MotionWorks IEC Configuration - Rev. H: 4/11/2011

YASKAWA™

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1. MotionWorks IEC Configuration

1.1 MotionWorks IEC Configuration Overview

MotionWorks IEC Configuration provides a means of setting hardware and communication information with which the application program operates. This information consists of items such as: MECHATROLINK Axis and Remote I/O configuration, parameters for devices on the Ethernet network, and Option Slot configuration. For each of these elements, the Configuration software automatically enters variable groups and default names in the Global Data Definition for use with the application program.

MotionWorks IEC Configuration also provides a graphical motor tuning interface, which allows the user to change parameters in the ServoPacks in real time and view motor response.

1.2 Accessing the Configuration

Open a project before launching the Configuration, otherwise the Open Project dialog box will appear so a project can be selected.

Click the Icon on the toolbar to launch the Configuration.

1.3 Closing the Configuration

The Configuration will automatically close when the programming environment is closed, or if another project is opened. It is not necessary to close the Configuration while in the MotionWorks IEC programming environment.

1.4 Online vs. Offline

When the Configuration is offline, all data displayed, modified and saved is written to XML files in the project directory.

Upon connection with a controller, a search for configuration data previously stored by MotionWorks IEC Configuration is performed.

If no configuration is found in controller (factory default):

The auto discovered hardware is compared to the offline hardware configuration. If the hardware matches, the parameters for each component are compared. If the parameters match, the controller's configuration is displayed. If the configurations are different at either the hardware or parameter level, a side-by-side comparison will be displayed. The user must select one of the two configurations. When the Save function is executed, the user configuration is stored in the controller.

If a previously stored configuration is found:

The previously stored hardware configuration is compared to the offline hardware. If the hardware matches, the parameters for each component are compared. If the parameters match, the controller's configuration is displayed. If the configurations are different at either the hardware or parameter level, a side-by-side comparison will be displayed. The user must select one of the two configurations. A backup copy of the ServoPack parameters is stored in the controller.

1.9.0 Connecting to the Controller

The project IP address is located under the TCP/IP Settings in the Configuration Tree. The IP Address is cross-linked with the IP Address in the Hardware Tab of the Project. All programming tools can communicate simultaneously with the controller (MotionWorks IEC, Configuration, and web server.) A color-coded indicator in the upper right corner of the window indicates the connection status with a red or green background and displaying the text "Online" or "Offline."

MotionWorksIEC uses the following Ethernet ports to communicate with the controller hardware. Certain firewall implementations may block these ports, and prohibit communication. An easy way to test for this is a network Ping, or if communication is possible via the web server, but not MotionWorks IEC.

Communication Method	Port Number
MotionWorks IEC	20547
Hardware Configuration	4040
Web Server	80
Ethernet/IP	2222
Modbus/TCP	502
OPC Server	20547

Application Note on www.yaskawa.com

Setup Information for Remote Connections Via Router

1.6 Saving Configuration Data

Configuration files are stored in a sub directory of the application's project directory when the SAVE operation is invoked. When online with the controller, the save function also downloads parameters to the controller and all Mechatrolink ServoPack devices.

A red status message on certain parameters will alert the user when power cycle is necessary for updated values to become effective.

The Save operation will universally save data for all configuration components.

1.7 Saving While Online

When the save operation is performed, XML data files are written to the project directory on the computer and controller. Servopack Parameters are written to FLASH memory. Notice the red text indicators will inform the user when a parameter requires power cycle to become effective.

The Save operation will universally save data for all configuration components.

1.8 MECHATROLINK Configuration

1.8.1 Adding a Servo Axis

There are a couple ways to add axes to the configuration.

Offline:

1) Right click on the Mechatrolink-II item in the configuration tree.

2) Select Add Device

3) Select a ServoPack model.

4) Enter a hardware node number. This must match the rotary switch of the Mechatrolink-II address on the device. Each device must have a unique hardware and logical address.

Online:

If Self Configuration is selected, the configuration will be automatically loaded into the configuration tree if the auto discovered is selected.

ServoPack configuration is divided into the following areas:

Limits	Test Move	Hardware
Configuration	Function	Alarm
I/O	Absolute	Brake
Tuning	Encoder	Dual Encoder

Note: Do not delete automatically created variables or groups. If you must delete a group, be sure to delete the group header (an all of its variables) and the group name as listed under IO_Configuration in the Hardware tab. These two items must remain in sync for project to compile properly.

1.8.2 Servopack I/O Addressing

Global variable groups are automatically added to the global variable list when the Hardware Configuration is saved.   The following groups and their associated hardware addresses (for all 16 axes) are provided for reference.

Name	Type	Usage	Description	Address
⊟ <SGDV Rotary> - Sigma-V Rotary Servo Amplifier - 1:1 (' Modify Variable Names, Not Group Name. ')				
AX1_SI1_POT	BOOL	VAR_GLOBAL	POT, default on pin #7, configurable by Pn50A.3	%IX53248.0
AX1_SI2_NOT	BOOL	VAR_GLOBAL	NOT, default on pin #8, configurable by Pn50B.0	%IX53248.1
AX1_SI3_DEC	BOOL	VAR_GLOBAL	DEC, default on pin #9, configurable by Pn511.0	%IX53248.2
AX1_SI4_EXT1	BOOL	VAR_GLOBAL	EXT1, default on pin #10, configurable by Pn511.1	%IX53248.6
AX1_SI5_EXT2	BOOL	VAR_GLOBAL	EXT2, default on pin #11, configurable by Pn511.2	%IX53248.7
AX1_SI6_EXT3	BOOL	VAR_GLOBAL	EXT3, default on pin #12, configurable by Pn511.3	%IX53249.0
AX1_BRK	BOOL	VAR_GLOBAL	Brake Output Status	%IX53249.1
AX1_HBB	BOOL	VAR_GLOBAL	HBB, Stop Signal Input	%IX53249.2
AX1_SI0_IO12	BOOL	VAR_GLOBAL	Configurable by Pn81E.0, default is unallocated	%IX53249.4
AX1_SI1_IO13	BOOL	VAR_GLOBAL	Configurable by Pn81E.1, default is unallocated	%IX53249.5
AX1_SI2_IO14	BOOL	VAR_GLOBAL	Configurable by Pn81E.2, default is unallocated	%IX53249.6
AX1_SI3_IO15	BOOL	VAR_GLOBAL	Configurable by Pn81E.3, default is unallocated	%IX53249.7
AX1_ALM	BOOL	VAR_GLOBAL	Alarm On Drive	%IX53252.0
AX1_WARNG	BOOL	VAR_GLOBAL	Warning On Drive	%IX53252.1
AX1_SVON	BOOL	VAR_GLOBAL	Servo On	%IX53252.3
AX1_PON	BOOL	VAR_GLOBAL	Main Circuit Power On	%IX53252.4
AX1_PSET	BOOL	VAR_GLOBAL	Positioning Completed	%IX53252.7
AX1_SO1	BOOL	VAR_GLOBAL	SO1, pins 1 and 2, configurable by Pn82E, Pn50E, Pn50F, P...	%QX53248.0
AX1_SO2	BOOL	VAR_GLOBAL	SO2, pins 23 and 24, configurable by Pn82E, Pn50E, Pn50F,...	%QX53248.1
AX1_SO3	BOOL	VAR_GLOBAL	SO3, pins 25 and 26, configurable by Pn82E, Pn50E, Pn50F,...	%QX53248.2

Name	Type	Usage	Description	Address
⊟ <SGDV Rotary> - Sigma-V Rotary Servo Amplifier - 1:2 (' Modify Variable Names, Not Group Name. ')				
AX2_SI1_POT	BOOL	VAR_GLOBAL	POT, default on pin #7, configurable by Pn50A.3	%IX53312.0
AX2_SI2_NOT	BOOL	VAR_GLOBAL	NOT, default on pin #8, configurable by Pn50B.0	%IX53312.1
AX2_SI3_DEC	BOOL	VAR_GLOBAL	DEC, default on pin #9, configurable by Pn511.0	%IX53312.2
AX2_SI4_EXT1	BOOL	VAR_GLOBAL	EXT1, default on pin #10, configurable by Pn511.1	%IX53312.6
AX2_SI5_EXT2	BOOL	VAR_GLOBAL	EXT2, default on pin #11, configurable by Pn511.2	%IX53312.7
AX2_SI6_EXT3	BOOL	VAR_GLOBAL	EXT3, default on pin #12, configurable by Pn511.3	%IX53313.0
AX2_BRK	BOOL	VAR_GLOBAL	Brake Output Status	%IX53313.1
AX2_HBB	BOOL	VAR_GLOBAL	HBB, Stop Signal Input	%IX53313.2
AX2_SI0_IO12	BOOL	VAR_GLOBAL	Configurable by Pn81E.0, default is unallocated	%IX53313.4
AX2_SI1_IO13	BOOL	VAR_GLOBAL	Configurable by Pn81E.1, default is unallocated	%IX53313.5
AX2_SI2_IO14	BOOL	VAR_GLOBAL	Configurable by Pn81E.2, default is unallocated	%IX53313.6
AX2_SI3_IO15	BOOL	VAR_GLOBAL	Configurable by Pn81E.3, default is unallocated	%IX53313.7
AX2_ALM	BOOL	VAR_GLOBAL	Alarm On Drive	%IX53316.0
AX2_WARNG	BOOL	VAR_GLOBAL	Warning On Drive	%IX53316.1
AX2_SVON	BOOL	VAR_GLOBAL	Servo On	%IX53316.3
AX2_PON	BOOL	VAR_GLOBAL	Main Circuit Power On	%IX53316.4
AX2_PSET	BOOL	VAR_GLOBAL	Positioning Completed	%IX53316.7
AX2_SO1	BOOL	VAR_GLOBAL	SO1, pins 1 and 2, configurable by Pn82E, Pn50E, Pn50F, P...	%QX53312.0
AX2_SO2	BOOL	VAR_GLOBAL	SO2, pins 23 and 24, configurable by Pn82E, Pn50E, Pn50F,...	%QX53312.1
AX2_SO3	BOOL	VAR_GLOBAL	SO3, pins 25 and 26, configurable by Pn82E, Pn50E, Pn50F,...	%QX53312.2

Name	Type	Usage	Description	Address
⊟ <SGDV Rotary> - Sigma-V Rotary Servo Amplifier - 1:3 (' Modify Variable Names, Not Group Name. ')				
AX3_SI1_POT	BOOL	VAR_GLOBAL	POT, default on pin #7, configurable by Pn50A.3	%IX53376.0
AX3_SI2_NOT	BOOL	VAR_GLOBAL	NOT, default on pin #8, configurable by Pn50B.0	%IX53376.1
AX3_SI3_DEC	BOOL	VAR_GLOBAL	DEC, default on pin #9, configurable by Pn511.0	%IX53376.2
AX3_SI4_EXT1	BOOL	VAR_GLOBAL	EXT1, default on pin #10, configurable by Pn511.1	%IX53376.6
AX3_SI5_EXT2	BOOL	VAR_GLOBAL	EXT2, default on pin #11, configurable by Pn511.2	%IX53376.7
AX3_SI6_EXT3	BOOL	VAR_GLOBAL	EXT3, default on pin #12, configurable by Pn511.3	%IX53377.0
AX3_BRK	BOOL	VAR_GLOBAL	Brake Output Status	%IX53377.1
AX3_HBB	BOOL	VAR_GLOBAL	HBB, Stop Signal Input	%IX53377.2
AX3_SI0_IO12	BOOL	VAR_GLOBAL	Configurable by Pn81E.0, default is unallocated	%IX53377.4
AX3_SI1_IO13	BOOL	VAR_GLOBAL	Configurable by Pn81E.1, default is unallocated	%IX53377.5
AX3_SI2_IO14	BOOL	VAR_GLOBAL	Configurable by Pn81E.2, default is unallocated	%IX53377.6
AX3_SI3_IO15	BOOL	VAR_GLOBAL	Configurable by Pn81E.3, default is unallocated	%IX53377.7
AX3_ALM	BOOL	VAR_GLOBAL	Alarm On Drive	%IX53380.0
AX3_WARNG	BOOL	VAR_GLOBAL	Warning On Drive	%IX53380.1
AX3_SVON	BOOL	VAR_GLOBAL	Servo On	%IX53380.3
AX3_PON	BOOL	VAR_GLOBAL	Main Circuit Power On	%IX53380.4
AX3_PSET	BOOL	VAR_GLOBAL	Positioning Completed	%IX53380.7
AX3_SO1	BOOL	VAR_GLOBAL	SO1, pins 1 and 2, configurable by Pn82E, Pn50E, Pn50F, P...	%QX53376.0
AX3_SO2	BOOL	VAR_GLOBAL	SO2, pins 23 and 24, configurable by Pn82E, Pn50E, Pn50F,...	%QX53376.1
AX3_SO3	BOOL	VAR_GLOBAL	SO3, pins 25 and 26, configurable by Pn82E, Pn50E, Pn50F,...	%QX53376.2

Name	Type	Usage	Description	Address
⊟ <SGDV Rotary> - Sigma-V Rotary Servo Amplifier - 1:4 (' Modify Variable Names, Not Group Name. ')				
AX4_SI1_POT	BOOL	VAR_GLOBAL	POT, default on pin #7, configurable by Pn50A.3	%IX53440.0
AX4_SI2_NOT	BOOL	VAR_GLOBAL	NOT, default on pin #8, configurable by Pn50B.0	%IX53440.1
AX4_SI3_DEC	BOOL	VAR_GLOBAL	DEC, default on pin #9, configurable by Pn511.0	%IX53440.2
AX4_SI4_EXT1	BOOL	VAR_GLOBAL	EXT1, default on pin #10, configurable by Pn511.1	%IX53440.6
AX4_SI5_EXT2	BOOL	VAR_GLOBAL	EXT2, default on pin #11, configurable by Pn511.2	%IX53440.7
AX4_SI6_EXT3	BOOL	VAR_GLOBAL	EXT3, default on pin #12, configurable by Pn511.3	%IX53441.0
AX4_BRK	BOOL	VAR_GLOBAL	Brake Output Status	%IX53441.1
AX4_HBB	BOOL	VAR_GLOBAL	HBB, Stop Signal Input	%IX53441.2
AX4_SI0_IO12	BOOL	VAR_GLOBAL	Configurable by Pn81E.0, default is unallocated	%IX53441.4
AX4_SI1_IO13	BOOL	VAR_GLOBAL	Configurable by Pn81E.1, default is unallocated	%IX53441.5
AX4_SI2_IO14	BOOL	VAR_GLOBAL	Configurable by Pn81E.2, default is unallocated	%IX53441.6
AX4_SI3_IO15	BOOL	VAR_GLOBAL	Configurable by Pn81E.3, default is unallocated	%IX53441.7
AX4_ALM	BOOL	VAR_GLOBAL	Alarm On Drive	%IX53444.0
AX4_WARNG	BOOL	VAR_GLOBAL	Warning On Drive	%IX53444.1
AX4_SVON	BOOL	VAR_GLOBAL	Servo On	%IX53444.3
AX4_PON	BOOL	VAR_GLOBAL	Main Circuit Power On	%IX53444.4
AX4_PSET	BOOL	VAR_GLOBAL	Positioning Completed	%IX53444.7
AX4_SO1	BOOL	VAR_GLOBAL	SO1, pins 1 and 2, configurable by Pn82E, Pn50E, Pn50F, P...	%QX53440.0
AX4_SO2	BOOL	VAR_GLOBAL	SO2, pins 23 and 24, configurable by Pn82E, Pn50E, Pn50F,...	%QX53440.1
AX4_SO3	BOOL	VAR_GLOBAL	SO3, pins 25 and 26, configurable by Pn82E, Pn50E, Pn50F,...	%QX53440.2

Name	Type	Usage	Description	Address
⊟ **<SGDV Linear> - Sigma-V Linear Servo Amplifier - 1:5 (' Modify Variable Names, Not Group Name. ')**				
AX5_SI1_POT	BOOL	VAR_GLOBAL	POT, default on pin #7, configurable by Pn50A.3	%IX53504.0
AX5_SI2_NOT	BOOL	VAR_GLOBAL	NOT, default on pin #8, configurable by Pn50B.0	%IX53504.1
AX5_SI3_DEC	BOOL	VAR_GLOBAL	DEC, default on pin #9, configurable by Pn511.0	%IX53504.2
AX5_SI4_EXT1	BOOL	VAR_GLOBAL	EXT1, default on pin #10, configurable by Pn511.1	%IX53504.6
AX5_SI5_EXT2	BOOL	VAR_GLOBAL	EXT2, default on pin #11, configurable by Pn511.2	%IX53504.7
AX5_SI6_EXT3	BOOL	VAR_GLOBAL	EXT3, default on pin #12, configurable by Pn511.3	%IX53505.0
AX5_BRK	BOOL	VAR_GLOBAL	Brake Output Status	%IX53505.1
AX5_HBB	BOOL	VAR_GLOBAL	HBB, Stop Signal Input	%IX53505.2
AX5_SI0_IO12	BOOL	VAR_GLOBAL	Configurable by Pn81E.0, default is unallocated	%IX53505.4
AX5_SI1_IO13	BOOL	VAR_GLOBAL	Configurable by Pn81E.1, default is unallocated	%IX53505.5
AX5_SI2_IO14	BOOL	VAR_GLOBAL	Configurable by Pn81E.2, default is unallocated	%IX53505.6
AX5_SI3_IO15	BOOL	VAR_GLOBAL	Configurable by Pn81E.3, default is unallocated	%IX53505.7
AX5_ALM	BOOL	VAR_GLOBAL	Alarm On Drive	%IX53508.0
AX5_WARNG	BOOL	VAR_GLOBAL	Warning On Drive	%IX53508.1
AX5_SVON	BOOL	VAR_GLOBAL	Servo On	%IX53508.3
AX5_PON	BOOL	VAR_GLOBAL	Main Circuit Power On	%IX53508.4
AX5_PSET	BOOL	VAR_GLOBAL	Positioning Completed	%IX53508.7
AX5_SO1	BOOL	VAR_GLOBAL	SO1, pins 1 and 2, configurable by Pn82E, Pn50E, Pn50F, P...	%QX53504.0
AX5_SO2	BOOL	VAR_GLOBAL	SO2, pins 23 and 24, configurable by Pn82E, Pn50E, Pn50F,...	%QX53504.1
AX5_SO3	BOOL	VAR_GLOBAL	SO3, pins 25 and 26, configurable by Pn82E, Pn50E, Pn50F,...	%QX53504.2

Name	Type	Usage	Description	Address
⊟ **<SGDV Rotary> - Sigma-V Rotary Servo Amplifier - 1:6 (' Modify Variable Names, Not Group Name. ')**				
AX6_SI1_POT	BOOL	VAR_GLOBAL	POT, default on pin #7, configurable by Pn50A.3	%IX53568.0
AX6_SI2_NOT	BOOL	VAR_GLOBAL	NOT, default on pin #8, configurable by Pn50B.0	%IX53568.1
AX6_SI3_DEC	BOOL	VAR_GLOBAL	DEC, default on pin #9, configurable by Pn511.0	%IX53568.2
AX6_SI4_EXT1	BOOL	VAR_GLOBAL	EXT1, default on pin #10, configurable by Pn511.1	%IX53568.6
AX6_SI5_EXT2	BOOL	VAR_GLOBAL	EXT2, default on pin #11, configurable by Pn511.2	%IX53568.7
AX6_SI6_EXT3	BOOL	VAR_GLOBAL	EXT3, default on pin #12, configurable by Pn511.3	%IX53569.0
AX6_BRK	BOOL	VAR_GLOBAL	Brake Output Status	%IX53569.1
AX6_HBB	BOOL	VAR_GLOBAL	HBB, Stop Signal Input	%IX53569.2
AX6_SI0_IO12	BOOL	VAR_GLOBAL	Configurable by Pn81E.0, default is unallocated	%IX53569.4
AX6_SI1_IO13	BOOL	VAR_GLOBAL	Configurable by Pn81E.1, default is unallocated	%IX53569.5
AX6_SI2_IO14	BOOL	VAR_GLOBAL	Configurable by Pn81E.2, default is unallocated	%IX53569.6
AX6_SI3_IO15	BOOL	VAR_GLOBAL	Configurable by Pn81E.3, default is unallocated	%IX53569.7
AX6_ALM	BOOL	VAR_GLOBAL	Alarm On Drive	%IX53572.0
AX6_WARNG	BOOL	VAR_GLOBAL	Warning On Drive	%IX53572.1
AX6_SVON	BOOL	VAR_GLOBAL	Servo On	%IX53572.3
AX6_PON	BOOL	VAR_GLOBAL	Main Circuit Power On	%IX53572.4
AX6_PSET	BOOL	VAR_GLOBAL	Positioning Completed	%IX53572.7
AX6_SO1	BOOL	VAR_GLOBAL	SO1, pins 1 and 2, configurable by Pn82E, Pn50E, Pn50F, P...	%QX53568.0
AX6_SO2	BOOL	VAR_GLOBAL	SO2, pins 23 and 24, configurable by Pn82E, Pn50E, Pn50F,...	%QX53568.1
AX6_SO3	BOOL	VAR_GLOBAL	SO3, pins 25 and 26, configurable by Pn82E, Pn50E, Pn50F,...	%QX53568.2

