

SYSMAC
CXONE-AL□□D-V4

CX-Motion-MCH

OPERATION MANUAL

OMRON

NOTE

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CXONE-AL□□D-V4

CX-Motion-MCH

Operation Manual

Revised April 2016

Notice:

OMRON products are manufactured for use according to proper procedures by a qualified operator and only for the purposes described in this manual.

The following conventions are used to indicate and classify precautions in this manual. Always heed the information provided with them. Failure to heed precautions can result in injury to people or damage to property.

 **DANGER** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. Additionally, there may be severe property damage.

 **WARNING** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. Additionally, there may be severe property damage.

 **Caution** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or property damage.

OMRON Product References

All OMRON products are capitalized in this manual. The word “Unit” is also capitalized when it refers to an OMRON product, regardless of whether or not it appears in the proper name of the product.

The abbreviation “Ch,” which appears in some displays and on some OMRON products, often means “word” and is abbreviated “Wd” in documentation in this sense.

The abbreviation “PLC” means Programmable Controller. “PC” is used, however, in some Programming Device displays to mean Programmable Controller.

Visual Aids

The following headings appear in the left column of the manual to help you locate different types of information.

Note Indicates information of particular interest for efficient and convenient operation of the product.

1,2,3... 1. Indicates lists of one sort or another, such as procedures, checklists, etc.

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About this Manual:

This manual provides information required to use the CX-Motion-MCH software, including specifications and operating methods. The CX-Motion-MCH runs on any OS that is supported by the CXOne. It is used to set data used by CS1W-MCH71 and CJ1W-MCH71 Motion Control Units (also referred to as MC Units), create the required programs, and monitor the MC Unit's operating status.

Please read this manual carefully and be sure you understand the information provided before attempting to use the CX-Motion-MCH. Be sure to read the precautions provided in the following section.

Please read the MC Unit Operation Manual carefully and be sure you understand the information provided before setting up or using an application for a Motion Control Unit.

Name	Contents	Cat. No. (suffixes omitted)
SYSMAC CX-Motion-MCH Operation Manual	Describes the specifications and operating procedures for the CX-Motion-MCH.	W448 (this manual)
SYSMAC CS1W/CJ1W-MCH71 Motion Control Unit Operation Manual	Describes the installation and operation of the CS1W/CJ1W-MCH71 Motion Control Unit.	W435

For details on procedures for installing the CX-Motion-MCH from the CX-One FA Integrated Tool Package, refer to the *CX-One Setup Manual* provided with CX-One.

Cat. No.	Model	Name	Contents
W463	CXONE-AL□□D-V4	CX-One Setup Manual	Installation and overview of CX-One FA Integrated Tool Package.

Precautions provides general precautions for using the CX-Motion-MCH, Programmable Controller, and related devices.

Section 1 provides an overview of the CX-Motion-MCH, and describes the functions and system configuration required to operate the CX-Motion-MCH. Be sure to read this section before using the CX-Motion MCH.

Section 2 provides information on installing the CX-Motion-MCH and CX-Server, and connecting to the PLC.

Section 3 describes each of the windows and basic operations.

Section 4 provides information on creating projects and adding MC Units, tasks, axes, programs, sub-programs, and CAM tables.

Section 5 describes the operations used to edit data.

Section 6 describes the operations used to save and read new projects.

Section 7 describes the operations used to transfer or compare data between the personal computer and Motion Control Unit/Servo Driver, and to write data transferred to the Motion Control Unit to the Motion Control Unit's flash memory.

Section 8 provides information on monitoring the MC Units. The MC Unit's communications status, error status, and axis's present position and status are displayed in the Monitor Windows.

Section 9 describes various operations on the axes of the MC Unit, including test run operations and program debugging.

Section 10 describes the data trace function.

Section 11 describes the operations used to back up data from MC Units and restore data to MC Units.

Section 12 describes the operations used to set and release protection on programs or cam data in MC Units, set and change primary and secondary passwords, and switch the user.

Section 13 describes the operations used to print project data.

Section 14 provides information on the error log generated by the MC Unit.

Section 15 provides information on the troubleshooting methods for the MC Unit.

Terms and Conditions Agreement

WARRANTY

- The warranty period for the Software is one year from the date of purchase, unless otherwise specifically agreed.
- If the User discovers defect of the Software (substantial non-conformity with the manual), and return it to OMRON within the above warranty period, OMRON will replace the Software without charge by offering media or download from OMRON's website. And if the User discovers defect of media which is attributable to OMRON and return it to OMRON within the above warranty period, OMRON will replace defective media without charge. If OMRON is unable to replace defective media or correct the Software, the liability of OMRON and the User's remedy shall be limited to the refund of the license fee paid to OMRON for the Software.

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APPLICABLE CONDITIONS

USER SHALL NOT USE THE SOFTWARE FOR THE PURPOSE THAT IS NOT PROVIDED IN THE ATTACHED USER MANUAL.

CHANGE IN SPECIFICATION

The software specifications and accessories may be changed at any time based on improvements and other reasons.

ERRORS AND OMISSIONS

The information in this manual has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.

Version Upgrade Information

Improvements from Version 2.2 to Version 2.24

New functions are listed in the following table.

Ver. 2.2	Ver. 2.24
Applicable OS: Windows 2000, XP, or Vista	Applicable OS: Windows 2000, XP, Vista, or 7

Improvements from Version 2.1 to Version 2.2

New functions are listed in the following table.

Ver. 2.1	Ver. 2.2
Motion Control Units in CS/CJ-series PLCs (excluding CJ2 PLCs) were supported.	Motion Control Units in CS/CJ-series PLCs (including CJ2 PLCs) are supported.

Version Upgrade from Version 2.0 to Version 2.1

New functions are listed in the following table.

Ver. 2.0	Ver. 2.1
The CX-Motion-MCH could not backup data from MC Units, restore data to MC Units and verify backup files with MC Units.	The CX-Motion-MCH can execute Backup from MC Units, Restore to MC Units and Verify backup files with MC Units.
The CX-Motion-MCH could not provide read protection.	The CX-Motion-MCH can set/release Read Protection. The CX-Motion-MCH can set passwords and switch user status.
The CX-Motion-MCH could not search in programs.	The CX-Motion-MCH can find words in all programs.
The CX-Motion-MCH could compare data with MC Units in detail.	The CX-Motion-MCH can compare data with MC Units in detail. The CX-Motion-MCH can display comparison results in Overview/Detail View. The CX-Motion-MCH can save results of comparing programs.

Note All new functions can be used with Motion Control Units with unit version 3.1 or later.

Version Upgrade from Version 1.0 to Version 2.0

New functions are listed in the following table.

Ver. 1.0	Ver. 2.0
The CX-Motion-MCH could not execute data traces.	The CX-Motion-MCH can execute data traces. The results of a trace are displayed graphically.
The CX-Motion-MCH could not execute test runs.	The CX-Motion-MCH can execute the test run operations, such as the following: Servo locks, JOG operations, STEP operations, origin searches, origin returns, forced origins, setting an absolute origin, teaching, and resetting errors.

Ver. 1.0	Ver. 2.0
The CX-Motion-MCH could not execute motion programs.	The CX-Motion-MCH can execute motion programs. Motion programs can be debugged by setting break points and by using single step execution.
The CX-Motion-MCH could be used to set only the previous parameters.	<p>New parameters have been added to use the following functions.</p> <ul style="list-style-type: none"> • Zones • A setting for the number of the parallel branches in each motion task • Establishing the origin using the present position preset • Changing the motor to Servo OFF state using an external input signal.

Note All new functions can be used in Motion Control Units with unit version 3.0 or later.

PRECAUTIONS

This section provides general precautions for using the CX-Motion-MCH software package.

The information contained in this section is important for the safe and reliable application of the CX-Motion-MCH. You must read this section and understand the information contained before attempting to set up or operate the CX-Motion-MCH.

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1 Intended Audience

This manual is intended for the following personnel, who must also have knowledge of electrical systems (an electrical engineer or the equivalent).

- Personnel in charge of installing FA systems.
- Personnel in charge of designing FA systems.
- Personnel in charge of managing FA systems and facilities.

2 General Precautions

The user must operate the product according to the performance specifications described in the operation manuals.

Before using the product under conditions which are not described in the manual or applying the product to nuclear control systems, railroad systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, safety equipment, and other systems, machines, and equipment that may have a serious influence on lives and property if used improperly, consult your OMRON representative.

Make sure that the ratings and performance characteristics of the product are sufficient for the systems, machines, and equipment, and be sure to provide the systems, machines, and equipment with double safety mechanisms.

This manual provides information for programming and operating the Unit. Be sure to read this manual before attempting to use the Unit and keep this manual close at hand for reference during operation.

 **WARNING** It is extremely important that the CX-Motion-MCH and related devices be used for the specified purpose and under the specified conditions, especially in applications that can directly or indirectly affect human life. You must consult with your OMRON representative before applying Motion Control Units and related devices to the above-mentioned applications.

3 Safety Precautions

 **WARNING** Do not attempt to take any Unit apart while the power is being supplied. Doing so may result in electric shock.

 **WARNING** Never touch any of the terminals while power is being supplied. Doing so may result in serious electric shock.

 **WARNING** Always back up programs, parameter data, position data, or cam data to the flash memory after it has been transferred to the Motion Control Unit. If transferred data is not backed up in flash memory, the previous settings may be used the next time the power is turned ON, resulting in a malfunction.

 **Caution** Check that the axis number is correct before operating an axis from the CX-Motion-MCH.

 **Caution** Confirm safety at the destination node before transferring parameters or other data to another node. Doing either of these without confirming safety may result in injury.

-  **Caution** Do not save data (i.e., do not write data to flash memory) while the motion program is being executed or the motor is operating. Unexpected operation may result.

4 Operating Environment Precautions

-  **Caution** Do not operate the MC Unit in the following locations:

- Locations subject to direct sunlight.
- Locations subject to temperatures or humidity outside the range specified in the specifications.
- Locations subject to condensation as the result of severe changes in temperature.
- Locations subject to corrosive or flammable gases.
- Locations subject to dust (especially iron dust) or salts.
- Locations subject to exposure to water, oil, or chemicals.
- Locations subject to shock or vibration.

-  **Caution** Take appropriate and sufficient countermeasures when installing the MC Unit in the following locations:

- Locations subject to static electricity or other forms of noise.
- Locations subject to strong electromagnetic fields.
- Locations subject to possible exposure to radioactivity.
- Locations close to power supplies.

5 Application Precautions

Observe the following precautions when using the CX-Motion-MCH.

- Confirm that the correct unit number is specified for the destination node before transferring parameters or other data to the Motion Control Unit.
- Confirm that programs, set parameters, and position data operate properly before using them in actual applications.
- Do not turn OFF the power to the Unit while writing to flash memory. Doing so may result in damage to the flash memory.
- After replacing an MC Unit, restart operation only after saving the required parameters, position data, and other data in the MC Unit.
- After transferring system parameters, servo parameters, programs, position data, or cam data to the MC Unit, always save the data to flash memory in the MC Unit before turning OFF the power supply using either the Support Software or a command from the CPU Unit. If data is transferred to the MC Unit without saving it to flash memory, the data will exist only in S-RAM in the MC Unit and will thus be lost when the power supply to the MC Unit is turned OFF.
- After transferring system parameters to the MC Unit, always save them in flash memory and then either cycle the power supply to the MC Unit or restart the MC Unit as a CPU Bus Unit from the CPU Unit. Some system parameters will not be updated if the MC Unit is not restarted.

- Confirm that no adverse effect will occur in the system before attempting any of the following. Not doing so may result in an unexpected operation.
 - Changing the operating mode of the PLC (including changing the Start-up Mode).
 - Force-setting/force-resetting any bit in memory.
 - Changing the present value of any word or any set value in memory.
- Do not turn OFF the power to the personal computer while installing or uninstalling CX-Motion-MCH. Doing so may result in corrupted data in the personal computer.

SECTION 1

Overview of the CX-Motion MCH

This section provides an overview of the CX-Motion-MCH, and describes the functions and system configuration required to operate the CX-Motion-MCH. Be sure to read this section before using the CX-Motion MCH.

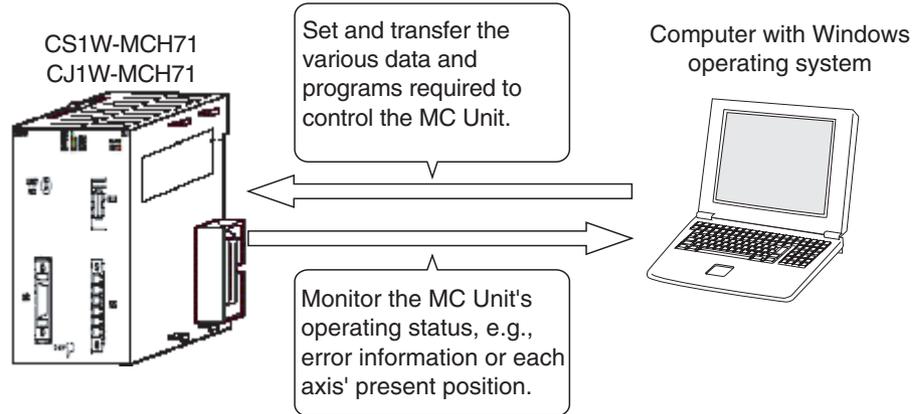
1-1	What is the CX-Motion-MCH?	2
1-2	System Configuration	3
1-3	Function List	4
1-4	Operation Procedure	6

1-1 What is the CX-Motion-MCH?

Introduction

The CX-Motion-MCH is a software package that can be used to set, create, and print various data required to control MC Units (such as system parameters, position data, motion task programs, and CAM data), transfer the data to and from the MC Unit, compare the data in the computer with the data in the MC Unit, and monitor the operating status of the MC Unit.

The CX-Motion-MCH runs on any OS that is supported by the CX-One.



Applicable MC Units

The CX-Motion-MCH supports the following MC Units.

Model number	Applicable PLCs
CS1W-MCH71	Recent versions of CS1 CPU Units (CS1□-CPU□□H)
CJ1W-MCH71	CJ2 CPU Units CJ1H/CJ1M CPU Units with unit version 2.0 or later, CP-series PLCs, and NSJ-series NSJ Controllers

Refer to 1-2 System Configuration for details on the system configuration.

Applicable Computers

Refer to the CX-One Setup Manual (W463) for the computer system requirements for the CX-Motion-MCH.

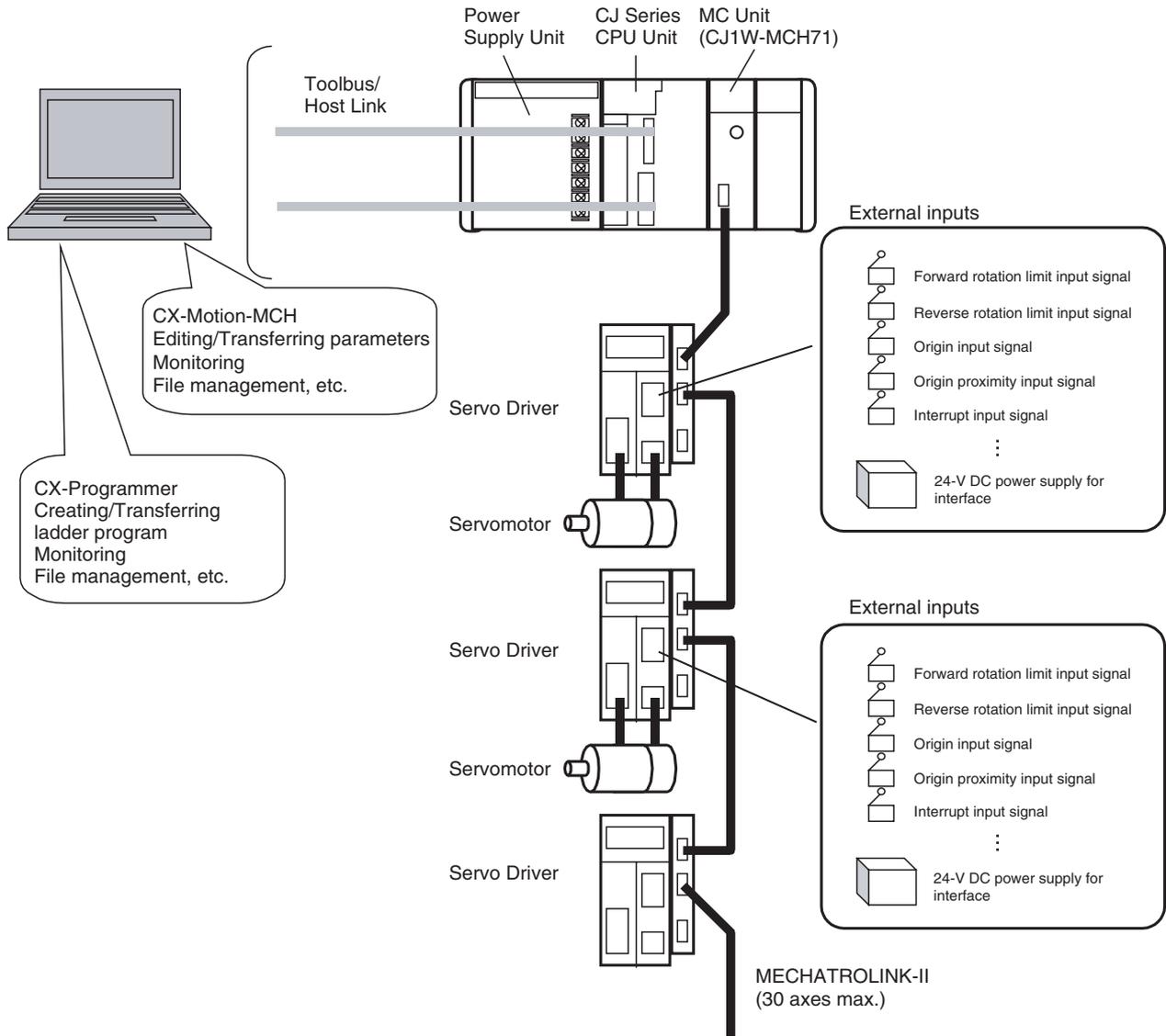
Checking the Package

Refer to the CX-One Setup Manual (W463) for details on the contents of the CX-One package that includes the CX-Motion-MCH.

Cat. No.	Model	Manual name	Contents
W463	CXONE-AL□□D-V4	CX-One Setup Manual	Installation and overview of CX-One FA Integrated Tool Package.

1-2 System Configuration

The system configuration for Motion Control Units is shown below.



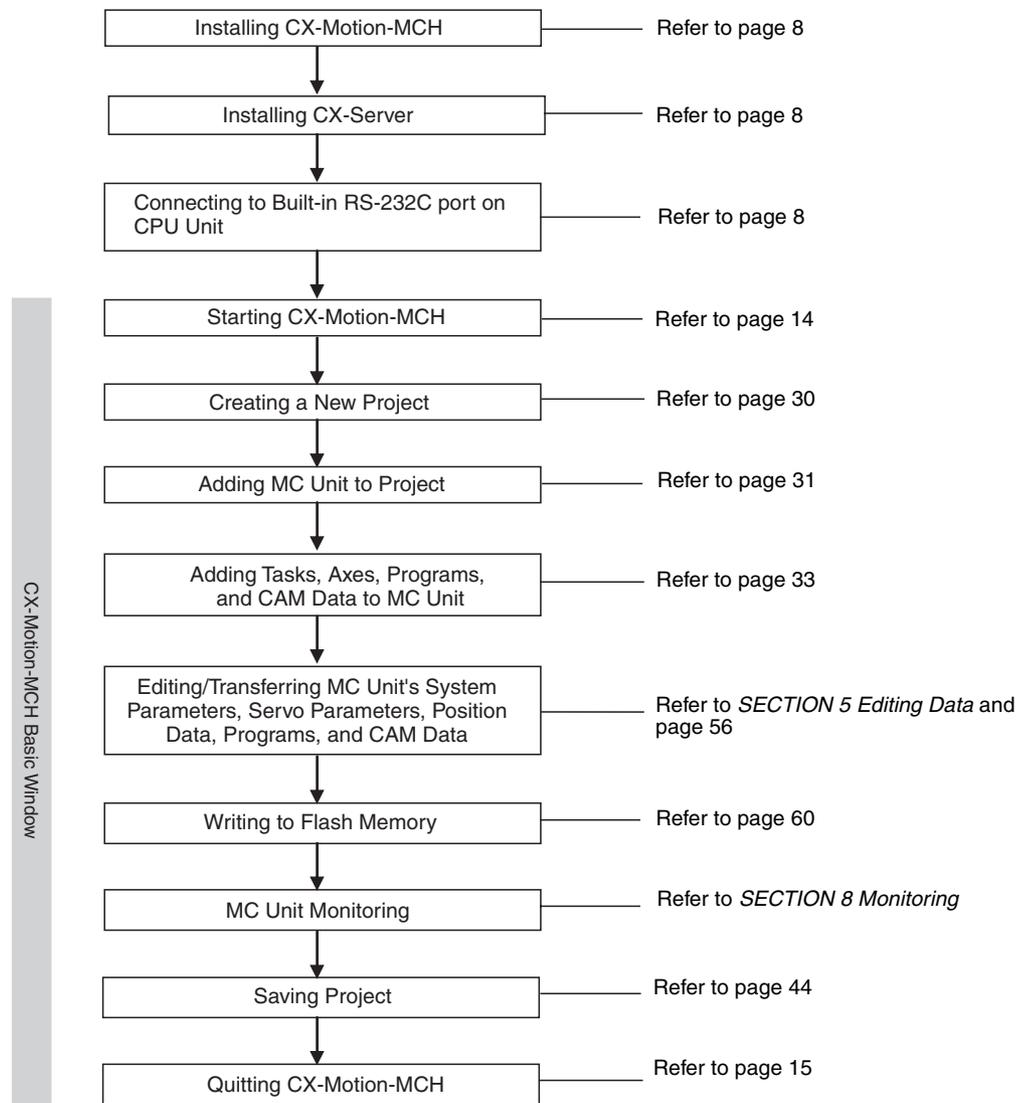
1-3 Function List

Group	Function	Details	Reference
Editing projects	Create project	Used to create project files (*.mnh)	page 30
	Add/delete Motion Control Unit	Used to add or delete MC Unit data in a project.	page 31
	Add/delete motion task	Used to add or delete motion tasks in a project.	page 32
	Add/delete axis	Used to add or delete axes in a project.	page 33
	Add/delete program	Used to add or delete programs in a project.	page 34
	Add/delete subprogram	Used to add or delete subprograms in a project	page 35
	Add/delete CAM table	Used to add or delete CAM tables in a project.	page 35
Editing data	Edit system parameters	Used to edit system parameters. (unit settings, tasks, and settings)	page 40
	Edit servo parameters	Used to edit servo parameters.	page 42
	Edit motor parameters	Used to edit motor parameters.	page 42
	Edit position data	Used to edit position data.	page 41
	Edit program or subprogram	Used to edit programs or subprograms.	page 42
	Edit CAM table	Used to edit CAM tables.	page 42
	Edit symbol	Used to edit symbols.	page 41
Saving and reading project files	Save project	Used to save data as a project file (*.mnh).	page 44
	Read project	Used to read a project file (*.mnh).	page 44
Importing and exporting data	Import	Used to import MC-Miel for MCH files, position data, programs, and CAM data.	page 45
	Export	Used to export position data, programs, and CAM data.	page 48
Printing	Print	Used to print various project data.	page 88
Online	Initial setting	Used to setup CPU Unit or MC Unit.	page 54
	Communications setting	Used to make settings for communications with the PLC.	page 54
	Download Upload Compare	Used to download, compare, or upload system parameters, servo parameters, position data, programs, and CAM data.	page 56
	Write to flash memory	Used to write RAM data inside the MC Unit to flash memory inside the MC Unit.	page 60
	Status monitor	Used to display the error information, program number in progress, and axes' present positions.	page 64
	General monitor	Used to display and change the MC Unit's variables, such as the system variables, global variables, input variables, output variables, position data, and task variables.	page 64
	Test Run	Used to execute the following operations: Servo locks, JOG operations, STEP operations, origin searches, origin returns, forced origins, setting an absolute origin, teaching, and resetting errors.	page 67
	Debug the Program	Used to debug the motion program. Motion programs can be debugged by setting break points and by using single step execution.	page 69
Data Trace	Data Trace	Used to set the trigger conditions and trace objects. The results of the trace operation are displayed graphically.	page 74
Backup and Restore	Backup from MC	Used to backup the MC Unit.	page 78
	Restore to MC	Used to restore the selected backup file to the MC Unit.	page 78
	Verify Backup file with MC Unit	Used to verify the backup file with the MC Unit.	page 79

Group	Function	Details	Reference
Read Protection	Set/Change Password	Used to set/change passwords for read protection.	page 83
	Set/Release Protection	Used to set/release protection on programs and cam data and select data items that can be read through the secondary password.	page 85
	Switch User	Used to switch the user.	page 86
Error	Error log	Used to display the error log.	page 92
	Error information	Used to display error code and error name.	page 92

1-4 Operation Procedure

The following flowchart shows the procedures required to install CX-Motion-MCH and CX-Server, create various data, transfer that data to MC Units, and use in actual operations.



SECTION 2

Setup

This section provides information on installing the CX-Motion-MCH and CX-Server, and connecting to the PLC.

2-1	Installing and Uninstalling the Software	8
2-2	Connecting to a PLC	8
2-2-1	Connecting to CS/CJ-series PLCs	8
2-2-2	Connecting to CP-series PLCs	10
2-2-3	Connecting to CJ2 PLCs.	11

2-1 Installing and Uninstalling the Software

Required Software

The following software must be installed on the same computer to use the CX-Motion-MCH.

1. CX-Motion-MCH
2. CX-Server (the communications driver)

Installing CX-Motion-MCH

Refer to the *CX-One Setup Manual* (Cat. No. W463) (supplied with the CX-One FA Integrated Tool Package) for information on how to install or uninstall the CX-Motion-MCH from the CX-One FA Integrated Tool Package.

Cat. No.	Model	Manual name	Contents
W463	CXONE-AL□□D-V4	CX-One Setup Manual	An overview of the CX-One FA Integrated Tool Package and the CX-One installation procedure

2-2 Connecting to a PLC

To transfer the project data that was created using CX-Motion-MCH to the Motion Control Unit, the personal computer and PLC (CPU Unit) have to be physically connected with a cable and also connected online.

2-2-1 Connecting to CS/CJ-series PLCs

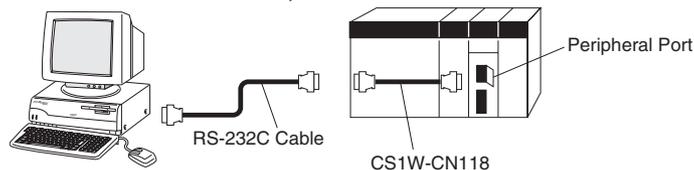
Connection Format

Using either the Host Link (SYSMAC WAY) or Toolbus, connect the personal computer to the peripheral port or RS-232C port on the PLC.

Personal computer	Connecting to Peripheral Port	Connecting to RS-232C Port
IBM PC/AT or compatible	<p>CS1W-CN118 (See note 1.) CS1W-CN226 CS1W-CN626</p>	<p>XW2Z-200S-CV/-200S-V XW2Z-500S-CV/-500S-V</p>

Note

- (1) The CS1W-CN118 cable is used as a relay cable to connect the personal computer to the CPU Unit's peripheral port using the RS-232C cable (model XW2Z-□□□□-□□) as shown below.



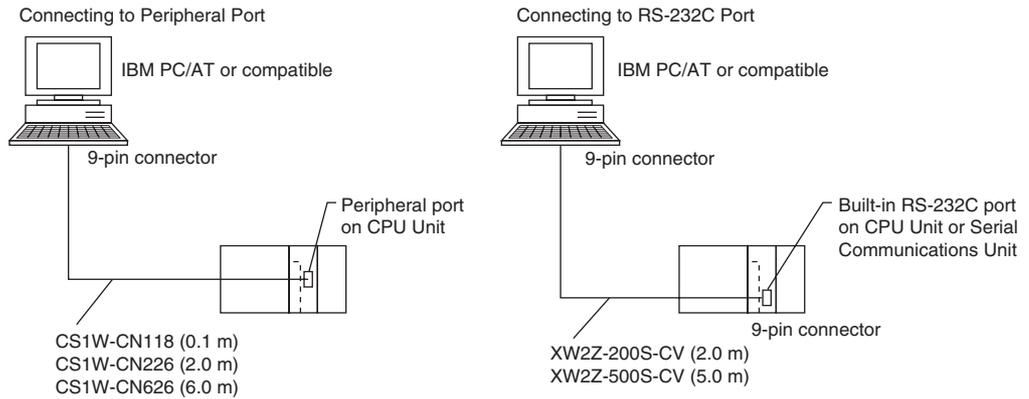
- (2) There are two network protocols (serial communications modes), SYSMAC WAY and Toolbus, that can be used to connect the CX-Motion-MCH

to the PLC. The characteristics of the network protocols are as shown below.

