them to a secure location.

### **Restoring from Backup Files**

Damaged files can be restored by copying the backup files into the appropriate locations.

## Transport System Limits

Table A-1: Transport System Limits

	Path	Node Controller	System (HLC)
<b>Motors</b>	20/RS-422 30/Ethernet	†	3,840
<b>Node Controllers</b>	—	—	96
<b>Nodes</b>	2	—†	320
<b>Paths</b>	—	—†	160
<b>Stations</b>	—	—	2048
<b>Vehicles</b>	50/RS-422* 300/Ethernet	384	6,400‡

\* When using RS-422 communications with the motors, 50 vehicles max per path when all vehicles on the path are commanded forward (downstream).  
45 vehicles max per path when all vehicles on the path are commanded backwards.

† Node controller loading depends on node controller type. See *MagneMotion Node Controller Interface User Manual*, publication [MMI-UM013](#), for information.

‡ 6,000 vehicles max when using an HLC Control Group.

For transport system motion limits, see the motor technical data manuals in the [Additional Resources](#) table on [page 19](#).

Table A-2: Transport System Motion Limits \*

	Acceleration	Velocity	Thrust
<b>MagneMover LITE†</b>	2.0 m/s <sup>2</sup> [0.2 g]	2.0 m/s [4.5 mph]	10.0 N/cycle‡
<b>QuickStick HT with QSMC</b>	60.0 m/s <sup>2</sup> [6.1 g]	3.5 m/s [7.8 mph]	182.0 N/cycle§
<b>QuickStick HT with QSHT 5700 Inverter</b>	60.0 m/s <sup>2</sup> [6.1 g]	5.0 m/s [11.2 mph]	182.0 N/cycle§

\* The limits that are shown are at the typical payloads. Use of a smaller payload may permit higher limits. Use of a larger payload may lower the limits. See *MagneMotion QuickStick and QuickStick HT Design Guide*, publication [MMI-RM001](#) for thrust force calculations.

† The limits that are shown are for standard MagneMover LITE glide pucks. Using other pucks, or custom vehicles, may permit different limits.

‡ Thrust at 25% duty cycle, nominal Vehicle Gap is 1 mm for G3 and 1.5 mm for G4.2 magnet arrays.

§ Thrust at 10.9 A stator current with a nominal Vehicle Gap of 12 mm with a high flux magnet array.



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