Name	Type	Usage	Description	Address
⊟ <SGDV Rotary> - Sigma-V Rotary Servo Amplifier - 1:7 (' Modify Variable Names, Not Group Name. ')				
AX7_SI1_POT	BOOL	VAR_GLOBAL	POT, default on pin #7, configurable by Pn50A.3	%IX53632.0
AX7_SI2_NOT	BOOL	VAR_GLOBAL	NOT, default on pin #8, configurable by Pn50B.0	%IX53632.1
AX7_SI3_DEC	BOOL	VAR_GLOBAL	DEC, default on pin #9, configurable by Pn511.0	%IX53632.2
AX7_SI4_EXT1	BOOL	VAR_GLOBAL	EXT1, default on pin #10, configurable by Pn511.1	%IX53632.6
AX7_SI5_EXT2	BOOL	VAR_GLOBAL	EXT2, default on pin #11, configurable by Pn511.2	%IX53632.7
AX7_SI6_EXT3	BOOL	VAR_GLOBAL	EXT3, default on pin #12, configurable by Pn511.3	%IX53633.0
AX7_BRK	BOOL	VAR_GLOBAL	Brake Output Status	%IX53633.1
AX7_HBB	BOOL	VAR_GLOBAL	HBB, Stop Signal Input	%IX53633.2
AX7_SI0_IO12	BOOL	VAR_GLOBAL	Configurable by Pn81E.0, default is unallocated	%IX53633.4
AX7_SI1_IO13	BOOL	VAR_GLOBAL	Configurable by Pn81E.1, default is unallocated	%IX53633.5
AX7_SI2_IO14	BOOL	VAR_GLOBAL	Configurable by Pn81E.2, default is unallocated	%IX53633.6
AX7_SI3_IO15	BOOL	VAR_GLOBAL	Configurable by Pn81E.3, default is unallocated	%IX53633.7
AX7_ALM	BOOL	VAR_GLOBAL	Alarm On Drive	%IX53636.0
AX7_WARNG	BOOL	VAR_GLOBAL	Warning On Drive	%IX53636.1
AX7_SVON	BOOL	VAR_GLOBAL	Servo On	%IX53636.3
AX7_PON	BOOL	VAR_GLOBAL	Main Circuit Power On	%IX53636.4
AX7_PSET	BOOL	VAR_GLOBAL	Positioning Completed	%IX53636.7
AX7_SO1	BOOL	VAR_GLOBAL	SO1, pins 1 and 2, configurable by Pn82E, Pn50E, Pn50F, P...	%QX53632.0
AX7_SO2	BOOL	VAR_GLOBAL	SO2, pins 23 and 24, configurable by Pn82E, Pn50E, Pn50F,...	%QX53632.1
AX7_SO3	BOOL	VAR_GLOBAL	SO3, pins 25 and 26, configurable by Pn82E, Pn50E, Pn50F,...	%QX53632.2

Name	Type	Usage	Description	Address
⊟ <SGDV Rotary> - Sigma-V Rotary Servo Amplifier - 1:8 (' Modify Variable Names, Not Group Name. ')				
AX8_SI1_POT	BOOL	VAR_GLOBAL	POT, default on pin #7, configurable by Pn50A.3	%IX53696.0
AX8_SI2_NOT	BOOL	VAR_GLOBAL	NOT, default on pin #8, configurable by Pn50B.0	%IX53696.1
AX8_SI3_DEC	BOOL	VAR_GLOBAL	DEC, default on pin #9, configurable by Pn511.0	%IX53696.2
AX8_SI4_EXT1	BOOL	VAR_GLOBAL	EXT1, default on pin #10, configurable by Pn511.1	%IX53696.6
AX8_SI5_EXT2	BOOL	VAR_GLOBAL	EXT2, default on pin #11, configurable by Pn511.2	%IX53696.7
AX8_SI6_EXT3	BOOL	VAR_GLOBAL	EXT3, default on pin #12, configurable by Pn511.3	%IX53697.0
AX8_BRK	BOOL	VAR_GLOBAL	Brake Output Status	%IX53697.1
AX8_HBB	BOOL	VAR_GLOBAL	HBB, Stop Signal Input	%IX53697.2
AX8_SI0_IO12	BOOL	VAR_GLOBAL	Configurable by Pn81E.0, default is unallocated	%IX53697.4
AX8_SI1_IO13	BOOL	VAR_GLOBAL	Configurable by Pn81E.1, default is unallocated	%IX53697.5
AX8_SI2_IO14	BOOL	VAR_GLOBAL	Configurable by Pn81E.2, default is unallocated	%IX53697.6
AX8_SI3_IO15	BOOL	VAR_GLOBAL	Configurable by Pn81E.3, default is unallocated	%IX53697.7
AX8_ALM	BOOL	VAR_GLOBAL	Alarm On Drive	%IX53700.0
AX8_WARNG	BOOL	VAR_GLOBAL	Warning On Drive	%IX53700.1
AX8_SVON	BOOL	VAR_GLOBAL	Servo On	%IX53700.3
AX8_PON	BOOL	VAR_GLOBAL	Main Circuit Power On	%IX53700.4
AX8_PSET	BOOL	VAR_GLOBAL	Positioning Completed	%IX53700.7
AX8_SO1	BOOL	VAR_GLOBAL	SO1, pins 1 and 2, configurable by Pn82E, Pn50E, Pn50F, P...	%QX53696.0
AX8_SO2	BOOL	VAR_GLOBAL	SO2, pins 23 and 24, configurable by Pn82E, Pn50E, Pn50F,...	%QX53696.1
AX8_SO3	BOOL	VAR_GLOBAL	SO3, pins 25 and 26, configurable by Pn82E, Pn50E, Pn50F,...	%QX53696.2

Name	Type	Usage	Description	Address
⊟ **<SGDV Rotary> - Sigma-V Rotary Servo Amplifier - 1:9 (' Modify Variable Names, Not Group Name. ')**				
AX9_SI1_POT	BOOL	VAR_GLOBAL	POT, default on pin #7, configurable by Pn50A.3	%IX53760.0
AX9_SI2_NOT	BOOL	VAR_GLOBAL	NOT, default on pin #8, configurable by Pn50B.0	%IX53760.1
AX9_SI3_DEC	BOOL	VAR_GLOBAL	DEC, default on pin #9, configurable by Pn511.0	%IX53760.2
AX9_SI4_EXT1	BOOL	VAR_GLOBAL	EXT1, default on pin #10, configurable by Pn511.1	%IX53760.6
AX9_SI5_EXT2	BOOL	VAR_GLOBAL	EXT2, default on pin #11, configurable by Pn511.2	%IX53760.7
AX9_SI6_EXT3	BOOL	VAR_GLOBAL	EXT3, default on pin #12, configurable by Pn511.3	%IX53761.0
AX9_BRK	BOOL	VAR_GLOBAL	Brake Output Status	%IX53761.1
AX9_HBB	BOOL	VAR_GLOBAL	HBB, Stop Signal Input	%IX53761.2
AX9_SI0_IO12	BOOL	VAR_GLOBAL	Configurable by Pn81E.0, default is unallocated	%IX53761.4
AX9_SI1_IO13	BOOL	VAR_GLOBAL	Configurable by Pn81E.1, default is unallocated	%IX53761.5
AX9_SI2_IO14	BOOL	VAR_GLOBAL	Configurable by Pn81E.2, default is unallocated	%IX53761.6
AX9_SI3_IO15	BOOL	VAR_GLOBAL	Configurable by Pn81E.3, default is unallocated	%IX53761.7
AX9_ALM	BOOL	VAR_GLOBAL	Alarm On Drive	%IX53764.0
AX9_WARNG	BOOL	VAR_GLOBAL	Warning On Drive	%IX53764.1
AX9_SVON	BOOL	VAR_GLOBAL	Servo On	%IX53764.3
AX9_PON	BOOL	VAR_GLOBAL	Main Circuit Power On	%IX53764.4
AX9_PSET	BOOL	VAR_GLOBAL	Positioning Completed	%IX53764.7
AX9_SO1	BOOL	VAR_GLOBAL	SO1, pins 1 and 2, configurable by Pn82E, Pn50E, Pn50F, P...	%QX53760.0
AX9_SO2	BOOL	VAR_GLOBAL	SO2, pins 23 and 24, configurable by Pn82E, Pn50E, Pn50F,...	%QX53760.1
AX9_SO3	BOOL	VAR_GLOBAL	SO3, pins 25 and 26, configurable by Pn82E, Pn50E, Pn50F,...	%QX53760.2

Name	Type	Usage	Description	Address
⊟ **<SGDV Rotary> - Sigma-V Rotary Servo Amplifier - 1:10 (' Modify Variable Names, Not Group Name. ')**				
AX10_SI1_POT	BOOL	VAR_GLOBAL	POT, default on pin #7, configurable by Pn50A.3	%IX53824.0
AX10_SI2_NOT	BOOL	VAR_GLOBAL	NOT, default on pin #8, configurable by Pn50B.0	%IX53824.1
AX10_SI3_DEC	BOOL	VAR_GLOBAL	DEC, default on pin #9, configurable by Pn511.0	%IX53824.2
AX10_SI4_EXT1	BOOL	VAR_GLOBAL	EXT1, default on pin #10, configurable by Pn511.1	%IX53824.6
AX10_SI5_EXT2	BOOL	VAR_GLOBAL	EXT2, default on pin #11, configurable by Pn511.2	%IX53824.7
AX10_SI6_EXT3	BOOL	VAR_GLOBAL	EXT3, default on pin #12, configurable by Pn511.3	%IX53825.0
AX10_BRK	BOOL	VAR_GLOBAL	Brake Output Status	%IX53825.1
AX10_HBB	BOOL	VAR_GLOBAL	HBB, Stop Signal Input	%IX53825.2
AX10_SI0_IO12	BOOL	VAR_GLOBAL	Configurable by Pn81E.0, default is unallocated	%IX53825.4
AX10_SI1_IO13	BOOL	VAR_GLOBAL	Configurable by Pn81E.1, default is unallocated	%IX53825.5
AX10_SI2_IO14	BOOL	VAR_GLOBAL	Configurable by Pn81E.2, default is unallocated	%IX53825.6
AX10_SI3_IO15	BOOL	VAR_GLOBAL	Configurable by Pn81E.3, default is unallocated	%IX53825.7
AX10_ALM	BOOL	VAR_GLOBAL	Alarm On Drive	%IX53828.0
AX10_WARNG	BOOL	VAR_GLOBAL	Warning On Drive	%IX53828.1
AX10_SVON	BOOL	VAR_GLOBAL	Servo On	%IX53828.3
AX10_PON	BOOL	VAR_GLOBAL	Main Circuit Power On	%IX53828.4
AX10_PSET	BOOL	VAR_GLOBAL	Positioning Completed	%IX53828.7
AX10_SO1	BOOL	VAR_GLOBAL	SO1, pins 1 and 2, configurable by Pn82E, Pn50E, Pn50F, P...	%QX53824.0
AX10_SO2	BOOL	VAR_GLOBAL	SO2, pins 23 and 24, configurable by Pn82E, Pn50E, Pn50F,...	%QX53824.1
AX10_SO3	BOOL	VAR_GLOBAL	SO3, pins 25 and 26, configurable by Pn82E, Pn50E, Pn50F,...	%QX53824.2

Name	Type	Usage	Description	Address
⊟ **\<SGDV Rotary\> - Sigma-V Rotary Servo Amplifier - 1:11 (* Modify Variable Names, Not Group Name. *)**				
AX11_SI1_POT	BOOL	VAR_GLOBAL	POT, default on pin #7, configurable by Pn50A.3	%IX53888.0
AX11_SI2_NOT	BOOL	VAR_GLOBAL	NOT, default on pin #8, configurable by Pn50B.0	%IX53888.1
AX11_SI3_DEC	BOOL	VAR_GLOBAL	DEC, default on pin #9, configurable by Pn511.0	%IX53888.2
AX11_SI4_EXT1	BOOL	VAR_GLOBAL	EXT1, default on pin #10, configurable by Pn511.1	%IX53888.6
AX11_SI5_EXT2	BOOL	VAR_GLOBAL	EXT2, default on pin #11, configurable by Pn511.2	%IX53888.7
AX11_SI6_EXT3	BOOL	VAR_GLOBAL	EXT3, default on pin #12, configurable by Pn511.3	%IX53889.0
AX11_BRK	BOOL	VAR_GLOBAL	Brake Output Status	%IX53889.1
AX11_HBB	BOOL	VAR_GLOBAL	HBB, Stop Signal Input	%IX53889.2
AX11_SI0_IO12	BOOL	VAR_GLOBAL	Configurable by Pn81E.0, default is unallocated	%IX53889.4
AX11_SI1_IO13	BOOL	VAR_GLOBAL	Configurable by Pn81E.1, default is unallocated	%IX53889.5
AX11_SI2_IO14	BOOL	VAR_GLOBAL	Configurable by Pn81E.2, default is unallocated	%IX53889.6
AX11_SI3_IO15	BOOL	VAR_GLOBAL	Configurable by Pn81E.3, default is unallocated	%IX53889.7
AX11_ALM	BOOL	VAR_GLOBAL	Alarm On Drive	%IX53892.0
AX11_WARNG	BOOL	VAR_GLOBAL	Warning On Drive	%IX53892.1
AX11_SVON	BOOL	VAR_GLOBAL	Servo On	%IX53892.3
AX11_PON	BOOL	VAR_GLOBAL	Main Circuit Power On	%IX53892.4
AX11_PSET	BOOL	VAR_GLOBAL	Positioning Completed	%IX53892.7
AX11_SO1	BOOL	VAR_GLOBAL	SO1, pins 1 and 2, configurable by Pn82E, Pn50E, Pn50F, P...	%QX53888.0
AX11_SO2	BOOL	VAR_GLOBAL	SO2, pins 23 and 24, configurable by Pn82E, Pn50E, Pn50F,...	%QX53888.1
AX11_SO3	BOOL	VAR_GLOBAL	SO3, pins 25 and 26, configurable by Pn82E, Pn50E, Pn50F,...	%QX53888.2

Name	Type	Usage	Description	Address
⊟ **\<SGDV Rotary\> - Sigma-V Rotary Servo Amplifier - 1:12 (* Modify Variable Names, Not Group Name. *)**				
AX12_SI1_POT	BOOL	VAR_GLOBAL	POT, default on pin #7, configurable by Pn50A.3	%IX53952.0
AX12_SI2_NOT	BOOL	VAR_GLOBAL	NOT, default on pin #8, configurable by Pn50B.0	%IX53952.1
AX12_SI3_DEC	BOOL	VAR_GLOBAL	DEC, default on pin #9, configurable by Pn511.0	%IX53952.2
AX12_SI4_EXT1	BOOL	VAR_GLOBAL	EXT1, default on pin #10, configurable by Pn511.1	%IX53952.6
AX12_SI5_EXT2	BOOL	VAR_GLOBAL	EXT2, default on pin #11, configurable by Pn511.2	%IX53952.7
AX12_SI6_EXT3	BOOL	VAR_GLOBAL	EXT3, default on pin #12, configurable by Pn511.3	%IX53953.0
AX12_BRK	BOOL	VAR_GLOBAL	Brake Output Status	%IX53953.1
AX12_HBB	BOOL	VAR_GLOBAL	HBB, Stop Signal Input	%IX53953.2
AX12_SI0_IO12	BOOL	VAR_GLOBAL	Configurable by Pn81E.0, default is unallocated	%IX53953.4
AX12_SI1_IO13	BOOL	VAR_GLOBAL	Configurable by Pn81E.1, default is unallocated	%IX53953.5
AX12_SI2_IO14	BOOL	VAR_GLOBAL	Configurable by Pn81E.2, default is unallocated	%IX53953.6
AX12_SI3_IO15	BOOL	VAR_GLOBAL	Configurable by Pn81E.3, default is unallocated	%IX53953.7
AX12_ALM	BOOL	VAR_GLOBAL	Alarm On Drive	%IX53956.0
AX12_WARNG	BOOL	VAR_GLOBAL	Warning On Drive	%IX53956.1
AX12_SVON	BOOL	VAR_GLOBAL	Servo On	%IX53956.3
AX12_PON	BOOL	VAR_GLOBAL	Main Circuit Power On	%IX53956.4
AX12_PSET	BOOL	VAR_GLOBAL	Positioning Completed	%IX53956.7
AX12_SO1	BOOL	VAR_GLOBAL	SO1, pins 1 and 2, configurable by Pn82E, Pn50E, Pn50F, P...	%QX53952.0
AX12_SO2	BOOL	VAR_GLOBAL	SO2, pins 23 and 24, configurable by Pn82E, Pn50E, Pn50F,...	%QX53952.1
AX12_SO3	BOOL	VAR_GLOBAL	SO3, pins 25 and 26, configurable by Pn82E, Pn50E, Pn50F,...	%QX53952.2

Name	Type	Usage	Description	Address
⊟ <SGDV Rotary> - Sigma-V Rotary Servo Amplifier - 1:13 (* Modify Variable Names, Not Group Name. *)				
AX13_SI1_POT	BOOL	VAR_GLOBAL	POT, default on pin #7, configurable by Pn50A.3	%IX54016.0
AX13_SI2_NOT	BOOL	VAR_GLOBAL	NOT, default on pin #8, configurable by Pn50B.0	%IX54016.1
AX13_SI3_DEC	BOOL	VAR_GLOBAL	DEC, default on pin #9, configurable by Pn511.0	%IX54016.2
AX13_SI4_EXT1	BOOL	VAR_GLOBAL	EXT1, default on pin #10, configurable by Pn511.1	%IX54016.6
AX13_SI5_EXT2	BOOL	VAR_GLOBAL	EXT2, default on pin #11, configurable by Pn511.2	%IX54016.7
AX13_SI6_EXT3	BOOL	VAR_GLOBAL	EXT3, default on pin #12, configurable by Pn511.3	%IX54017.0
AX13_BRK	BOOL	VAR_GLOBAL	Brake Output Status	%IX54017.1
AX13_HBB	BOOL	VAR_GLOBAL	HBB, Stop Signal Input	%IX54017.2
AX13_SI0_IO12	BOOL	VAR_GLOBAL	Configurable by Pn81E.0, default is unallocated	%IX54017.4
AX13_SI1_IO13	BOOL	VAR_GLOBAL	Configurable by Pn81E.1, default is unallocated	%IX54017.5
AX13_SI2_IO14	BOOL	VAR_GLOBAL	Configurable by Pn81E.2, default is unallocated	%IX54017.6
AX13_SI3_IO15	BOOL	VAR_GLOBAL	Configurable by Pn81E.3, default is unallocated	%IX54017.7
AX13_ALM	BOOL	VAR_GLOBAL	Alarm On Drive	%IX54020.0
AX13_WARNG	BOOL	VAR_GLOBAL	Warning On Drive	%IX54020.1
AX13_SVON	BOOL	VAR_GLOBAL	Servo On	%IX54020.3
AX13_PON	BOOL	VAR_GLOBAL	Main Circuit Power On	%IX54020.4
AX13_PSET	BOOL	VAR_GLOBAL	Positioning Completed	%IX54020.7
AX13_SO1	BOOL	VAR_GLOBAL	SO1, pins 1 and 2, configurable by Pn82E, Pn50E, Pn50F, P...	%QX54016.0
AX13_SO2	BOOL	VAR_GLOBAL	SO2, pins 23 and 24, configurable by Pn82E, Pn50E, Pn50F,...	%QX54016.1
AX13_SO3	BOOL	VAR_GLOBAL	SO3, pins 25 and 26, configurable by Pn82E, Pn50E, Pn50F,...	%QX54016.2

Name	Type	Usage	Description	Address
⊟ <SGDV Rotary> - Sigma-V Rotary Servo Amplifier - 1:14 (* Modify Variable Names, Not Group Name. *)				
AX14_SI1_POT	BOOL	VAR_GLOBAL	POT, default on pin #7, configurable by Pn50A.3	%IX54080.0
AX14_SI2_NOT	BOOL	VAR_GLOBAL	NOT, default on pin #8, configurable by Pn50B.0	%IX54080.1
AX14_SI3_DEC	BOOL	VAR_GLOBAL	DEC, default on pin #9, configurable by Pn511.0	%IX54080.2
AX14_SI4_EXT1	BOOL	VAR_GLOBAL	EXT1, default on pin #10, configurable by Pn511.1	%IX54080.6
AX14_SI5_EXT2	BOOL	VAR_GLOBAL	EXT2, default on pin #11, configurable by Pn511.2	%IX54080.7
AX14_SI6_EXT3	BOOL	VAR_GLOBAL	EXT3, default on pin #12, configurable by Pn511.3	%IX54081.0
AX14_BRK	BOOL	VAR_GLOBAL	Brake Output Status	%IX54081.1
AX14_HBB	BOOL	VAR_GLOBAL	HBB, Stop Signal Input	%IX54081.2
AX14_SI0_IO12	BOOL	VAR_GLOBAL	Configurable by Pn81E.0, default is unallocated	%IX54081.4
AX14_SI1_IO13	BOOL	VAR_GLOBAL	Configurable by Pn81E.1, default is unallocated	%IX54081.5
AX14_SI2_IO14	BOOL	VAR_GLOBAL	Configurable by Pn81E.2, default is unallocated	%IX54081.6
AX14_SI3_IO15	BOOL	VAR_GLOBAL	Configurable by Pn81E.3, default is unallocated	%IX54081.7
AX14_ALM	BOOL	VAR_GLOBAL	Alarm On Drive	%IX54084.0
AX14_WARNG	BOOL	VAR_GLOBAL	Warning On Drive	%IX54084.1
AX14_SVON	BOOL	VAR_GLOBAL	Servo On	%IX54084.3
AX14_PON	BOOL	VAR_GLOBAL	Main Circuit Power On	%IX54084.4
AX14_PSET	BOOL	VAR_GLOBAL	Positioning Completed	%IX54084.7
AX14_SO1	BOOL	VAR_GLOBAL	SO1, pins 1 and 2, configurable by Pn82E, Pn50E, Pn50F, P...	%QX54080.0
AX14_SO2	BOOL	VAR_GLOBAL	SO2, pins 23 and 24, configurable by Pn82E, Pn50E, Pn50F,...	%QX54080.1
AX14_SO3	BOOL	VAR_GLOBAL	SO3, pins 25 and 26, configurable by Pn82E, Pn50E, Pn50F,...	%QX54080.2