Network type	Characteristics
Toolbus	Faster communications. If possible, use this network type. <ul style="list-style-type: none"> • For CS/CJ Series, the baud rate on the peripherals can be detected automatically, and be connected. • Only 1 on 1 connection possible. • For CX-Motion-MCH, it can also be connected to a modem.
SYSMAC WAY (Host Link)	Used for communications with general host computers. <ul style="list-style-type: none"> • Slower than Toolbus. • Not only 1 on 1 connection, but also 1-many connection possible. • Connecting to a modem and optical adaptor possible.

Connection Methods

Use one of the following methods to connect the personal computer (CX-Motion-MCH) and PLC (CPU Unit). It is also possible to connect the personal computer to the port on the CS/CJ Series Serial Communications Unit. In that case, the only network type that can be used is Host Link.



Connection Cables

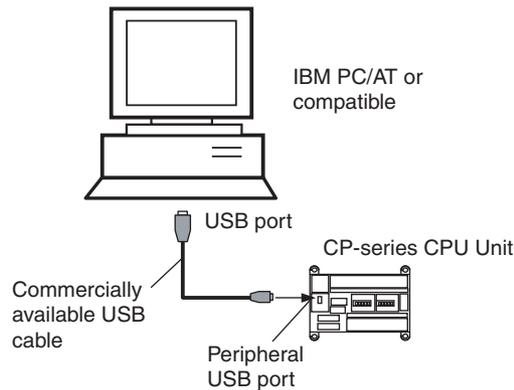
Unit	Port on Unit	Computer	Port on computer	Network type (serial communications mode)	Model number	Length	Remarks
CPU Unit	Built-in peripheral port	IBM PC/AT compatible	D-SUB, 9-pin, male	SYSMAC WAY (Host Link)	CS1W-CN226	2 m	---
					CS1W-CN626	6 m	
	Built-in RS-232C port (D-SUB, 9-pin, female)	IBM PC/AT compatible	D-SUB, 9-pin, male	SYSMAC WAY (Host Link)	XW2Z-200S-CV	2 m	Uses anti-static connector
						XW2Z-500S-CV	
Serial Communications Unit	RS-232C port (D-SUB, 9-pin, female)	IBM PC/AT compatible	D-SUB, 9-pin, male	SYSMAC WAY (Host Link)	XW2Z-200S-CV	2 m	Uses anti-static connector
						XW2Z-500S-CV	

Note When connecting the connectors of the above cables to the PLC's RS-232C port, discharge any static build-up (e.g., by touching a grounded metal object) before touching the connectors. Although XW2Z-□□□S-CV Cables use the anti-static XM2S-0911-E Connector Hood (thus reducing the possibility of static build-up), be sure to discharge any static as a safety precaution.

2-2-2 Connecting to CP-series PLCs

Connecting to USB Port on CPU Unit with Commercially Available US Cable

Unit	Port on Unit	Computer	Port on computer	Serial communications mode (network type)	Model number	Length	Remarks
CPU Unit	USB port (B connector)	IBM PC/AT compatible	USB port (A connector)	USB	Commercially available USB 1.1 or 2.0 cable	5 m max.	---



Connecting to RS-232C Port on Serial Communications Board with RS-232C Cable

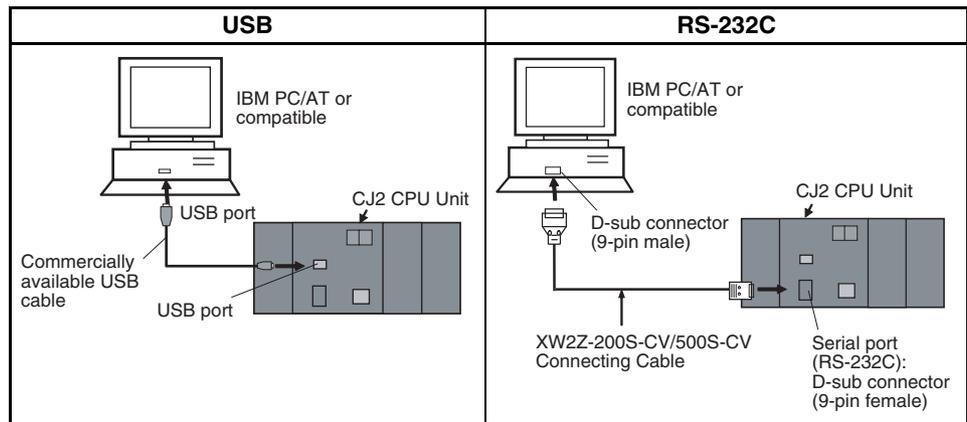
Unit	Port on Unit	Computer	Port on computer	Serial communications mode (network type)	Model number	Length	Remarks
CP1W-CIF01 Serial Communications Board	RS-232C port, D-sub 9-pin female	IBM PC/AT compatible	D-Sub, 9-pin, male	Toolbus (Peripheral) or SYSMAC WAY (Host Link)	XW2Z-200S-CV/500S-CV	2 m/5 m	Uses anti-static connector
				SYSMAC WAY (Host Link)	XW2Z-200S-V/500S-V	2 m/5 m	---

2-2-3 Connecting to CJ2 PLCs

USB or RS-232C Connection

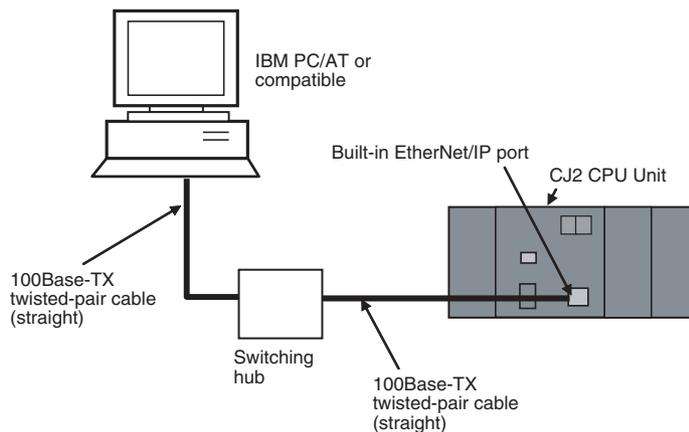
Unit	Port on Unit	Computer	Port on computer	Serial communications mode (network type)	Model number	Length	Remarks
CPU Unit	USB port (B connector)	IBM PC/AT compatible	USB port (A connector)	USB	Commercially available USB 1.1 or 2.0 cable	5 m max.	---
	Built-in RS-232C port, D-sub 9-pin female	IBM PC/AT compatible	D-sub 9-pin, male	Toolbus (See note.)	XW2Z-200S-CV/500S-CV	2 m / 5 m	Uses anti-static connector

Note A Host Link (SYSMAC WAY) connection to an RS-232C port on the CPU Unit or a Serial Communications Unit is not possible for CJ2 PLCs.



Ethernet Connection

Port on Unit	Port on computer	Serial communications mode (network type)	Model number	Length	Remarks
Built-in EtherNet/IP port	Ethernet port	100Base-TX/10Base-T (Recommended: 100Base-TX)	Commercially available twisted-pair cable based on EtherNet/IP standard	100 m (between hub and node)	---
			Commercially available switching hub	---	



SECTION 3

Basic Operations

This section describes each of the windows and basic operations.

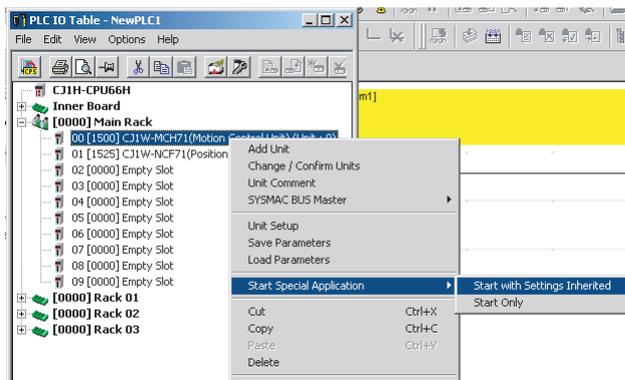
3-1	Basic Operations	14
3-2	Operations Listed by Purpose	25

3-1 Basic Operations

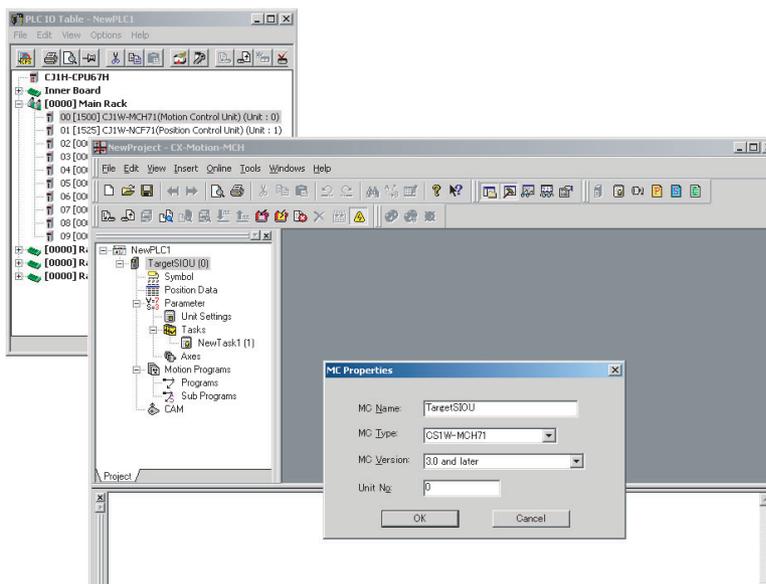
Starting the CX-Motion-MCH

Starting the CX-Motion-MCH Using **Start Special Application - Start with Settings Inherited** from the I/O Table Window Opened from the CX-Programmer That Was Installed from the CX-One

- 1,2,3... 1. Right-click a Motion Control Unit in the I/O Table Window and select **Start Special Application - Start with Settings Inherited** from the pop-up menu.

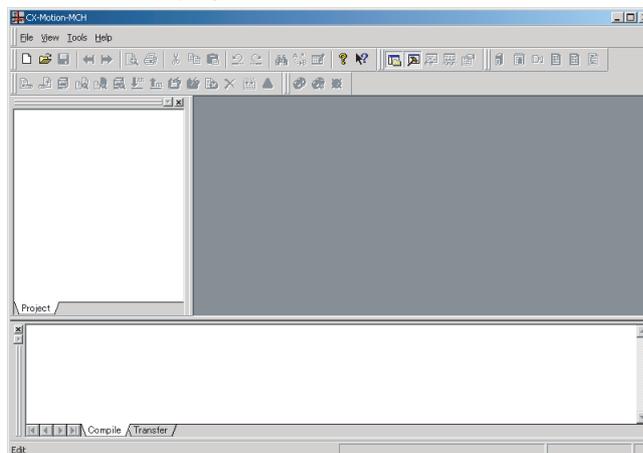


2. The CX-Motion-MCH will be started, a new project will be created, and a Motion Control Unit will be added automatically. The Motion Control Unit model will be inherited as shown below.



Starting the CX-Motion-MCH Using *Start Special Application - Start Only* from the I/O Table Window Opened from the CX-Programmer That Was Installed from the CX-One

Right-click a Motion Control Unit in the I/O Table Window and select **Start Special Application - Start Only** from the pop-up menu. The following window will be displayed.

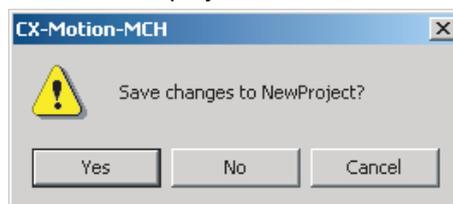


Starting the CX-Motion-MCH from Windows Start Menu

Select **Start - Programs - OMRON - CX-One - CX-Motion-MCH - CX-Motion-MCH**. The same window as when selecting **Start Only** will be displayed.

Quitting the CX-Motion-MCH

- 1,2,3... 1. Select **File - Exit** or click the  at the top right corner of the window. After editing a project, if the project has not been saved, the following dialog box will be displayed.



2. Click the **Yes** Button to save the changes made. Click the **No** Button if it is not necessary to save the changes. Click the **Cancel** Button to return to the Basic Window without quitting CX-Motion-MCH.

Main Menus

Main Menu	Contents	Keyboard shortcut
File	Used to create or save projects.	Alt+F
Edit	Used to edit the MC Unit's data.	Alt+E
View	Used to display or hide the Toolbars, Windows, or the Status Bar.	Alt+V
Insert	Used to insert an MC Unit, motion task, axis, program, subprogram, or CAM table into a project.	Alt+I
Online	Used to establish communications with the MC Unit.	Alt+O
Program	Used to compile the program.	Alt+P
Debug	Used to debug the program.	Alt+D
Tools	Used to change the fonts or toolbar.	Alt+T

Main Menu	Contents	Keyboard shortcut
Windows	Used to change the arrangement of open windows.	Alt+W
Help	Used to display help and version information.	Alt+H

Main Menu Items

The names and functions for all of the menus are given in the table below. When an item is selected, the dialog box for that function is displayed. Follow the instructions in the dialog box.

Main menu	Item	Contents	Keyboard shortcut
File	New	Creates a new project file (*.mnh).	Ctrl+N
	Open	Opens an existing project file (*.mnh).	Ctrl+O
	Close	Closes the project file (*.mnh).	---
	Save	Saves the active project file (*.mnh) by overwriting the previous data.	Ctrl+S
	Save As	Saves the active project data in a project file (*.mnh) with a new name.	---
	Import	Imports <i>MC-Miel for MCH</i> files, position data, motion programs, or CAM data.	---
	Export	Exports position data, motion programs, or CAM data.	---
	Print Preview	Shows a print preview image.	---
	Print	Prints project data.	Ctrl+P
	Exit	Quits CX-Motion-MCH.	Alt+F4

Main menu	Item	Contents	Keyboard shortcut
Edit	Undo	Restores the previous data that was edited in the parameter data, position data, motion program, or CAM data editing window.	Ctrl+Z
	Redo	Restores the edited data that was undone in the parameter data, position data, motion program, or CAM data editing window.	Ctrl+Y
	Cut	Cuts the data selected in the program editing window.	Ctrl+X
	Copy	Copies the data selected in the parameter data, position data, motion program, or CAM data editing window.	Ctrl+C
	Paste	Pastes the copied data in the parameter data, position data, motion program, or CAM data editing window.	Ctrl+V
	Delete	Deletes an MC Unit, motion task, axis, motion program, or CAM table.	Del
	Select All	Selects all of the data displayed in the parameter data, position data, motion program, or CAM data editing window.	Ctrl+A
	Find	Searches for text in the motion program, position data, or CAM data editing window.	Ctrl+F
	Find In Programs	Searches for text in all motion programs.	
	Replace	Replaces text in the motion program, position data, or CAM data editing window.	Ctrl+H
	Go to	Moves the cursor to the specified line number in the motion program or position data editing window.	Ctrl+G
	Edit	Opens the editing window for parameter data, position data, motion program, or CAM data.	Ctrl+E

Main menu	Item	Contents	Keyboard shortcut	
View	Toolbar	Standard	Displays/hides the Standard Toolbar.	---
		Insert	Displays/hides the Insert Toolbar.	---
		Online	Displays/hides the Online Toolbar.	---
		Views	Displays/hides the View Toolbar.	---
		Servo Settings	Displays/hides the Servo Settings Toolbar.	---
		Program	Displays/hides the Program Toolbar.	
		Debug	Displays/hides the Debug Toolbar.	
	Windows	Project Workspace	Displays/hides the Project Workspace Window.	Alt+1
		Output Window	Displays/hides the Output Window.	Alt+2
		General Watch Window	Displays/hides the General Watch Window.	Alt+3
		Debug Watch Window	Displays/hides the Debug Watch Window.	Alt+4
		Status Monitor	Displays/hides the Status Monitor Window.	Alt+5
		Test Run	Displays/hides the Test Run Window.	Alt+6

Main menu	Item	Contents	Keyboard shortcut	
View	Status Bar	Displays/hides the Status Bar.	---	
	Properties	Opens the Properties Window for a PLC, MC Unit, motion task, axis, motion program or CAM table.	---	
	Servo Parameters	All Constants	Displays all of the parameters in the servo parameters editing window.	---
		Function Selection Constants	Displays only the function selection constants in the servo parameters editing window.	---
		Gain Related Constants	Displays only the gain-related constants in the servo parameters editing window.	---
		Position Related Constants	Displays only the position-related constants in the servo parameters editing window.	---
		Speed Related Constants	Displays only the speed-related constants in the servo parameters editing window.	---
		Torque Related Constants	Displays only the torque-related constants in the servo parameters editing window.	---
		Sequence Related Constants	Displays only the sequence-related constants in the servo parameters editing window.	---
		Other Constants	Displays only the other constants in the servo parameters editing window.	---
	Servo Parameter Value	Show Modified Only	Displays only those parameters with changed values from the default in the servo parameters editing window.	---
		Show Different Only	Displays only those parameters with values different between the computer and MC Unit in the servo parameters editing window.	---
		Show Invalid Only	Displays only those parameters with invalid values (out-of-range settings) in the servo parameters editing window.	---
Insert	MC	Inserts an MC Unit to the project.	---	
	Task	Inserts a motion task to the project.	---	
	Axis	Inserts an axis to the project.	---	
	Program	Inserts a program to the project.	---	
	Sub Program	Inserts a subprogram to the project.	---	
	CAM	Inserts a CAM table to the project.	---	

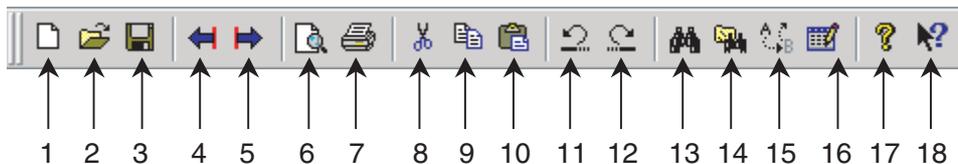
Main menu	Item	Contents	Keyboard shortcut	
Online	Work Online	Switches between online/offline.	---	
	Monitor Mode	Switches between normal mode and monitor mode		
	Unit Information	Displays the Unit information.	---	
	Transfer	To MC	Transfers parameters and other data to the MC Unit.	---
		From MC	Transfers parameters and other data from the MC Unit.	---
		From Servo	Transfers servo parameters from the Servo Driver.	---
		Compare	Compares parameters and data values between the MC Unit and computer.	---
		Compare Servo Parameter with MC	Compares servo parameter values between the MC Unit and computer.	---
		Compare Servo Parameter with Servo	Compares servo parameter values between the Servo Driver and computer.	---
	Batch Transfer	To All MC	Transfers parameters and other data altogether to the MC Unit.	---
		From All MC	Transfers parameters and other data altogether from the MC Unit.	---
	Write To Flash	Saves the MC Unit's parameters and other data.	---	
	Clear Memory	Initializes the MC Unit's parameters and other data.	---	
	Error Log	Displays the MC Unit's error log.	---	
	Data Trace	Displays the Data Trace Window.		
	Backup and Restore	Backup from MC	Backs up the MC Unit.	
		Restore to MC	Restores the selected backup file to the MC Unit.	
		Verify Backup file with MC Unit	Verifies the backup file with the MC Unit.	
	Read Protection	Set/Change Password	Sets/changes the passwords for read protection.	
Set/Release Protection		Sets/releases protection on programs and cam data and selects data items that can be read through the secondary password.		
Switch User		Switches the user.		
Program	Compile	Compiles the program.	F7	

Main menu	Item	Contents	Keyboard shortcut
Debug	Insert/Remove Break Point	Inserts/removes a break point.	F9
	Remove All Break Points	Removes all break points.	Ctrl+Shift+F9
	Go	Debugs the program.	F5
	Step Into	Debugs the program one step at a time.	F11
	Stop	Stops debugging the program.	Shift+F5
	Run To Cursor	Debugging will stop one line before the cursor.	Ctrl+F10
Tools	Customize	Customizes the Toolbar.	---
	Font Options	Sets the font.	---
Win-dows	Close All	Closes all open editing windows.	---
	Next Docked	Moves the focus to the next window.	Alt+0
	Previous Docked	Moves the focus to the previous window.	Alt+Shift+0
	Cascade	Stacks the open editing windows.	---
	Tile Horizontally	Horizontally tiles the open editing windows.	---
	Tile Vertically	Vertically tiles the open editing windows.	---
Help	Help Contents	Displays the table of contents for help.	F1
	Search for Help On	Displays the help search topics.	---
	Command Reference	Displays the command reference help.	---
	Parameter Reference	Displays the parameter reference help.	---
	Value Reference	Displays the value reference help.	---
	Troubleshooting	Displays the troubleshooting help.	---
	Online Registration	Connects to the OMRON online user registration.	---
	About CX-Motion-MCH	Displays the version information.	---

Toolbars

Functions can be executed directly by clicking on the appropriate icon on the toolbar. The functions that can be executed from the toolbars are given below.

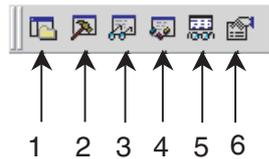
Standard Toolbar



Number	Function
(1)	Create a new project.
(2)	Open an existing project.
(3)	Save the active project by overwriting the existing project file.
(4)	Export to file.
(5)	Import from file.
(6)	Display the print preview.
(7)	Print

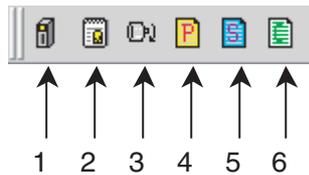
Number	Function
(8)	Cut
(9)	Copy
(10)	Paste
(11)	Undo
(12)	Redo
(13)	Find
(14)	Find In Programs
(15)	Replace
(16)	Edit
(17)	Display CX-Motion-MCH information.
(18)	Display the table of contents for help.

View Toolbar



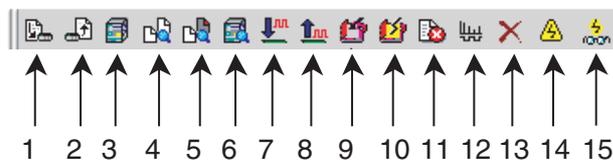
Number	Function
(1)	Display/hide the Project Workspace Window.
(2)	Display/hide the Output Window.
(3)	Display/hide the General Watch Window.
(4)	Display/hide the Debug Watch Window.
(5)	Display/hide the Status Monitor Window.
(6)	Display the Properties Window.

Insert Toolbar



Number	Function
(1)	Insert an MC Unit.
(2)	Insert a motion task.
(3)	Insert an axis.
(4)	Insert a program.
(5)	Insert a subprogram.
(6)	Insert a CAM table.

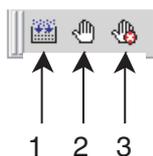
Online Toolbar



Number	Function
(1)	Transfer to MC Unit.
(2)	Transfer from MC Unit.
(3)	Transfer from Servo Driver.

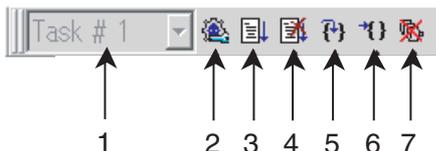
Number	Function
(4)	Compare with MC Unit.
(5)	Compare servo parameters with MC Unit.
(6)	Compare servo parameters with Servo Driver.
(7)	Batch transfer to MC Unit.
(8)	Batch transfer from MC Unit.
(9)	Save in flash memory.
(10)	Clear memory.
(11)	Display error log.
(12)	Display the Data Trace Window.
(13)	Delete
(14)	Switch between online/offline.
(15)	Switch between normal mode and monitor mode.

Program Toolbar



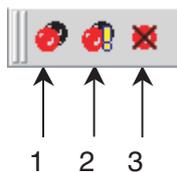
Number	Function
(1)	Compile the program.
(2)	Insert/remove a break point.
(3)	Remove all break points.

Debug Toolbar



Number	Function
(1)	Select the task number.
(2)	Display/hide the Test Run Window.
(3)	Debug the program.
(4)	Stop debugging the program.
(5)	Debug the program one step at a time.
(6)	Debugging will stop one line before the cursor.
(7)	Stop all axes.

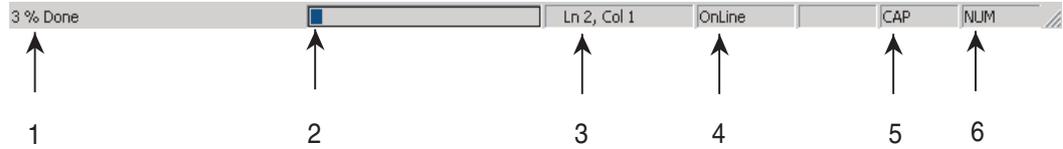
Servo Settings Toolbar



Number	Function
(1)	Show Modified Only
(2)	Show Different Only
(3)	Show Invalid Only

Status Bar

The following information is displayed on the status bar.



Number	Function
(1)	Displays messages regarding the status of data being edited or transferred.
(2)	Displays a bar graph showing the progress of a data transfer.
(3)	Displays the cursor position in the program editing window.
(4)	Indicates the online/offline status.
(5)	Indicates the keyboard Caps Lock status.
(6)	Indicates the keyboard Num Lock status.

Help

Displaying the Help Contents

- 1,2,3...**
1. Select **Help - Help Contents**. The table of contents for help will be displayed.
 2. Click a topic to display information. The contents related to that topic will be displayed.

Displaying CX-Motion-MCH Version Information

Select **Help - About CX-Motion-MCH**. The CX-Motion-MCH version information will be displayed.

3-2 Operations Listed by Purpose

Operations Listed by Purpose

Function (Purpose)	Operation	Keyboard shortcut	Toolbar icon	Page
Project				
Creating a new project	Select File - New .	Ctrl+N		30
Opening a project	Select File - Open .	Ctrl+O		44
Saving a project (over-writing)	Select File - Save .	Ctrl+S		44
Saving a project with a different name	Select File - Save As .	---	---	44
Close a project	Select File - Close .	---	---	---
Quitting CX-Motion-MCH	Select File - Exit .	---	---	15
Adding an MC Unit to the project	Select the PLC and select Insert - MC or right-click and select Insert MC .	---		31
Importing a file created by MC-Miel for MCH	Select the PLC and select File - Import or right-click and select Import From Miel .	---		45
Importing position data from a file	Select the position data and select File - Import or right-click and select Import .	---		45
Exporting position data to a file	Select the position data and select File - Export or right-click and select Export .	---		48
Importing a program from a file	Select Motion Programs, Programs , or the program and select File - Import or right-click and select Import Program or Import .	---		46
Exporting a program to a file	Select the program and select File - Export or right-click and select Export .	---		48
Importing a subprogram from a file	Select Motion Programs, Programs or the sub program and select File - Import or right-click and select Import Sub Program or Import .	---		46
Exporting a subprogram to a file	Select the subprogram and select File - Export or right-click and select Export .	---		49
Importing a CAM table from a file	Select a CAM or CAM table and select File - Import or right-click and select Import CAM or Import .	---		47
Exporting a CAM table to a file	Select the CAM table and select File - Export or right-click and select Export .	---		50
Displaying properties	Select a PLC, MC Unit, task, Servo Driver, program, sub-program, or CAM table and select View - Properties or right-click and select Properties .	---		22
Adding a motion task	Select Tasks and select Insert - Task or right-click and select Insert Task .	---		32
Deleting a motion task	Select Tasks and select Edit - Delete or right-click and select Delete .	Del		32
Adding an axis	Select Axes and select Insert - Axis or right-click and select Insert Axis .	---		33
Deleting an axis	Select the axis and select Edit - Delete or right-click and select Delete .	Del		34
Adding a program	Select Motion Programs or Programs and select Insert - Program or right-click and select Insert Program .	---		34
Deleting a program	Select the program and select Edit - Delete or right-click and select Delete .	Del		35
Adding a subprogram	Select Motion Programs or Sub Programs and select Insert - Sub Program or right-click and select Insert Sub Program .	---		35

Function (Purpose)		Operation	Keyboard shortcut	Toolbar icon	Page
	Deleting a subprogram	Select the subprogram and select Edit - Delete or right-click and select Delete .	Del		36
	Adding a CAM table	Select CAM and select Insert - CAM or right-click and select Insert CAM .	---		37
	Deleting a CAM table	Select the CAM table and select Edit - Delete or right-click and select Delete .	Del		38
	Displaying a print preview	Select File - Print Preview .	---		21
	Printing parameters or programs	Select File - Print .	Ctrl+P		92
Editing parameters					
	Editing Unit Parameters	Select Unit Settings and select Edit - Edit , right-click and select Edit , or double-click.	Ctrl+E		41
	Editing task parameters	Select the task and select Edit - Edit , right-click and select Edit , or double-click.	Ctrl+E		42
	Editing axis parameters	Select settings and select Edit - Edit , right-click and select Edit , or double-click.	Ctrl+E		42
	Editing servo parameters	Select servo settings and select Edit - Edit , right-click and select Edit , or double-click.	Ctrl+E		42
	Editing motor parameters	Select motor settings and select Edit - Edit , right-click and select Edit , or double-click.	Ctrl+E		42
Editing data					
	Editing position data	Select Position Data and select Edit - Edit , right-click and select Edit , or double-click.	Ctrl+E		41
	Editing a program	Select Programs and select Edit - Edit , right-click and select Edit , or double-click.	Ctrl+E		42
	Editing a subprogram	Select Sub Programs and select Edit - Edit , right-click and select Edit , or double-click.	Ctrl+E		42
	Compiling a program	Select the program or subprogram and select Edit - Compile or right-click and select Compile .	F7		23
	Editing a CAM table	Select the CAM table and select Edit - Edit , right-click and select Edit , or double-click.	Ctrl+E		42
Online operations					
	Starting communications with PLC	Select the PLC and select Online - Work Online or right-click and select Work Online .	Ctrl+W		55
	Setting communications with PLC	Select the PLC and select View - Properties or right-click and select Properties .	---		54
	Transferring selected data to the MC Unit	Select the parameters or data to be transferred and select Online - Transfer - To MC .	---		56
	Transferring selected data from the MC Unit	Select the parameters or data to be transferred and select Online - Transfer - From MC .	---		57
	Transferring data to all the MC Units	Select the PLC and select Online - Batch Transfer - To All MC .	---		61
	Transferring data from all the MC Units	Select the PLC and select Online - Batch Transfer - From All MC .	---		61
	Transferring from the Servo Driver	Select Servo Settings and select Online - Transfer - From Servo or right-click and select Transfer - From Servo .	---		---
	Comparing parameters or data with MC Unit	Select the MC Unit to be compared and select Online - Transfer - Compare or right-click and select Transfer - Compare .	---		58
	Comparing servo parameters with MC Unit	Select the Servo Settings and select Online - Transfer - Compare Servo Parameter with MC or right-click and select Transfer - Compare Servo Parameter with MC .	---		---

Function (Purpose)		Operation	Keyboard shortcut	Toolbar icon	Page
Comparing servo parameters with Servo Driver	Select <i>Servo Settings</i> and select Online - Transfer - Compare Servo Parameter with Servo or right-click and select Transfer - Compare Servo Parameter with Servo .	---		---	
Initializing memory	Select the MC Unit and select Online - Clear Memory .	---		61	
Writing to flash memory	Select the MC Unit and select Online - Write To Flash .	---		60	
Monitoring the MC Unit's status or errors	Select the MC Unit and select View - Windows - Status Monitor .	Alt+5		64	
Monitoring variables	Select the MC Unit and select View - Windows - General Watch Window .	Alt+3		64	
Displaying error log	Select the MC Unit and select Online - Error Log .	---		92	
Debugging the program	Select the MC Unit and select Online - Monitor Mode .				
Executing Test Run operations, such as JOG operations	Select the MC Unit and select Online - Monitor Mode .				
Tracing data	Select the MC Unit and select Online - Data Trace .				
Backing up the MC Unit	Select the MC Unit and select Online - Backup and Restore - Backup from MC .		---	78	
Restoring a backup file to the MC Unit	Select the MC Unit and select Online - Backup and Restore - Restore to MC .		---	78	
Verifying a backup file with the MC Unit	Select the MC Unit and select Online - Backup and Restore - Verify Backup files with MC .		---	79	
Setting and changing passwords for protection	Select the MC Unit and select Online - Read Protection - Set/Change Password .		---	83	
Setting and releasing protection	Select the MC Unit and select Online - Read Protection - Set/Release Protection .		---	85	
Switching user	Select the MC Unit and select Online - Read Protection - Switch User .		---	86	
Displaying settings					
Displaying/hiding Toolbar	Select View - ToolBar and select Standard, Insert, Online, View or Servo Settings .	---	---	18	
Displaying/hiding the Project Workspace	Select View - Windows - Project Workspace .	Alt+1		22	
Displaying/hiding the Output Window	Select View - Windows - Output Window .	Alt+2		22	
Displaying/hiding Status Bar	Select View - Status Bar .	---	---	19	
Displaying/hiding the Debug Watch Window	Select View - Window - Debug Watch Window .	Alt+4		69	
Displaying/hiding the Test Run	Select View - Window - Test Run .	Alt+6		67	
Help					
Displaying the MC Unit's model and version	Select the MC Unit and select Online - Unit Information .	F1	---	60	
Displaying help	Select Help - Help Contents .	F1		24	
	Select Help - Search for Help On .	F1	---	21	
Displaying the CX-Motion-MCH	Select Help - About CX-Motion-MCH .	---		24	

SECTION 4

Creating Projects

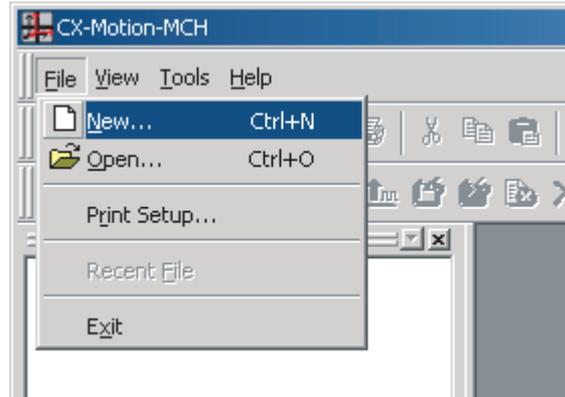
This section provides information on creating projects and adding MC Units, tasks, axes, programs, subprograms, and CAM tables.

4-1	Creating a New Project	30
4-2	Adding and Deleting MC Units	31
4-3	Adding and Deleting Tasks	32
4-4	Adding and Deleting Axes	33
4-5	Adding and Deleting Programs	34
4-6	Adding and Deleting Subprograms	35
4-7	Adding and Deleting CAMs	37

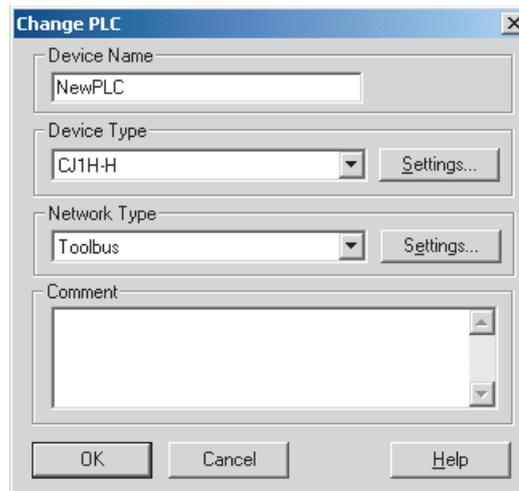
4-1 Creating a New Project

Follow the procedure below to create a new project on the CX-Motion-MCH Basic Window. When a new CX-Motion-MCH project is being created, a dialog box will be displayed for adding an MC Unit after setting the PLC model.

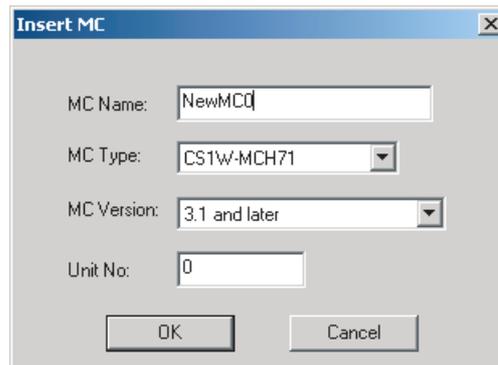
- 1,2,3... 1. On the CX-Motion-MCH Basic Window, select **File - New**, press the **Ctrl+N** Keys, or click  in the toolbar.



2. The Change PLC Dialog Box will be displayed. Set the model number of the PLC being used.



3. The Insert MC Dialog Box will be displayed. Set the model number of the MC Unit being used.

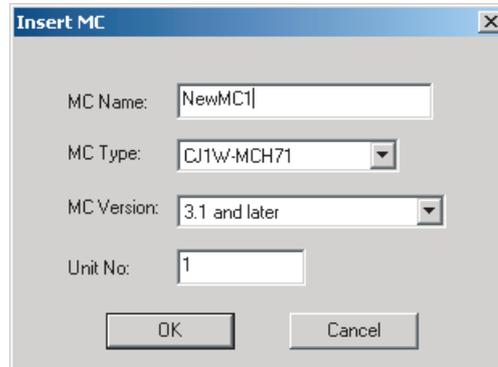


4-2 Adding and Deleting MC Units

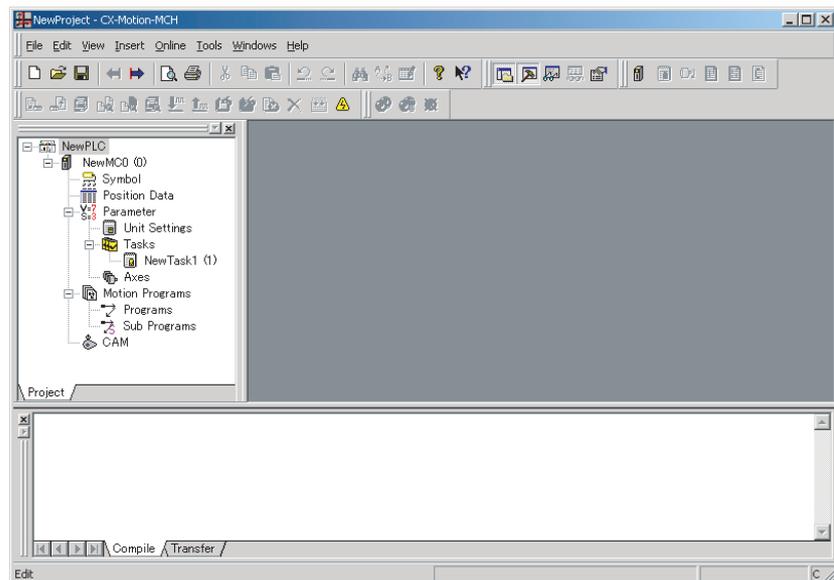
Adding MC Units to Projects

Follow the procedure below to add a Motion Control Unit to the project.

- 1,2,3...
1. Select the PLC icon in the project tree and select **Insert - MC** or click  in the toolbar. It is also possible to right-click the PLC icon in the project tree and select **Insert MC** from the pop-up menu.
 2. Set the MC Unit's name, model number, and unit number (unit number as a CPU Bus Unit) in the Insert MC Dialog Box.



3. Click the **OK** Button. The MC Unit will be added to the project.



Deleting MC Units

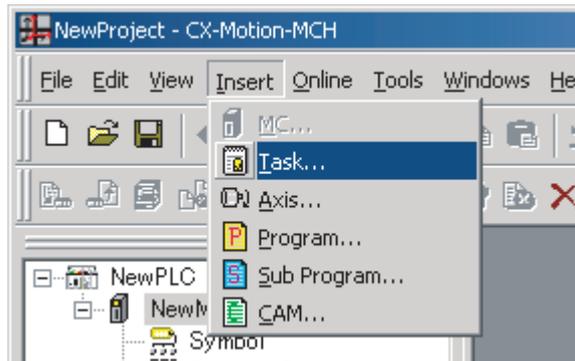
- 1,2,3...
1. Select the unwanted MC Unit icon () in the project tree and select **Edit - Delete**, click  in the toolbar, or press the **Delete** Key. It is also possible to right-click the unwanted MC Unit icon in the project tree and select **Delete** from the pop-up menu.
 2. A dialog box will be displayed to confirm the deletion. Click the **Yes** Button to delete the MC Unit. The selected MC Unit will be deleted from the project tree.

4-3 Adding and Deleting Tasks

Adding a Task to an MC Unit

The following procedure adds an individual task to a project’s MC Unit. Up to 8 individual tasks can be added to one MC Unit. Each MC Unit must have at least one task.

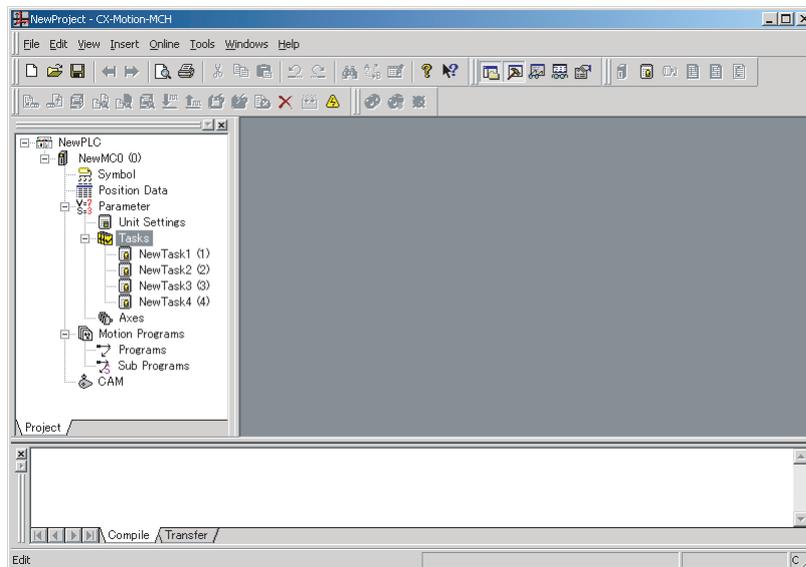
- 1,2,3...
1. Select the MC Unit or *Tasks* Icon in the project tree and select **Insert - Task** or click  in the toolbar. It is also possible to right-click the *Tasks* Icon in the project tree and select **Insert Task** from the pop-up menu.



2. An individual task will be added to the MC Unit’s Tasks folder.

Deleting a Task from an MC Unit

The following procedure deletes a registered task from an MC Unit. The lowest individual task will be deleted from the MC Unit’s registered tasks.



- 1,2,3...
1. Select the *Tasks* Icon () in the project tree and select **Edit - Delete**, click  in the toolbar, or press the **Delete** Key. It is also possible to right-click the *Tasks* Icon and select **Delete** from the pop-up menu.
 2. A dialog box will be displayed to confirm the deletion. Click the **Yes** Button to delete the task. The lowest individual task will be deleted from the MC Unit’s registered tasks.

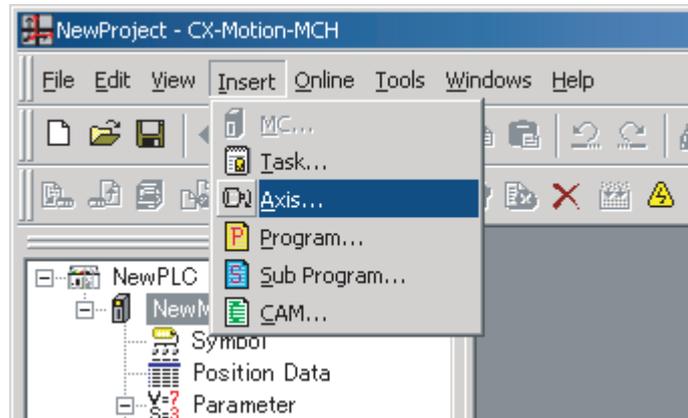
4-4 Adding and Deleting Axes

Adding an Axis to an MC Unit

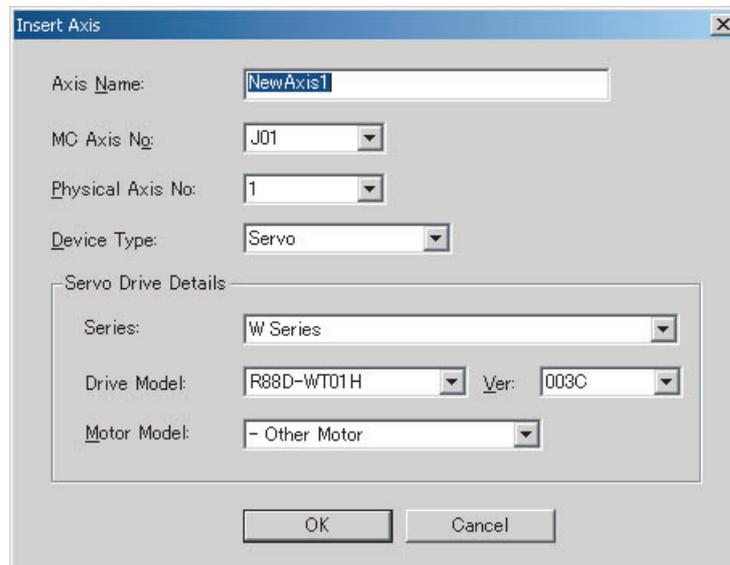
The following procedure adds an individual axis to a project's MC Unit.

Up to 32 individual axes can be added to one MC Unit, of which 30 axes can be physical.

- 1,2,3... 1. Select the MC Unit, or the *Parameter* or *Axes* Icon in the project tree, and select **Insert - Axis** or click  in the toolbar. It is also possible to right-click the *Axes* Icon and select **Insert Axis** from the pop-up menu.



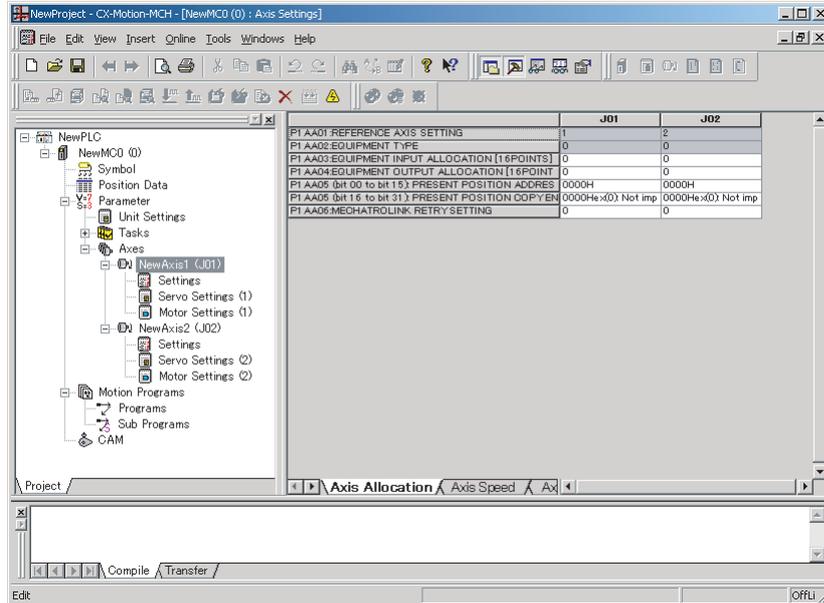
2. The Insert Axis Dialog Box will be displayed. Set the Axis' name, axis number, physical axis number, and device type. Also set the Servo Driver series, Servo Driver model, Servo Driver version, and motor model if *Servo* is set as the device type.



3. Click the **OK** Button. The individual axis will be added to the MC Unit.

Deleting an Axis from an MC Unit

The following procedure deletes a registered axis from an MC Unit.



1,2,3...

1. Select the unwanted axis icon (🗑️) in the project tree and select **Edit - Delete**, click in the toolbar, or press the **Delete** Key. It is also possible to right-click the unwanted axis icon and select **Delete** from the pop-up menu.
2. A dialog box will be displayed to confirm the deletion. Click the **Yes** Button to delete the axis. The selected axis will be deleted from the axes registered in the MC Unit.

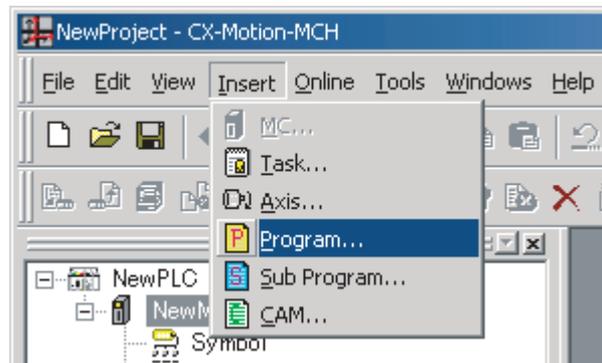
4-5 Adding and Deleting Programs

Adding a Program to an MC Unit

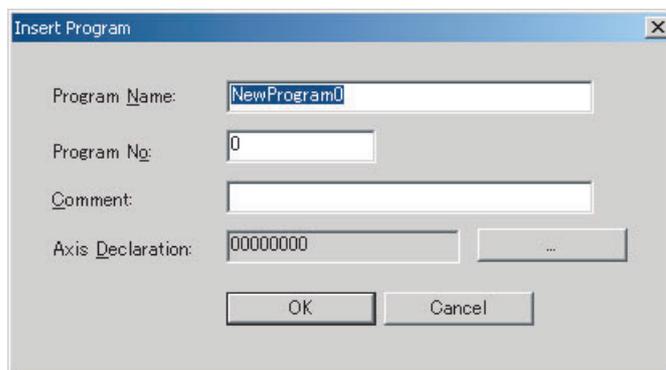
The following procedure adds an individual program to a project's MC Unit. Individual programs can be added with program numbers from 0 to 499.

1,2,3...

1. Select the MC Unit or the *Motion Programs*, or *Program Icon* in the project tree and select **Insert - Program** or click in the toolbar. It is also possible to right-click the *Motion Programs* or *Programs* Icon and select **Insert Program** from the pop-up menu.



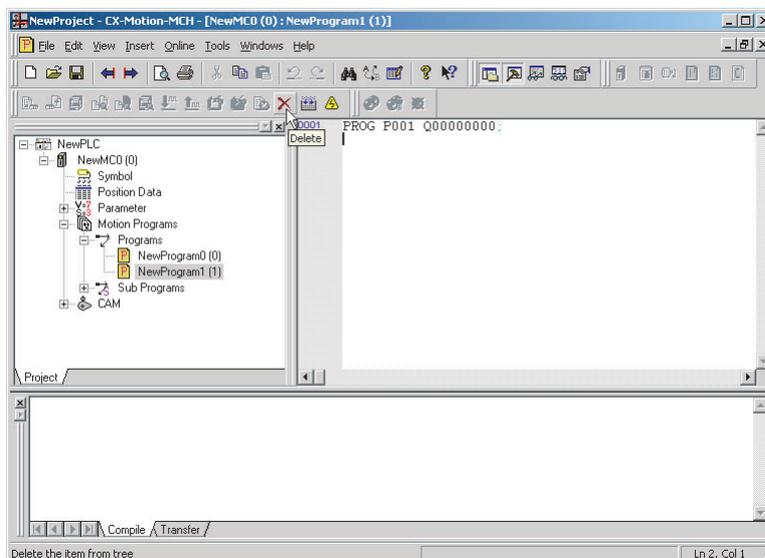
- The Insert Program Dialog Box will be displayed. Set the program name, program number, comment, and axis declaration.



- Click the **OK** Button. The individual program will be added to the MC Unit.

Deleting a Program from an MC Unit

The following procedure deletes a registered program from an MC Unit.



- 1,2,3...**
- Select the unwanted program icon () in the project tree and select **Edit - Delete**, click  in the toolbar, or press the **Delete** Key. It is also possible to right-click the unwanted program icon and select **Delete** from the pop-up menu.
 - A dialog box will be displayed to confirm the deletion. Click the **Yes** Button to delete the program. The selected program will be deleted from the programs registered in the MC Unit.

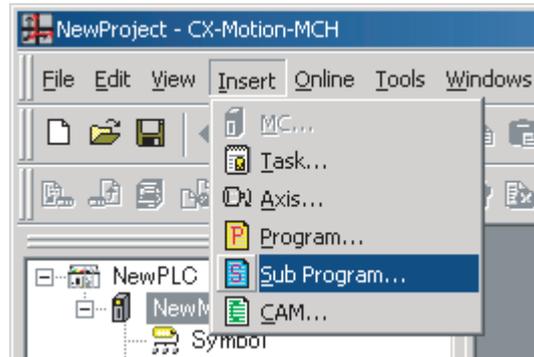
4-6 Adding and Deleting Subprograms

Adding a Subprogram to an MC Unit

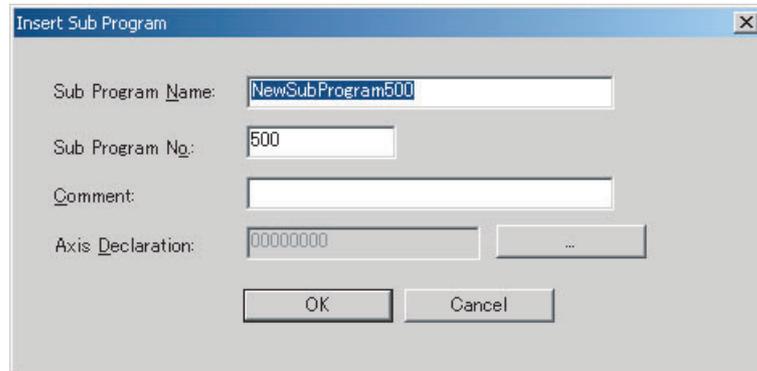
The following procedure adds an individual subprogram to a project's MC Unit.

Individual subprograms can be added with program numbers from 500 to 599.

- 1,2,3...
1. Select the MC Unit or the *Motion Programs* or *Sub Programs* Icon in the project tree and select **Insert - Sub Program** or click  in the toolbar. It is also possible to right-click the *Motion Programs* or *Sub Programs* Icon and select **Insert Sub Program** from the pop-up menu.



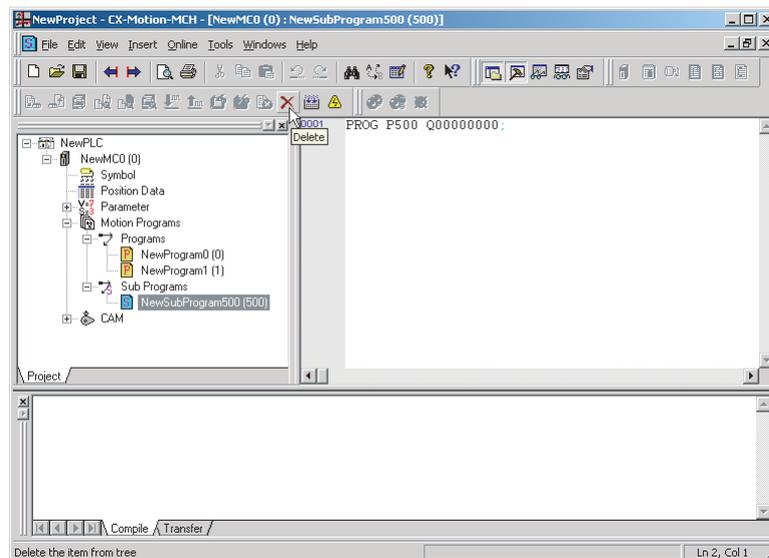
2. The Insert Sub Program Dialog Box will be displayed. Set the subprogram name, subprogram number, comment, and axis declaration.



3. Click the **OK** Button. The individual subprogram will be added to the MC Unit.

Deleting a Subprogram from an MC Unit

The following procedure deletes a registered subprogram from an MC Unit.



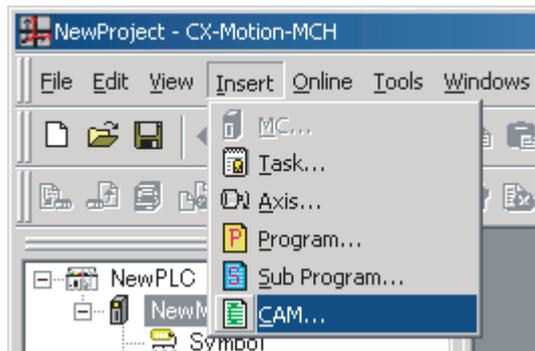
- 1,2,3...
1. Select the unwanted subprogram icon () in the project tree and select **Edit - Delete**, click  in the toolbar, or press the **Delete** Key. It is also possible to right-click the unwanted subprogram icon and select **Delete** from the pop-up menu.
 2. A dialog box will be displayed to confirm the deletion. Click the **Yes** Button to delete the subprogram. The selected subprogram will be deleted from the subprograms registered in the MC Unit.