Name	Type	Usage	Description	Address
⊟ <SGDV Rotary> - Sigma-V Rotary Servo Amplifier - 1:15 (* Modify Variable Names, Not Group Name. *)				
AX15_SI1_POT	BOOL	VAR_GLOBAL	POT, default on pin #7, configurable by Pn50A.3	%IX54144.0
AX15_SI2_NOT	BOOL	VAR_GLOBAL	NOT, default on pin #8, configurable by Pn50B.0	%IX54144.1
AX15_SI3_DEC	BOOL	VAR_GLOBAL	DEC, default on pin #9, configurable by Pn511.0	%IX54144.2
AX15_SI4_EXT1	BOOL	VAR_GLOBAL	EXT1, default on pin #10, configurable by Pn511.1	%IX54144.6
AX15_SI5_EXT2	BOOL	VAR_GLOBAL	EXT2, default on pin #11, configurable by Pn511.2	%IX54144.7
AX15_SI6_EXT3	BOOL	VAR_GLOBAL	EXT3, default on pin #12, configurable by Pn511.3	%IX54145.0
AX15_BRK	BOOL	VAR_GLOBAL	Brake Output Status	%IX54145.1
AX15_HBB	BOOL	VAR_GLOBAL	HBB, Stop Signal Input	%IX54145.2
AX15_SI0_IO12	BOOL	VAR_GLOBAL	Configurable by Pn81E.0, default is unallocated	%IX54145.4
AX15_SI1_IO13	BOOL	VAR_GLOBAL	Configurable by Pn81E.1, default is unallocated	%IX54145.5
AX15_SI2_IO14	BOOL	VAR_GLOBAL	Configurable by Pn81E.2, default is unallocated	%IX54145.6
AX15_SI3_IO15	BOOL	VAR_GLOBAL	Configurable by Pn81E.3, default is unallocated	%IX54145.7
AX15_ALM	BOOL	VAR_GLOBAL	Alarm On Drive	%IX54148.0
AX15_WARNG	BOOL	VAR_GLOBAL	Warning On Drive	%IX54148.1
AX15_SVON	BOOL	VAR_GLOBAL	Servo On	%IX54148.3
AX15_PON	BOOL	VAR_GLOBAL	Main Circuit Power On	%IX54148.4
AX15_PSET	BOOL	VAR_GLOBAL	Positioning Completed	%IX54148.7
AX15_SO1	BOOL	VAR_GLOBAL	SO1, pins 1 and 2, configurable by Pn82E, Pn50E, Pn50F, P...	%QX54144.0
AX15_SO2	BOOL	VAR_GLOBAL	SO2, pins 23 and 24, configurable by Pn82E, Pn50E, Pn50F,...	%QX54144.1
AX15_SO3	BOOL	VAR_GLOBAL	SO3, pins 25 and 26, configurable by Pn82E, Pn50E, Pn50F,...	%QX54144.2

Name	Type	Usage	Description	Address
⊟ <SGDV Rotary> - Sigma-V Rotary Servo Amplifier - 1:16 (* Modify Variable Names, Not Group Name. *)				
AX16_SI1_POT	BOOL	VAR_GLOBAL	POT, default on pin #7, configurable by Pn50A.3	%IX54208.0
AX16_SI2_NOT	BOOL	VAR_GLOBAL	NOT, default on pin #8, configurable by Pn50B.0	%IX54208.1
AX16_SI3_DEC	BOOL	VAR_GLOBAL	DEC, default on pin #9, configurable by Pn511.0	%IX54208.2
AX16_SI4_EXT1	BOOL	VAR_GLOBAL	EXT1, default on pin #10, configurable by Pn511.1	%IX54208.6
AX16_SI5_EXT2	BOOL	VAR_GLOBAL	EXT2, default on pin #11, configurable by Pn511.2	%IX54208.7
AX16_SI6_EXT3	BOOL	VAR_GLOBAL	EXT3, default on pin #12, configurable by Pn511.3	%IX54209.0
AX16_BRK	BOOL	VAR_GLOBAL	Brake Output Status	%IX54209.1
AX16_HBB	BOOL	VAR_GLOBAL	HBB, Stop Signal Input	%IX54209.2
AX16_SI0_IO12	BOOL	VAR_GLOBAL	Configurable by Pn81E.0, default is unallocated	%IX54209.4
AX16_SI1_IO13	BOOL	VAR_GLOBAL	Configurable by Pn81E.1, default is unallocated	%IX54209.5
AX16_SI2_IO14	BOOL	VAR_GLOBAL	Configurable by Pn81E.2, default is unallocated	%IX54209.6
AX16_SI3_IO15	BOOL	VAR_GLOBAL	Configurable by Pn81E.3, default is unallocated	%IX54209.7
AX16_ALM	BOOL	VAR_GLOBAL	Alarm On Drive	%IX54212.0
AX16_WARNG	BOOL	VAR_GLOBAL	Warning On Drive	%IX54212.1
AX16_SVON	BOOL	VAR_GLOBAL	Servo On	%IX54212.3
AX16_PON	BOOL	VAR_GLOBAL	Main Circuit Power On	%IX54212.4
AX16_PSET	BOOL	VAR_GLOBAL	Positioning Completed	%IX54212.7
AX16_SO1	BOOL	VAR_GLOBAL	SO1, pins 1 and 2, configurable by Pn82E, Pn50E, Pn50F, P...	%QX54208.0
AX16_SO2	BOOL	VAR_GLOBAL	SO2, pins 23 and 24, configurable by Pn82E, Pn50E, Pn50F,...	%QX54208.1
AX16_SO3	BOOL	VAR_GLOBAL	SO3, pins 25 and 26, configurable by Pn82E, Pn50E, Pn50F,...	%QX54208.2

1.8.3 Limits

Set the Position (Software limits), Torque, and Speed limits for the application.

1.8.4 Servo Tuning

Please refer to these documents related to tuning on www.yaskawa.com:

What should the inertia ratio parameter, Pn103, be set to in the Sigma II amplifier when the inertia ratio is not known?

1.8.5 Performing a Test Move

The tuning tab provides access to the ServoPack's tuning parameters with changes taking effect in real time. All basic and advanced tuning parameters are listed. Warning: Be sure to safeguard the machine during the Test Move operation! Use a hardwired E-Stop function in case of unexpected operation.
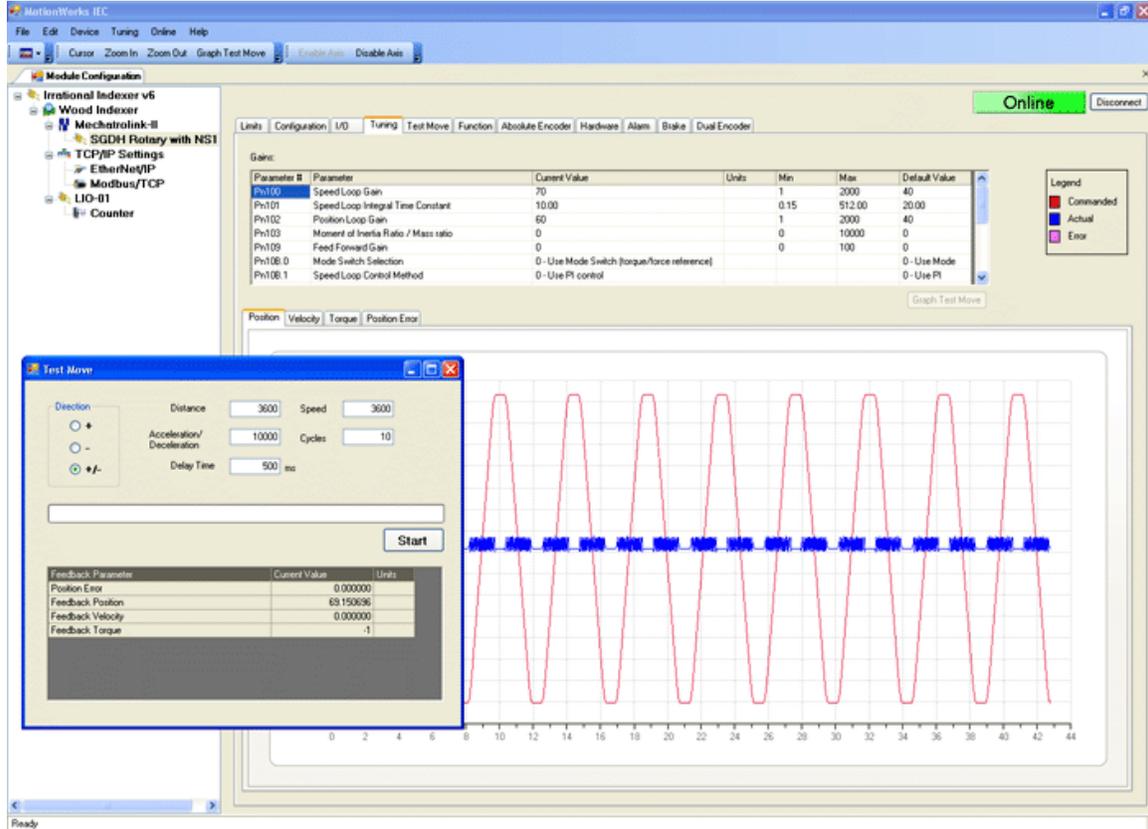
Direction

Select from forward only, reverse only, and forward & reverse motion.

Distance	User Units
Accel/Decel	User Units/s^2
Delay Time	ms
Speed	User Units/s
Cycles	Quantity

1.8.6 Servopack Alarms

A tab is provided to show alarm history. The alarms displayed here are the same alarms available from the MC_ReadAxisAlarm function block. For more information regarding Servopack alarms, refer to the following manuals:

Sigma II with NS115: SIEP C710800 01, see section 9.3

Sigma III: YEA-SIA-S800-11, see section 10.1.4

Sigma-5 with rotary motor: SIEPS8000043, see Section 6.1

Sigma-5 with linear motor: SIEPS8000044, see Section 6.1

1.8.7 Remote I/O Devices

Phoenix I/O Bus Coupler information:

Please use this link to open the Phoenix Contact Bus Coupler Manual from www.phoenixcontact.com

1.8.8 Setting User Units

When one of the servo axes is selected on the configuration tree, click on the Configuration tab to set the user unit parameters. Changes to user units will only take effect after a power cycle.

Mechanical Configuration: Conveyor Belt

Warning: If user unit parameters are changed after MC_SetPosition has been executed to store an absolute encoder position offset, the position value will be incorrect after power cycle. Use MC_SetPosition again to calibrate the axis after changing the User Unit parameters.

1.9 Ethernet Connections

1.9.0 Connecting to the Controller

The project IP address is located under the TCP/IP Settings in the Configuration Tree. The IP Address is cross-linked with the IP Address in the Hardware Tab of the Project. All programming tools can communicate simultaneously with the controller (MotionWorks IEC, Configuration, and web server.) A color-coded indicator in the upper right corner of the window indicates the connection status with a red or green background and displaying the text "Online" or "Offline."

MotionWorksIEC uses the following Ethernet ports to communicate with the controller hardware. Certain firewall implementations may block these ports, and prohibit communication. An easy way to test for this is a network Ping, or if communication is possible via the web server, but not MotionWorks IEC.

Communication Method	Port Number
MotionWorks IEC	20547
Hardware Configuration	4040
Web Server	80
Ethernet/IP	2222
Modbus/TCP	502
OPC Server	20547

Application Note on www.yaskawa.com

Setup Information for Remote Connections Via Router

1.9.1 Ethernet Connections Overview

The controller can operate as an EtherNet/IP scanner and adapter, a Modbus/TCP master and slave, and deliver OPC data simultaneously. The "New Project" template will automatically create communication drivers and allocate global memory for external devices to read & write information in the controller. These memory areas are generic: no variables are automatically created, the user can decide on the arrangement and type of data to populate within the communications memory region.

⊟ E/IP Output Instance #101, Qty: 128 Bytes, Address Range: %QB21488-%QB21615
⊟ E/IP Output Instance #102, Qty: 256 Bytes, Address Range: %QB22000-%QB22255
⊟ E/IP Output Instance #103, Qty: 128 Bytes, Address Range: %QB22512-%QB22639
⊟ E/IP Output Instance #104, Qty: 256 Bytes, Address Range: %QB23024-%QB23279
⊟ E/IP Output Instance #105, Qty: 128 Bytes, Address Range: %QB23536-%QB23663
⊟ E/IP Output Instance #106, Qty: 256 Bytes, Address Range: %QB24048-%QB24303
⊟ E/IP Input Instance #111, Qty: 128 Bytes, Address Range: %IB21488-%IB21615
⊟ E/IP Input Instance #112, Qty: 256 Bytes, Address Range: %IB22000-%IB22255
⊟ E/IP Input Instance #113, Qty: 128 Bytes, Address Range: %IB22512-%IB22639
⊟ E/IP Input Instance #114, Qty: 256 Bytes, Address Range: %IB23024-%IB23279
⊟ E/IP Input Instance #115, Qty: 128 Bytes, Address Range: %IB23536-%IB23663
⊟ E/IP Input Instance #116, Qty: 256 Bytes, Address Range: %IB24048-%IB24303
⊟ Modbus FC#05 Qty: 128 Coils, Address Range: %IB24560 - %IB24575
⊟ Modbus FC#02 Qty: 128 Inputs, Address Range: %QB24560 - %QB24575
⊟ Modbus FC#04 Qty: 1024 Input Registers, Address Range: %QB28672 - %QB30719
⊟ Modbus FC#06,16 Qty: 1024 Registers, Address Range: %IB28672 - %IB30719
⊟ Modbus FC#03 Qty: 1024 Registers, Address Range: %QB24576 - %QB26623

Global Variable Groups created when slave communication capabilities are enabled in the Hardware Configuration.

1.9.2. Using an HMI (Master) to Communicate to the Controller Via Modbus/TCP

The New Project template includes global I/O groups and drivers to allow the controller to respond to incoming Modbus messages.   Figure 2 shows the Modbus memory map, and how it relates to the Global Variables in MotionWorks IEC. Note that function codes 01 and 03 return data that was sent to the controller from the master and do not reflect data from the Global Variables in the application program.

If the master has a Device ID setting, the MP2300Siec requires the value of "1".

Other Modbus Driver features:
- The Modbus data memory is copied to the Global Variables at the task update rate.

- Modbus coil 0 equates to the Global Variable at %IX24560. 128 coils are available.

- Modbus register 40000 equates to the Global Variable at %IW28672. 1024 registers are available.

- Modbus input 10000 equates to the Global Variable at %QX24560. 128 inputs are available.

- Modbus register 30000 equates to the Global Variable at %QW28672. 1024 registers are available.

As shown in Figure 2 below, the input and output memory is in a different location even though they have the same numerical addressing.
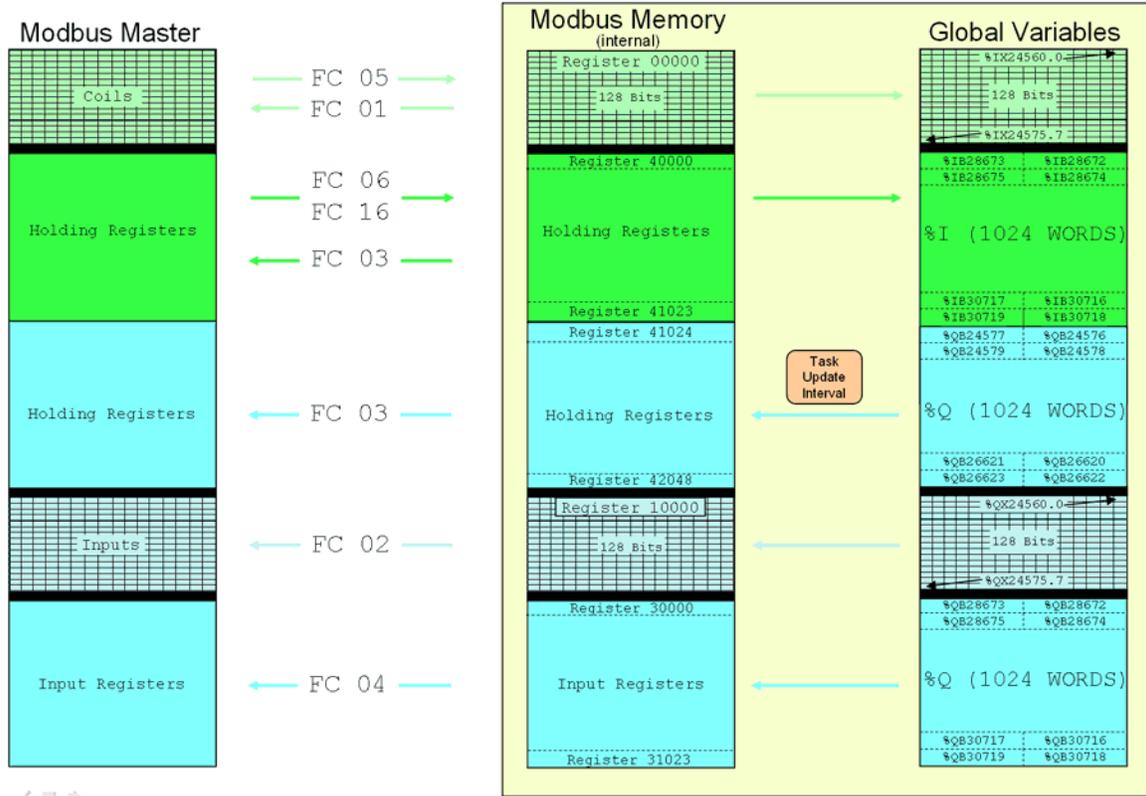
Figure 2: Memory map for Modbus data when the controller is a server / slave.

Application Notes:

Red Lion HMI: Configuring a RedLion HMI to communicate to an MP2000iec Controller via MODBUS/TCP

Maple Systems HMI: Configuring a Maple Systems HMI to communicate with an MP2000iec controller

1.9.3 Adding a Modbus Server/Slave Device

The MP2000iec controller can communicate with up to 10 unique IP addresses simultaneously using Modbus TCP. A maximum of 20 blocks of memory or various function codes can be configured for each device if necessary.

Supported Modbus Function Codes:

Function Code	Description
1	Read Coils
2	Read Inputs
3	Read Holding Registers
4	Read Input Registers
5	Write Single Coil
6	Write Single Register
16	Write Multiple Registers

Modbus Server devices must be added to the configuration offline, then sent to the controller. Before the new configuration will become effective, power on the controller must be cycled.