4-7 Adding and Deleting CAMs

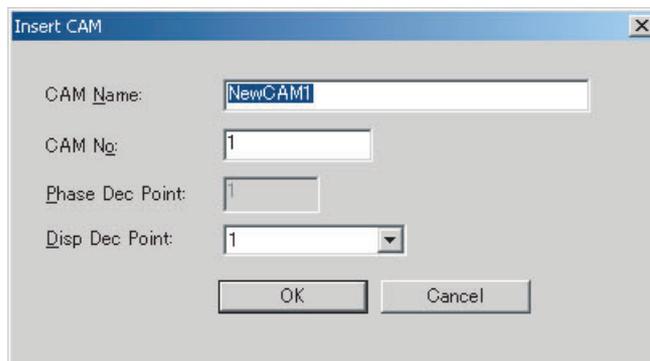
Adding CAM Tables to an MC Unit

The following procedure adds individual CAM tables to a project's MC Unit. Up to 32 CAM tables can be added to one MC Unit.

- 1,2,3...
1. Select the MC Unit or the *CAM* Icon in the project tree and select **Insert - CAM** or click  in the toolbar. It is also possible to right-click the *CAM* Icon and select **Insert CAM** from the pop-up menu.



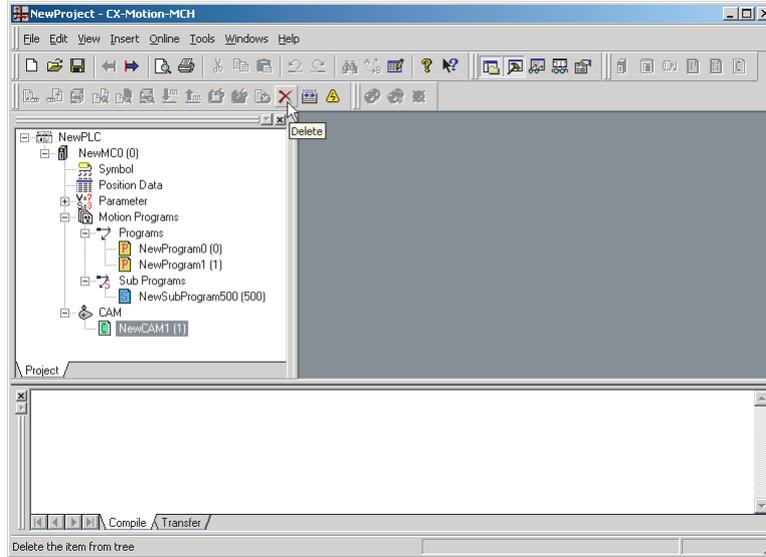
2. The Insert CAM Dialog Box will be displayed. Set the CAM name, CAM number, and displacement decimal point position.



3. Click the **OK** Button. The CAM table will be added to the MC Unit.

Deleting CAM Tables from an MC Unit

The following procedure deletes a registered CAM table from an MC Unit.



1,2,3...

1. Select the unwanted CAM table icon () in the project tree and select **Edit - Delete**, click  in the toolbar, or press the **Delete** Key. It is also possible to right-click the unwanted CAM table icon and select **Delete** from the pop-up menu.
2. A dialog box will be displayed to confirm the deletion. Click the **Yes** Button to delete the CAM table. The selected CAM table will be deleted from the CAMs registered in the MC Unit.

SECTION 5

Editing Data

This section describes the operations used to edit data.

This manual shows how to edit data, but does not describe the functions of the data and parameters. For details on the various data settings, refer to the MC Unit's Operation Manual.

5-1	Editing Data	40
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5-1 Editing Data

This section describes how to edit data only. For details on the MC Unit's setting contents, Unit parameters, and Servo Parameters, refer to the *CS1W-MCH71 Motion Control Unit Operation Manual (W419)* or *CJ1W-MCH71 Motion Control Unit Operation Manual (W435)*.

Overview of the Editing Windows

The following table provides an overview of the editing windows.

Editing window	Overview
Symbol	Names and comments can be set for system parameters and variable addresses. Those names can be used to reference parameters in the General Watch Window, programs, and subprograms.
Position Data	Position data can be edited. The names edited here can be used to reference the data in the General Watch Window, programs and subprograms.
Unit Settings	Unit parameters can be edited.
Zone Settings	Zone parameters can be edited. This function can be used in an MC Unit with the unit version 3.0 or later.
Tasks	Motion task parameters can be edited. All of the current motion task parameters are displayed in the Edit Motion Task Parameters Window.
Settings	Axis parameters can be edited. All of the current axis parameters are displayed in the Edit Axis Parameters Window.
Servo Settings	Parameters in the Servo Driver can be edited.
Motor Settings	Motor parameters can be edited.
Programs	The motion task's program can be edited.
Sub Programs	The motion task's subprograms can be edited.
CAM Data	Imported CAM table can be edited.

Editing Data

This section describes the main editing methods.

n Direct Input

P0001:NO. OF MOTION TASKS (TASKS)	3
P0002:NO. OF PARALLEL BRANCHES	4
P0003:MECHATROLINK COMMUNICATION CYCLE (MS)	n

Input data directly.

The allowed setting range is displayed on the left side of the Status Bar, as shown in the following diagram.



n Drop-down List

Either click the \uparrow button or press the **Alt+↓** Keys. Click the desired setting directly from the drop-down list to select it.

P0004 (bit 00): NEGATIVE CIRCULAR INTERPOLATION SPEED	0: Speed on circumference
P00004 (bit 01): CIRCULAR INTERPOLATION CENTER POSITION	0: Always specify relative positions
P00004 (bit 02): SPEED COMMAND VALUE	0: Always specify relative positions
P00004 (bit 03): COMMUNICATIONS CYCLE SUPPORT	1: Specify relative or absolute positions
P00004 (bit 04): POSITIONING COMPLETED SIGNAL SELECT	0: Turns OFF when starting the position

n **Drop-down List (Check Boxes)**

Either click the **t** button or press the **Alt+↓** Keys. Select the box to the left of the desired setting to select that option.

P00006:GENERAL INPUT / OUTPUT SIGNALS VALID SWITCH	0003000FH
P00007:VALID TASK SWITCH	<input checked="" type="checkbox"/> 00:Deceleration stop input enabled
P00008:VALID AXES SWITCH	<input checked="" type="checkbox"/> 01:Reserved
P00009:MECHATROLINK COMMUNICATION SETTING	<input checked="" type="checkbox"/> 02:General input 1 enabled
P00010:MECHATROLINK DELAY TIME [MS]	<input checked="" type="checkbox"/> 03:General input 2 enabled
	<input checked="" type="checkbox"/> 16:General output 1 enabled
	<input checked="" type="checkbox"/> 17:General output 2 enabled

Editing Symbols

n **Displaying the Window**

With the project tree displayed, either double-click the desired MC Unit's symbol or select the desired MC Unit's symbol and press the **Enter** Key.

n **Switching between Edit Symbols Tabs**

Either system parameters or variables can be edited by clicking the corresponding tab.

n **Editing in the System Parameters Tab**

To edit the names of system parameters, click the **System Parameters** Tab and either double-click the desired parameter or right-click the desired parameter and select **Edit** from the pop-up menu.

n **Editing in the Variables Tab**

To edit the names of variables, click the **Variables** Tab and either double-click the desired parameter or right-click the desired parameter and select **Edit** from the pop-up menu.

A new variable can be added by right-clicking on the Variables Tab Page and selecting **Insert** from the pop-up menu. Select or input the name, variable type, data type, address, and comment in the displayed New Symbol Dialog Box, and then press the **OK** Button.

Editing Position Data

n **Displaying the Window**

With the project tree displayed, either double-click the desired MC Unit's position data or select the desired MC Unit's position data and press the **Enter** Key.

Editing Unit Settings

n **Displaying the Window**

With the project tree displayed, either double-click the desired MC Unit's Unit parameters or select the desired MC Unit's Unit parameters and press the **Enter** Key.

Editing Zone Settings

n **Displaying the Window**

With the project tree displayed, either double-click the desired MC Unit's zone parameters or select the desired MC Unit's zone parameters and press the **Enter** Key.

Editing Tasks

n Displaying the Window

With the project tree displayed, either double-click the desired MC Unit's task or select the desired MC Unit's task and press the **Enter** Key.

All of the current motion task parameters will be displayed in the Edit Motion Task Parameters Window.

Editing Settings

n Displaying the Window

With the project tree displayed, either double-click the desired MC Unit's axis parameters or select the desired MC Unit's axis parameters and press the **Enter** Key.

All of the current axis parameters are displayed in the Edit Axis Parameters Window.

n Switching between Edit Axis Parameters Tabs

The axis' Allocation, Speed, Position, Origin, and Machine Parameters can be edited by clicking the corresponding tab.

Editing Servo Settings

n Displaying the Window

With the project tree displayed, either double-click the desired MC Unit's servo parameters or select the desired MC Unit's servo parameters and press the **Enter** Key.

Editing Motor Settings

n Displaying the Window

With the project tree displayed, either double-click the desired MC Unit's motor parameters or select the desired MC Unit's motor parameters and press the **Enter** Key.

Editing Programs or Subprograms

n Displaying the Window

With the project tree displayed, either double-click the desired MC Unit's program/subprogram or select the desired MC Unit's program/subprogram and press the **Enter** Key.

n Characteristics

- Instructions and comments are displayed in different colors.
- Symbol names in the symbols and position data names can be used when writing programs. "\$" is added to the front of names.
- Syntax checks can be performed in advance by compiling programs offline.

Editing CAM Tables

n Displaying the Window

With the project tree displayed, either double-click the desired MC Unit's CAM table or select the desired MC Unit's CAM table and press the **Enter** Key.

SECTION 6

Saving and Reading Projects

This section describes the operations used to save and read new projects.

6-1	Saving a Project	44
6-2	Reading a Project	44
6-3	Importing Files	45
6-4	Exporting File	48

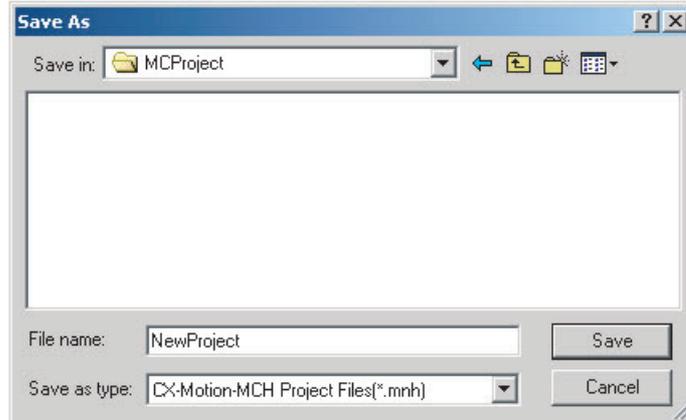
6-1 Saving a Project

To save a project, select **File - Save** or **File - Save As**.

When editing a project that was saved before and saving it again with the same name, select **File - Save**. The project will be overwritten. When saving a new project or saving a project with a different name, select **File - Save As**.

Saving a Project by Name

- 1,2,3... 1. Select **File - Save As**. The following window will be displayed.

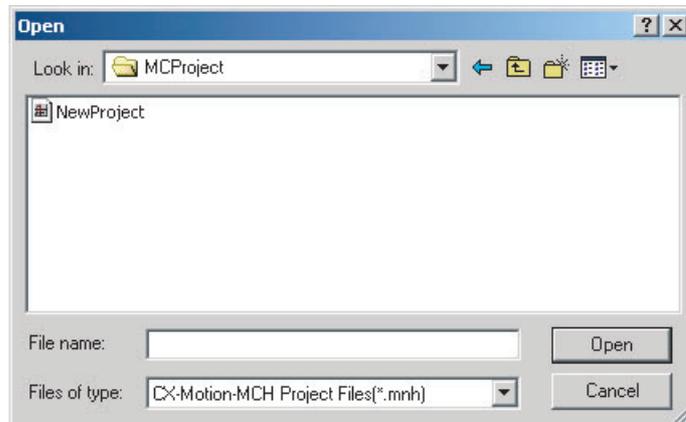


2. After entering the destination folder, file name, and file type, click the **Save** Button. Use the default file type (*.mnh), since the project is being saved as a CX-Motion-MCH project file.

6-2 Reading a Project

To read a project that has already been saved, select **File - Open**.

- 1,2,3... 1. Select **File - Open**.



2. From the *Look in* Drop-down List, select the drive and folder containing the file.
3. Enter the project name, or select one from the file list. Set the file type to *.mnh.
4. Click the **Open** Button.

6-3 Importing Files

MC Miel for MCH Files

This procedure imports a project file created as an *MC Miel for MCH* file (*.mil filename extension).

- 1,2,3...
1. Select the PLC icon in the project tree and either select **File - Import** or click  in the toolbar. It is also possible to right-click the PLC icon and select **Import from Miel** from the pop-up menu.

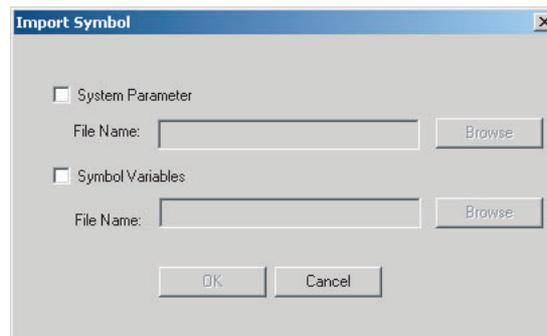


2. Enter the MC name, unit number, and Miel file name, then click the **OK** Button.

Symbol Files

This procedure imports a system parameter or variable file under the *Symbol* Icon (*.csv filename extension).

- 1,2,3...
1. Select the *Symbol* Icon in the project tree and either select **File - Import** or click  in the toolbar. It is also possible to right-click the *Symbol* Icon and select **Import** from the pop-up menu.

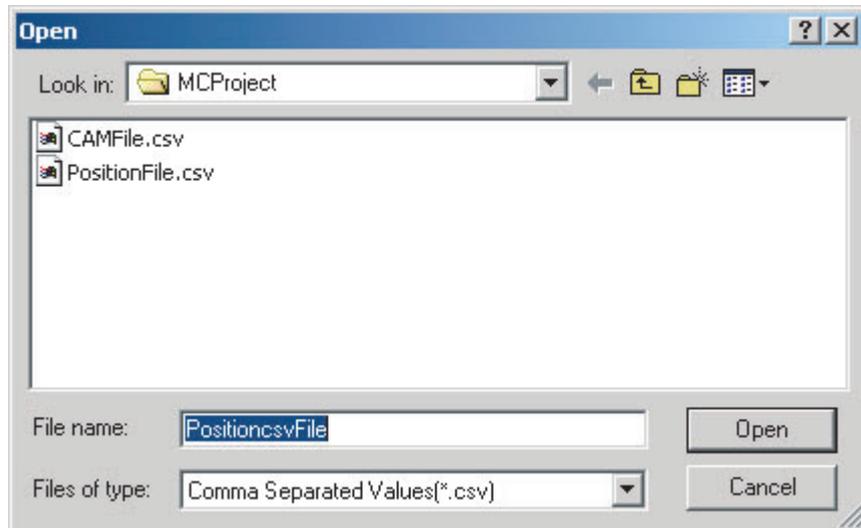


2. Select the target system parameter or variable to be imported, enter or select the file name, and click the **OK** Button.

Position Data Files

This procedure imports a position data file (*.csv filename extension).

- 1,2,3...
1. Select the *Position Data* Icon in the project tree and either select **File - Import** or click  in the toolbar. It is also possible to right-click the *Position Data* Icon and select **Import** from the pop-up menu.



2. Enter the destination folder, file name, and file type, and then click the **Open** Button.

Program Files

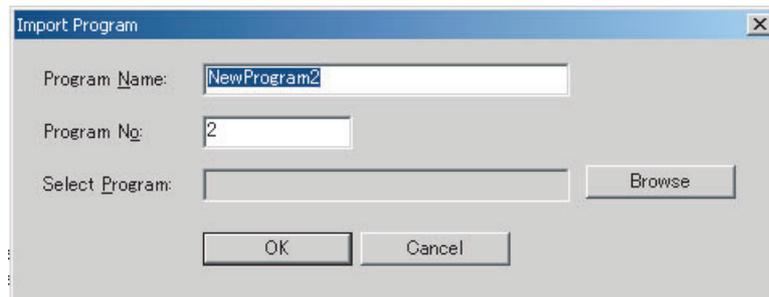
This procedure imports a program file (*.txt filename extension).

1,2,3...

1. Select the *Programs* Icon or an individual program icon in the project tree and either select **File - Import** or click  in the toolbar. It is also possible to right-click the *Programs* Icon or the individual program icon and select **Import Program** or **Import** from the pop-up menu.

Note

When a file is imported to an individual program, the existing program will be overwritten.



2. Enter the program name, program number, and select program, and then click the **OK** Button.

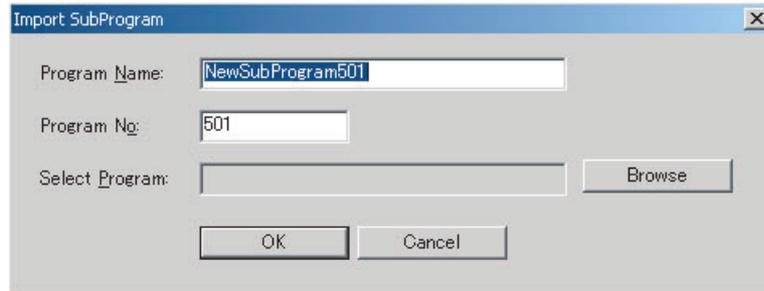
Subprogram Files

This procedure imports a subprogram file (*.txt filename extension).

1,2,3...

1. Select the *Sub Programs* Icon or an individual subprogram icon in the project tree and either select **File - Import** or click  in the toolbar. It is also possible to right-click the *Sub Programs* Icon or the individual subprogram icon and select **Import Sub Program** or **Import** from the pop-up menu.

Note When a file is imported to an individual subprogram, the existing subprogram will be overwritten.



2. Enter the subprogram name, subprogram number and select subprogram, and then click the **OK** Button.

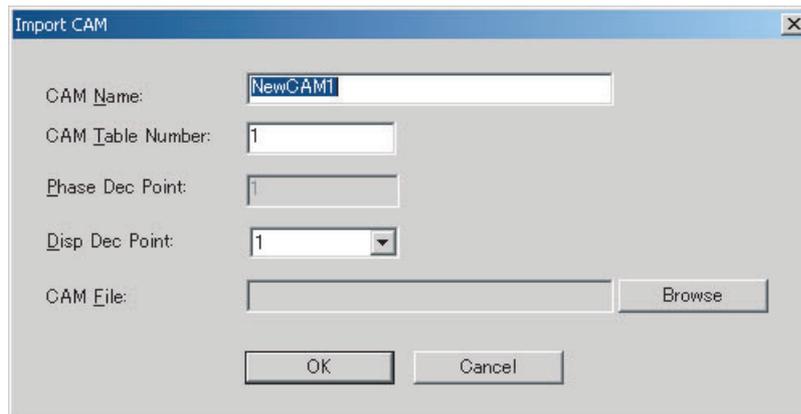
CAM Files

This procedure imports a CAM file (*.csv filename extension).

1,2,3...

1. Select the *CAM* Icon or an individual CAM table icon in the project tree and either select **File - Import** or click  in the toolbar. It is also possible to right-click the *CAM* Icon or the individual CAM table icon and select **Import CAM** or **Import** from the pop-up menu.

Note When a file is imported to an individual CAM table, the existing CAM table will be overwritten.



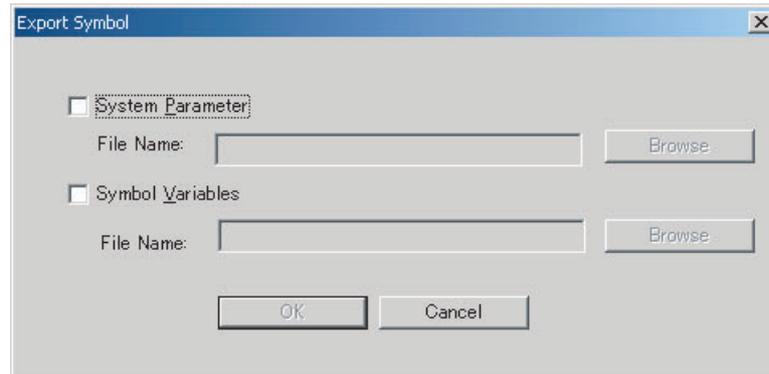
2. Enter the CAM name, CAM table number, and CAM table file, and then click **OK** Button.

6-4 Exporting File

Symbol File

This procedure exports a symbol file (*.csv filename extension) containing the system parameters and variables.

- 1,2,3... 1. Select the *Symbol* Icon in the project tree and either select **File - Export** or click  in the toolbar. It is also possible to right-click the *Symbol* Icon and select **Export** from the pop-up menu.

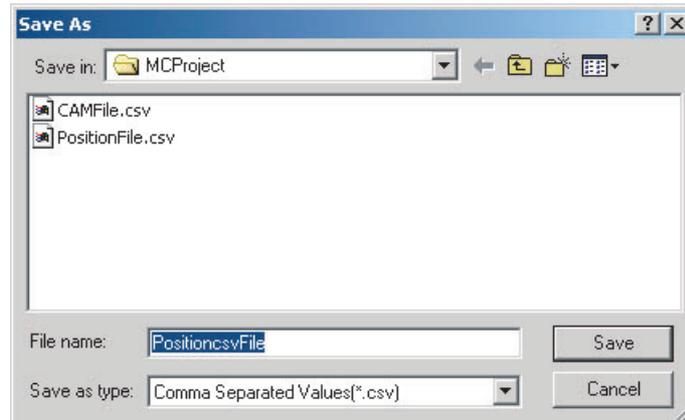


2. Select the *System Parameter* and *Symbol Variables* Options, input the file names (or click the **Browse** Button and select the file), and then click the **OK** Button.

Position Data Files

This procedure exports a position data file (*.csv filename extension).

- 1,2,3... 1. Select the *Position Data* Icon in the project tree and either select **File - Export** or click  in the toolbar. It is also possible to right-click the *Position Data* Icon and select **Export** from the pop-up menu.

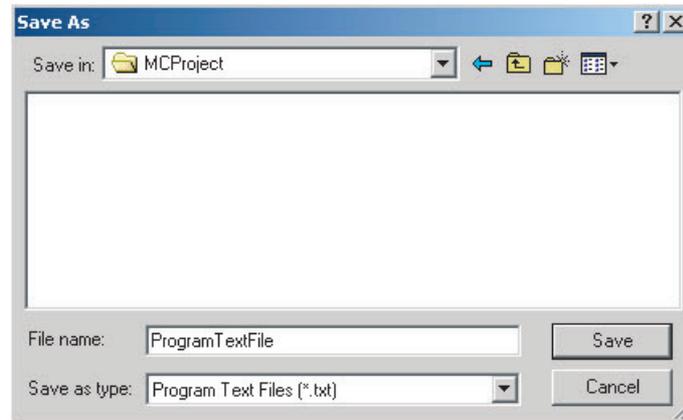


2. Enter the destination folder, file name, and file type, and then click the **Save** Button.

Program Files

This procedure exports a program file (*.txt filename extension).

- 1,2,3... 1. Select an individual program icon in the project tree and either select **File - Export** or click  in the toolbar. It is also possible to right-click the individual program icon and select **Export** from the pop-up menu.



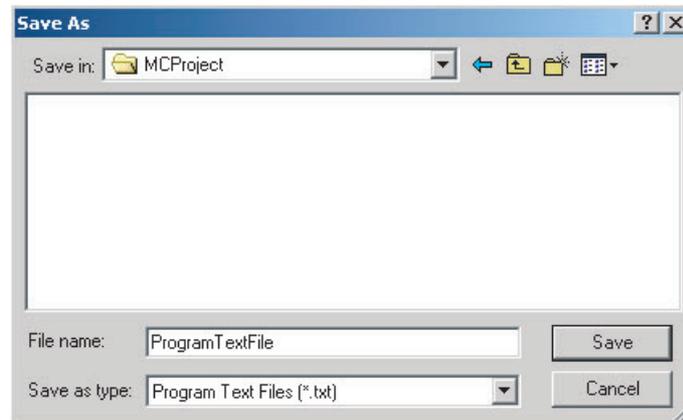
2. Enter the destination folder, file name, and file type, and then click the **Save** Button.

Subprogram Files

This procedure exports a subprogram file (*.txt filename extension).

1,2,3...

1. Select an individual subprogram icon in the project tree and either select **File - Export** or click  in the toolbar. It is also possible to right-click the individual subprogram icon and select **Export** from the pop-up menu.



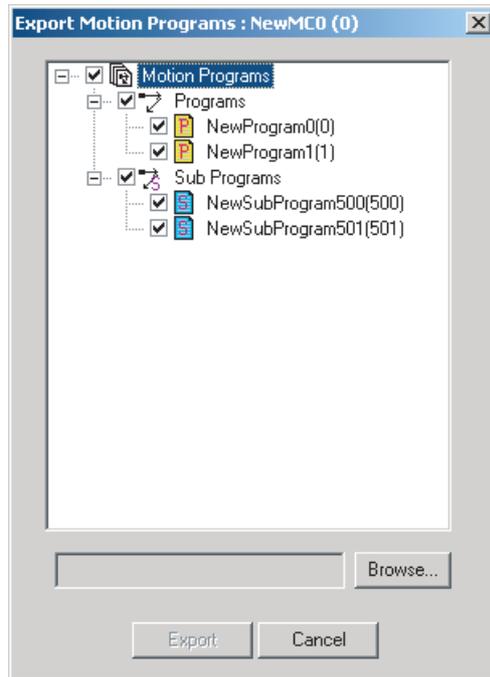
2. Enter the destination folder, file name, and file type, and then click the **Save** Button.

**Multiple Program/
Subprogram Files**

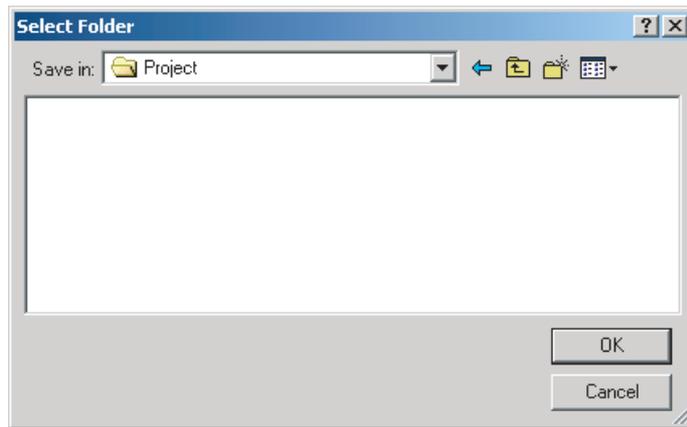
This procedure exports selected multiple program/subprogram files at the same time (*.txt filename extension).

1,2,3...

1. Select the **Motion programs, Programs, or Sub Programs** Icon in the project tree and either select **File - Export** or click  in the toolbar. It is also possible to right-click one of the above icons and select **Export** from the pop-up menu.



2. Select the programs and subprograms to be exported, select the destination folder, and then click the **Export** Button.

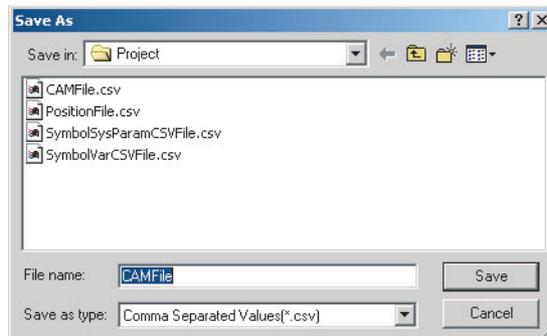


CAM Data Files

This procedure exports a CAM data file (*.csv filename extension).

1,2,3...

1. Select an CAM table icon in the project tree and either select **File - Export** or click  in the toolbar. It is also possible to right-click the CAM table icon and select **Export** from the pop-up menu.



2. Enter the destination folder, file name, and file type, and then click the **Save** Button.

SECTION 7

Transferring and Comparing Data

This section describes the operations used to transfer or compare data between the personal computer and Motion Control Unit/Servo Driver, and to write data transferred to the Motion Control Unit to the Motion Control Unit's flash memory.

Note Be sure that the personal computer is connected to the PLC via a connecting cable and that online communications are established before transferring data, comparing data, or writing data to flash memory.

7-1	Initial Settings for Online Connection	54
7-2	Setting/Changing Communications Specifications.	54
7-3	Transferring, Comparing, and Saving Data	56

7-1 Initial Settings for Online Connection

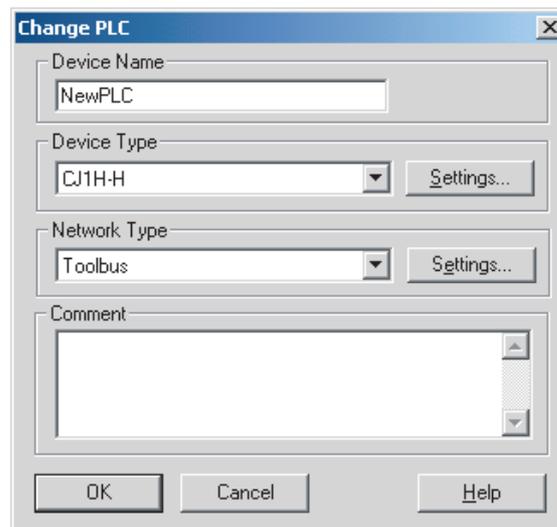
Initial Settings for the CPU Unit and MC Unit

- 1,2,3...
1. Set the MC Unit's unit number (using the rotary switch on the front panel)
 2. Set the DIP switch on the CPU Unit or the Controller Section of the NSJ Controller.
 - a. For Communications via Toolbus:
 - When using the peripheral port, set SW4 to OFF, or set SW4 to ON and make appropriate setting of PLC Setup (set Programming Console Address 144 to 0400 Hex).
 - When using the RS-232C port, set SW5 to ON, or set SW5 to OFF and make appropriate setting of PLC Setup (set Programming Console Address 160 to 0400 Hex).
 - b. For Communications via SYSMAC WAY (Host Link):
 - When using the peripheral port, set SW4 to ON, or set SW4 to OFF and make appropriate setting of PLC Setup. (Set Programming Console Address 144 to its default, 0000 Hex. If the default setting has not been changed, leave the setting as it is.)
 - When using the RS-232C port, set SW5 to OFF, or set SW5 to ON and make appropriate setting of PLC Setup. (Set Programming Console Address 160 to its default, 0000 Hex. If the default setting has not been changed, leave the setting as it is.)
 3. Create the I/O tables (using the CX-Programmer or a Programming Console).

7-2 Setting/Changing Communications Specifications

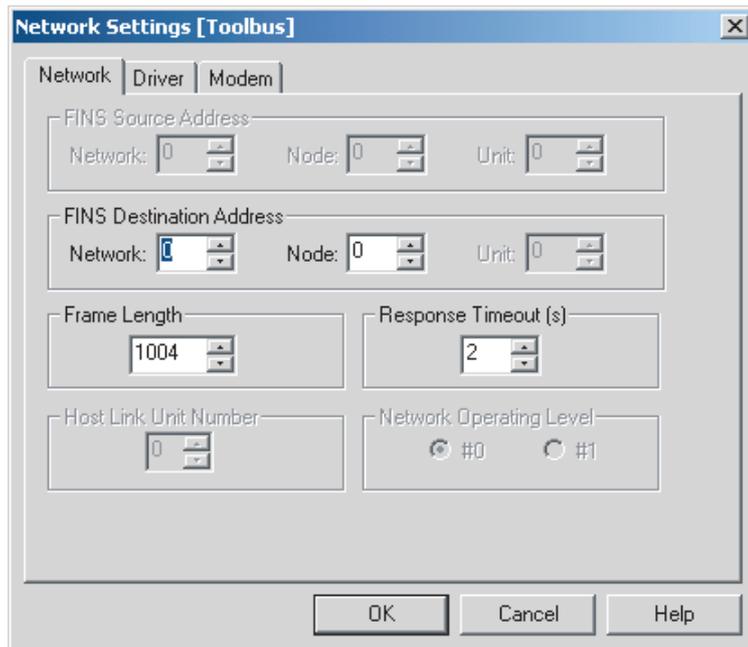
Communications Settings

- 1,2,3...
1. Right-click the PLC icon in the project tree and select **Properties** from the pop-up menu. Select the *Target PLC* Setting on the PLC Properties Dialog Box. The following dialog box will be displayed. Set the Device Type to be connected to the PLC.

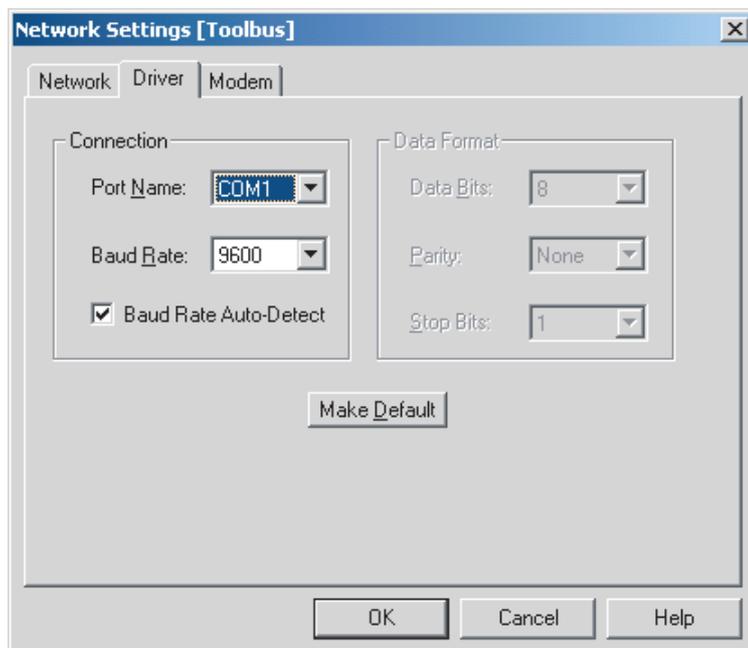


2. Set the Network Type.
Click the *Network Type* Drop-down List to display the list and select the desired communications method.

3. Make the network settings
 - To check or change the network settings, click the **Settings** Button in the *Network Type Area*.
 - a. Make settings in the Network Tab Page.



- b. Make settings in the Driver Tab Page.



Connecting to the PLC

Select **Online - Work Online** or click  in the toolbar. It is also possible to right-click the PLC icon in the project tree and select **Work Online** from the pop-up menu.

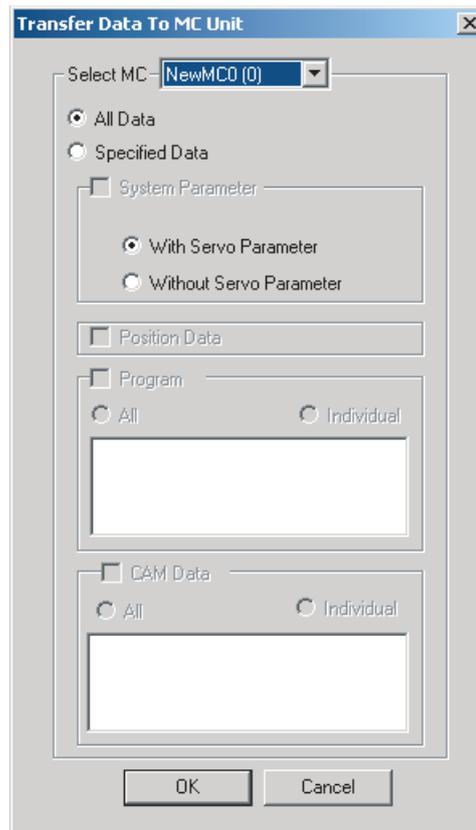
Note When transferring driver parameters, the transfer may be stopped with the following message: “Error (36355) Communications to the device could not be established or the connection has been broken. Check the communication

settings and connection method to the device.”
 Open the PLC property to increase the response monitoring time in the PLC Setup.

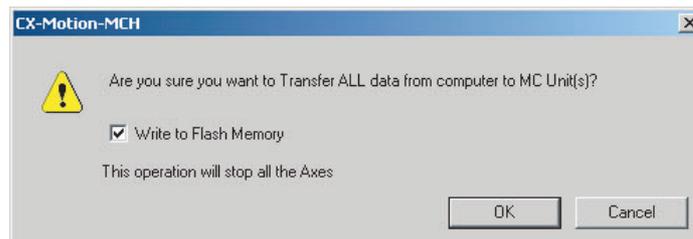
7-3 Transferring, Comparing, and Saving Data

Transferring to the MC Unit

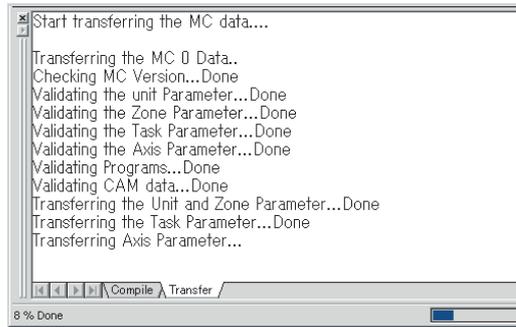
- 1,2,3... 1. Select the MC Unit icon in the project tree and either select **Online - Transfer - To MC** or click  in the toolbar. It is also possible to right-click the MC Unit icon in the project tree and select **Transfer - To MC** from the pop-up menu.



2. Select the data to be transferred and then click the **OK** Button.

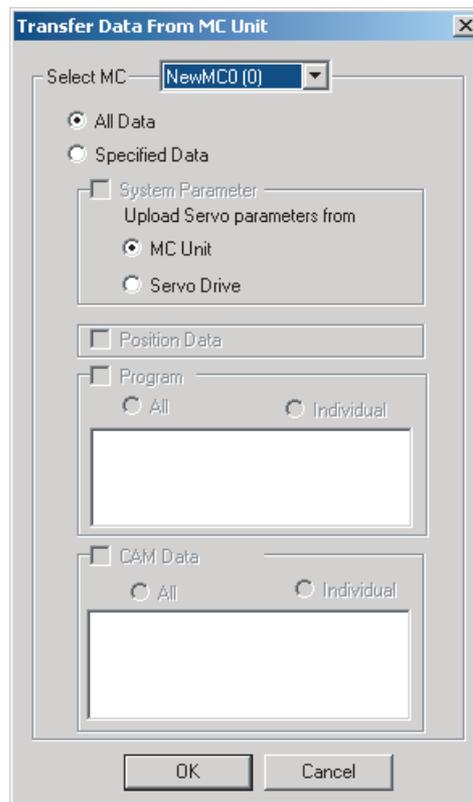


3. If the *Write to Flash Memory* Option is selected, the transferred data will be saved in flash memory. The transfer will start when the **OK** Button is clicked. The progress of the transfer will be displayed, as shown in the following diagram.

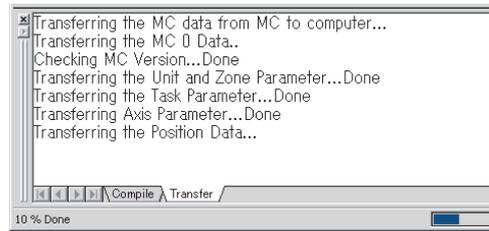


Transferring from the MC Unit

- 1,2,3... 1. Select the MC Unit icon in the project tree and either select **Online - Transfer - From MC** or click  in the toolbar. It is also possible to right-click the MC Unit icon in the project tree and select **Transfer - From MC** from the pop-up menu.

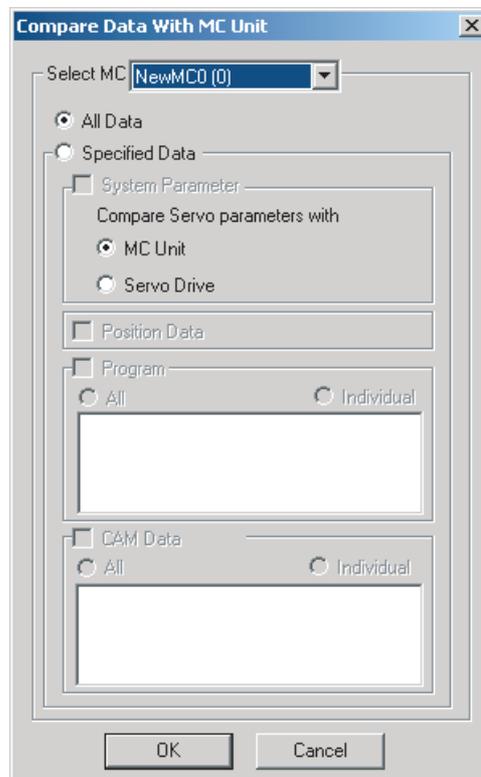


2. Select the data to be transferred and click the **OK** Button. The progress of the transfer will be displayed, as shown in the following diagram.



Comparing Data with the MC Unit

- 1,2,3... 1. Select the MC Unit icon in the project tree and either select **Online - Transfer - Compare** or click  in the toolbar. It is also possible to right-click the MC Unit icon in the project tree and select **Transfer - Compare** from the pop-up menu.



2. Select the data to be compared and then click **OK** Button.

- When the transfer from the MC Unit is completed, the Compare MC Window will be displayed showing the comparison results.

Description	Project	MC Unit
Position Data		
Parameters		
Unit Parameters		
P00002:NO. OF PARALL...	6	4
Zone Settings		
Tasks		
Axes		
Axis 1	Present	Not Present
Motion Programs		
Programs		
Sub Programs		
CAM		
CAM Number 1	Not Present	Present

- Double-click *Position Data*, *Programs*, *Sub Programs*, or *Cam data*. The following window will be displayed.

Description	Project	MC Unit
Position Data		
Parameters		
Unit Settings		
P00003:MECHATROLINK COMM...	5	2
P00011:ZONE OUTPUT POINTS	7	0
Zone Settings		
Tasks		
Axes		
Motion Programs		
Programs		
NewProgram0	Different	Different
NewProgram1	Different	Different
Sub Programs		
CAM		

- Click the **Overview** Button to display the Overview Window.

```

0001.....PROG_P000_Q00000001;.....
0002      ; Declaration of the program
0003      MOVELINK [J01]200 [J02]1000 A
0004      MOVE [J01]3000; Moves J01 to
0005      #MW0000 = 0055; Writes 0055 t
0006      MOVE [J01]4000; Moves J01 to
0007      MOVE [J03]1500; Moves J03 to
0008      MOVE [J01]3000; Moves J01 to
0009      ;MOVE [J01]3000; Moves J03 to
0010      END;
  
```

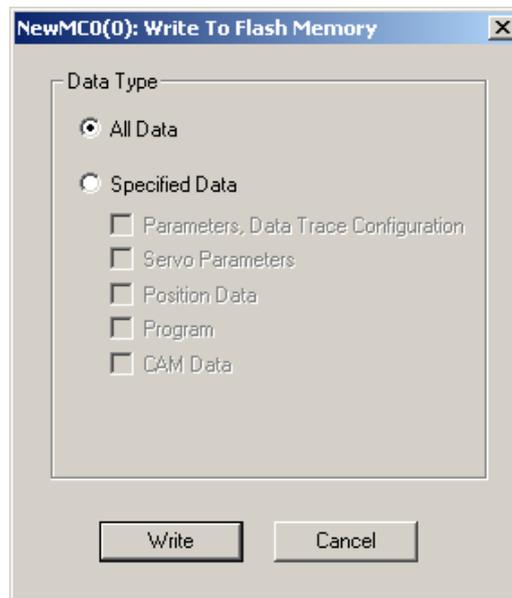
Legend: Same (white), Different (yellow), Moved (green), None (black)

- Select **File - Save as** to save the overview or detail view of the results of comparing programs.

Writing Data to Flash Memory

Caution Always backup the data in the flash memory after downloading the program, parameter data, position data, or CAM data to the MC Unit. Otherwise, the original data (before the transfer) will be restored the next time that the power is turned ON, which may cause unexpected operation.

- 1,2,3... 1. Select the MC Unit icon in the project tree and either select **Online - Write To Flash** or click  in the toolbar. It is also possible to right-click the MC Unit icon in the project tree and select **Write To Flash** from the pop-up menu.

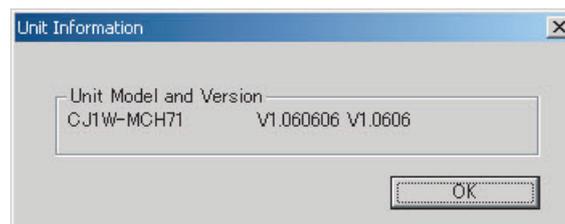


2. Select the data to be saved in the *Data Type* Options and click the **Write** Button.

Note If an error occurs while data is being written to the flash memory, the data may not be written to the flash memory successfully. In this case, write the data to the flash memory again after resetting the error.

Displaying Unit Information

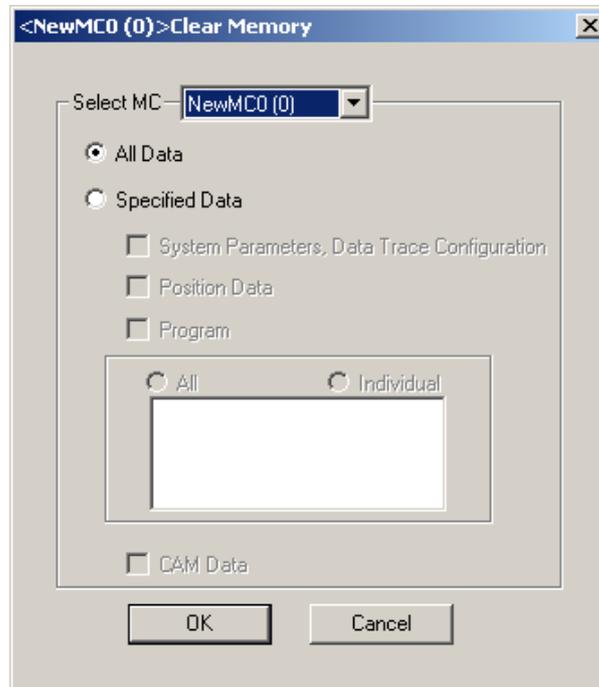
- 1,2,3... 1. Select **Online - Unit Information**.



2. The MC Unit's model and version information will be displayed.

Initializing Memory

- 1,2,3... 1. Select the MC Unit icon in the project tree and either select **Online - Clear Memory** or click  in the toolbar. It is also possible to right-click the MC Unit icon in the project tree and select **Clear Memory** from the pop-up menu.



2. Select the data to be initialized and click the **OK** Button.

Batch Transfer (Computer to MC Unit)

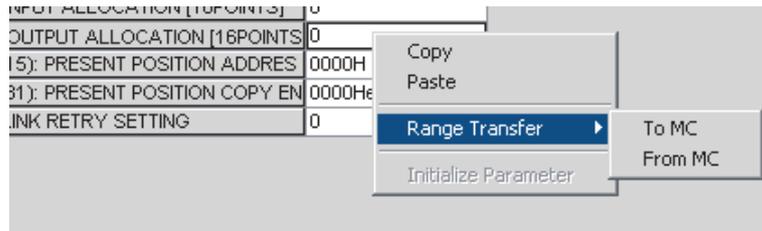
- 1,2,3... 1. Select the PLC icon in the project tree and either select **Online - Batch Transfer - To All MC** or click  in the toolbar. It is also possible to right-click the PLC icon in the project tree and select **Batch Transfer - To MC** from the pop-up menu.
2. Select the destination MC Unit in the *Select MC* Drop-down List. Select the data to be transferred and click the **OK** Button.

Batch Transfer (MC Unit to Computer)

- 1,2,3... 1. Select the PLC icon in the project tree and either select **Online - Batch Transfer - From All MC** or click  in the toolbar. It is also possible to right-click the PLC icon in the project tree and select **Batch Transfer - From MC** from the pop-up menu.
2. Select the source MC Unit in the *Select MC* Drop-down List. Select the data to be transferred and click the **OK** Button.

Range Transfer (Computer to MC Unit)

- 1,2,3... 1. Right-click in the Edit Parameters Window or Edit Position Data Window and select **Range Transfer - To MC** from the pop-up menu.



2. The data of the selected *Value* will be transferred to the MC Unit.

Range Transfer (MC Unit to Computer)

- 1,2,3... 1. Right-click in the Edit Parameters Window or Edit Position Data Window and select **Range Transfer - From MC** from the pop-up menu.
2. The data of the selected *Value* will be transferred from the MC Unit.

SECTION 8

Monitoring

This section provides information on monitoring the MC Units. The error status, axis's present position, and variable values are displayed in the Monitor Windows.

Note Be sure that the computer and PLC are connected with the connection cable and the communications between them are established before starting monitoring operations.

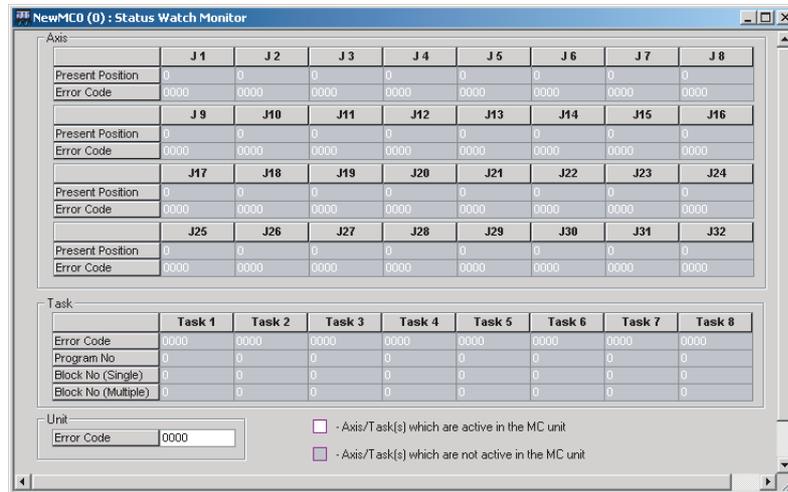
8-1	Status Monitor	64
8-2	General Watch Window	64

8-1 Status Monitor

Use the Status Monitor to monitor MC Unit errors, the present position of each axis, and the program number in progress.

Starting the Status Monitor

Click  in the toolbar.



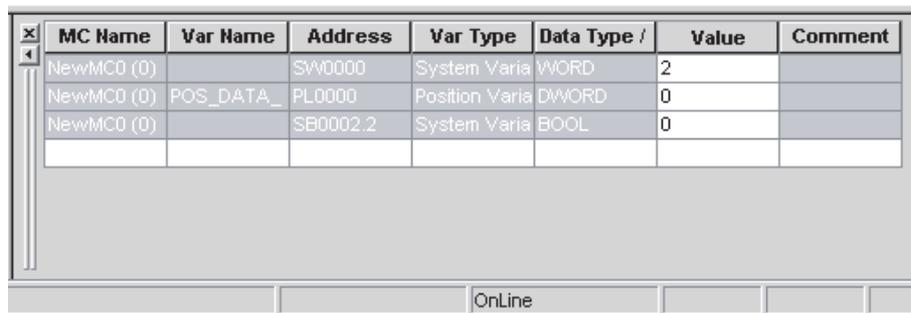
If the CX-Motion-MCH is connected online, monitoring will start automatically; if the CX-Motion-MCH is offline, monitoring will stop.

8-2 General Watch Window

The General Watch Window can be used to check and change variable values (excluding system variables).

Starting the General Watch Window

Click  in the toolbar.



If the CX-Motion-MCH is connected online, monitoring will start automatically; if the CX-Motion-MCH is offline, monitoring will stop.

To check a variable, select **Insert** from the Context Menu and register the variable.

To change a variable's value, change the value directly in the variable's **Value** column and press the **Enter** Key to confirm the change.

The variables registered in the General Watch Window can also be referenced again by saving the project.

SECTION 9

Operation

This section describes various operations on the axes of the MC Unit, including test run operations and program debugging.

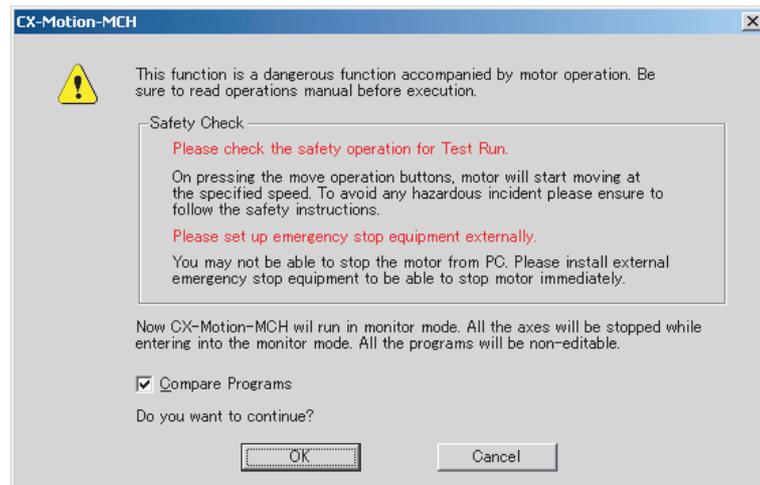
Note Operation from Support Tool is supported for MC Units with unit version 3.0 or later.

9-1	Switching to Monitor Mode	66
9-1-1	Starting Monitor Mode	66
9-1-2	Ending Monitor Mode	67
9-2	Test Run	67
9-2-1	Executing a Test Run	67
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9-3	Debugging the Program	69
9-3-1	Setting Break Points	69
9-3-2	Debugging the Program	70

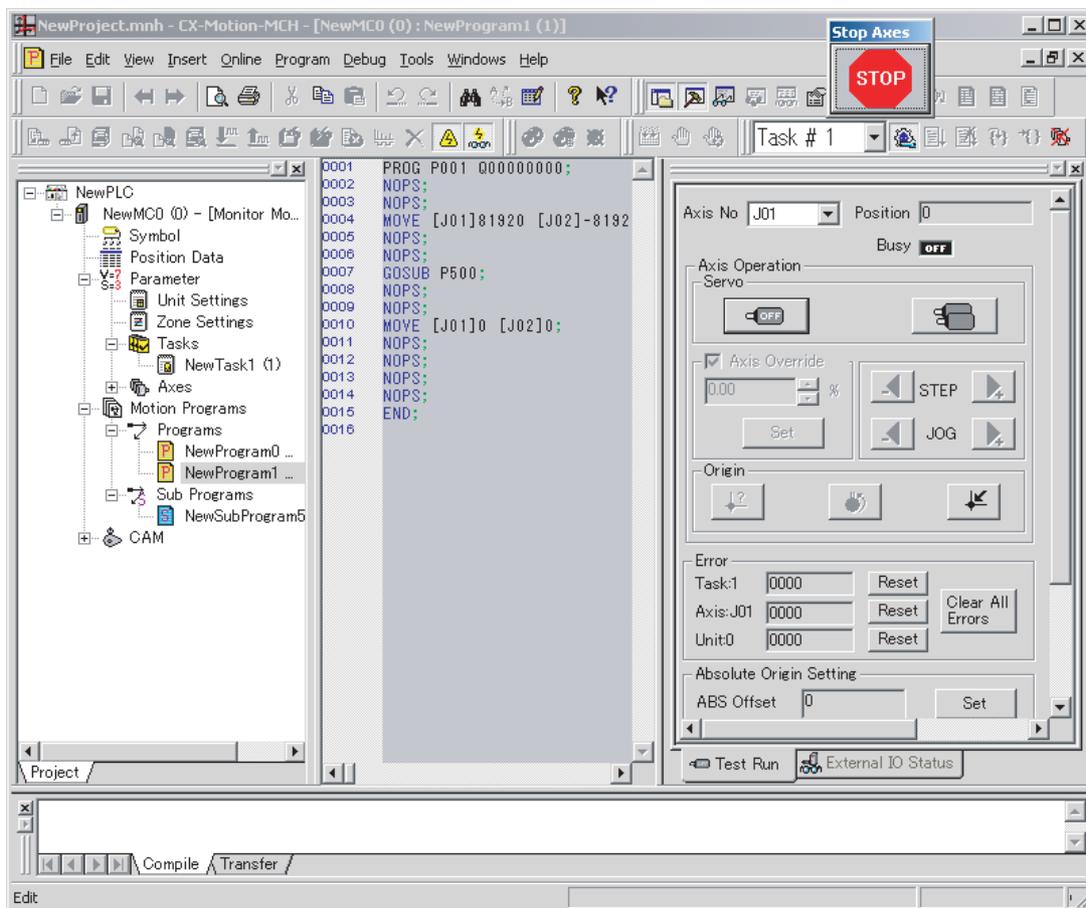
9-1 Switching to Monitor Mode

9-1-1 Starting Monitor Mode

- 1,2,3...
1. Select a PLC icon in the project tree and select **Online - Work Online**, or right-click a PLC icon and select Work Online from the pop-up menu. It is also possible to click  in the toolbar. The CX-Motion-MCH will be connected to the PLC.
 2. Select the MC Unit in the project tree, and then select **Online - Monitor Mode** or click  in the toolbar. The following warning dialog box will be displayed. Read the contents of the warning carefully. Click the **OK** Button only after confirming safety.