Step 1: Launch the Configuration

Step 2: Right click on the Configuration tree on the Modbus/TCP item
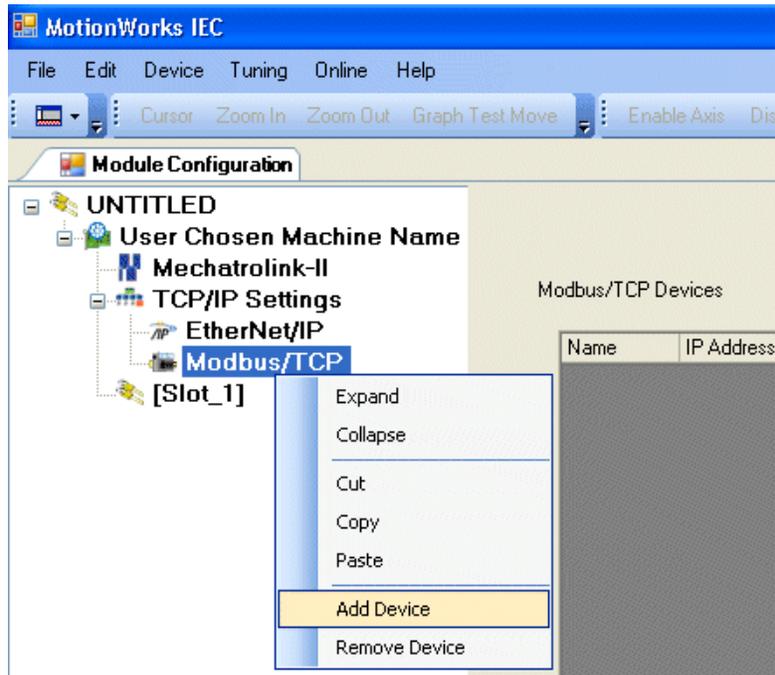
Step 3: Click Finish on the Add Device Dialog Box.
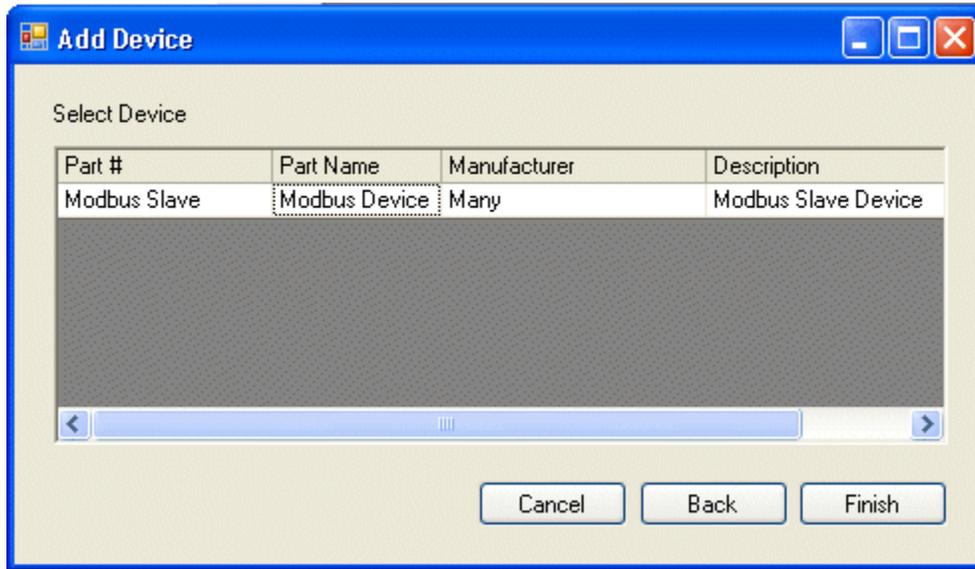
Step 4: The Add Modbus Device window is shown below in Figure 3. Select a name for the device to be added. This name will be displayed in the Global Variables list. The Status Variable will be automatically entered in the Global Variables section of the Development Environment. The Status Variable data type is WORD. This variable will indicate the status of the connection. See Figure 7 for details regarding the status variable. The minimum update time is 20 mSec.
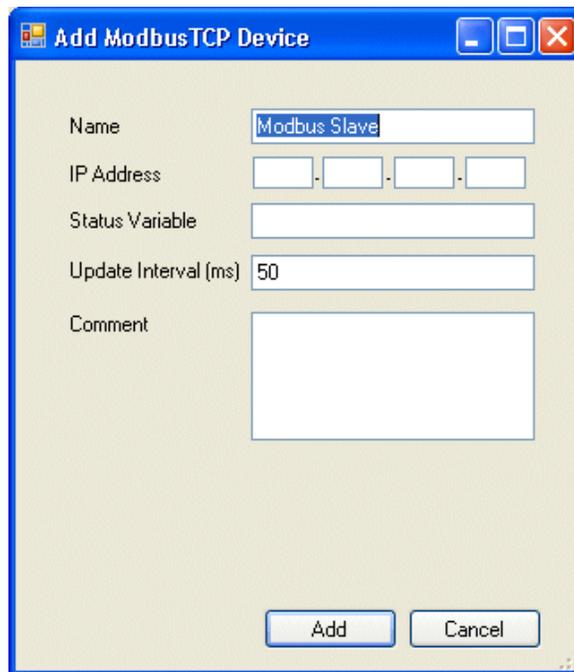
Figure 3: Add Modbus Device
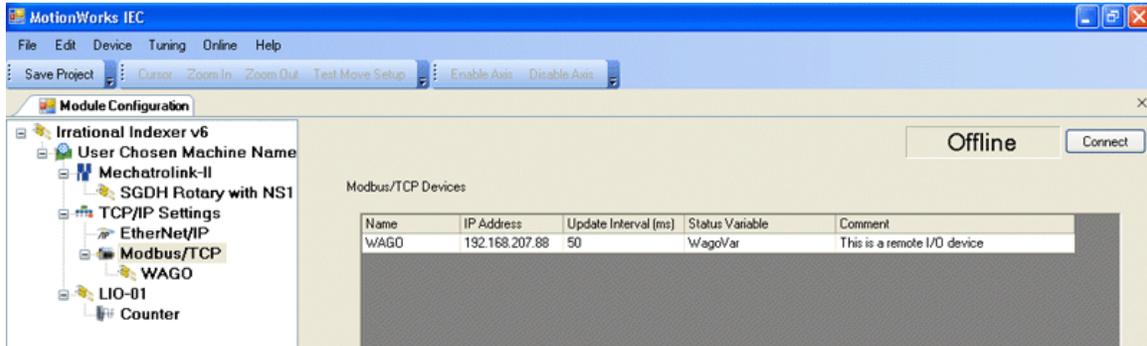
Figure 4: Configuration as shown with one Modbus server / slave configured.

Step 5: Click on the new Modbus Device in the Configuration tree at the left of the screen. Locate the hyperlink at the lower right of the screen to Add Data Blocks to this device. Select a name to be associated with the function code. For example, if the device is remote I/O, name the I/O Group "Output" for example. There is a seven-character limitation on the I/O Group name. The Starting Address is dependant on the remote device. Consult the documentation for the remote device to understand the register offset required to access its functions.
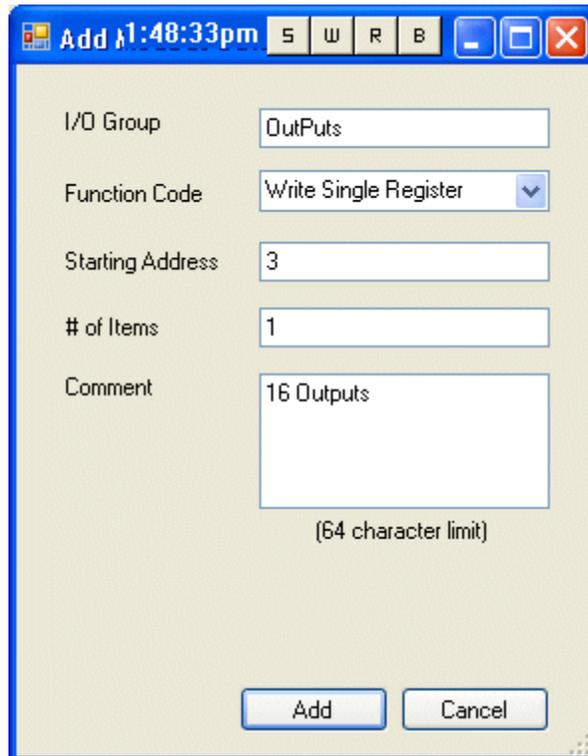
Step 6: When finished entering data blocks, Save the Configuration. This will create the global memory I/O Group in the Development Environment.
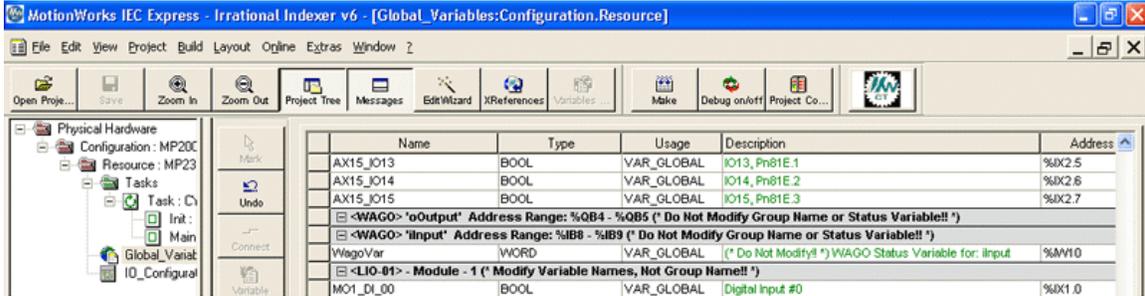
Figure 5: View of the Global Variables list. Click the Hardware tab in the Project Tree or use the 'View' menu to access. Note the status variable has been created under an input section for this Modbus device even though no input-type function codes were configured.

Step 7: Open the Global Variables list. Right click on the I/O group header to "Insert Variable." This variable can either be a BOOL, WORD, or any other data type that fits the usage within the program. For example, 16 outputs can be defined as one WORD, and in the program, the bits can be accessed as follows: MYWORD.X3. Another example would be 16 individual BOOL variables with unique names.
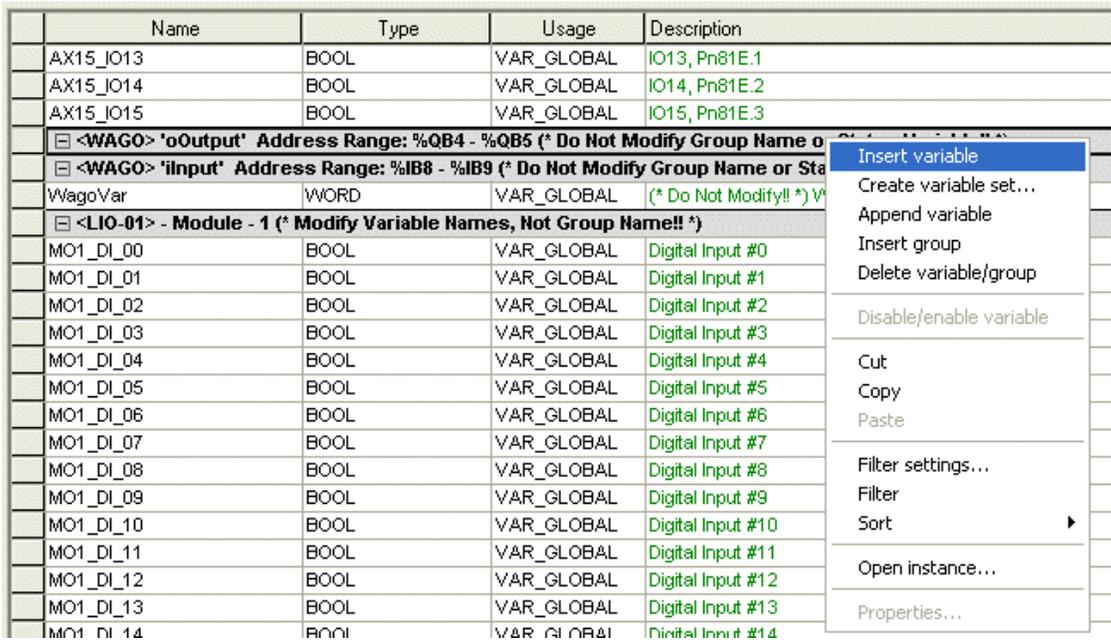
Figure 6: Inserting a variable into the Modbus group.

The memory area for this Modbus device is shown in the Group Heading. In Figure 5, bytes %B1 and %QB2 are allocated for the Modbus output register. Enter the proper memory address for the Modbus memory. If bits are required, enter %IX1.0 for example, or if creating a WORD, enter %IW1.

Any IEC data type can be transmitted or requested from the remote device, provided the data is interpreted as the same type on the other side.

To determine the memory area allocated for the Modbus connection, look in the MotionWorks IEC's IO_Configuration window in the hardware section.

Modbus TCP Status Variable

This variable reflects the connection status. It can be used in the application program to determine if the connection to the remote device is active and the data is valid. The status WORD can be compared to 16#1000, which means that the connection is good. If bits 0 or 1 are on, the connection is not active, and the controller is attempting to reconnect to the remote device.

The status variable is only available when the MP2000iec controller is the client or master of remote devices.

NOTE: If the status variable has a value of zero as observed in the Global Variables list, the controller may not be running the application program.
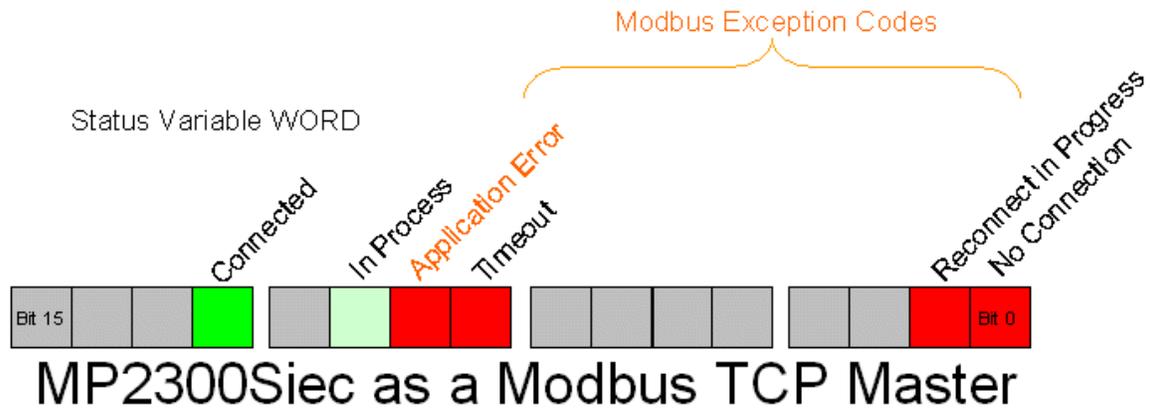
Figure 7: Modbus status WORD

Modbus errors in the lower byte of the status variable ONLY if the Application Error bit is TRUE.

Modbus Exception Codes		
Code (In lower byte of the status variable)	Name	Meaning
01	Illegal Function	The function code received in the query is not an allowable action for the server (or slave). This may be because the function code is only applicable to newer devices, and was not implemented in the unit selected. It could also indicate that the server (or slave) is in the wrong state to process a request of this type, for example because it is not configured and is being asked to return register values.

02	Illegal Data Address	The data address received in the query is not an allowable address for the server (or slave). More specifically, the combination of reference number and transfer length is invalid. For a controller with 100 registers, the PDU addresses the first register as 0, and the last one as 99. If a request is submitted with a starting register address of 96 and a quantity of registers of 4, then this request will successfully operate (address-wise at least) on registers 96, 97, 98, and 99. If a request is submitted with a starting register address of 96 and a quantity of registers of 5, then this request will fail with Exception Code 0x02 "Illegal Data Address" since it attempts to operate on registers 96, 97, 98, 99 and 100, and there is no register with address 100.
03	Illegal Data Value	A value contained in the query data field is not an allowable value for server (or slave). This indicates a fault in the structure of the remainder of a complex request, such as that the implied length is incorrect. It specifically does NOT mean that a data item submitted for storage in a register has a value outside the expectation of the application program, since the MODBUS protocol is unaware of the significance of any particular value of any particular register.
04	Slave Device Failure	An unrecoverable error occurred while the server (or slave) was attempting to perform the requested action.
05	Acknowledge	Specialized use in conjunction with programming commands. The server (or slave) has accepted the request and is processing it, but a long duration of time will be required to do so. This response is returned to prevent a timeout error from occurring in the client (or master). The client or master) can next issue a Poll Program Complete message to determine if processing is completed.
06	Slave Device Busy	Specialized use in conjunction with programming commands. The server (or slave) is engaged in processing a long–duration program command. The client (or master) should retransmit the message later when the server (or slave) is free.
08	Memory Parity Error	Specialized use in conjunction with function codes 20 and 21 and reference type 6, to indicate that the extended file area failed to pass a consistency check. The server (or slave) attempted to read record file, but detected a parity error in the memory. The client (or master) can retry the request, but service may be required on the server (or slave) device.
0A	Gateway Path Unavailable	Specialized use in conjunction with gateways. It indicates that the gateway was unable to allocate an internal communication path from the input port to the output port for processing the request. Usually means that the gateway is misconfigured or overloaded.
0B	Gateway Target Device Failed to Respond	Specialized use in conjunction with gateways. It indicates that no response was obtained from the target device. Usually means that the device is not present on the network.

Note: Do not delete automatically created variables or groups.   If you must delete a group, be sure to delete the group header (an all of its variables) and the group name as listed under IO_Configuration in the Hardware tab. These two items must remain in sync for project to compile properly

1.9.4 Using an EtherNet/IP Scanner to Communicate to the MP2000iec Controller as an Adapter

As previously mentioned, the controller will be configured to accept select EtherNet/IP instances when the New Project template is selected. Six pre-configured Instances are defined in the controller for input and output. The following diagram shows these instances and their Global Variable mapping.

Note: when communicating to the MP2000iec controller to the available instances, the exact byte size of the instance must be configured on the Scanner side. (The entire 128-byte or 256-byte block must be transferred even if less data is required.)

The controller will automatically respond to incoming EtherNet/IP messages from Scanners requesting to read or write data into the pre-defined instances. No other instance numbers can be used.

Note: The scanner must configure both an input and output assembly. If the scanner is not required to receive any data from the MP2000iec controller, use assembly 128 with a size of zero and make sure the "Use Run/Idle" checkbox is not checked.

	⊟ E/IP Output Instance #101, Qty: 128 Bytes, Address Range: %QB21488-%QB21615
	⊟ E/IP Output Instance #102, Qty: 256 Bytes, Address Range: %QB22000-%QB22255
	⊟ E/IP Output Instance #103, Qty: 128 Bytes, Address Range: %QB22512-%QB22639
	⊟ E/IP Output Instance #104, Qty: 256 Bytes, Address Range: %QB23024-%QB23279
	⊟ E/IP Output Instance #105, Qty: 128 Bytes, Address Range: %QB23536-%QB23663
	⊟ E/IP Output Instance #106, Qty: 256 Bytes, Address Range: %QB24048-%QB24303
	⊟ E/IP Input Instance #111, Qty: 128 Bytes, Address Range: %IB21488-%IB21615
	⊟ E/IP Input Instance #112, Qty: 256 Bytes, Address Range: %IB22000-%IB22255
	⊟ E/IP Input Instance #113, Qty: 128 Bytes, Address Range: %IB22512-%IB22639
	⊟ E/IP Input Instance #114, Qty: 256 Bytes, Address Range: %IB23024-%IB23279
	⊟ E/IP Input Instance #115, Qty: 128 Bytes, Address Range: %IB23536-%IB23663
	⊟ E/IP Input Instance #116, Qty: 256 Bytes, Address Range: %IB24048-%IB24303
	⊟ Modbus FC#05 Qty: 128 Coils, Address Range: %IB24560 - %IB24575
	⊟ Modbus FC#02 Qty: 128 Inputs, Address Range: %QB24560 - %QB24575
	⊟ Modbus FC#04 Qty: 1024 Input Registers, Address Range: %QB28672 - %QB30719
	⊟ Modbus FC#06,16 Qty: 1024 Registers, Address Range: %IB28672 - %IB30719
	⊟ Modbus FC#03 Qty: 1024 Registers, Address Range: %QB24576 - %QB26623

Global Variable Groups created when slave communication capabilities are enabled in the Hardware Configuration.