3. The CX-Motion-MCH will switch to Monitor Mode, and the following Test Run Window and Stop Axes Button will be displayed.  will be displayed in the toolbar. The Stop Axes Button can be used in Monitor Mode and will come to the front of the displayed window. All axes will decelerate to a stop if the Stop Axes Button is clicked.



Note The Status Monitor Window will not be displayed in Monitor Mode. Also, the MC Unit cannot be controlled from the ladder program in Monitor Mode.

9-1-2 Ending Monitor Mode

- 1,2,3...**
1. Select **Online - Monitor Mode** or click  in the toolbar.
 2. Monitor Mode will be ended, and the CX-Motion-MCH will display  in the toolbar.

9-2 Test Run

9-2-1 Executing a Test Run

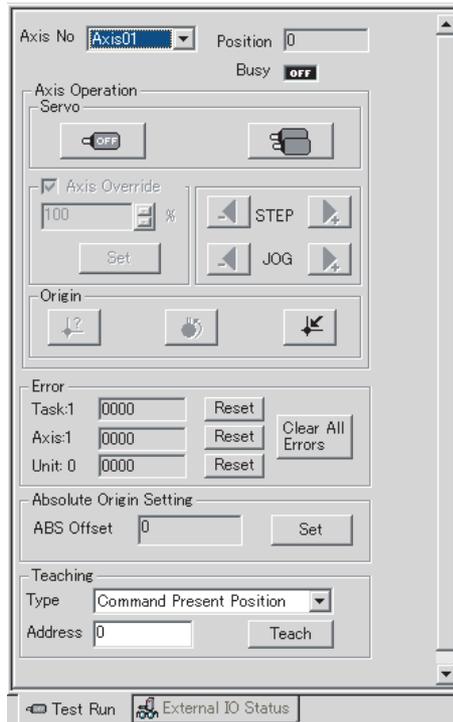
- 1,2,3...**
1. Select the axis for which to execute a test run in the Test Run Window.
 2. Click  to lock the selected axis.
 3. To use an override, select the *Axis Override* Option and enter the override set value. Click the **Set** Button to write the set value to the MC Unit.
 4. Click the JOG, STEP, or Origin Buttons. The axis will be operated.

Note

- (1) Clicking any of the operation buttons will operate the motor at the designated speed. Execute the operation only after confirming safety.
- (2) The operation on the personal computer may not stop the motor. Provide an emergency stop device externally to enable stopping the motor immediately at any time.

9-2-2 Test Run Window

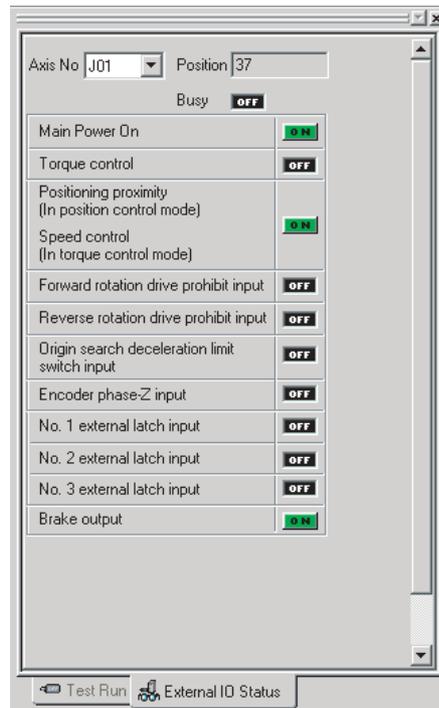
Test Run



Axis No.		Sets the axis to operate.
Position		Displays the current position of the axis.
Busy		Displays the operating status.
Servo	Lock Servo	Locks/unlocks the axis.
	Lock/Unlock Multiple	Displays a dialog to lock/unlock multiple axes.
Override	Axis Override	Sets the override value. Range: 0.00 to 327.67%
	Set	Sets the override in the MC Unit.
STEP	+	Steps the axis in the positive direction.
	-	Steps the axis in the negative direction.
JOG	+	Jogs the axis in the positive direction.
	-	Jogs the axis in the negative direction.
Origin Search		Searches for the origin.
Origin Return		Returns the axis to the origin.
Forced Origin		Force the current position to the origin.
Task Error		Display the error code occurred in Task. Click the Reset Button to reset the error.
Axis Error		Displays any error code for any error that has occurred for the axis. Click the Reset Button to reset the error.
Unit Error		Displays any error code for any error that has occurred in the MC Unit. Click the Reset Button to reset the error.
Clear All Errors		Resets all errors that have occurred in the task, axis, and unit.

Absolute Origin Setting	ABS Offset	Displays the value of the Absolute Origin Offset set in the Axis Parameters of the MC Unit.
	Set	Sets the absolute origin.
Teaching	Type	Sets either a Feedback Present Position or Command Present Position.
	Address	Sets the first address in which to store data (position data number). Range: 0 to 10239
	Teach	Executes teaching. After execution, the address will be incremented automatically.

External I/O Status



9-3 Debugging the Program

The CX-Motion-MCH can be used to debug the motion program in an MC Unit.

Before switching to Monitor Mode, click **To MC** or **From MC** to transfer the motion program between the MC Unit and CX-Motion-MCH so that both the MC Unit and CX-Motion-MCH have the same program.

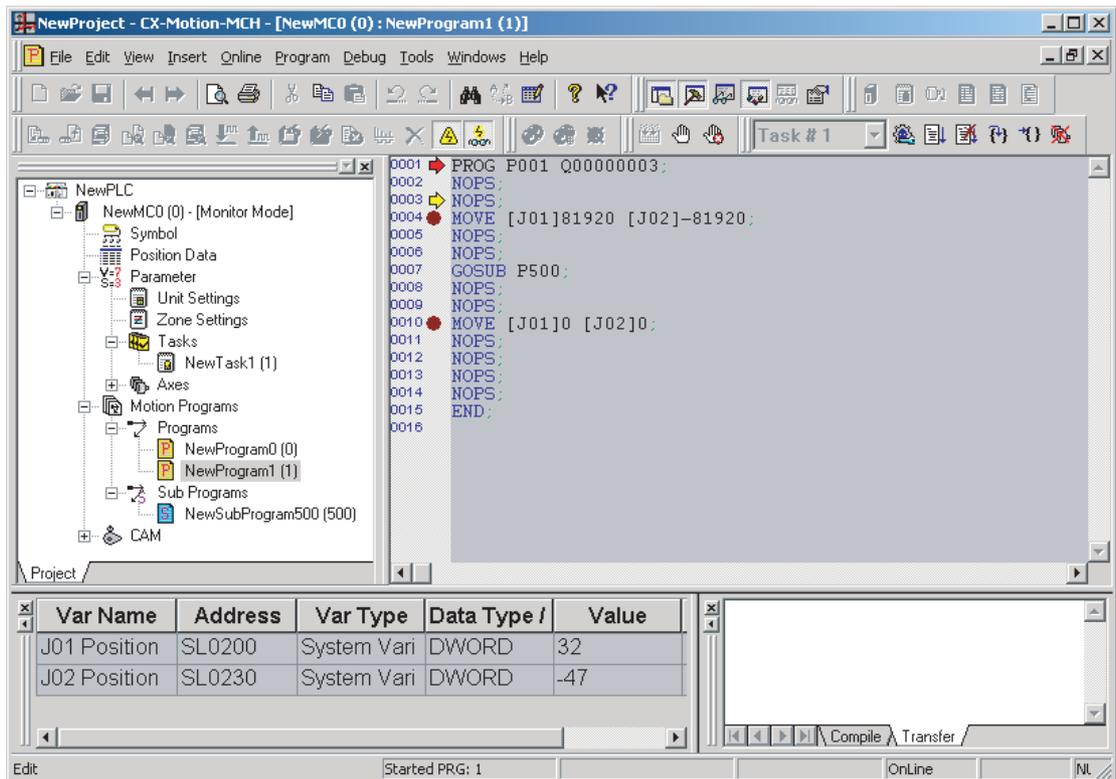
Note Debugging motion program is supported for MC Units with unit version 3.0 or later.

9-3-1 Setting Break Points

- 1,2,3...
1. Display the program to debug.
 2. Move the cursor to the step to set the break point, and click . A break point mark will be displayed.
 3. Click again, the break point will be removed.

9-3-2 Debugging the Program

- 1,2,3...
1. Display the program.
 2. Servolock the axis to be used if the program operates the axis.
 3. In the toolbar, select the number of the task to debug.
 4. Click  in the toolbar, the MC Unit will execute the program. Program execution will stop at the first break point.
 5. Set variables in the General Watch Window as required.
 6. Click  in the toolbar to debug the program again from the first break point. Click  in the toolbar to debug the program one step at a time.



Note In the following case, program execution will not stop at a breakpoint and will continue to the next breakpoint.

- The first break point is skipped using the IF function.

```

0004 IF #DW0001 == 1;
0005 MOVE [J01]100.00 [J02]200.00;
0006 ELSE;
0007 MOVE [J03]-100.00 [J04]-10.00;
0008 ENDIF;
    
```

When step 0004 is false, step 0007 would be executed next after step 0004. A break point is set for step 0007, so program execution would stop at the step that was executed immediately before step 0007. In this example, that would be step 0004, i.e., program execution would stop immediately after executing the IF statement in step 0004.

Program execution also may not stop at a break point set for the WHILE, FOR, PARALLEL, and SWITCH control commands.

- Note**
- (1) Clicking any of the operation buttons will operate the motor at the designated speed. Execute the operation only after confirming safety.
 - (2) The operation on the personal computer may not stop the motor. Provide an emergency stop device externally to enable stopping the motor immediately at any time.

SECTION 10

Data Traces

This section describes the data trace function.

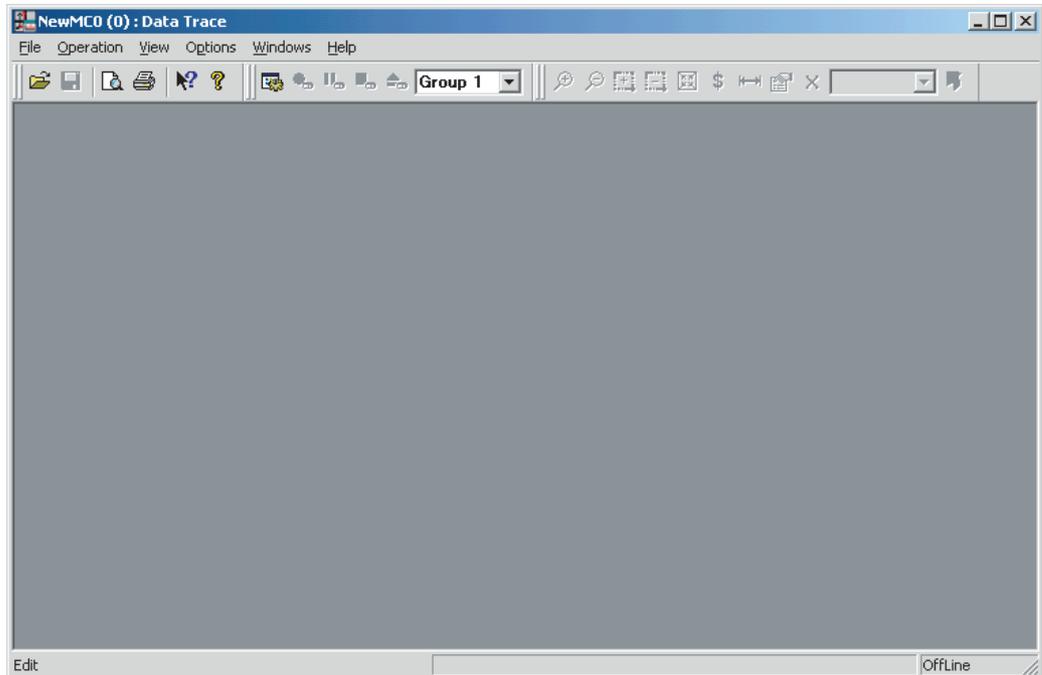
Note Data traces are supported for MC Units with unit version 3.0 or later.

10-1	Data Traces	74
10-1-1	Executing a Data Trace	74
10-1-2	Changing the Graph Display	75

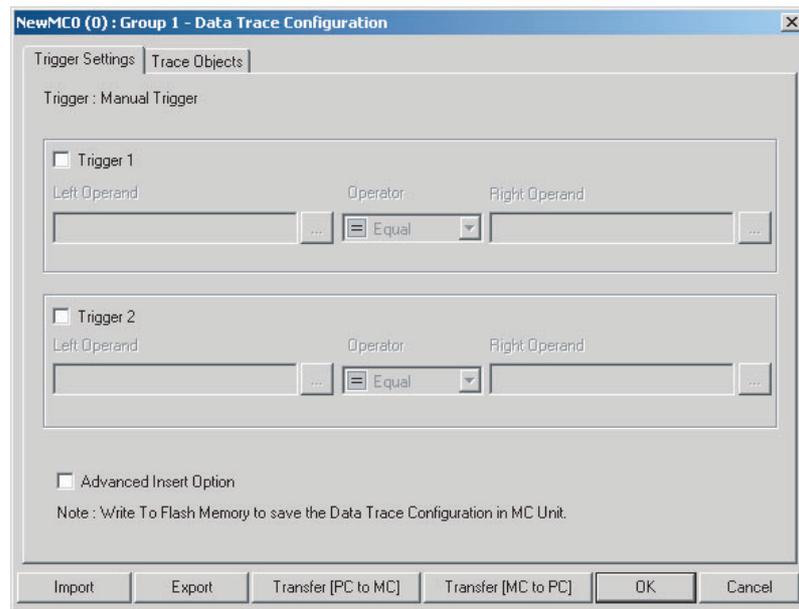
10-1 Data Traces

10-1-1 Executing a Data Trace

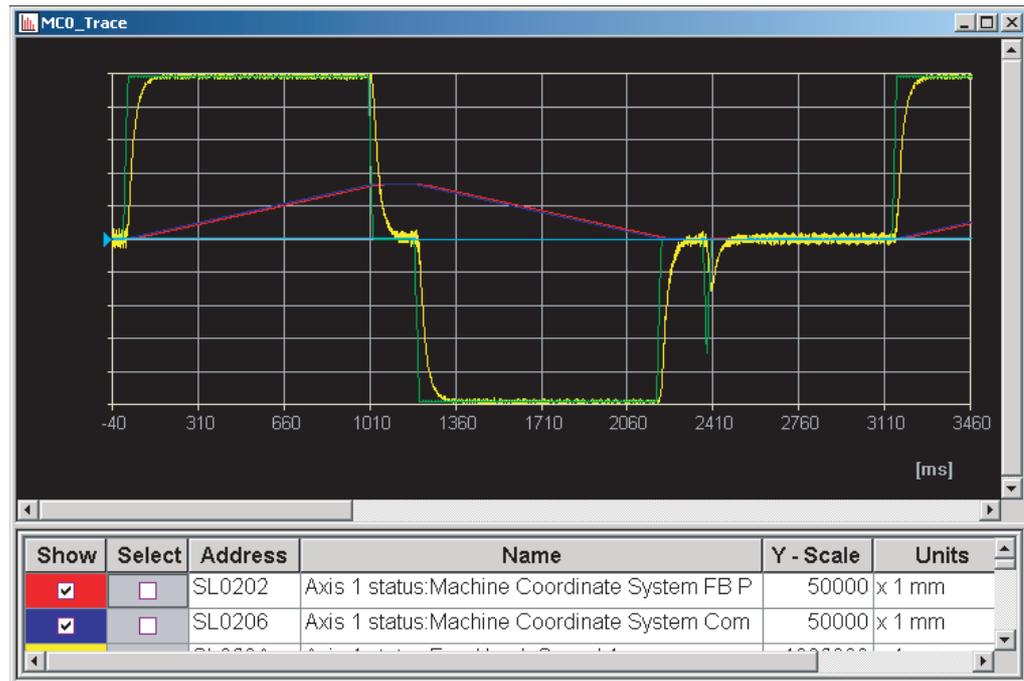
- 1,2,3...
1. Select the PLC icon in the project tree and select **Online - Work Online**, or right-click the PLC icon and select **Work Online** from the pop-up menu. It is also possible to click  in the toolbar. The CX-Motion-MCH will be connected to the PLC.
 2. Select the MC Unit icon in the project tree, and then select **Online - Data Trace** or click  in the toolbar. The Data Trace Window will be displayed.



3. Click  in the Data Trace Window. The Data Trace Configuration dialog box will be displayed.

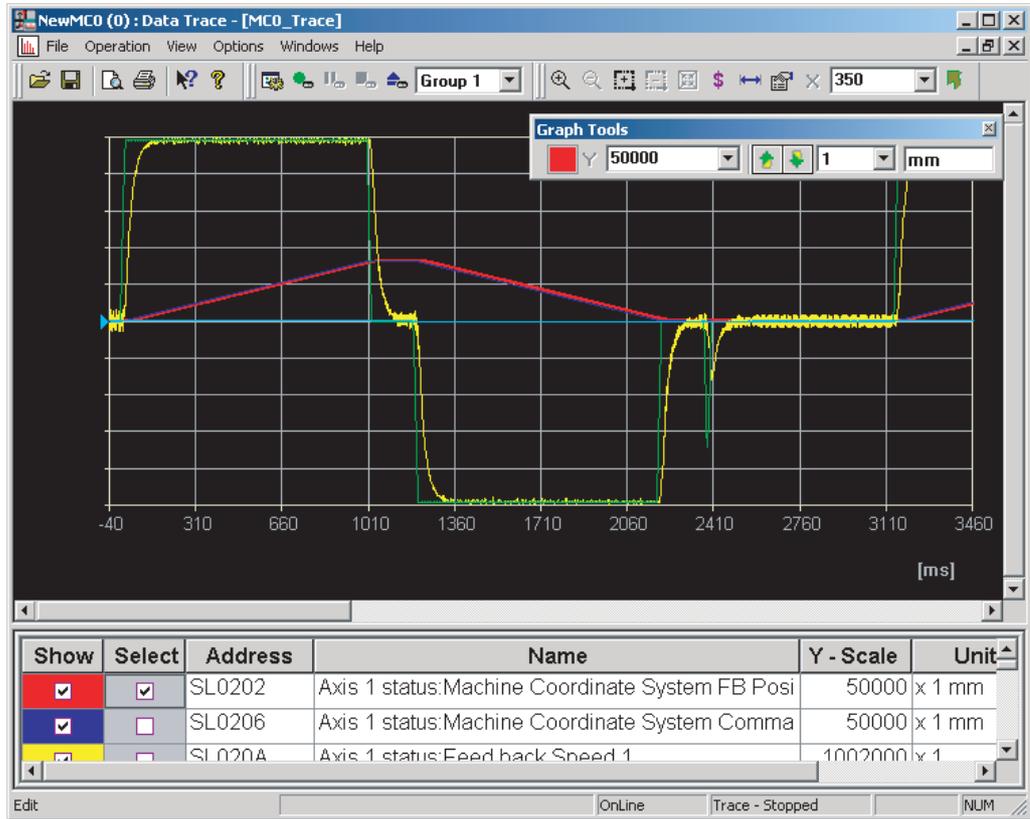


4. Set the trigger conditions, trace objects, and number of samplings.
5. Click the **Transfer [PC to MC]** Button to write the set values to the MC Unit.
6. Click the **OK** Button to close the Data Trace Configuration Dialog Box.
7. Click  in the Data Trace Window. The MC Unit will execute the data trace.
8. The trigger condition is activated, and the data trace is completed. The MC Unit will transfer the results of the data trace to the CX-Motion-MCH automatically and display them graphically.



10-1-2 Changing the Graph Display

- 1,2,3...
1. Select in the legend to display the required items.
 2. Select the data of the item to change.
 3. Change the vertical scale using in the Graph Tools Window.
 4. Change the displayed position using .
 5. Select  to display the value at the cursor position.
 6. Select  to display the difference between two points.
 7. Click  in the Data Trace Window to save the data to a CSV file.



SECTION 11

Backup and Restore

This section describes the operations used to back up data from MC Units and restore data to MC Units.

- Note**
- Be sure that the personal computer is connected to the PLC via a Connecting Cable and that online communications are established before backing up and restoring data.
 - Backing up and restoring data is supported for MC Units with unit version 3.1 or later.

11-1 Backup from MC	78
11-2 Restoring to MC	78
11-3 Verifying Backup File with MC Unit	79

11-1 Backup from MC

Use the following procedure to backup an MC Unit on the CX-Motion-MCH.

- 1,2,3... 1. Select **Online - Backup and Restore - Backup from MC** in online mode. The following window will be displayed.

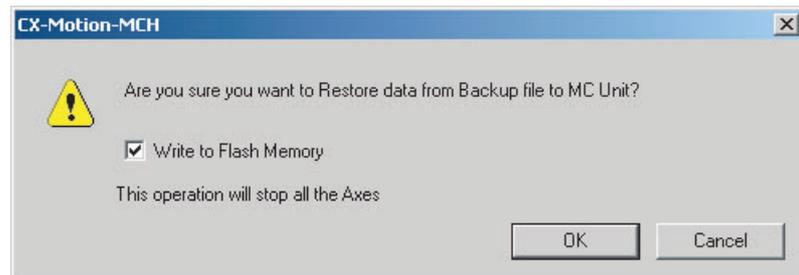


2. After entering or selecting the destination folder, file name and file type, click the **Save** Button. Use the default file type (*.bkh), because the MC Unit data is being saved in a CX-Motion-MCH backup file.

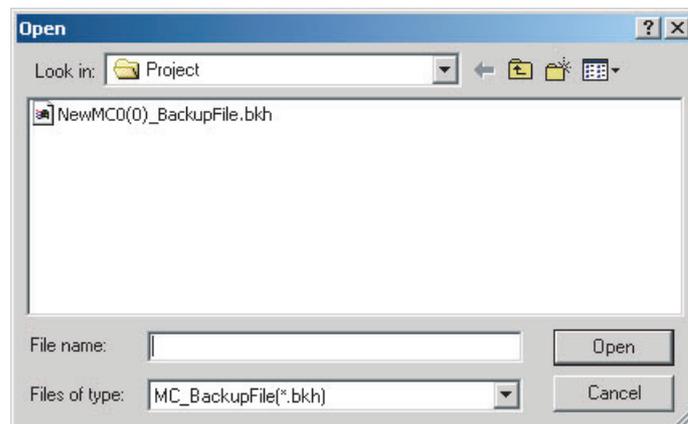
11-2 Restoring to MC

Use the following procedure to restore a backup file to an MC Unit.

- 1,2,3... 1. Select **Online - Backup and Restore - Restore to MC** in online mode. The following message will be displayed.



2. Click the **OK** Button to display the following window.



3. Enter or select the folder to be looked in, the file name, and the file type, and then click the **Open** Button. The following message will be displayed after restoring backup data is done.

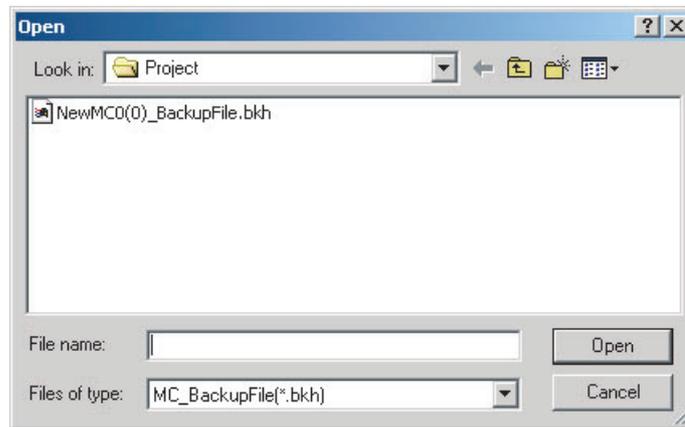


4. Click the **Yes** Button to start verifying.

11-3 Verifying Backup File with MC Unit

Use the following procedure to verify a backup file with an MC Unit.

- 1,2,3... 1. Select **Online - Backup and Restore - Verify Backup file with MC Unit** in online mode. The following window will be displayed.



2. Enter or select the destination folder, file name, and file type, and then click the **Open** Button. Verifying will start. A message will be displayed to tell if the data is identical.

SECTION 12

Read Protection

This section describes the operations used to set and release protection on programs or cam data in MC Units, set and change primary and secondary passwords, and switch the user.

- Note**
- Be sure that the personal computer is connected to the PLC via a Connecting Cable and that online communications are established before setting or releasing read protection, setting or changing passwords, or switching the user.
 - Read protection is supported for MC Units with unit version 3.1 or later.

12-1	Read Protection	82
12-1-1	Read Protection	82
12-1-2	User	82
12-1-3	Setting and Releasing Read Protection	82
12-2	Setting and Changing Passwords	83
12-3	Setting and Releasing Protection	85
12-4	Switching the User	86

12-1 Read Protection

12-1-1 Read Protection

The CX-Motion-MCH can be used to protect all of programs and cam data in an MC Unit from being read.

Note Protection cannot be set for reading parameters. It also cannot be set for writing parameters, programs or cam data.

12-1-2 User

There are 3 types of user. Read protection can be set only by the primary user. What data can be read depends on the user.

User	What can be done	What cannot be done
Primary user	Setting the primary password and the secondary password Setting and releasing protection Specifying programs or cam data that can be read through the secondary password Reading all programs and cam data	---
Secondary user	Reading only the programs and cam data that can be read through the secondary password.	Setting and releasing protection
Normal user	---	Reading all programs or cam data for which read protection is set. Setting and releasing read protection.

12-1-3 Setting and Releasing Read Protection

Only the primary user can protect data in an MC Unit by setting and releasing protection on the data that can be read. To set protection, set a primary password and a secondary password and then select the data items that can be read through the secondary password.

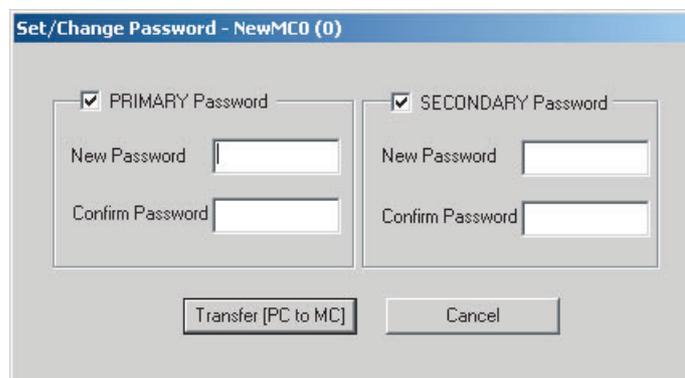
Read protection can be set or released using the primary password at any time.

12-2 Setting and Changing Passwords

- 1,2,3... 1. Select **Online - Read Protection- Set/Change Password** in online mode. The following window will be displayed.