MP2000iec as an EtherNet/IP Adapter
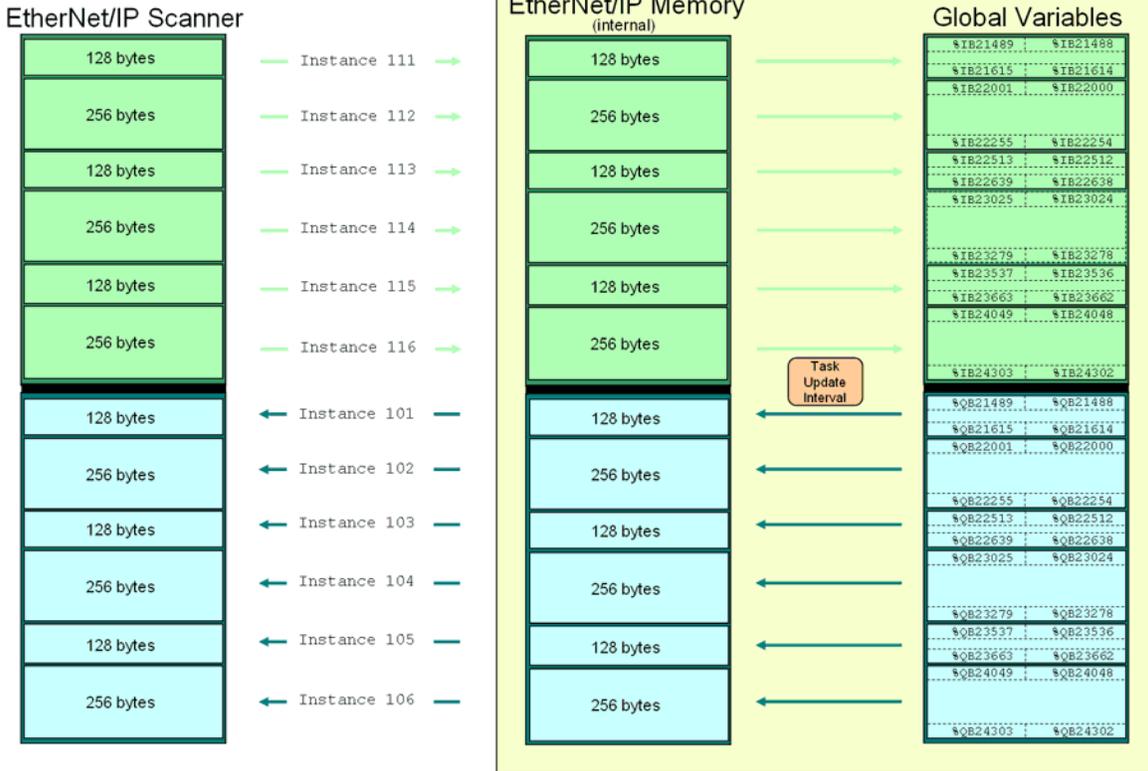
Application Notes on www.yaskawa.com

MP2300Siec & AB MicroLogix 1100 - Configuration for EtherNet/IP Communication

MP2300Siec & AB ControlLogix 5555 - Configuration for EtherNet/IP Communication

1.9.5 Adding an Ethernet/IP Adapter

1.9.5.1 Adapter Settings for Selected Products

Cognex 5400 Adapter

I/O Assembly Instances

Type	Instance #	Size (bytes)	Update Interval (ms)	Ownership	Priority	Connection	Use Run Idle
Input	11	32	20	Exclusive	Scheduled	Multicast	False
Output	21	18	20	Exclusive	Scheduled	Point to Point	True

Add Input/Output Assembly Instance

Configuration Assembly Instance

Type	Instance #	Size (bytes)	Optional Data (hexadecimal)
Config	1	0	

Beckhoff_IL2301

I/O Assembly Instances

Type	Instance #	Size (bytes)	Update Interval	Ownership	Priority	Connection	Use Run Idle
Input	101	6	50	Exclusive	Scheduled	Multicast	False
Output	102	6	50	Exclusive	Scheduled	Point to Poin	True

Add Input/Output Assembly Instance

Configuration Assembly Instance

Type	Instance #	Size (bytes)	Optional Data (hexadecimal)
Config	100	0	

Add Configuration Assembly Instance

RTA 455ED Gateway

I/O Assembly Instances

Type	Instance #	Size (bytes)	Update Interval (ms)	Ownership	Priority	Connection	Use Run Idle
Input	100	400	20	Exclusive	Scheduled	Multicast	False
Output	113	400	20	Exclusive	Scheduled	Point to Point	True

Add Input/Output Assembly Instance

Configuration Assembly Instance

Type	Instance #	Size (bytes)	Optional Data (hexadecimal)

Add Configuration Assembly Instance

Turck BL-67

I/O Assembly Instances

Type	Instance #	Size (bytes)	Update Interval (ms)	Ownership	Priority	Connection	Use Run Idle
Input	101	128	20	Exclusive	Scheduled	Multicast	False
Output	102	128	20	Exclusive	Scheduled	Point to Point	True

Add Input/Output Assembly Instance

Configuration Assembly Instance

Type	Instance #	Size (bytes)	Optional Data (hexadecimal)
Config	1	0	

Phoenix_BK

I/O Assembly Instances

Type	Instance #	Size (bytes)	Update Interval (ms)	Ownership	Priority	Connection	Use Run Idle
Input	101	4	25	Exclusive	Scheduled	Multicast	False
Output	100	2	25	Exclusive	Scheduled	Multicast	True

Add Input/Output Assembly Instance

Configuration Assembly Instance

Type	Instance #	Size (bytes)	Optional Data (hexadecimal)
Config	1	0	

Add Configuration Assembly Instance

1.9.6 OPC Server
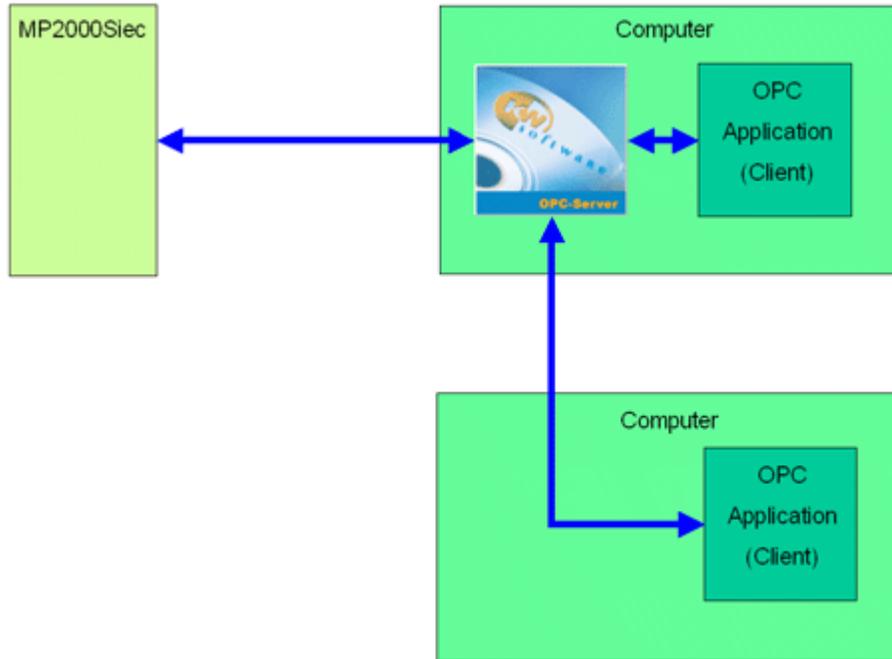
By default, all global variables are transmitted as OPC data. To disable this feature, click the hardware tab, right-click the resource folder, and select Settings. (See Figure 10)
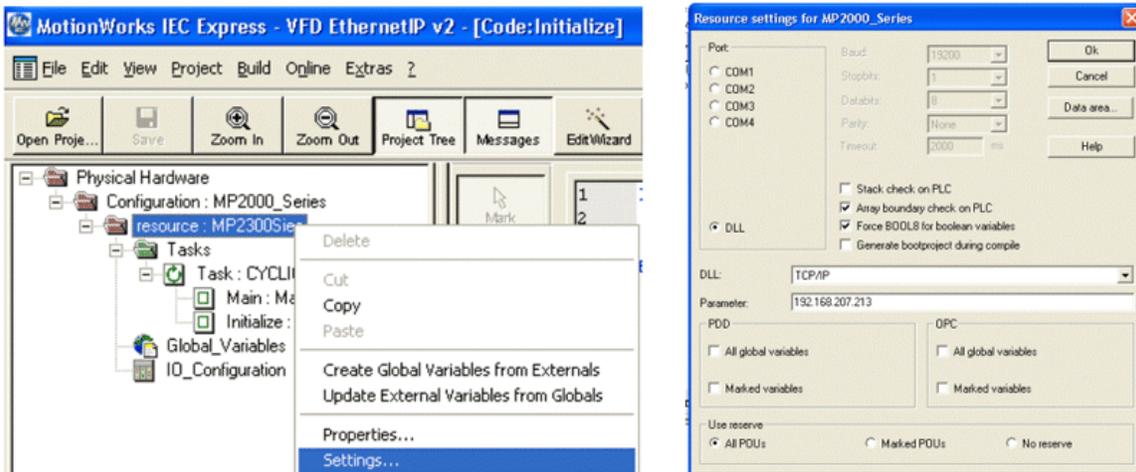
Figure 10: OPC Configuration

Any data in the application program can be set as OPC data by simply clicking the checkbox in the variable definition screen in the IEC development environment.

Figure 11: Variable Definition Window
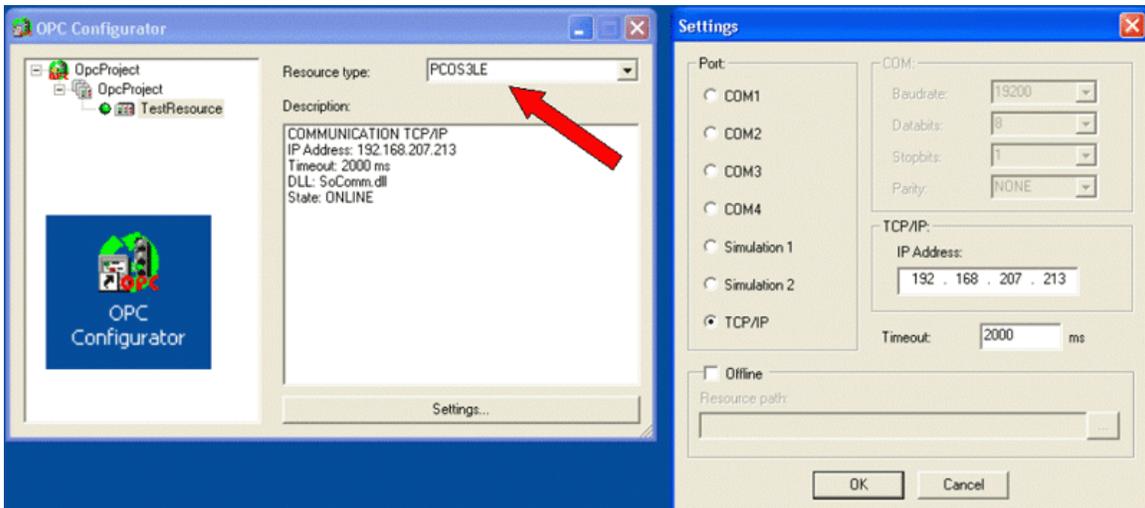
Figure 12: OPC Server Configurator

1.10 External Encoders

Option cards LIO-01, LIO-02, CNTR-01, and LIO-06 have an encoder input available for use with the PLCopen function blocks. When any of these cards are configured, external encoder functionality is enabled.
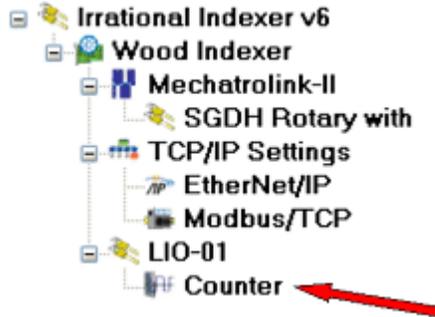
To use the encoder, look in the configuration to identify the logical axis number. Changes to the user unit parameters will not take effect until power is cycled. Encoder operation can be verified by checking the Feedback tab.
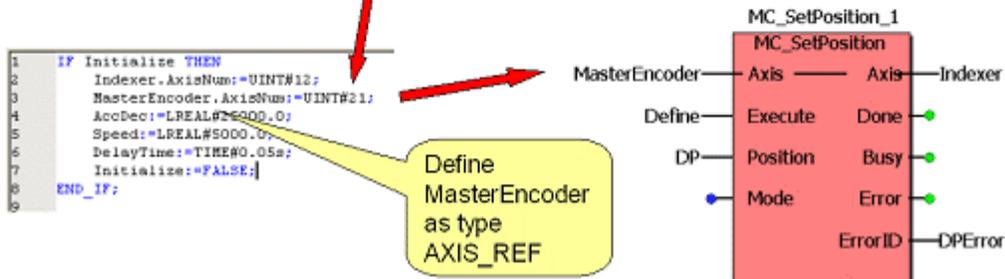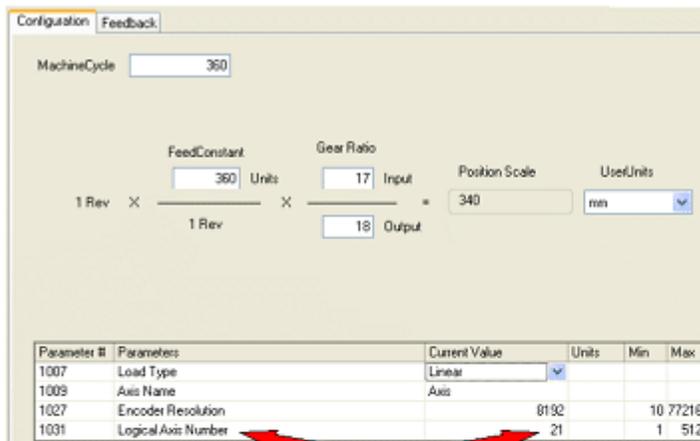
1.11 Option Slots

Each slot in the controller can optionally contain a module, or remain empty.

The following option cards are supported:
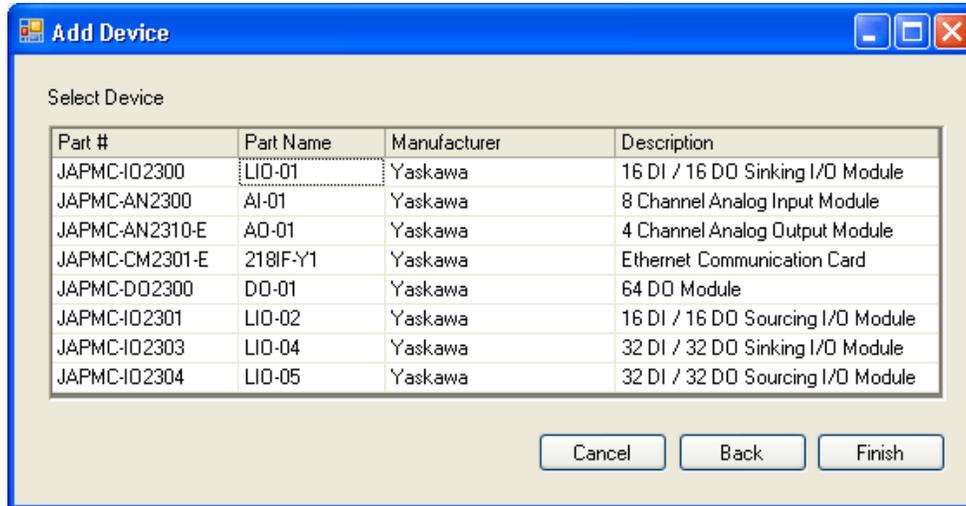
Global variables for the following remote I/O devices with a fixed number of I/O will automatically be entered in the Global Variables window of the IEC Programming Environment when the user presses 'Save' in the configuration:

      LIO-01   LIO-02   LIO-04   LIO-05   LIO-06   CNTR   AO-01   AI-01

Note: Do not delete automatically created variables or groups.   If you must delete a group, be sure to delete the group header (an all of its variables) and the group name as listed under IO_Configuration in the Hardware tab. These two items must remain in sync for project to compile properly

1.12 Task Priority Planning

The following table should be used as a guide to architect the execution priority of the various parts of the application program.   This table is only applicable to programs that utilize MotionWorks IEC Professional. MotionWorks IEC Express only supports 1 task.

Controller Task	Overall Priority	Note
System Tasks with higher priority than IEC Tasks	0	
	0	
	0	
	0	
System Tasks with higher priority than IEC Tasks	8	System Tasks
	9	
	10	
	10	
	11	
	13	
	20	
System Tasks with higher priority than IEC Tasks	21	
Highest Priority IEC Application Task - Priority 0	42	These PLC Tasks are not interrupted by network activity
IEC Application Task - Priority 1	43	
IEC Application Task - Priority 2	44	
IEC Application Task - Priority 3	45	
IEC Application Task - Priority 4	46	
IEC Application Task - Priority 5	47	
IEC Application Task - Priority 6	48	PLC Tasks, round robin with MECHATROLINK Work Task
MECHATROLINK Work Task	48	MECHATROLINK alarm polling Task, reads all alarms from drives
Alarm Task	48	Executes lower priority alarm handlers
IEC Application Task - Priority 7	49	PLC Tasks interrupted by MECHATROLINK work q
IEC Application Task - Priority 8	50	PLC Tasks interrupted by MECHATROLINK work q; round robin with inbound net activity
Network Communication Task	50	All inbound traffic comes in at this Priority. Outbound is handled by the driver Tasks

IEC Application Task - Priority 9	51	These PLC Tasks interrupted by network, use for custom network driver
IEC Application Task - Priority 10	52	
IEC Application Task - Priority 11	53	This PLC Task is interrupted by network, round robin with EIP Communication Task
E/IP Communication Task	53	EthernetIP communication driver
IEC Application Task - Priority 12	54	These PLC Tasks interrupted by network and EIP
IEC Application Task - Priority 13	55	
IEC Application Task - Priority 14	56	This PLC Task is interrupted by network and EIP; Round robin with Modbus TCP Task
Modbus TCP Communication Task	56	Modbus communication driver
IEC Application Task - Priority 15	57	This PLC Task is interrupted by Modbus and EIP; but not interrupted by OPC or RMI
Lowest Priority IEC Application Task - Priority 16	58	Interrupted by Modbus and EIP; not OPC or RMI
IEC Application Idle Task	60	MotionWorks IEC "Default" Task.
ProConOS Communication Task	70	PLC communication: OPC and MotionWorks IEC debug
ProConOS Communication Task	70	
ProConOS Communication Task	70	
ProConOS Communication Task	70	
ProConOS Task for Application "Download Changes"	73	
ProConOS Task for MotionWorks IEC communication	74	
ProConOS debugging Task	76	
ProConOS Task for managing code	77	
ProConOS Task for Run/Stop mode	78	
System Tasks with lower priority than IEC Tasks	80	Applet / Hardware Configuration / Web Server communication
	81	
	82	
	83	
System Tasks with lower priority than IEC Tasks	85	
	85	
	85	
	85	

Color Codes:

	Hardware Operating System Tasks
	Hardware Operating System Tasks
	IEC Operating System Tasks
	IEC Application Tasks
	Network Communication Driver (Incoming Traffic)
	Tasks for Hardware Configuration
	Network Communication Tasks

1.13 Additional Tools

1.13.1 Cam File Download

To add a CSV file to any MP2000iec controller, follow these steps:

1) Open the Hardware Configuration

2) Click the "Online" menu

3) Click the "Controller Configuration Utilities" menu

4) Select the radio button called "Send Cam Data to Controller"
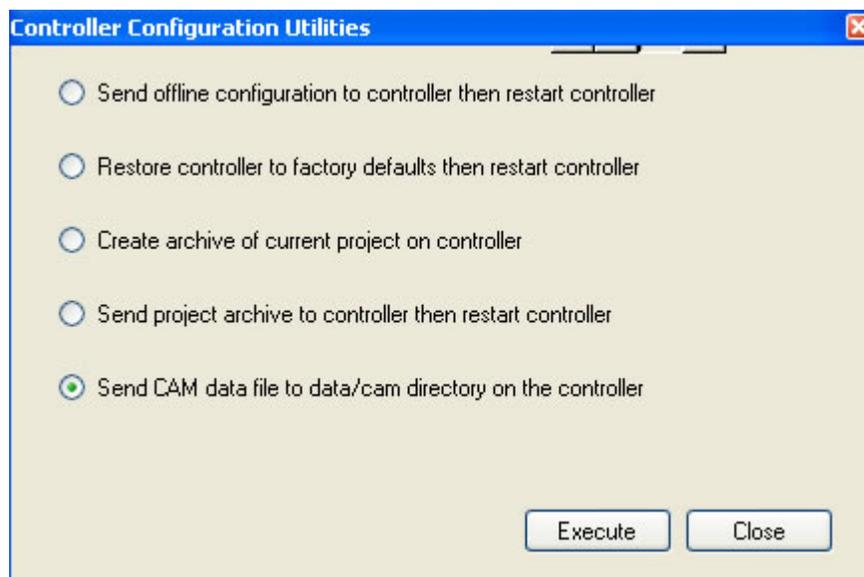
5) Select a CSV file.

6) Press Execute.

7) The file will be visible from the web server Project Archive list, and it is possible to select the CSV file using Y_CamFileSelect. Use the directory path in the filename input as shown below:

File Listing

Filename	Size
procon/any/PcFiles.pcf	320
procon/any/Pdc.MLI	14078
procon/any/Pdc.PRI	716
procon/any/PLCopenP.xml	154
procon/any/sr.zsv	1391
procon/boot/BootFile.pro	79475
user/config/current.xml	65
user/config/disco/axis.xml	5788
user/config/disco/hardware.xml	912
user/config/disco/io.xml	2041
user/config/disco/servonet.xml	1449
user/config/startup/axis.xml	5204
user/config/startup/hardware.xml	944
user/config/startup/io.xml	1496
user/config/startup/servonet.xml	1309
user/config/startup/taskdata.xml	775
user/config/startup/userdata.xml	2906
user/data/cam/dawg4.csv	11550
user/data/cam/TestCam.csv	11550
user/driveParam/AXIS1DrivePn.xml	17211
user/driveParam/AXIS2DrivePn.xml	8781
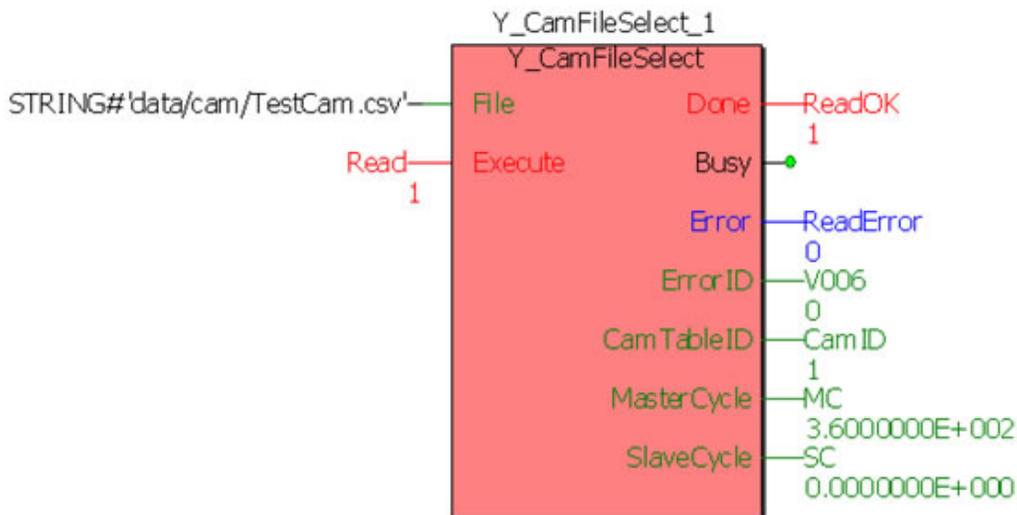
2. Web Server

2.1 Web Server Overview

The Web Server is built into the controller firmware and allows the user to locally or remotely perform various activities. There are two access levels to the controller via the web server; the second level requires a password to access features such as firmware upgrade utilities.