2. Enter the primary password and click the **OK** Button.



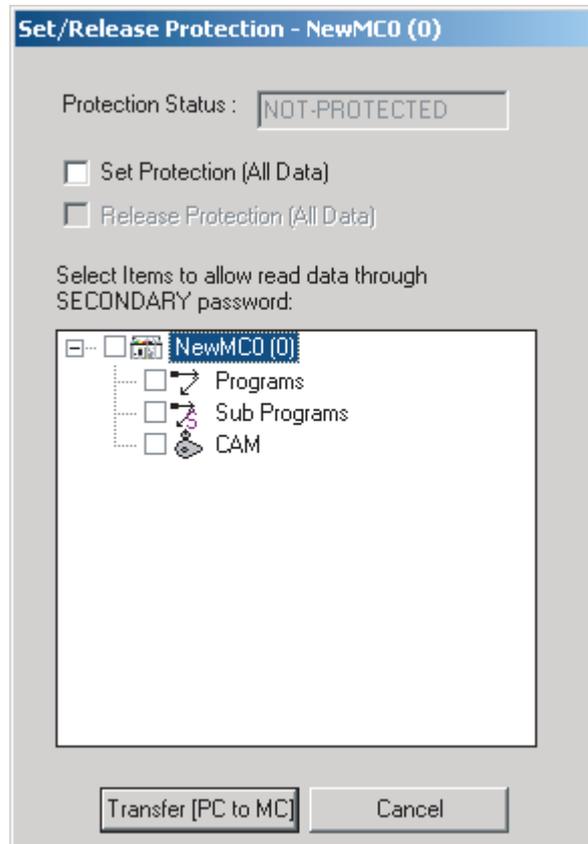
3. After entering the new password and the confirm password, click the **Transfer [PC to MC]** Button.

Note All programs and cam data cannot be read if the primary password is forgotten. Please make a copy of the password and keep it in a safe place.

4. A message to tell that the password has been set successfully will be displayed. When it appears, click the **OK** Button. The following window will be displayed.



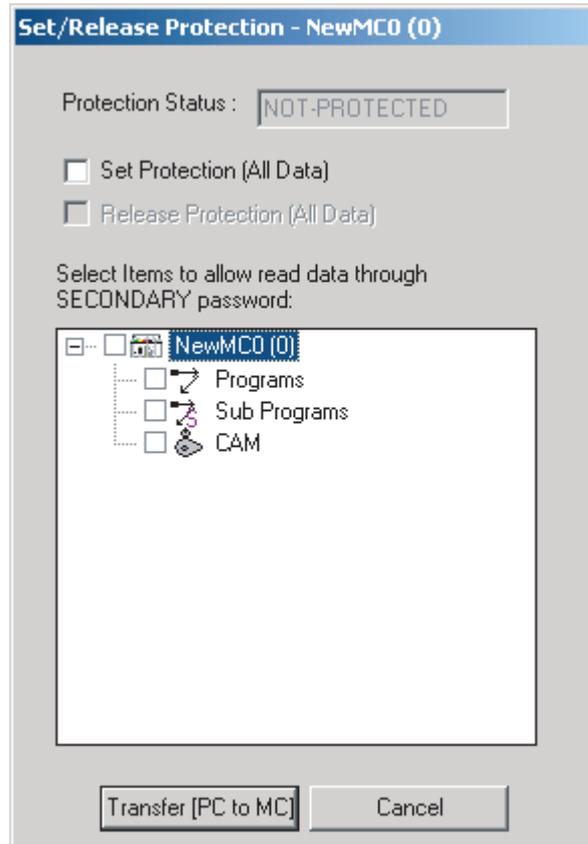
5. Click the **Yes** Button to display the following window.



6. Select *Set Protection* or *Release Protection*, and the data items that can be read through the secondary password, and then click the **Transfer [PC to MC]** Button.

12-3 Setting and Releasing Protection

- 1,2,3... 1. Select **Online - Read Protection- Set/Release Protection** in online mode. The following window will be displayed.



2. Select *Set Protection* or *Release Protection*, and the data items that can be read through the secondary password, and then click the **Transfer [PC to MC]** Button.

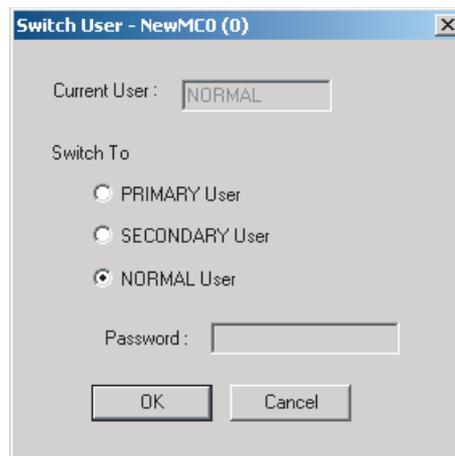
12-4 Switching the User

A current user can be switched to a different user. Switching to the primary or secondary user requires the primary password or the secondary password.

- 1,2,3...
1. Select **Online - Read Protection- Switch User** in online mode. The following window will be displayed to request entering the primary password in secondary/normal user status.



The following window will be displayed when the primary password is entered.



2. Select the user to be switched to. Enter the primary password to switch to the primary user or the secondary password to switch to the secondary user, and then click the **OK** Button.

SECTION 13

Printing

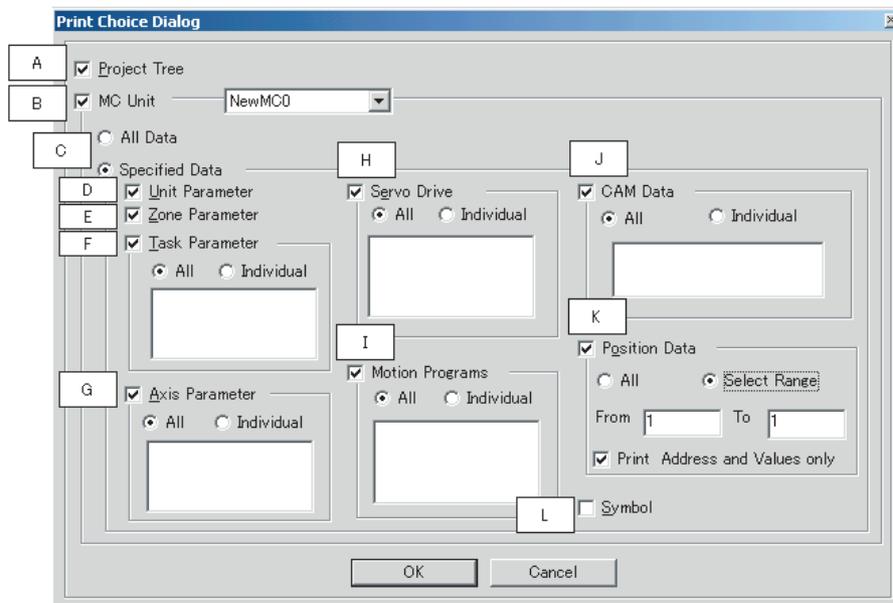
This section describes the operations used to print project data.

13-1 Printing	88
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13-1 Printing

Printing Data and Parameters

To print project data, select **File - Print** and select the desired data from the following Print Choice Dialog Box.



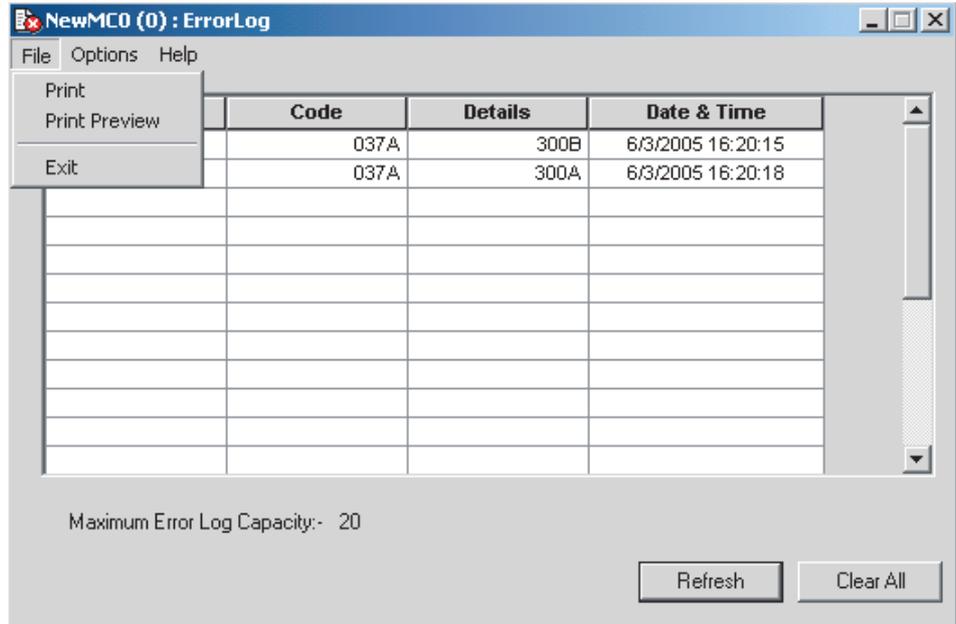
The following data and parameters can be selected for printing.

Item	Name	Function
A	Project Tree	If this option is selected, the project tree is printed.
B	MC Unit	If this option is selected, the specified MC Unit parameters are printed.
C	All Data or Specified Data	These options specify the range of MC Unit parameters to print.
		All Data Print all of the data.
	Specified Data	Print only selected data and parameters.
D	Unit Parameter	Select this option to print the Unit Parameters
E	Zone Parameter	Select this option to print the zone parameters.
F	Task Parameter	All Print all of the motion task parameters.
		Individual Print only the motion task parameters specified in the list.
G	Axis Parameter	All Print all of the axis parameters.
		Individual Print only the axis parameters specified in the list.
H	Servo Drive (Servo Parameters)	All Print all of the servo parameters.
		Individual Print only the servo parameters specified in the list.
I	Motion Programs (Includes subprograms.)	All Print all of the programs and subprograms.
		Individual Print only the programs and subprograms specified in the list.
J	CAM Data	All Print all of the CAM table's data.
		Individual Print only the CAM table's data specified in the list.
K	Position Data	All Print all of the position data.
		Select Range Print only the specified range of position data.
		Print Address and Values only Print only the address and value, not comment and name.
L	Symbol	Print the symbols.

Printing the Error Log

The Error Log can be printed.

To print the error log, display the Error Log Window and select **File - Print** from the Error Log Window's menu bar.



SECTION 14

Error Log

This section provides information on the error log generated by the MC Unit.

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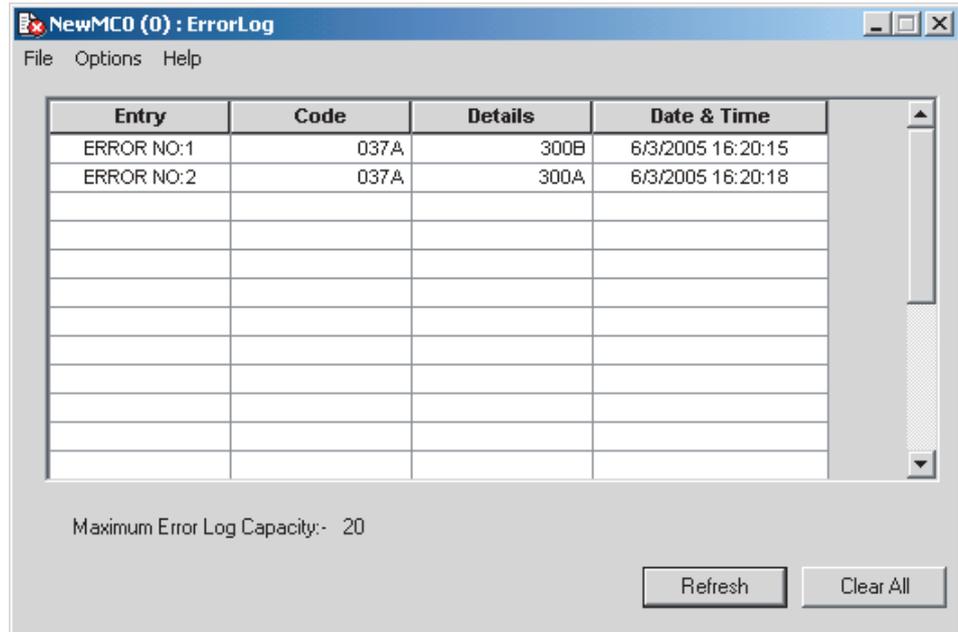
14-1 Error Log

Overview

The error log can record and display the up to 20 MC Unit errors. If more than 20 errors occur, the oldest error record will be deleted to make room for the new error record.

Displaying the Error Log

Select the MC Unit icon in the project tree and select **Online - Error Log**.



The **Refresh** Button can be clicked to read the latest error log information from the MC Unit.

The **Clear All** Button can be clicked to delete the error log.

Note Axis errors are not displayed in the error log.

14-2 Error Codes

n Error Causes and Error Processing

For details on the probable causes of error codes and methods used to clear errors, refer to *Troubleshooting* in the *CS1W-MCH71 Motion Control Units Operation Manual (W419)* or *CJ1W-MCH71 Motion Control Units Operation Manual (W435)*, or click **Help - Help Contents** in the CX-Motion-MCH and select *Trouble Shooting - MC-UNIT*, or refer to *15-1 Troubleshooting* in this manual.

SECTION 15

Troubleshooting

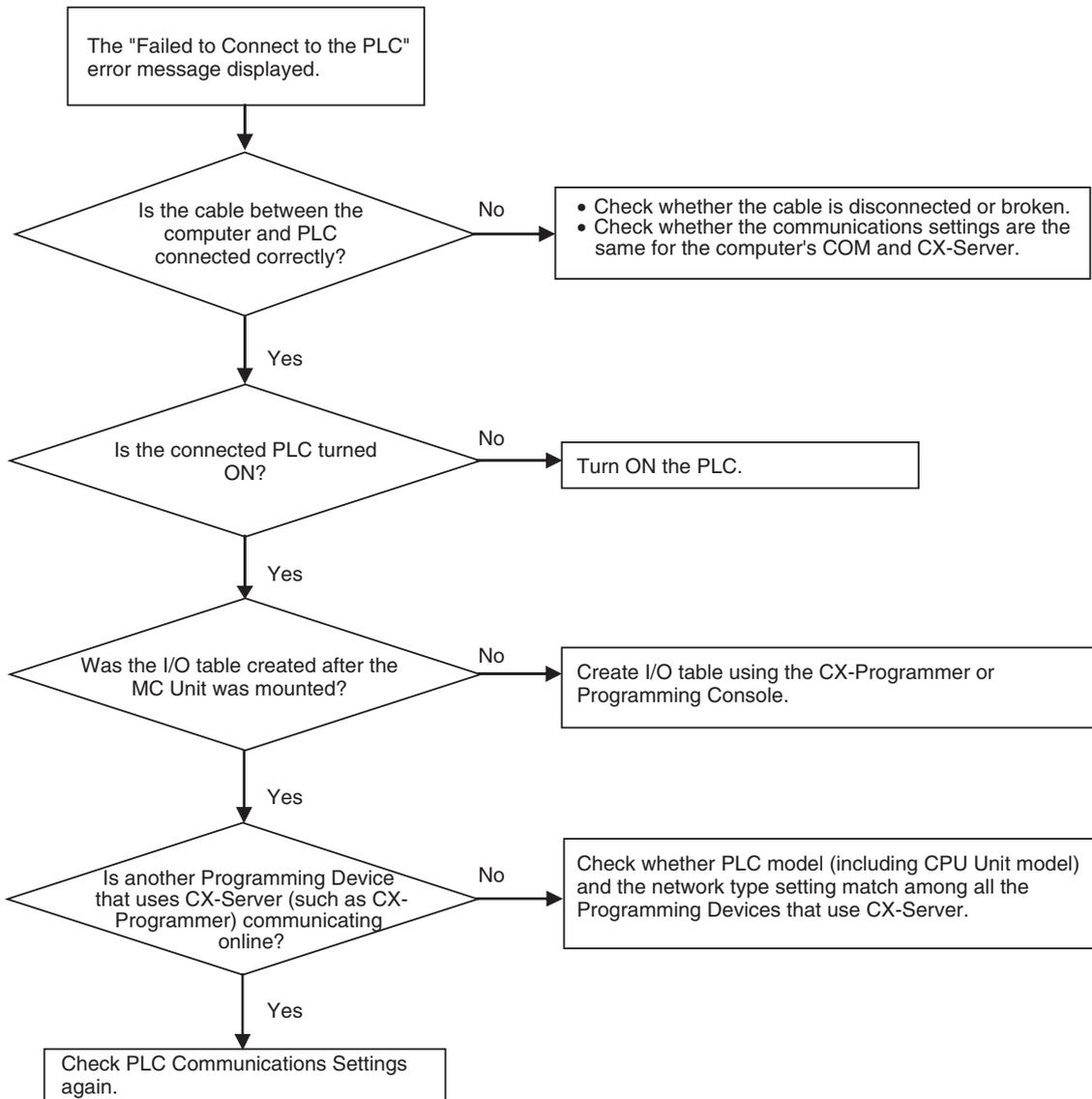
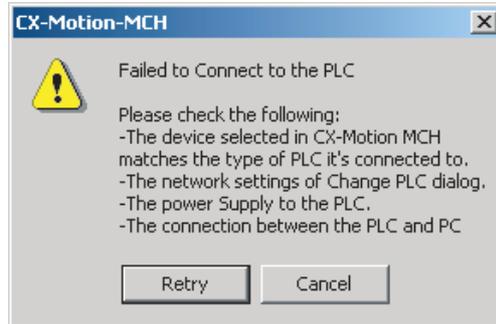
This section provides information on the troubleshooting methods for the MC Unit.

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15-1 Troubleshooting

Error Processing of Online Errors

The following error message may be displayed when attempting to connect online on the CX-Motion-MCH Basic Window. Use the following flow chart to help identify and correct the error.



- If a transfer operation fails when transferring servo parameters for many axes, a timeout may have occurred. Increase the response monitoring time in the PLC Setup.

- A communications error may occur in the servo driver after the MC Unit is restarted. If this occurs, restore the power supply to the Servo driver and the MC Unit

Error Messages and Remedies

The following table shows the probable causes and remedies of messages that may be displayed during online operations.

Message	Probable cause	Remedy
12289: No access right - Another tool is occupying MCH. General or READ/ WRITE is not permitted	The CX-Motion MCH tried to get the access right to the MC Unit but another process (tool) has the access right.	Wait until the other process releases the access right. Or stop the other process so that access will be released.
35355: Communications to the device could not be established or the connection has been broken. Check the communication settings and connection method to the device	<ol style="list-style-type: none"> 1. Communications between the computer and the MC Unit have been disconnected, or the MC Unit power supply has been cut off. 2. Communications between the computer and the servo drive timed out. 	<ol style="list-style-type: none"> 1. Check the network setup and check the power supply to the MC Unit. 2. Increase the Response Timeout Setting in the Network Settings of the PLC.
32775: CX-Server has not been initialized by the application	The CX-Server is corrupted or might not be installed.	Check whether the CX-Server is installed and try restarting the application.
34845: CX-Server is currently processing the maximum number of requests. This error indicates the application is thrashing the maximum possible communications throughput of the device's connection	The CX-Server is currently processing the maximum number of requests. The communications system is busy and cannot handle any more requests.	Either stop some of the applications or wait until processing for other applications has been completed.
8720: Operation mode of MC Unit is wrong	<p>The operating mode is set to the wrong mode.</p> <p>Or the mode was changed by another application, like the CX-Programmer, while CX-Motion MCH was writing or saving data.</p>	Wait until the other application is finished and then retry the operation.
4364: Invalid data. Failed to transfer	<p>Parameter Read:</p> <ul style="list-style-type: none"> • No. of words read is zero. • Beginning read address is for an odd-numbered byte. (For system parameter and position data, the byte address is not a multiple of 4.) • No. of read words is an odd number of bytes. (For system parameter and position data, the byte size is not a multiple of 4.) <p>Parameter Write:</p> <ul style="list-style-type: none"> • The beginning write address or number of write words does not have the correct access unit for the area. • Command sequence error. <p>Program Write:</p> <ul style="list-style-type: none"> • Number of data in the program information and the size of the program transmitted do not match each other. • There is no program information. <p>CAM Data Write:</p> <ul style="list-style-type: none"> • When writing the last frame, the phase and displacement were not written together. • The number of data in the CAM information and the size of the data transmitted do not match each other. 	Check the data for validity before transfer.

Message	Probable cause	Remedy
514: No unit with the specified unit number address	User tried to transfer the data to an MC Unit that is not connected to the PLC.	Check the hardware unit number and correct it accordingly.
515, 8196, 8452: The specified data not available in MC Unit	<p>Program Read:</p> <ul style="list-style-type: none"> • The specified program does not exist. • An error has occurred in the program memory. <p>CAM Read:</p> <ul style="list-style-type: none"> • The specified CAM table does not exist. • An error has occurred in the CAM data memory. <p>Servo Parameter Read:</p> <ul style="list-style-type: none"> • The specified data has not been written. <p>Clear Program:</p> <ul style="list-style-type: none"> • The specified program does not exist. <p>Clear CAM:</p> <ul style="list-style-type: none"> • The specified CAM data does not exist. 	Make sure the data exist in MC Unit
8456: Cannot write the parameter	<ul style="list-style-type: none"> • The content of parameter data is incorrect. • An attempt was made to transfer a parameter value that was too large. 	Check the parameter values before transfer.
10001: No Servo information found in MC Unit, cannot perform transfer from MC Unit	An attempt was made to transfer the servo parameters but there is no servo information in the MC Unit.	Configure the MC Unit with the proper servo parameter and motor parameter information before doing the transfer operation.
<p>1: Servo Transfer - Servo parameter has been transferred successfully to MC Unit. However servo parameters could not be transferred to Servo drive. Please check the servo drive connection.</p> <p>1: Save Servo Parameter - Servo parameters saved in MC Unit. However failed to save in Servo drive</p>	<p>This error occurs when:</p> <ul style="list-style-type: none"> • Servo drive is not connected • Mismatch of axis numbers in project and the servo drives connected to MC Unit. • Series or models in the project and servo drive are different. 	<ol style="list-style-type: none"> 1. Check whether servo drive is connected. 2. Check whether the axis numbers in servo drives and the project are same and correct them if they are different. 3. Check whether the servo drive series or models are the same as in servo drives and correct them if they are different.
513: Remote network has not been started (destination node not part of the network). Communication with slave not possible, or not allocated as servo axis	An attempt was made to read the data from a servo drive but servo drive is not connected to MC Unit.	Connect the proper servo drive and configure the drive with proper information, then try to read the data.
10002: Motor Parameter not set in hardware, Hence fail to read	Servo parameters and motor parameter are not set in the servo and thus cannot be read.	Write the parameters before reading them.
10000: MC Model you have selected does not match with unit connected.	An attempt was made to read or write data to or from an MC Unit from a different MC series.	<ol style="list-style-type: none"> 1. Use the same PLC and MC series as those connected to computer. 2. Check the unit number.
66: A communication monitor time error occurred.	Communications with the PLC were disconnected for more than a certain period of time while the CX-Motion-MCH was in monitor mode.	Switch other Support Software, including the CX-Programmer, to offline status or increase the baud rate, and then switch the CX-Motion-MCH back to monitor mode.

Message	Probable cause	Remedy
4361: Parameter error/Inconsistent Parameters error	<ul style="list-style-type: none"> • Servo parameters don't exist in the MC Unit. • The specified parameter number doesn't exist in the Servo Driver. 	<ul style="list-style-type: none"> • Transfer Servo parameters to the MC Unit. • In the Axis Properties Dialog Box, match the drive model and version with the connected Driver.
8451: Cannot register nor write	<ol style="list-style-type: none"> 1. The program capacity has been exceeded. 2. The CAM data capacity has been exceeded. 3. Writing to flash memory is not possible because a backup is being performed. 	<ol style="list-style-type: none"> 1. Reduce the size of the program and then transfer the program again. 2. Reduce the amount of CAM data and then transfer the data again. 3. Wait until the backup has been completed, and then write to flash memory.

The following table provides a description and detailed description of the compilation errors that may be displayed while compiling programs.

Error code	Description	Detailed description
1	Too Many Blocks	Number of blocks of programming exceeded 800.
2	No Description	---
3	No Description	---
4	Too Many Characters in one Block	Number of characters in one block exceeded 128 including CR-LF.
5	Illegal Program Start	Specification of operand 'P' value at a subprogram's PROG command is greater than 1000 and lower than 499. Specification of operand 'P' value at the main program's PROG command is greater than 500 and below 0.
6	Illegal Program End	The END command was used outside of the main program. The RETURN command was used outside of a subprogram. No ENDIF for IF. No NEXT for FOR. No WEND for WHILE. No SEND for SWITCH.
7	Illegal Motion Task Instruction	A command has been used that cannot be specified in a motion task.
8	Reserved	---
9	Illegal Argument	Necessary operands have not been established to respond to the command. Insufficient axis data to respond to the command.
10	Too Many Arguments	The total number of operands exceeded 11. The number of axes to respond to the command has exceeded the number of programmable axes. The total number of variables or immediate values has exceeded the number of programmable axes. An illegal operand was used. The same operands were overlapped in one block. Data for both axes and operand 'P' was set in the PARAM command.
11	Too Many Parallel Branches	Value of operand 'N' (number of branches) in the PARALLEL command has overflowed.
12	Illegal Branch/Parallel Structure	Number of branch blocks is smaller than N. Number of branch blocks is larger than N.
13	Illegal Axis Declaration	Value of operand 'Q' (axis declaration) in the motion program is zero.
14	Position Specification Error	The target position is outside of the usable range. Examples: MOVELINK command <Slave axis travel amount><Master axis travel amount> CAMBOX <Link distance> CONNECT <Gear ratio denominator> SYNCR <Travel amount at deceleration stop>
15	Speed Specification Error	A speed-related operand (e.g., operands 'F', 'V') has exceeded the limit. Examples: Operand 'F' for MOVE, MOVEC, and MOVETRV.
16	Time Specification Error	A speed-related operand (e.g., operands 'F', 'V') has exceeded the limit. Examples: Operand 'F' for MOVE, MOVEC, and MOVETRV.

Error code	Description	Detailed description
17	Number Specification Error	A number-related operand (e.g., operands 'C', 'E', and 'S') has exceeded the limit. Examples: @Operand 'C' for WORK, OFFPOS, Operand 'S' or 'E' for CAM, CAMBOX
18	Specification Error in Number of Times	An operand related to number of times and data numbers (operands 'L' or 'N') has exceeded the limit. Example: @PARALLEL N <Number of branches>, SFTR, SFTL N <Shift amount>
19	Mode Error	A mode-related operand (operand 'Q') has exceeded the limit. Examples: Operand 'Q' for MOVELINK, CAMBOX.
20	Immediate Value Range Exceeded	An immediate value range (-2147483648 to 2147483647) or digit number (10-digit) has overflowed.
21	Illegal Variable Data Type	A variable that cannot be used in commands or a substitutions has been defined. A data type that cannot be used in commands or substitutions has been defined. A variable ('S', 'C', an indirect specification, of OW0300 to OW0AFF) that cannot be on the left side of a substitution has been set. A variable that cannot be written in the operand 'W' for FOR has been set. A variable that cannot be written has been set for the variable to edit for XFER, CLEAR, SFTR, and SFTL. The data type character of a variable was not B, W, L, or F.
22	Variable Address Range Exceeded	Neither hexadecimal operand parameters nor axis parameter values have been set. The hexadecimal digit number has exceeded eight digits. The acronym followed by #, @ was not S, M, C, O, T, A, or I. The hexadecimal digit number for a bit variable was not five digits. The hexadecimal digit number of variables other than bit variables was not four digits. An odd-numbered address was set for the variable S, O, M, C, or I. The maximum value of the variable addresses has overflowed. The individual data types of variables have exceeded the maximum value.
23	Illegal Expression	Multiple terms have been used in an operation command.
24	Illegal Nesting	The number of nesting levels of IF-ELSE-ENDIF exceeded the limit. The number of nesting levels of FOR-NEXT exceeded the limit. The number of nesting levels of WHILE-WEND exceeded the limit.
25	Illegal Subprogram Specification number	Specification of operand 'P' value at the subprogram's SUB command is higher than 1000 or lower than 499.
26	Radius Specification, Multi-circumference Specification	The operands 'R' and 'L' were specified simultaneously for the MOVEC command
27	No Description	
28	Sync Trailing Axis Specification Error	More than two of the same axis numbers have been set in one block.
29	NSTOP/INC/ABL Duplication Error	Commands are overlapped as the result of repeating the same command, such as NSTOP-NSTOP, INC-INC, ABL-ABL.