2.2 Web Server Requirements

Internet Explorer with Sun Microsystems Java Virtual Machine 1.4.1 or later is required.

2.3 Web Server Homepage
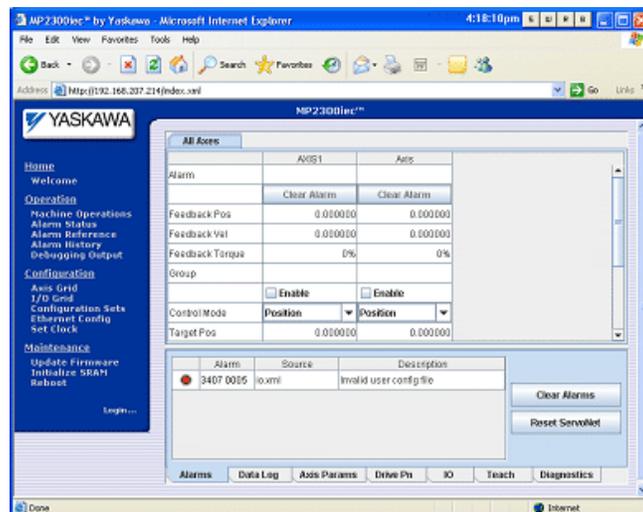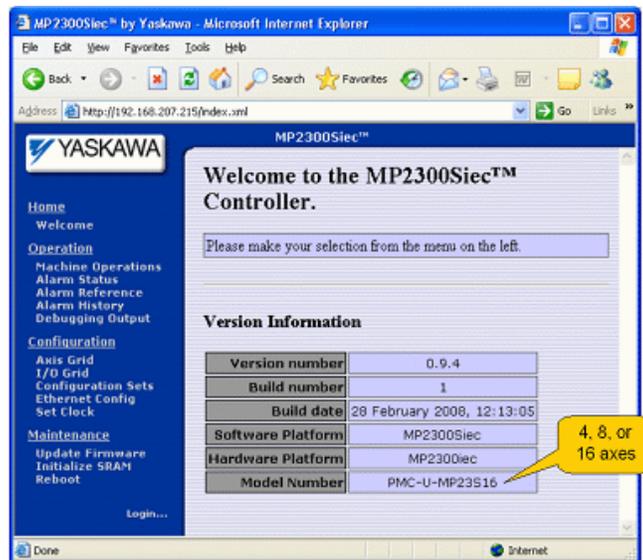
2.4 Firmware Upgrade

The firmware should not be upgraded unless recommended by an authorized Yaskawa representative.

This document describes the two methods to upgrade the controller firmware on the MP2□□□iec controller.

NOTE: DO NOT EXTRACT THE FILES FROM THE ZIP. THE CONTROLLER WILL EXTRACT THE FILE ITSELF.

Updating the Firmware (By enabling the supervisor mode via web server):

1. To locate stored firmware versions on the local computer where MotionWorks IEC v1.0.6 or greater is installed, locate the following path:

> In this example, we are locating version 1.0.4:

>> MotionWorks IEC InstallPath/MotionWorks IEC Configuration/ConfigTool/ControllerFirmware/MP23iec-v_1_0_4

>> Firmware revisions are also available on www.yaskawa.com. Search for FAQ MTN-7LPUQC, which will show a table of all firmware releases.

2. Open the web interface in a web browser and connect to the controller by entering the controller IP Address in the Address field.

3. Select Login from the left menu bar.
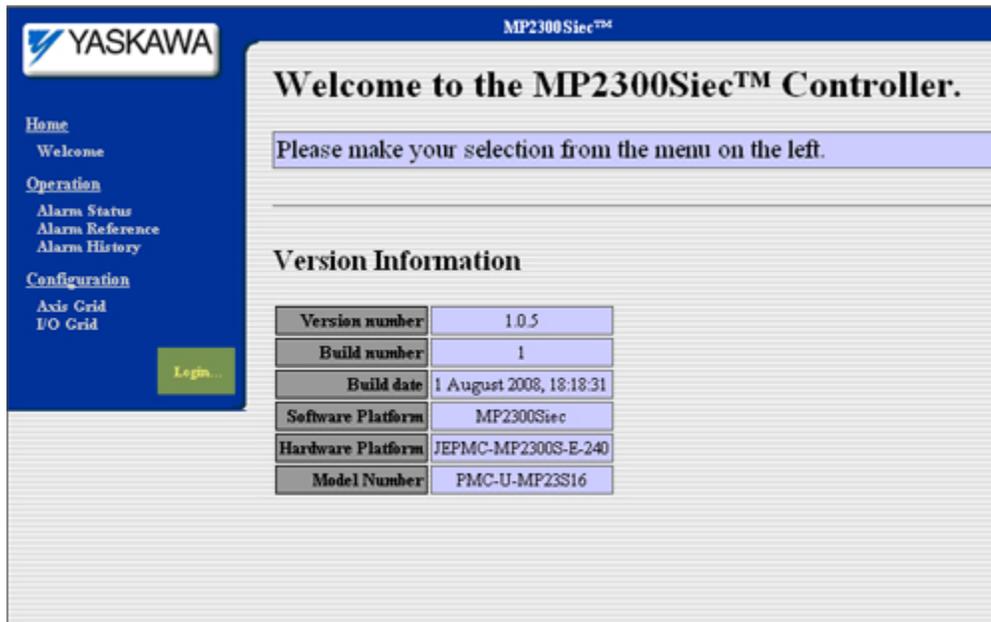
4. Login using the following Login name and password:

Controller	Login	Password
MP2300Siec	Admin	MP2300S
MP2310iec	Admin	MP2300S
MP2600iec	Admin	MP2600

Note that the factory default Login and passwords may be changed by the user according to the information supplied in product note AN.MCD.09.069.

5. Select Update Firmware from the left menu:

6. The firmware update screen will appear:
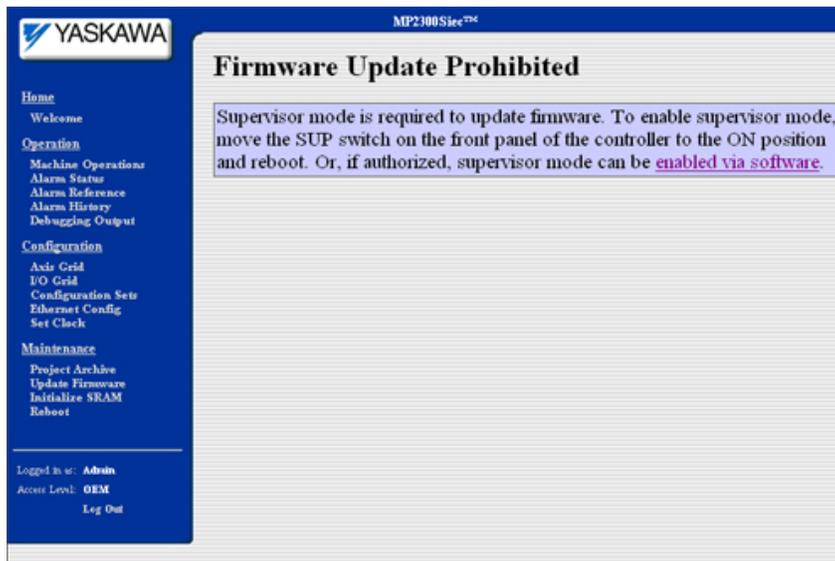
7. Click on the 'enabled via software' hyperlink in the text message area.

8. Reboot the controller by clicking on the 'Reboot Controller' button on the update page:
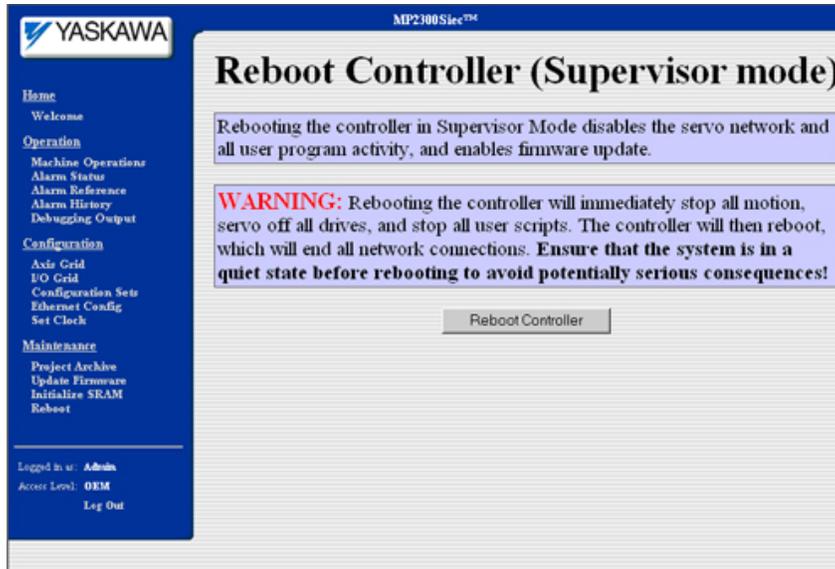
9. After the controller has finished rebooting, the following page will be displayed:

10. At this point, click on the 'Update Firmware' link in the left menu.

11. Select the firmware.zip file that you wish to upgrade the firmware: NOTE: DO NOT EXTRACT THE FILES FROM THE ZIP. THE CONTROLLER WILL EXTRACT THE FILE ITSELF.

12. Click 'Browse' to locate the file.

13. Click 'Upload' to upload the firmware file to the controller.

14. After the versions have been verified, a message box will inform you what is currently loaded on the controller, and what version you are attempting to upgrade.

15. Click on the 'Update' button to update the controller firmware.
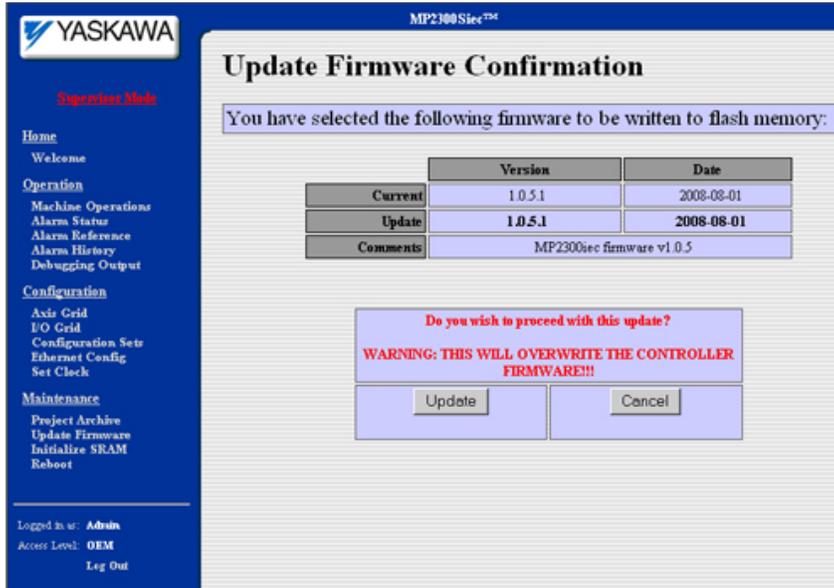
16. Do not power cycle the controller or attempt to click on any of the menu bar links while the upgrade is taking place!
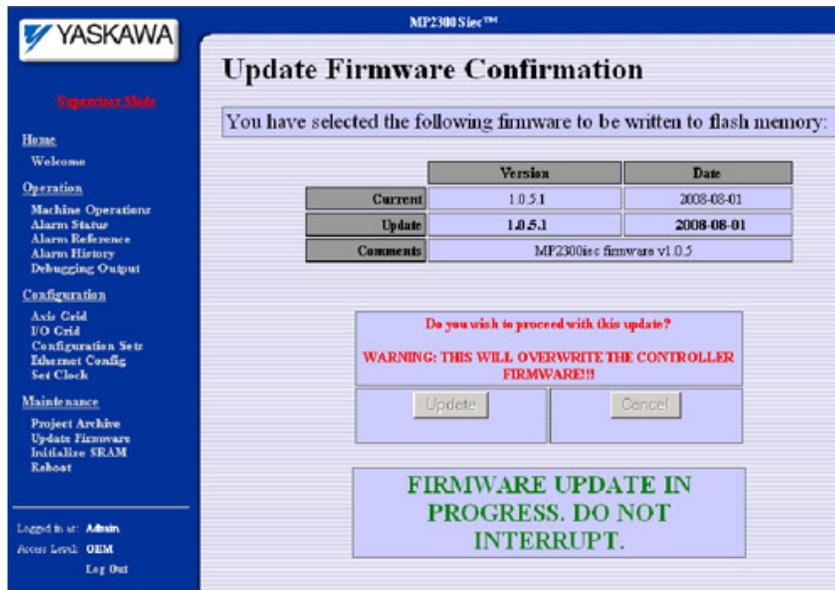
17. Verify correct version loaded on the controller by clicking 'Welcome' (to refresh) in the left menu bar.

Updating Firmware (By using the SUP DIP Switch):

1. Flip on the SUP switch on the MP2300Siec controller.

2. Reboot the controller. Controller will boot up in supervisor mode.

3. Login to the controller.

4. Point web browser at the controller. Go to the firmware update page.

5. Select the appropriate firmware.zip file. The file checksums will be automatically verified.

6. Click on the "Update" button to confirm update. Wait until firmware update finishes.

7. Flip off the SUP switch.

8. Reboot the controller. Wait until controller restarts correctly.

9. Verify correct version loaded on the controller by clicking 'Welcome' in the left menu bar.

2.5 Project Archive

It's possible to download or upload the complete application image to / from an MP2000iec controller without using MotionWorks IEC or the Hardware Configuration. A single file called "Archive.Zip" contains all the Hardware Configuration Data and the Application Program, including any data files that may be used by the application that were downloaded to flash using the "Download File" button from the MotionWorks IEC Resource Dialog or via HTTP file transfer to the controller.

To Install and Application archive on the controller, follow these steps.

1) Connect to the controller using Internet Explorer.
2) Enter the Login and Password.
3) Under the Maintenance section on the left hand of the screen, click Project Archive
4) Click Browse to locate a previously stored archive.zip file.
5) Click the Upload button to send the file to the controller. It will extract and replace all files shown in the file listing.
6) Reboot is necessary for the configuration and application program to become operable.

NOTE: If the application has absolute encoders, the absolute encoder offset stored when MC_SetPosition is executed is not part of the Archive.zip. The absolute encoder offsets will remain after uploading an Archive.zip file.

WARNING: If the Archive.zip file is loaded into another controller, and the application uses absolute encoders, axis calibration must be performed to be sure that the application will operate properly on the new controller.

3. Controller AlarmID List

The following is a list of alarm codes that are reported in the Configurations Controller Alarms tab or via the Y_ReadAlarm function block.
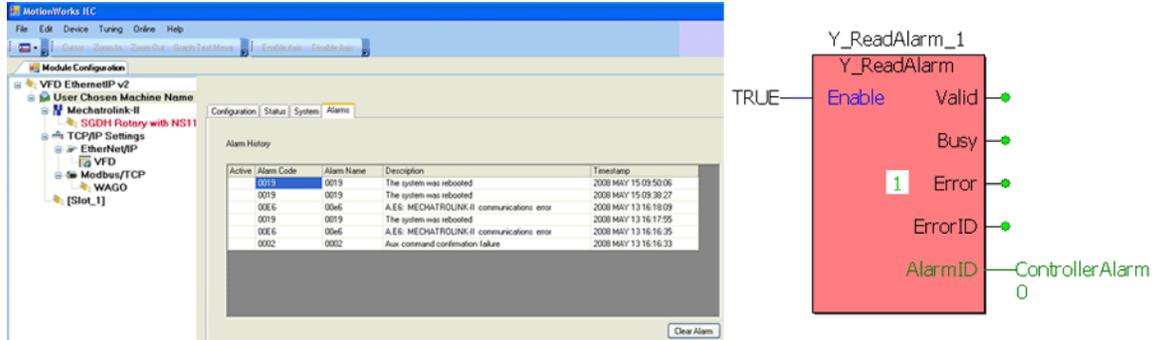
	Hex Code		Description
	ErrorClass	**AxisErrorID**	**ErrorClass+AxisErrorID output from MC_ReadAxisError**
	AlarmID		**AlarmID output from Y_ReadAlarm**
motionKernel	1201	0103	An alarm task queue was full when a new alarm was posted. This indicates that the task is being starved of execution time or that the system is generating many alarms simultaneously.
app	1401	0005	The script environment ran out of memory. This is a serious condition because it may prevent further errors from being handled correctly.
app	1401	0006	An error occurred while running the standard error handler for a general script error. This is a serious condition because it indicates the standard error handler is malfunctioning.
app	1401	0007	This error should never occur and is included only for completeness. It indicates that an unknown and potentially fatal problem has occurred within the script engine.
app	1401	000A	The script task failed to stop cleanly, which may result in unreleased system resources. Error recovery requires the controller be reset.
app	1401	000B	The command line task failed to stop cleanly, which may result in unreleased system resources. Error recovery requires the controller be reset.
app	1403	0002	The task responsible for publishing events to a remote client failed to stop cleanly, which may result in unreleased system resources. Error recovery requires the controller be reset.
app	1403	0003	The task responsible for replying to remote clients failed to stop cleanly, which may result in unreleased system resources. Error recovery requires the controller be reset.

app	1403	0004	The task responsible starting and stopping connections to remote clients failed to stop cleanly, which may result in unreleased system resources. Error recovery requires the controller be reset.
app	1407	0001	The file system on which the configuration file directory resides could not be read and may be unmounted or corrupted. The system has booted in a minimal configuration mode, and most functionality is limited. If possible, the file system should be recovered or reformatted and new config files uploaded if applicable.
app	1407	0103	The watchdog timer expired.
app	1407	0108	A CPU exception occurred.
app	1407	0109	The firmware files on the controller do not match the expected checksums.
app	1407	010A	The manufacturing procedure failed. The controller probably could not fetch the current time from the network.
app	140A	0009	Network reset detected multiple Axes connected to the same servo network node.
app	140A	000A	Network reset detected multiple I/O connected to the same network node.
app	140A	0015	Controller memory was corrupted during network reset resulting in a lost logical Axis data structure.
app	140A	0016	Controller memory was corrupted during network reset resulting in a lost logical I/O data structure.
app	140A	0018	An Abort input specified in the configuration could not be found. The abort condition is considered permanently asserted. No motion is possible until the I/O configuration can be matched to the abort inputs (restart required).
app	140A	0021	Too many events were posted from the system ISR. The motion scan and servo net loop have been shut down.
app	140C	1035	The manufacturing data on the controller is invalid. The controller needs to be returned to Yaskawa for reprogramming.
Mechatrolink	2301	0001	The drive returned an invalid watch dog code indicating a possible dropped communication packet.
Mechatrolink	2301	0002	The drive failed to return confirmation of last aux command within the default timeout period.
Mechatrolink	2301	0003	An unrecoverable error occurred during auto configuration. As a result, one or more drives are excluded from the servo network.
Mechatrolink	2301	0004	Overriding the auto configured axes parameters failed. As a result, one or more drives are excluded from the servo network.
Mechatrolink	2301	0005	Two or more nodes have the same ID. As a result, all servo network communication has been suspended.
Mechatrolink	2301	0006	The controller must be the root node on the servo network. All servo network communication has been suspended

Mechatrolink	2301	0007	The servo network communication device failed to initialize. Servo network communication is not possible.
Mechatrolink	2301	0008	An error occurred sending command to a node during initialization. The node may not support the configured communications rate. Communication with this node has been prohibited, but communication with other nodes may be possible.
Mechatrolink	2301	000E	The drive does not return response packet.
Mechatrolink	2301	000F	Bus reset generation that controller is not demanding.
Mechatrolink	2301	0010	It receives response with the same channel at the same Iso cycle.
Mechatrolink	2301	0011	The ID in the response packet is not same to ID of AxisNode.
Mechatrolink	2301	0012	The data length in the response packet is not same to value of CSR register(SEND_DSP_DATA_LENGTH) of drive.
Mechatrolink	2301	0013	The packet type in the response packet is not same S-DSP.
Mechatrolink	2301	0014	Invalid cycle time has passed with configuration file 'servonet.xml'. As a result, all servo network communication has been suspended.
Mechatrolink	2301	0015	Node is not found on 1394 network.
Mechatrolink	2301	0016	Invalid node.
Mechatrolink	2301	0017	Error matching node IDs.
motionKernel	3103	0101	The file system failed the integral consistency check. **Remedy**: Power up the controller in supervisory mode using the SUP switch. Clear the alarm. Turn off the SUP switch. Power cycle the controller.
motionKernel	3201	0001	The motion kernel didn't request to enable axis. But, the axis is enabled.
motionKernel	3201	0002	The motion kernel didn't request to disable axis. But, the axis is disabled.
motionKernel	3201	0004	The encoder position stored in SRAM could not be validated. The value has been reset.
motionKernel	3201	0005	Main bus power was disconnected while the axis was enabled. Main power must be restored and this alarm cleared before motion can continue.
motionKernel	3201	0101	Configuration error: multiple alarm tasks with duplicate priority.
motionKernel	3201	0102	Configuration error: Alarm task not configured. Using default priority and name.