Error code	Description	Detailed description
30	Illegal Instruction	Another command has been set prior to the NSTOP/INC/ABL. The INC/ABL command has been set prior to the NSTOP command. An unrecognizable command (command code) has been set.
31	Instruction Duplication Error	The same commands were overlapped in one block.
32	';' missing	There is no ";" in one block (within 128 characters).
33	Illegal Argument	Illegal characters for programs have been used. Illegal operands have been used. Illegal characters for axis parameters or operand parameters have been used. Something other than a variable or immediate value has been set for an axis parameter or operand. The first data in the INC or ABL was not operand data.
34	Immediate Value Error	Immediate value with a decimal point has been used at a command for which decimal point setting is disabled. Immediate value without a decimal point has been used for a decimal-point settable command.
35	Axis Name Error	There was no "J" after the "[". After the "[J", a character other than a numeric value has been set or nothing has been set at all. There was no "]". The axis number "x x" is more than 2 digits. The axis number was not between 1 and 32.
36	Rotation Direction Error	MOVEC Q <Rotation direction> has exceeded the limit.
37	NSTOP Mismatch Error	Other data for axes and operands has been set before the NSTOP command.
38	""Q"" argument of PROG is missing	No operand 'Q' existed at the Motion program's PROG command.
39	IF-ELSE-ENDIF Error	ENDIF and ELSE existed but no IF. Only the ELSE has been set.
40	WHILE-WEND Error	WHILE missing for WEND.
41	FOR-NEXT Error	FOR missing for NEXT.
42	LOOP-LEND Error	LOOP missing for LEND.
43	PARALLEL-JOINT-JWAIT Error	PARALLEL missing for JOINT and JWAIT. Only JOINT has been set. Only JWAIT has been set. PARALLEL-JOINT-JWAIT has been set in the motion subprogram.
44	SWITCH-CASE-BREAK-SEND Error	SWITCH missing for CASE, DEFAULT, BREAK, and SEND. Another command has been set between SWITCH and the first CASE. DEFAULT order is incorrect.
45	Illegal Condition Expression	At the command WHILE, STOPOP, IF, or WAIT, the format was not conditional expression <Left side><Conditional expression> <Right side>
46	Substitution Expression Format Error	The substitution expression format is incorrect. Unusable axis data or operand data for a substitution expression has been set. Notation was incorrect, such as #MW0000+1=100; The operator is a conditional expression. Too many operators.
47	Program Header Block Number Overflow	Number of program header blocks exceeded 800.

Error code	Description	Detailed description
48	Program Header Block Number Mismatched	Number of program header blocks and number of actual blocks do not match.
49	Program Header Program Number Mismatched	The program number of the program header and the program number of the PROG command's operand 'P' do not match.

15-2 Error Codes

For details on the probable causes of error codes and methods used to clear errors, refer to *Troubleshooting* in the *CS1W-MCH71 Motion Control Units Operation Manual (W419)* or *CJ1W-MCH71 Motion Control Units Operation Manual (W435)*, or click **Help - Help Contents** in the CX-Motion-MCH.

MC Unit Alarm Codes

Name	Error log		Alarm code	Cause and remedy
	Error code	Detail code		
Main board code error	0370h	0003h	0003h	System code area error on the main board.
Main board RAM error		0004h	0004h	RAM error in the main board.
WDC error between the main board and sub-board.		0005h	0005h	WDC error was generated between the main board and sub-board.
Internal HW-WDT error		0006h	0006h	Internal HW-WDT error
Sub-board code error		0013h	0013h	System code area error on the sub-board.
User program error		0026h	0026h	User program area error.
CAM data error		0027h	0027h	CAM data area error
PLC WDT error	0001h	0000h	0030h	WDT error on CPU Unit occurred. Follow the instructions in the applicable PLC manual.
PLC cyclic service monitor error	0002h	Monitor Time [ms]	0031h	CPU Unit did not execute end refresh processing within cyclic service monitor time. Check end refresh prohibition in CPU system setup. If prohibited, cancel it and turn the power OFF once, and then ON again. Increase CPU Unit cyclic service monitor time and turn the power OFF once, then ON again.
Bus error (PC21bus error)	000Eh	0000h	0032h	Bus error occurred between CPU Unit and MC Unit.
CPU fatal error	0015h	0000h	0033h	CPU fatal error occurred. Follow the instructions in the applicable PLC manual.
CPU non-fatal error	0016h	0000h	---	Follow the instructions in the applicable PLC manual.

Name	Error log		Alarm code	Cause and remedy
	Error code	Detail code		
Flash memory error	0370h	0040h	0040h	The following data could not be written in the Flash memory. <ul style="list-style-type: none"> • Protect data • ABS origin position data • System parameters • Servo parameters • Position data • User program • CAM data Try to save the data again. Replace MC Unit if this error persists after retrying several times.
Unit deceleration stop		0041h	0041h	Deceleration stop input of MC Unit was turned ON. After confirming the safety in the surrounding area, turn OFF the bit [Deceleration Stop] and execute [Unit Alarm Reset].
CPU memory error		0044h	0044h	The following error occurred between CPU Unit and MC Unit: <ul style="list-style-type: none"> • This error occurs when custom data area or custom I/O area of MC Unit is allocated to CPU's EM area, and when the specified EM areas are overlapping in executing the file memory function of CPU Unit, or when restoring the power after allocating custom data area or custom I/O area to the EM area already specified with the file memory function. • Release the file memory function of CPU Unit, correct the allocation of the area used for the file memory function so that it does not overlap with the area used for custom data area or custom I/O area of MC Unit and reset the alarm, or correct the allocation of the area used for custom data area or custom I/O area so that it does not overlap with the area used for the file memory function and restore the power.

MC Unit Alarm Codes

Name	Error log		Alarm code	Cause and remedy
	Error code	Detail code		
No Program	0372h - 0379h	2001h	2001h	The sub-program to be executed with GOSUB command does not exist. Create and download an appropriate program with the Support Tool, or check if the program No. specified by GOSUB is correct.
Sub-program nesting error		2002h	2002h	There are six or more sub-program nesting levels. Check the applicable program and correct the nesting to five levels or less.
Variable address error		2003h	2003h	Attempted to access the addresses other than "PL0000 to PL27FF" when specifying position data indirectly. Check the applicable program and correct the position data area specified indirectly to PL0000 to PL27FF.
Divide-by-zero alarm		2004h	2004h	Zero division has occurred in an operation command. Check if the calculation formula or the assigned values are correct.
Operation overflow		2005h	2005h	Operation result cannot be stored. Check if the calculation formula or the assigned values are correct.
Program error		2006h	2006h	The program to be executed is corrupted. Download the applicable program with the Support Tool, save it to the F-ROM, and restore the power. The followings can be the causes of the program destruction. <ul style="list-style-type: none"> • Destruction of data in memory due to external noise • The power of PLC (MC Unit) was turned OFF while writing to Flash memory was in progress.

Name	Error log		Alarm code	Cause and remedy
	Error code	Detail code		
Axis reservation disable	0372h - 0379h	2007h	2007h	<p>The axis that was declared in a program could not be reserved.</p> <ul style="list-style-type: none"> • The operating mode is set to Manual Mode. Make sure the applicable axis is not in use, and switch to Automatic Mode. • The axis is used in another program. Wait until the program is completed, or stop the program to start another program. • Axes to be used in subprogram are not reserved in the main program. Reserve all the axes to be used in the subprogram with PROG in the main program. • The axis that has not been declared was selected. Check if the axes to be used in the program are specified correctly. If the specification is correct, declare the axes with PROG. • In parallel execution, etc., a main program tried to use the axis already declared by a subprogram. Correct the program to operate the axis after the subprogram is completed. • In parallel execution, etc., a subprogram tried to declare the axis already being operated by a main program. Correct the program to call the subprogram after the block currently using the axis is completed.
Axis alarm generated		2008h	2008h	<p>An alarm has occurred in an axis controlled by a task. Remove the cause of the axis alarm, and reset the alarm.</p>
Position specification error		2009h	2009h	<p>The position specified with axis movement commands (except for CAM), axis operation commands, SYNCR, MOVEMODI, OFFPOS, and LATCH exceeded the allowable position range. Since the range of pulse unit system is expressed in 32-bit, the allowable range has to satisfy the following formula:</p> $-\text{Command unit limit} \leq \text{Command unit system position} \leq +\text{Command unit limit}$ $\text{Command unit limit [on machine]} \geq 2147483647 \text{ [on motor]} \times \frac{\text{P5AA04 [Command unit/1 machine rotation]} \times \text{P5AA06 [on machine]}}{9001h \text{ [No. of encoder pulses/1 motor rotation]} \times \text{P5AA05 [on motor]}}$ <p>Correct the applicable position to satisfy the formula above. When specifying with real numbers, check the setting value of the axis parameter [P5AA02: Position command decimal point position].</p> <ul style="list-style-type: none"> • With Traverse (MOVETRAV command): This error occurs when the operand "Winding axis rotations" = 0. Correct the program so that "Winding axis rotations" is not 0.

Name	Error log		Alarm code	Cause and remedy
	Error code	Detail code		
Speed specification error	0372h - 0379h	200Ah	200Ah	The following operands have exceeded the allowable range: <ul style="list-style-type: none"> • F (MOVEI, MOVEC, MOVETRAV), V (MOVEI, MOVET), SPEED command. Correct the applicable operands. When specifying with real numbers, check the setting value of the task parameter [P00M10: Interpolation feed decimal point position].
Time specification error		200Bh	200Bh	The following operands have exceeded the allowable range: <ul style="list-style-type: none"> • T (MOVET, CAM, SPEED, TORQUE, SPEEDR, TORQUER, DWELL) Correct the applicable operands. <ul style="list-style-type: none"> • With Time-specified Positioning (MOVET command): [Speed of each axis] = Travel distance of each axis/Positioning time This error occurs when the speed specified by the above formula exceeds the axis-speed parameter [P2AA01: Maximum rapid feed rate]. Check if the setting of the parameter is correct, and if so, correct the program.
Number specification error		200Ch	200Ch	The following operands have exceeded the limit: <ul style="list-style-type: none"> • C (WORK, OFFPOS), E, S (CAM, CAMBOX, FOR) Correct the applicable operands. <ul style="list-style-type: none"> • With CAM, CAMBOX: This error occurs when setting the operands as [Starting data number] = [Ending data number], or when setting the operands as [Starting data number] ≥ [Ending data number] in using global general variables or position data for cam data. • When using cam table for cam data, correct the program as [Starting data number] ≠ [Ending data number]. When using global general variables or position data, correct the program as [Starting data number] < [Ending data number].
Count specification error		200Dh	200Dh	The following operands have exceeded the range: <ul style="list-style-type: none"> • L (MOVEC, MOVETRAV, FOR), N (PARALLEL, SFTR, SFTL, XFER, CLEAR) Correct the applicable operands. <ul style="list-style-type: none"> • With PARALLEL: This error occurs when setting the value exceeding the Max. No. of branches for the unit (the value set in the system parameter [P00002: No. of parallel branches]). Either correct (increase) the system parameter [P00002: No. of parallel branches], or correct (decrease) the No. of branches of the PARALLEL command for the motion program.

Name	Error log		Alarm code	Cause and remedy
	Error code	Detail code		
Mode specification error	0372h - 0379h	200Eh	200Eh	The following operand has exceeded the range. • Q (MOVEC, MOVETRAV, MOVELINK, CAMBOX) Correct the applicable operands.
Other operand error		200Fh	200Fh	The following operands have exceeded the range. • K (CAM, CAMBOX) • B (MOVELINK, CAMBOX, CONNECT, SYNC, ADDAX) • TORQUE • SIN, COS, ASIN, ACOS, SQT, LGN, BIN, BCD Correct the applicable operands.
---		2010h	2010h	---
Circular interpolation travel distance over		2011h	2011h	Travel distance specified in MOVEC is too great. • The tangent arc length has exceeded 2147483647. Check the program and correct the setting value so that it will not exceed the allowable range. (When specifying with variables, check if the substitution formula is correct.) • The radius has exceeded 2147483647. Check the program and correct the setting value so that it will not exceed the allowable range. (When specifying with variables, check if the substitution formula is correct.)
Circular interpolation radius error		2012h	2012h	The following instructions have been given in MOVEC. In Radius specification: The radius is specified to 0. • Check the program and correct the radius to the value larger than 0. (When specifying with variables, check if the substitution formula is correct.) • In Center specification: The start or end point, and the center are at the same position. Check the program and correct it so that the start or end position are not on the center.

Name	Error log		Alarm code	Cause and remedy
	Error code	Detail code		
Control mode error	0372h - 0379h	2014h	2014h	<ul style="list-style-type: none"> • A position control command (MOVE, etc.) or speed control command (SPEED) was executed during Torque control (TORQUE). Correct the program so that position control commands or speed control command will not be executed during TORQUE execution. • SPEED or TORQUE was executed during position control command execution. Correct the program so that SPEED or TORQUE will not be executed during position control command execution. • Position control commands other than MOVE was executed during SPEED command execution. Correct the program so that any position control command other than MOVE will not be executed during SPEED command execution.
---		2015h	2015h	---
Same axis specification multiplicity		2016h	2016h	<ul style="list-style-type: none"> • Multiple commands were executed on the same one axis using parallel branches. (Or when a main program is trying to use the axis being used by the subprogram called by the main program, etc.) Correct the program so that multiple commands are not executed on one axis from multiple rows in the program. • Axis movement command was executed on the axis, which is in synchronous execution as a slave axis. Correct the program so that any axis movement command will not be executed during synchronization. • The axis, which was specified as a slave axis has been a slave axis of the different type of synchronous command. Correct the program so that any slave axis is not shared between commands. • When a command requiring a latch input was executed, and the latch range parameter is being written, another latch-requiring command was executed on the same axis. Correct the program so that any latch-requiring command will not be executed on the same axis, or the timings do not overlap.
---		2017h	2017h	---
Synchronous slave axis specification error		2018h	2018h	The axis that is specified as a slave axis has already been used as the master axis. When an axis is to be operated as a slave axis of an axis and the slave axis is to be used as a master axis of another axis, the program (to change the order of specification) has to be arranged so that the axis is specified as a slave axis of an axis first, and then as a master of another axis.

Name	Error log		Alarm code	Cause and remedy
	Error code	Detail code		
Parameter setting error	0372h - 0379h	2019h	2019h	<p><PARAM></p> <p>System parameters:</p> <ul style="list-style-type: none"> • Attempted to change a parameter that cannot be changed after restoring the power. • Attempted incorrect parameter setting. Check the program so that correct values can be set. (When specifying with variables, check if the substitution formula is correct.) <p>Servo parameters:</p> <ul style="list-style-type: none"> • Attempted to change a parameter that cannot be changed after restoring the power. • Attempted to set incorrect setting value • Attempted to set incorrect number. • Attempted to change parameter of other tasks or undeclared axes. Check and correct the program so that correct values can be set. (When specifying with variables, check if the substitution formula is correct.) • Attempted to set servo parameters on virtual axes or I/O axes. Servo parameters cannot be set on virtual axes and I/O axes. Correct the program. <p><LATCH></p> <ul style="list-style-type: none"> • The contents of [900Ah: Positive latch enabled range] and [900Bh: Negative latch enabled range] in the motor parameters are not written correctly. After checking the applicable axis and if the motor model is correct, transfer the motor parameters and save them to F-ROM (when individual, specify servo parameter), and restore the power. <p><SPEED></p> <ul style="list-style-type: none"> • The contents of [900Dh: Position loop gain] and [900Eh: Position loop gain index] in the motor parameter are not written correctly. After checking the applicable axis and if the motor model is correct, transfer the motor parameters and save them to F-ROM (when individual, specify servo parameter), and restore the power.
Axis declaration error		201Ah	201Ah	<p>Axis other than servo/virtual axis is included in the axis declaration.</p> <p>Check the parameter [P1AA02: MECHATROLINK-II device classification] of the applicable axis. If the setting of the parameter is correct, correct the program.</p>

Axis Alarm Codes

Name	Error log		Alarm code	Cause and remedy
	Error code	Detail code		
---	037Ah	3001h	3001h	---
Over travel, positive direction	- 0399h	3002h	3002h	<ul style="list-style-type: none"> The over travel signal in positive direction has turned ON during axis movement. After resetting the alarm, attempted to operate the axis in the positive direction with the positive direction over travel signal ON. Move the axis in the negative direction manually.
Over travel, negative direction		3003h	3003h	<ul style="list-style-type: none"> The over travel signal in negative direction has turned ON during axis movement. After resetting the alarm, attempted to operate the axis in the negative direction with the negative direction over travel signal ON. Move the axis in the positive direction manually.
Over travel, both directions		3004h	3004h	<ul style="list-style-type: none"> The over travel signals in both directions have turned ON during axis movement or when the axis was about to move. After resetting the alarm, attempted to operate the axis with the over travel signals in both directions ON. Check if the over travel signals for both directions are wired correctly.
Software limit, positive direction		3005h	3005h	<ul style="list-style-type: none"> The axis entered the software limit area in positive direction during axis movement with the origin defined. Check if the setting value of the axis parameter [P3AA02: Positive direction software limit] is correct. (The error may occur when executing circular interpolation right on the software limit values.) If the setting value is incorrect, set a larger limit value. When the value is correct, correct the program or travel distance of the axis.

Name	Error log		Alarm code	Cause and remedy
	Error code	Detail code		
Software limit negative direction	037Ah - 0399h	3006h	3006h	<ul style="list-style-type: none"> The axis entered the software limit area in negative direction during axis movement with the origin defined. Check if the setting value of the axis parameter [P3AA02: Negative direction software limit] is correct. (The error may occur when executing circular interpolation right on the software limit values.) If the setting value is incorrect, set a larger limit value. When the value is correct, correct the program or travel distance of the axis.
Servo OFF		3007h	3007h	<ul style="list-style-type: none"> The axis that received a movement command is in Servo OFF state. (In operations with programs, this alarm will occur when the applicable axis is specified at the beginning of the block and a movement command is executed for the axis that is in Servo OFF state.) Switch the axis to Servo lock state. Servo OFF was executed for the axis receiving a movement command. <p>Do not execute Servo Unlock during axis movement.</p>
Synchronous communications alarm		300Ah	300Ah	<p>An error was occurred in the MECHATROLINK synchronous communications. The followings are the possible causes:</p> <ul style="list-style-type: none"> Disconnection, breakage of MECHATROLINK cable Check the MECHATROLINK cable. Communications error caused by noise Remove the cause of the noise. <p>When this error persists even after providing these remedies, the Driver (NS115) or MC Unit may be broken. Replace the broken one with a new unit.</p>
Communications alarm		300Bh	300Bh	<p>Detected MECHATROLINK communications errors twice in a row. Or the No. of error detections specified in [P1AA06: MECHATROLINK-II communications error detection setting] has been exceeded. The followings are the possible causes:</p> <ul style="list-style-type: none"> Disconnection, breakage of MECHATROLINK cable Check the MECHATROLINK cable. Communications error caused by noise Remove the cause of the noise. <p>When this error persists even after providing these remedies, the Driver (NS115) or MC Unit may be broken. Replace the broken one with a new unit.</p>

Name	Error log		Alarm code	Cause and remedy
	Error code	Detail code		
Command timeout	037Ah - 0399h	300Ch	300Ch	<p>A MECHATROLINK command could not be completed within a fixed period of time (10 seconds). The followings are the possible causes:</p> <ul style="list-style-type: none"> • Disconnection, breakage of MECHATROLINK cable Check the MECHATROLINK cable. • Communications error caused by noise Remove the cause of the noise. <p>When this error persists even after providing these remedies, the Driver (NS115) or MC Unit may be broken. Replace the broken one with a new unit.</p>
Absolute encoder error		300Dh	300Dh	<p>Data from the ABS encoder could not be processed normally.</p> <ul style="list-style-type: none"> • Initial multi-turn value exceeds the multi-turn limit. Set the same value in the driver parameter [Pn205: Multi-turn limit setting] and the motor parameter [900C: Multi-turn limit]. After the setting is completed, restore the power, reset the alarm, and perform the origin setting. • After origin setting, the following values related to B/A were changed. <p>Note $B = \text{No. of encoder pulses} \times P5AA05$ $A = P5AA04 \times P5AA06$ B/A is integer calculation and the result is to be reduced. After the change was made (saving to F-ROM), restore the power, reset the alarm, and perform origin setting.</p> <ul style="list-style-type: none"> • The multi-turn limit value in the driver parameter or the motor parameter was changed after origin setting. After the change was made (saving to F-ROM), restore the power, reset the alarm, and perform origin setting. (When the multi-turn value of the driver parameter was changed, make sure to perform "Absolute encoder multi-turn amount setting change" on the driver.) • Servo driver is set as an incremental encoder. Set the driver parameter Pn002 digit No. 2 to "0" (used as an absolute encoder) and restore the power. • Disconnection, breakage of encoder cable Check the encoder cable. • Communications error caused by noise Remove the cause of the noise. <p>When this error persists even after providing these remedies, the encoder or MC Unit may be broken. Replace the broken one with a new unit.</p>

Name	Error log		Alarm code	Cause and remedy
	Error code	Detail code		
Over travel already ON	037Ah - 0399h	300Eh	300Eh	The limit switch in the direction of the search was already ON when a one direction-mode origin search was executed. Check the status of the limit switch in the origin search start direction. Also check and correct the origin search start position.
Origin proximity reverse alarm		300Fh	300Fh	The limit reversal mode origin search cannot be performed because the limit switch in the direction of the search turned ON while the search was reversing. Check the status of the limit switch in the origin search start direction. And check and correct the positions of the origin proximity limit switch and the limit switch.
Over travel reverse alarm		3010h	3010h	The limit reversal mode origin search cannot be performed because the limit switch or deceleration LS in the opposite direction of the search turned ON while the search was reversing due to over travel signal ON in the direction of the origin search. Check the status of the limit switch in the origin search start direction. And check and correct the positions of the origin proximity limit switch and the limit switch.
Synchronous slave axis speed over		3011h	3011h	With synchronous commands (MOVELINK, CAMBOX, CONNECT, SYNC, ADDAX), the speed of the slave axis exceeded the speed specified in [P2AA01: Maximum rapid feed rate]. Check if the setting value in the parameter is correct. If it is correct, correct the program. With CAMBOX, check also the displacement of the CAM data.
Excessive error alarm		3012h	3012h	Position error exceeded the setting value of the axis parameter [P3AA06: Position error alarm detection value]. Check if the set value is appropriate for the system configuration and correct it as needed. When the value is correct, check the followings: <ul style="list-style-type: none"> • Breakage of encoder cable • Malfunction caused by noise • Unadjusted servo system • Unadjusted or unprepared machine system These causes are to be removed.
MECHATROLINK-II slave axis error 1		3013h	3013h	An error occurred on a MECHATROLINK-II slave axis. Check the MECHATROLINK slave of the applicable node No. and remove the cause of the error. Slave alarm codes are stored in the error log in the MC Unit.

Name	Error log		Alarm code	Cause and remedy
	Error code	Detail code		
Axis classification error	037Ah - 0399h	3015h	3015h	Attempted to execute a command that cannot be executed as an axis. (The command that requires an external signal (MOVEI, etc.) was executed on the virtual axis, or the winding axis of MOVETRAV is not set as an unlimited length axis, etc.) Correct the applicable parameters or program.
No origin proximity signal		3016h	3016h	During an origin search in the limit reversal mode, there was no deceleration limit switch in between over travel of both directions. Provide the origin proximity limit switch, or check if the limit switches themselves or wiring is normal.
Origin proximity and over travel simultaneously ON		3017h	3017h	During an origin search, the deceleration limit switch and the over travel in direction of the search were turned ON simultaneously. Check if the origin proximity signal, or over travel signals for both directions are wired correctly.
No origin signal		3018h	3018h	During an origin search, the over travel signal turned ON while waiting for the origin signal (while waiting for the rise of phase-Z after the fall (ON to OFF) of the origin proximity limit switch). Check if the settings of the axis parameter [P4AA06: Origin determine signal] and the servo parameter [Pn511: Input signal select 5] are correct (if the applicable signal is enabled). If the settings are correct, check the followings: <ul style="list-style-type: none"> • Problem on Phase-Z of the encoder • Breakage of encoder cable • Too small distance between the origin proximity limit switch and the limit switch These causes are to be removed.
Excessive speed command	037Ah - 0399h	3019h	3019h	The axis speed has exceeded maximum rapid feed rate during the following command execution: <ul style="list-style-type: none"> • MOVEI (Axes except for the one with the longest travel distance) • MOVEC (Linear axis: if not specified with the tangential speed of the circular interpolation portion.) • MOVETRAV (Traverse axis) • CAM Check if the speed set in [P2AA01: Maximum rapid feed rate] is correct. If it is not correct, set a higher speed. If it is correct, lower the feed rate of the program or lower the speed using override.
Counter latch resource violation		301Ah	301Ah	With DATUM, MOVEI, MOVELINK, CAMBOX, SYNC, and LATCH commands, attempted to execute the functions simultaneously that require the counter latch. Check the axis specified for the Latch and correct the program so that there are no redundant specifications (executing LATCH command on the axis already executing LATCH command, executing LATCH command on the axis waiting for the synchronization start conditions to be satisfied, or etc.).
Gear ratio range error		3040h	3040h	Relations between the No. of encoder pulses and command unit is not normal. When the following expression is not satisfied, the error will occur: $1/7FFFFFFFh \leq B/A \leq 7FFFFFFFh$ Note B = No. of encoder pulses × P5AA05 A = P5AA04 × P5AA06 B/A is integer calculation and the result is to be reduced. Set the parameters so that the formula above is satisfied.

MLK Device Alarm Codes

Name	Error log		Cause and remedy
	Error code	Detail code	
Depending on the device	037Ah to 0399h	4000h + Alarm code of each device	Depending on the device. Follow the directions of the applicable manuals.

Revision History

A manual revision code appears as a suffix to the catalog number on the front cover of the manual.

Cat. No. W448-E1-07



The following table outlines the changes made to the manual during each revision. Page numbers refer to the previous version.

Revision code	Date	Revised content
01	November 2005	Original production
02	July 2006	<p>The following changes and corrections were made in updating from software version 1.0 to version 2.0.</p> <p>Page xvi: Caution added.</p> <p>Page 4: Test run and program debugging functions added to online operations and data trace function added.</p> <p>Page 6: Version upgrade information added.</p> <p>Pages 12 and 13: Procedures altered.</p> <p>Page 13: Program and Debug commands added.</p> <p>Page 15: Debug Watch Window and Test Run commands added.</p> <p>Page 16: Monitor Mode command added to Online operations and Program and Debug menus added.</p> <p>Pages 17 to 19: Toolbars updated for new functionality.</p> <p>Page 22: Debugging, text run, and data trace items added.</p> <p>Pages 34 and 35: Zone settings added.</p> <p>Page 47: Note added.</p> <p>Pages 48 to 50: Screen shots replaced.</p> <p>Page 57: New sections 9 and 10 added.</p> <p>Page 58: Screen shot replaced and zone settings added.</p>
03	June 2007	<p>Cover: Model numbers added and “SYSMAC” removed.</p> <p>Page ix: Middle row of table removed and “CS1W” added to bottom row (two locations).</p> <p>Pages ix and 2: Windows XP and Vista added.</p> <p>Pages ix and 2: CX-One version changed to 2.1.</p> <p>Page xiii: Version information moved from page 6 and new version information added.</p> <p>Page 2: “CP-series PLCs” added to top table.</p> <p>Page 4: Functions added to table after “Data Trace.”</p> <p>Page 6: Information moved to page xiii.</p> <p>Page 8: Heading added.</p> <p>Page 9: Section added.</p> <p>Pages 15 and 18: Row added for “Find in Programs.”</p> <p>Pages 17 and 24: Rows added for “Backup and Restore” and “Read Protection.”</p> <p>Page 18: Toolbar illustration replaced.</p> <p>Page 26: Bottom screen capture replaced.</p> <p>Page 27, 50, and 52: Top screen capture replaced.</p> <p>Page 46: Section added.</p> <p>Page 51: Middle screen capture replaced.</p> <p>Page 52: New step 2 and steps 4 to 6 added.</p> <p>Page 71: New sections 11 and 12 added.</p>

Revision History

Revision code	Date	Revised content
04	June 2008	Page xi: Changed applicable OS's. Page xvi: Added version upgrade information. Page 2: Added "CJ2 CPU Units," corrected model numbers, and corrected software version. Page 10: Added new section (2-2-3).
05	December 2009	Made revisions for the upgrade to version 2.24 (including revisions accompanying the upgrade from CX-One version 3.2 to 4.03 and for support for Windows 7).
06	October 2010	Made revisions for the changing system requirements.
07	April 2016	Made revisions accompanying support for Windows 10 and a change in the CX-One model number.

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