motionKernel	3202	0001	Axis Coordinate System: The command position was outside the allowable range for the axis in the positive direction (positive overtravel). The axis may not be moved again until the alarm condition is cleared. After the alarm is cleared, it is permissible to execute a move which brings the axis back toward the allowed region, even though the axis is probably still outside the allowed region. Any move which pulls the axis further away from the allowed region will re-trigger the alarm.
motionKernel	3202	0002	Axis Coordinate System: The command position was outside the allowable range for the axis in the negative direction (negative overtravel). The axis may not be moved again until the alarm condition is cleared. After the alarm is cleared, it is permissible to execute a move which brings the axis back toward the allowed region, even though the axis is probably still outside the allowed region. Any move which pulls the axis further away from the allowed region will re-trigger the alarm.
motionKernel	3202	0003	Axis Coordinate System: The command speed was greater than the allowable range for the axis in the positive direction (overspeed). The axis may not be moved again until the alarm condition is cleared.
motionKernel	3202	0004	Axis Coordinate System: The command speed was greater than the allowable range for the axis in the negative direction (overspeed). The axis may not be moved again until the alarm condition is cleared.
motionKernel	3202	0005	Axis Coordinate System: The command acceleration was greater than the allowable range for the axis in the positive direction. The axis may not be moved again until the alarm condition is cleared.
motionKernel	3202	0006	Axis Coordinate System: The command acceleration was greater than the allowable range for the axis in the negative direction. The axis may not be moved again until the alarm condition is cleared.
motionKernel	3202	0007	Axis Coordinate System: The command torque was greater than the allowable range for the axis in the positive direction (overtorque). The axis may not be moved again until the alarm condition is cleared.
motionKernel	3202	0008	Axis Coordinate System: The command torque was greater than the allowable range for the axis in the negative direction (overtorque). The axis may not be moved again until the alarm condition is cleared.
motionKernel	3202	0011	Joint Coordinate System: The command position was outside the allowable range for the axis in the positive direction (positive overtravel). The axis may not be moved again until the alarm condition is cleared. After the alarm is cleared, it is permissible to execute a move which brings the axis back toward the allowed region, even though the axis is probably still outside the allowed region. Any move which pulls the axis further away from the allowed region will re-trigger the alarm.
motionKernel	3202	0012	Joint Coordinate System: The command position was outside the allowable range for the axis in the negative direction (negative overtravel). The axis may not be moved again until the alarm condition is cleared. After the alarm is cleared, it is permissible to execute a move which brings the axis back toward the allowed region, even though the axis is probably still outside the allowed region. Any move which pulls the axis further away from the allowed region will re-trigger the alarm.

motionKernel	3202	0013	Joint Coordinate System: The command speed was greater than the allowable range for the axis in the positive direction (overspeed). The axis may not be moved again until the alarm condition is cleared.
motionKernel	3202	0014	Joint Coordinate System: The command speed was greater than the allowable range for the axis in the negative direction (overspeed). The axis may not be moved again until the alarm condition is cleared.
motionKernel	3202	0015	Joint Coordinate System: The command acceleration was greater than the allowable range for the axis in the positive direction. The axis may not be moved again until the alarm condition is cleared.
motionKernel	3202	0016	Joint Coordinate System: The command acceleration was greater than the allowable range for the axis in the negative direction. The axis may not be moved again until the alarm condition is cleared.
motionKernel	3202	0017	Joint Coordinate System: The command torque was greater than the allowable range for the axis in the positive direction (overtorque). The axis may not be moved again until the alarm condition is cleared.
motionKernel	3202	0018	Joint Coordinate System: The command torque was greater than the allowable range for the axis in the negative direction (overtorque). The axis may not be moved again until the alarm condition is cleared.
motionKernel	3202	0021	World Coordinate System: The command position was outside the allowable range for the axis in the positive direction (positive overtravel). The axis may not be moved again until the alarm condition is cleared. After the alarm is cleared, it is permissible to execute a move which brings the axis back toward the allowed region, even though the axis is probably still outside the allowed region. Any move which pulls the axis further away from the allowed region will re-trigger the alarm.
motionKernel	3202	0022	World Coordinate System: The command position was outside the allowable range for the axis in the negative direction (negative overtravel). The axis may not be moved again until the alarm condition is cleared. After the alarm is cleared, it is permissible to execute a move which brings the axis back toward the allowed region, even though the axis is probably still outside the allowed region. Any move which pulls the axis further away from the allowed region will re-trigger the alarm.
motionKernel	3202	0023	World Coordinate System: The command speed was greater than the allowable range for the axis in the positive direction (overspeed). The axis may not be moved again until the alarm condition is cleared.
motionKernel	3202	0024	World Coordinate System: The command speed was greater than the allowable range for the axis in the negative direction (overspeed). The axis may not be moved again until the alarm condition is cleared.
motionKernel	3202	0025	World Coordinate System: The command acceleration was greater than the allowable range for the axis in the positive direction. The axis may not be moved again until the alarm condition is cleared.

motionKernel	3202	0026	World Coordinate System: The command acceleration was greater than the allowable range for the axis in the negative direction. The axis may not be moved again until the alarm condition is cleared.
motionKernel	3202	0027	World Coordinate System: The command torque was greater than the allowable range for the axis in the positive direction (overtorque). The axis may not be moved again until the alarm condition is cleared.
motionKernel	3202	0028	World Coordinate System: The command torque was greater than the allowable range for the axis in the negative direction (overtorque). The axis may not be moved again until the alarm condition is cleared.
motionKernel	3202	0031	The move specified would exceed the software position limits in the positive direction and was rejected before being started. The group may be moved again immediately if desired.
motionKernel	3202	0032	The move specified would exceed the software position limits in the negative direction and was rejected before being started. The group may be moved again immediately if desired.
motionKernel	3202	0033	The move specified would exceed the software speed limits in the positive direction and was rejected before being started. The group may be moved again immediately if desired.
motionKernel	3202	0034	The move specified would exceed the software speed limits in the negative direction and was rejected before being started. The group may be moved again immediately if desired.
motionKernel	3202	0035	The move specified would exceed the software acceleration limits in the positive direction and was rejected before being started. The group may be moved again immediately if desired.
motionKernel	3202	0036	The move specified would exceed the software acceleration limits in the negative direction and was rejected before being started. The group may be moved again immediately if desired.
motionKernel	3202	0037	The move specified would exceed the software torque limits in the positive direction and was rejected before being started. The group may be moved again immediately if desired.
motionKernel	3202	0038	The move specified would exceed the software torque limits in the negative direction and was rejected before being started. The group may be moved again immediately if desired.
motionKernel	3202	0039	The predictive soft limit encountered a segment that doesn't support the predicted stopping point.
motionKernel	3202	0041	Cam and Contour tables must have a header indicating the number of rows and colums and a feed forward velocity flag. Comma separated data values following the header.
motionKernel	3202	0042	In CamTables, the first (master) column must be either increasing or decreasing.
motionKernel	3202	0043	In ContourTables, the first (time) column must start at zero and be increasing.
motionKernel	3202	0044	The master position was outside the range of the CamTable, which automatically stopped the cam motion.

motionKernel	3202	0045	One or more slave axes could not attain the target position and velocity within the user specified time limit for the Cam or Gear motion.
motionKernel	3202	0046	One or more slave axes could not attain the target position and velocity within the user specified distance limit for the Cam or Gear motion.
motionKernel	3202	0051	Axis enable failed. This problem is usually a result of communication problems with the servo drive.
motionKernel	3202	0052	Runtime computation detected an invalid motion parameter.
motionKernel	3202	0061	The axis Positive Overtravel (P-OT) limit has been exceeded. Motion is prevented in the positive direction. The axis may not be moved again until the alarm condition is cleared.
motionKernel	3202	0062	The axis Negative Overtravel (N-OT) limit has been exceeded. Motion is prevented in the negative direction. The axis may not be moved again until the alarm condition is cleared.
motionKernel	3202	0100	The inverse kinematics computation detected a world position that can not be reached.
motionKernel	3202	0101	The inverse kinematics computation detected that the elbow 'handedness' (orientation) does not match the configuration. The 'handedness' must be fixed by commanding the individual axes or manually moving the robot.
motionKernel	3202	0102	The robot XY position intruded into the configured dead zone area near the origin.
Mechatrolink	3301	0009	Some motor properties, such as encoder resolution, maximum speed, and maximum torque, could not be determined for the attached motor. The serial encoder may be malfunctioning, incorrectly programmed, or unplugged.
Mechatrolink	3301	000B	Setting of Pn002, digits 3 and 4, disables torque limit and/or velocity limit in velocity and/or torque control modes. Set Pn002 = xx11 to initialize.
Mechatrolink	3301	000D	The servo network does not support this motion control mode.
Mechatrolink	3301	0018	The command position specified an instantaneous jump too large relative to the current position. Sigma-5 amplifiers give an A.94b warning and ignore subsequent position commands for any absolute position reference greater than 2,097,152 encoder pulses (2 revolutions of a 20-bit encoder). The controller watches for deviation between command position and actual motor position greater than 1,966,080 encoder pulses and issues an alarm. This is at 1.875 revolutions of a 20-bit motor little bit of margin. Sigma-II/III drives have a lower maximum following error limit of 1,048,576 encoder pulses. The position error limit on the Servopack (Pn520) should not be set greater than 1.875 rev = 1,966,080.
Mechatrolink	3301	0019	Setting of Pn002 digit 4 specifies torque feed-forward, but the SERVOPACK model does not support torque FF in position mode.
Mechatrolink	3302	00E4	The setting of the MECHATROLINK-II transmission cycle is out of the allowable range.

Mechatrolink	3304	0000	The base code for io alarms. The io's alarm value is bitwise OR'd in with this base value.
Mechatrolink	3312	0000	The base code for inverter alarms. The inverter's alarm value is bitwise OR'd in with this base value.
Mechatrolink	3312	0000	The base code for inverter alarms. The inverter's alarm value is bitwise OR'd in with this base value.
Mechatrolink	3312	0001	reserved
Mechatrolink	3312	0002	reserved
Mechatrolink	3312	0003	reserved
Mechatrolink	3312	0004	reserved
Mechatrolink	3312	0005	reserved
Mechatrolink	3312	0006	reserved
Mechatrolink	3312	0007	reserved
Mechatrolink	3312	0008	reserved
Mechatrolink	3312	0009	reserved
Mechatrolink	3312	000A	reserved
Mechatrolink	3312	000B	reserved
Mechatrolink	3312	000C	reserved
Mechatrolink	3312	000D	reserved
Mechatrolink	3312	000E	reserved
Mechatrolink	3312	000F	reserved
Mechatrolink	3312	0010	reserved
Mechatrolink	3312	0011	reserved
Mechatrolink	3312	0012	reserved
Mechatrolink	3312	0013	reserved
Mechatrolink	3312	0014	reserved
Mechatrolink	3312	0015	reserved
Mechatrolink	3312	0016	reserved
Mechatrolink	3312	0018	reserved
Mechatrolink	3312	0019	reserved
Mechatrolink	3312	001A	reserved

Mechatrolink	3312	001B	reserved
Mechatrolink	3312	001C	reserved
Mechatrolink	3312	001D	reserved
Mechatrolink	3312	001E	reserved
Mechatrolink	3312	001F	reserved
Mechatrolink	3312	0020	reserved
Mechatrolink	3312	0021	reserved
Mechatrolink	3312	0025	reserved
Mechatrolink	3312	0026	reserved
Mechatrolink	3312	0027	reserved
Mechatrolink	3312	0028	reserved
Mechatrolink	3312	0029	reserved
Mechatrolink	3312	002A	reserved
Mechatrolink	3312	002B	reserved
Mechatrolink	3312	002C	reserved
Mechatrolink	3312	002D	reserved
Mechatrolink	3312	002E	reserved
Mechatrolink	3312	002F	reserved
Mechatrolink	3312	0031	reserved
Mechatrolink	3312	0083	reserved
Mechatrolink	3312	0084	reserved
Mechatrolink	3312	0085	reserved
Mechatrolink	3312	0086	reserved
Mechatrolink	3312	0087	reserved
Mechatrolink	3312	0088	reserved
Mechatrolink	3312	0089	reserved
Mechatrolink	3312	008A	reserved
Mechatrolink	3312	008B	reserved
Mechatrolink	3312	0091	reserved

Mechatrolink	3312	0092	reserved
Mechatrolink	3312	0093	reserved
Mechatrolink	3312	0094	reserved
Mechatrolink	3312	00E6	reserved
Mechatrolink	3312	00EC	Power reset required.
Mechatrolink	3312	00ED	(Access not possible 10 consecutive times). Power reset required.
Mechatrolink	3312	00EE	(1s elapsed). Power reset required.
app	3401	0001	The user script encountered an alarm, suspending its operation.
app	3401	0002	Script syntax errors are detected before the script is actually executed, during the pre-compile phase. The syntax must be corrected before the script can be run successfully.
app	3401	0003	Script runtime errors can be caused by a variety of incorrect script routines. The most common error is an attempt to use a 'nil' object where it should not be used.
app	3401	0004	The system could not find the file specified.
app	3401	0011	A data value argument provided to the API function was out of the expected range.
app	3401	0012	An argument provided to the API function was not the expected type.
app	3401	0013	An object argument provided to the API function was not the expected object type.
app	3401	0014	A scalar value was provided where a vector was expected, or a vector value was provided where a scalar was expected.
app	3401	0015	The script attempted to write to a read-only variable.
app	3401	0016	Use of that API function is not permitted with the current conditions and/or arguments.
app	3401	0017	The number of data values provided did not match the expected number of axes.
app	3401	0018	CamTable must have a header indicating the number of rows and columns and a feed forward velocity flag. Comma separated data values follows the header. The first (master) column must be either increasing or decreasing.
app	3401	0019	ContourTables must have a header indicating the number of rows and columns and a feed forward velocity flag. Comma separated data values follow the header. In ContourTables, the first (time) column must start at zero and be increasing.
app	3401	001A	It is prohibited to start a torque (or velocity) move when any moves other than torque moves (or velocity moves) are currently in progress or queued.

app	3401	00ED	'LastMove' events should be detected when a move completes normally or is aborted. However, the controller detected a situation in which the move finished but the event did not occur. Please submit an SCR.
app	3406	0001	A web server login user was assigned to a group which did not exist. The system is unaffected, but that user will have limited (default) access.
app	3406	0002	The default login group for the web server was assigned to a group which did not exist. Access control has been disabled, because a minimal amount of access is required in order to log in. The configuration file should be fixed before continuing.
app	3406	0003	The web server configuration specified access control should be enabled, but did not specify at least one path to control access to. Access control has been disabled. The configuration file should be fixed before continuing.
app	3407	0002	The base directory for configuration files was missing and has been created automatically. The system has booted in a minimal configuration mode, and most functionality is limited. Please upload a new complete configuration file set.
app	3407	0003	A required default configuration file was missing. A minimal configuration for the corresponding component has been loaded, and some functionality may be limited.
app	3407	0004	A required default configuration file was incorrectly formatted. A minimal configuration for the corresponding component has been loaded, and some functionality may be disabled.
app	3407	0005	A configuration file specified by the user configuration file set was incorrectly formatted. The corresponding default configuration file is being used instead.
app	3407	0006	The file describing which configuration set to use was corrupted. The default configuration set is being used.
app	3407	0007	An error occurred while writing a config file. The file system may be full or damaged.
app	3407	0101	The configured RAM disk on the controller was unable to be created.
app	3407	0102	Detected an unsupported card.
app	3407	0104	Data in the controller SRAM did not match the expected value. It should be treated as corrupted until it is re-initialized.
app	3407	0106	The SRAM battery backup power failed. SRAM data should be treated as corrupted until it is re-initialized.
app	3407	0107	The controller's time-of-day clock detected a voltage decrease in the backup battery. The current time and date is likely to be incorrect. This alarm can be cleared, but will recur when the controller is powered ON until the time and day is reset and the battery is replaced.
app	3409	0001	The servo network axis node for the axis specified in the configuration file was not found.

app	3409	0002	Axis enable failed. This problem is usually a result of communication problems with the servo drive.
app	3409	0003	Axis group motion activation failed. Some axes in the group are currently under control of another group, or motion has been blocked by the user.
app	3409	0004	The motion segment could not be added to the motion queue because it is already queued.
app	3409	0005	Moves are prohibited when any of the group's axes are disabled, have an alarm, or are in violation of their soft limits.
app	340A	0001	The source for the logical input was not found, so the configured input will not be available.
app	340A	0002	The source for the logical output was not found, the the configured output will not be available.
app	340A	0003	Two or more axis in the configuration file had the same axis ID.
app	340A	0004	The servo network axis node for the axis specified in the configuration file was not found.
app	340A	0005	The axis group specified in the configuration file could not be created because either one or more of its axes are invalid or the group name is already being used.
app	340A	0006	The type of AtTargetAgent specified in the configuration file is unknown. This is because AtTargetAgent could not be created.
app	340A	0007	The number of constraints for axis group soft limit must be the same as the number of axes in the axis group.
app	340A	0008	The axis group doesn't have the configured frame.
app	340A	000B	A continuous-wrap range for an axis causes its position to automatically wrap around between two user-specified numbers. Generally these numbers evaluate to full revolutions of the encoder but other ranges are permitted. However, all ranges specified in user units must map exactly to an integral number of encoder pulses. This alarm indicates that the mapping from user units to encoder ticks was inexact. Use more precise numbers to describe the range or choose a different range that evaluates to an integral number of encoder pulses. When this alarm occurs at startup or servo-net reset, it indicates that the axis has not been connected to an axis node and cannot be servoed on. Otherwise, this alarm indicates that the specified continuous-wrap range was not put into effect.
app	340A	000D	Two or more logical outputs specified in the I/O configuration file use the same physical bit. This can cause writes to not correctly generate value-change events on logical outputs for the shared bits. The configuration file should be fixed.
app	340A	000E	One or more of the data parameters in the axis configuration file were out-of-range or otherwise incorrectly specified for the axis. The axis was not created and is not available.
app	340A	0010	After servo network reset, the Axis failed to reconnect to the servo network. The drive might have been removed from the network, the node ID of the drive might have changed or there might be a communication problem.

app	340A	0012	After servo network reset, the network I/O failed to reconnect to the servo network. The network I/O module might have been removed from the network, the node ID of the network I/O module might have changed or there might be a network communication problem.
app	340A	0013	After servo network reset, a new axis node was discovered. This axis node is not associated with any existing axes and will not be available. To make this node available, update the configuration and power cycle the controller.
app	340A	0014	After servo network reset, a new I/O node was discovered. This I/O node is not associated with any existing I/O and will not be available. To make this node available, update the configuration and power cycle the controller.
app	340A	0017	One or more of the axis data or configuration parameters were inconsistent or incompatible with the axis node specified. The axis was created but was not connected to the servo node.
app	340A	001B	Two or more LogicalInput have the same ID. The configuration file should be fixed.
app	340A	001C	Two or more LogicalOutput have the same ID. The configuration file should be fixed.
app	340A	001D	Two or more AnalogInput have the same ID. The configuration file should be fixed.
app	340A	001E	Two or more AnalogOutput have the same ID. The configuration file should be fixed.
app	340A	001F	Analog I/O configuration is missing the 'hardwareConfig' element, and configuration could not be resolved by the physical hardware. The configuration file should be fixed by adding this element to the analog I/O element.
app	340A	0020	One or more axes failed to respond to a servo-off command during a system I/O initiated abort. This is normally the result of communication problems with the drive, which also causes an automatic servo-off.
app	340A	0022	Reset of a servo node failed.
app	340A	0023	The axis position may not be valid because the persistent axis data was corrupted. SRAM should be reinitialized and the axis should be homed.
app	340C	0000	All PLCopen error codes are in the range from 0x0000 to 0x0fff.
app	340C	0001	Time limit exceeded.
app	340C	0002	Distance limit exceeded.
app	340C	0003	Torque limit exceeded.
app	340C	0100	Reserved
app	340C	0101	MBTCP Client I/O driver, MBTCP Connection config is missing input member

app	340C	0102	I/O memory area is not aligned to the correct byte to accommodate reading and writing.
app	340C	0103	Reserved
app	340C	0104	Reserved
app	340C	0106	Reserved
app	340C	0107	Reserved
app	340C	0108	Reserved
app	340C	0109	Reserved
app	340C	010A	Not enough memory on PLC for POU during insertion. Project size must be reduced.
app	340C	010B	Internal PLC Error in memory management. This error can occur if an older project was loaded on the controller which was compiled to use lees of the controllers total memory space. By using the "Resource" Dialog box, perform "Delete On target," for the bootproject, and then download the application code again.
app	340C	010C	Internal PLC Error: POU invalid
app	340C	010D	Internal PLC Error: Unknown POU type
app	340C	010E	Cannot insert a POU because there is no project.
app	340C	010F	Internal PLC Error: Cannot insert a POU because it does not belong to the project.
app	340C	0110	Internal PLC Error: Cannot insert a POU.
app	340C	0111	Internal PLC Error: Invalid POU type
app	340C	0112	Internal PLC Error: Memory reorganization not possible; PLC stopped.
app	340C	0113	Internal PLC Error: SPG defined more than once.
app	340C	0114	Internal PLC Error: Memory error for initialized data of POU.
app	340C	0115	Internal PLC Error: Retain CRC failed. Possible reasons: (1) actual project does not have any retain data, (2) actual project is 'old style' without retain CRC (3) PLC isn't in STOP mode
app	340C	0116	Internal PLC Error: FB defined more than once.
app	340C	0117	Internal PLC Error: Not all POU sent.
app	340C	0118	Internal PLC Error: No program memory defined.
app	340C	0119	Internal PLC Error: Invalid FB number.
app	340C	011A	Internal PLC Error: Invalid PG number.
app	340C	011B	Internal PLC Error: Invalid SPG number.

app	340C	011C	POU uses more than 80 percent of POU memory.
app	340C	011D	Project uses more than 80 percent of program memory.
app	340C	011E	Internal PLC Error: Invalid function or function block.
app	340C	011F	Internal PLC Error: Invalid firmware function or function block.
app	340C	0120	Internal PLC Error: Invalid program.
app	340C	0121	Internal PLC Error: Invalid change of mode.
app	340C	0122	Internal PLC Error: Unknown system mode! PLC stopped!
app	340C	0123	Stack overflow. Increase stack size.
app	340C	0124	System error in module. Check debugging output via controller's web interface.
app	340C	0125	System error in module. Check debugging output via controller's web interface.
app	340C	0126	Internal PLC Error: Error during indirect variable access.
app	340C	0127	PLC CPU overload.
app	340C	0128	Internal PLC Error: Breakpoint unexpected.
app	340C	0129	Internal PLC Error: Error in data configuration.
app	340C	012A	Internal PLC Error: Error in retain data configuration.
app	340C	012B	Internal PLC Error: Floating point error.
app	340C	012C	Internal PLC Error: Fatal error.
app	340C	012D	Output string is too short.
app	340C	012E	Input string is too short.
app	340C	012F	Invalid input parameter 'p' or 'l' (position or length).
app	340C	0130	String is identical to the output string.
app	340C	0131	Invalid string comparison.
app	340C	0132	Invalid data type for string conversion.
app	340C	0133	Error in format string.
app	340C	0134	Error during string conversion.
app	340C	0135	Error in I/O configuration.
app	340C	0136	Initializing I/O driver failed.
app	340C	0137	Board not instantiated.

app	340C	0138	Board number not allowed.
app	340C	0139	Input Group doesn't fit.
app	340C	013A	Output Group doesn't fit.
app	340C	013B	Board not found.
app	340C	013C	Error reading inputs.
app	340C	013D	Error writing outputs.
app	340C	013E	Error creating I/O semaphore.
app	340C	013F	Invalid memory size.
app	340C	0140	Invalid I/O memory address.
app	340C	0141	Internal PLC Error: PG defined more than once.
app	340C	0142	POU exceeds 64K module size during insertion. POU size must be reduced.
app	340C	0143	Internal PLC Error: Error in task configuration.
app	340C	0143	Unknown I/O Driver.
app	340C	0200	Common causes of invalid configuration include duplicate t2o/o2t assembly instances or invalid client connection parameters.
app	340C	0202	Unable to connect to the EtherNet/IP remote server. Common causes include: invalid remote server address, invalid gateway, invalid subnet mask, or the Ethernet network is not correctly configured.
app	340C	0203	There is no route to the EtherNet/IP server. Common causes include: invalid remote server address, invalid gateway, invalid subnet mask, or the Ethernet network is not correctly configured.
app	340C	0204	Unable to reach the network for the EtherNet/IP server. Common causes include: invalid remote server address, invalid gateway, invalid subnet mask, or the Ethernet network is not correctly configured.
app	340C	0205	Remote server rejected connection attempt. The remote server may not be listening for connections or there may be a firewall preventing the connection.
app	340C	0206	The Ethernet/IP client ran out of connection slot resources. Reduce the number of concurrent client connections.
app	340C	0302	Unable to connect to the Modbus TCP slave. Common causes include: invalid Modbus TCP slave address, invalid gateway, invalid subnet mask, or the Ethernet network is not correctly configured.
app	340C	0303	There is no route to the Modbus TCP slave. Common causes include: invalid Modbus TCP slave address, invalid gateway, invalid subnet mask, or the Ethernet network is not correctly configured.

app	340C	0304	Unable to reach the network for the Modbus TCP slave. Common causes include: invalid Modbus TCP slave address, invalid gateway, invalid subnet mask, or the Ethernet network is not correctly configured.
app	340C	0305	Modbus TCP slave rejected connection attempt. The Modbus TCP slave may not be listening for connections or there may be a firewall preventing the connection.
app	340C	0306	The Modbus TCP master ran out of connection slot resources. Reduce the number of concurrent slave connections.
app	340C	1020	The controller battery voltage has dropped, indicating it has failed or is about to fail. While the controller is powered on, the battery should be replaced as soon as possible or a prolonged power-down state will cause various static data to be lost.
app	340C	1028	The driver parameter specified in the axis configuration caused an exception
app	340C	1029	The driver parameter did not match the axis configuration
app	340C	1030	The configured axis count exceeded the allowable limit.
app	340C	1031	The axis count exceeded the allowable limit due to an auto-detected axis.
app	340C	1033	Using an incompatible version of the PLCopenPlus firmware function block library may result in controller instability. Consequently, the PLC application will not be allowed to run. Please change either the controller's firmware or the firmware function block library.
app	340C	1110	All motion error codes are in the range from 0x1111 to 0x111f.
app	340C	1111	The move could not be buffered because the motion queue for that axis is full.
app	340C	1112	The move could not be started because motion is prohibited.
app	340C	1113	The servo drive failed to enable or disable.
app	340C	1114	Drive parameter read/write did not complete.
app	340C	1115	Drive parameter read/write failed
app	340C	1116	Torque move prohibited while non-torque moves queued or in progress.
app	340C	1117	CamOut called while not camming.
app	340C	1118	The master slave relationship can not be modified because the master axis has not been set yet.
app	340C	1119	CamFileSelect can not open a second cam table while the first cam table is still being opened.
app	340C	111A	The function block can not command an external axis.
app	340C	111B	The homing sequence is already in progress.

app	340C	111C	MC_SetPosition can not be called while the axis is moving.
app	340C	111D	Motion aborted due to axis alarm.
app	340C	111E	MC_SetPosition can not set the position to be outside the configured wrap range.
app	340C	111F	Can not transition to homing state; must be in StandStill state first.
app	340C	1120	Clear alarms is already in progress.
app	340C	1121	Axis reset is already in progress.
app	340C	1122	Mechatrolink reset is already in progress.
app	340C	1123	CamStructSelect cannot tansfer a second cam structure while the first cam structure is being transferred.
app	340C	1124	CamTableRead cannot be read a second cam structure while the first cam structure is being read.
app	340C	1125	CamTableWrite cannot write a second cam structure while the first cam structure is being written.
app	340C	1126	MC_SetPosition cannot be called while either the master or slave axis is caming.
app	340C	1127	The function block can not be used with a virtual axis.
app	340C	1128	The function block can not be used with an inverter axis.
app	340C	1129	Y_VerifyParmeters and Y_WriteParameters can not be called a second time while the first one is in progress.
app	340C	1210	All error codes for structures are in the range from 0x1211 to 0x121f.
app	340C	1211	Axis ID does not correspond to an axis.
app	340C	1212	The master slave relationship is not defined.
app	340C	1213	The input reference does not correspond to a real input
app	340C	1214	The output reference does not correspond to a real output.
app	340C	1215	The input/output number does not correspond to a real input or output bit.
app	340C	1216	Trigger reference is not valid.
app	340C	1217	The cam switch structure is not valid.
app	340C	1218	The track structure is not valid.
app	340C	1219	Table size results in misaligned data.
app	340C	121A	Buffer size results in misaligned data.

app	340C	121B	Table type is not supported.
app	340C	121C	Invalid start index.
app	340C	121D	Invalid end index.
app	340C	1220	All error codes for invalid enumeration values are in the range from 0x1221 to 0x122f.
app	340C	1221	'BufferMode' does not correspond to a valid enumeration value.
app	340C	1222	'Direction' does not correspond to a valid enumeration value.
app	340C	1223	'StartMode' does not correspond to a valid enumeration value.
app	340C	1224	'ShiftMode' does not correspond to a valid enumeration value.
app	340C	1225	'OffsetMode' does not correspond to a valid enumeration value.
app	340C	1226	'Mode' does not correspond to a valid enumeration value.
app	340C	1227	'SynchMode' does not correspond to a valid enumeration value.
app	340C	1228	'Parameter' does not correspond to a valid enumeration value.
app	340C	1229	'AdjustMode' does not correspond to a valid enumeration value.
app	340C	122A	'RampIn' does not correspond to a valid enumeration value.
app	340C	122B	'ControlMode' does not correspond to a valid enumeration value.
app	340C	1230	All error codes for range errors are from 0x1221 to 0x122f.
app	340C	1231	Distance parameter is less than zero.
app	340C	1232	Velocity parameter is less than or equal to zero.
app	340C	1233	Acceleration is less than or equal to zero.
app	340C	1234	Deceleration is less than or equal to zero.
app	340C	1235	Torque is less than or equal to zero.
app	340C	1236	Time is less than or equal to zero
app	340C	1237	Specified time was less than zero.
app	340C	1238	Specified scale was less than or equal to zero.
app	340C	1239	Velocity is negative.
app	340C	123A	Denominator is zero.
app	340C	123B	Jerk is less than or equal to zero.
app	340C	123C	TorqueRamp is less than or equal to zero.
app	340C	123D	Engage position is outside the table domain.

app	340C	123E	Negative engage width.
app	340C	123F	Disengage position is outside the table domain.
app	340C	1240	Negative disengage width.
app	340C	1241	StartPosition is outside of master's range.
app	340C	1242	EndPosition is outside of master's range.
app	340C	1310	All error codes for invalid input data range from 0x1211 to 0x121f.
app	340C	1311	The specified Pn does not exist.
app	340C	1312	The mask does not correspond to valid tracks.
app	340C	1313	The profile must start with relative time equal to zero, and the time must be increasing.
app	340C	1314	The specified cam file does not exist.
app	340C	1315	Invalid header for the cam file. Cam tables must have a header indicating the number of rows, number of columns and a feed forward velocity flag
app	340C	1316	The first (master) column must be either increasing or decreasing.
app	340C	1317	Cam table reference does not refer to a valid cam table.
app	340C	1318	The engage phase exceeded the time limit. Slave axis could not attain the target position and velocity within the user specified time limit.
app	340C	1319	The engage phase exceeded the distance limit. Slave axis could not attain the target position and velocity within the user specified master distance.
app	340C	131A	Invalid width input. Width is an enumeration type with the following allowable values 'WIDTH_8'=0, 'WIDTH_16'=1, and 'WIDTH_32'=2.
app	340C	131B	The slave axis can not be the same as the master axis.
app	340C	131C	Default drive parameter info is not available for this parameter.
app	340C	131D	Invalid external axis.
app	340C	131E	Invalid virtual axis.
app	340C	131F	File extension is not recognized or missing.
app	340C	1320	Cound not find the axis parameter file.
app	340C	2110	All log error codes are in the range from 0x2111 to 0x211f.
app	340C	2111	Adding log items or setting up log is not possible because the data log is already set up.

app	340C	2112	Starting or stopping logging is not possible because the data log is not set up.
app	340C	2113	Invalid handle for user log item.
app	340C	2114	Data log can not be created because too many data logs are in use.
app	340C	2115	Invalid handle for data log.
app	340C	2116	A user log item can only support eight inputs for each type.
app	340C	2117	Saving the log failed.
app	340C	B114	Failed to send clear alarms command.
app	340C	B115	Failed to reset Mechatrolink.
app	340C	B116	Mechatrolink reset is prohibited while axes are moving.
app	340C	B117	Failed to initialize abs encoder.
app	340C	E110	All error codes for ProConOS errors range from 0xE111 to 0xE11f.
app	340C	E111	Instance object is NULL.
app	340C	E112	The instance data is NULL.
app	340C	E113	The structure pointer check sum is invalid.
app	340C	E114	The structure size does not match.
app	340C	EDED	This function block was implemented in a later firmware version. If you would like to use this function block, then the controller must be udpated.
app	340C	F110	All error codes for kernel errors range from 0xF111 to 0xF11f.
app	340C	F111	An internal assertion in the motion kernel failed indicating the controller is not in a stable state. This error should be reported to Yaskawa Electric America.
user	3501	0000	A user script task posted an alarm directly.
motionKernel	4202	0001	The command position will soon reach the allowable range for the axis in the positive direction (positive overtravel). The axis may not be moved again until the alarm condition is cleared. After the alarm is cleared, it is permissible to execute a move which brings the axis back toward the allowed region, even though the axis is probably still outside the allowed region. Any move which pulls the axis further away from the allowed region will re-trigger the alarm.

motionKernel	4202	0002	The command position will soon reach the allowable range for the axis in the negative direction (negative overtravel). The axis may not be moved again until the alarm condition is cleared. After the alarm is cleared, it is permissible to execute a move which brings the axis back toward the allowed region, even though the axis is probably still outside the allowed region. Any move which pulls the axis further away from the allowed region will re-trigger the alarm.
motionKernel	4202	0003	The command speed will soon reach the allowable range for the axis in the positive direction (overspeed). The axis may not be moved again until the alarm condition is cleared.
motionKernel	4202	0004	The command speed will soon reach the allowable range for the axis in the negative direction (overspeed). The axis may not be moved again until the alarm condition is cleared.
motionKernel	4202	0005	The command acceleration will soon reach the allowable range for the axis in the positive direction. The axis may not be moved again until the alarm condition is cleared.
motionKernel	4202	0006	The command acceleration will soon reach the allowable range for the axis in the negative direction. The axis may not be moved again until the alarm condition is cleared.
motionKernel	4202	0007	The command torque will soon reach the allowable range for the axis in the positive direction (overtorque). The axis may not be moved again until the alarm condition is cleared.
motionKernel	4202	0008	The command torque will soon reach the allowable range for the axis in the negative direction (overtorque). The axis may not be moved again until the alarm condition is cleared.
motionKernel	4202	0011	The command position will soon reach the allowable range for the axis in the positive direction (positive overtravel). The axis may not be moved again until the alarm condition is cleared. After the alarm is cleared, it is permissible to execute a move which brings the axis back toward the allowed region, even though the axis is probably still outside the allowed region. Any move which pulls the axis further away from the allowed region will re-trigger the alarm.
motionKernel	4202	0012	The command position will soon reach the allowable range for the axis in the negative direction (negative overtravel). The axis may not be moved again until the alarm condition is cleared. After the alarm is cleared, it is permissible to execute a move which brings the axis back toward the allowed region, even though the axis is probably still outside the allowed region. Any move which pulls the axis further away from the allowed region will re-trigger the alarm.
motionKernel	4202	0013	The command speed will soon reach the allowable range for the axis in the positive direction (overspeed). The axis may not be moved again until the alarm condition is cleared.
motionKernel	4202	0014	The command speed will soon reach the allowable range for the axis in the negative direction (overspeed). The axis may not be moved again until the alarm condition is cleared.
motionKernel	4202	0015	The command acceleration will soon reach the allowable range for the axis in the positive direction. The axis may not be moved again until the alarm condition is cleared.

motionKernel	4202	0016	The command acceleration will soon reach the allowable range for the axis in the negative direction. The axis may not be moved again until the alarm condition is cleared.
motionKernel	4202	0017	The command torque will soon reach the allowable range for the axis in the positive direction (overtorque). The axis may not be moved again until the alarm condition is cleared.
motionKernel	4202	0018	The command torque will soon reach the allowable range for the axis in the negative direction (overtorque). The axis may not be moved again until the alarm condition is cleared.
motionKernel	4202	0021	The command position will soon reach the allowable range for the axis in the positive direction (positive overtravel). The axis may not be moved again until the alarm condition is cleared. After the alarm is cleared, it is permissible to execute a move which brings the axis back toward the allowed region, even though the axis is probably still outside the allowed region. Any move which pulls the axis further away from the allowed region will re-trigger the alarm.
motionKernel	4202	0022	The command position will soon reach the allowable range for the axis in the negative direction (negative overtravel). The axis may not be moved again until the alarm condition is cleared. After the alarm is cleared, it is permissible to execute a move which brings the axis back toward the allowed region, even though the axis is probably still outside the allowed region. Any move which pulls the axis further away from the allowed region will re-trigger the alarm.
motionKernel	4202	0023	The command speed will soon reach the allowable range for the axis in the positive direction (overspeed). The axis may not be moved again until the alarm condition is cleared.
motionKernel	4202	0024	The command speed will soon reach the allowable range for the axis in the negative direction (overspeed). The axis may not be moved again until the alarm condition is cleared.
motionKernel	4202	0025	The command acceleration will soon reach the allowable range for the axis in the positive direction. The axis may not be moved again until the alarm condition is cleared.
motionKernel	4202	0026	The command acceleration will soon reach the allowable range for the axis in the negative direction. The axis may not be moved again until the alarm condition is cleared.
motionKernel	4202	0027	The command torque will soon reach the allowable range for the axis in the positive direction (overtorque). The axis may not be moved again until the alarm condition is cleared.
motionKernel	4202	0028	The command torque will soon reach the allowable range for the axis in the negative direction (overtorque). The axis may not be moved again until the alarm condition is cleared.
Mechatrolink	4301	000A	The SERVOPACK model type was unable to be determined. This can indicate that some parameters may be incorrect.
Mechatrolink	4301	000C	The controller was unable to send the drive command because servo network resources were allocated to motion. Brake on, brake off, absolute encoder initialization and alarm clear can only be sent when not moving.

Mechatrolink	4301	001C	The Mechatrolink.xml file specified duplicate configuration structures for a node. The first match was used, subsequent matches were ignored.
Mechatrolink	4301	001D	The Mechatrolink.xml file specified duplicate default configuration structures for a node type. The first default structure was used, subsequent structures were ignored.
Mechatrolink	4301	001E	A node was detected on the mechatrolink network, but it is not supported by the software.
Mechatrolink	4301	001F	The Mechatrolink comm board inverter control reference/run control is not enabled. Change the settings in parameters b1-01 and b1-02 to '3' to select PCB reference/run source.
Mechatrolink	4301	0020	The drive returned an invalid watch dog code indicating a possible dropped communication packet.
Mechatrolink	4302	0000	The base code for Sigma-II drive warnings. The drive's warning value is bitwise OR'd in with this base value.
Mechatrolink	4302	0091	This warning occurs before the overload alarms (A.710 or A.720) occur. If the warning is ignored and operation continues, an overload alarm may occur.
Mechatrolink	4302	0092	This warning occurs before the regenerative overload alarm (A.32) occurs. If the warning is ignored and operation continues, a regenerative overload alarm may occur.
Mechatrolink	4302	0093	This warning occurs when the absolute encoder battery voltage is lowered. Continuing the operation in this status may cause an alarm.
Mechatrolink	4302	0094	A value outside the setting range was set using MECHATROLINK-II communications.
Mechatrolink	4302	0095	A command not supported in the product specifications was sent, OR the command reception conditions were not met.
Mechatrolink	4302	0096	A communications error occurred (once).
Mechatrolink	4303	0000	The base code for Sigma-III drive warnings. The drive's warning value is bitwise OR'd in with this base value.
Mechatrolink	4303	0900	Position error pulse exceeded the parameter settings (Pn520 x Pn51E/100).
Mechatrolink	4303	0901	When the servo turned ON, the position error pulses exceeded the parameter setting (Pn526 x Pn528/100).
Mechatrolink	4303	0910	This warning occurs before the overload alarms (A.710 or A.720) occur. If the warning is ignored and operation continues, an overload alarm may occur.
Mechatrolink	4303	0911	Abnormal vibration at the motor speed was detected. The detection level is the same as A.520. Set whether to output an alarm or warning by "Vibration Detection Switch" of Pn310.
Mechatrolink	4303	0920	This warning occurs before the regenerative overload alarm (A.320) occurs. If the warning is ignored and operation continues, a regenerative overload alarm may occur.

Mechatrolink	4303	0930	This warning occurs when the absolute encoder battery voltage is lowered. Continuing the operation in this status may cause an alarm.
Mechatrolink	4303	0941	The change of the parameters can be validated only after turning the power ON from OFF.
Mechatrolink	4303	094A	Incorrect command parameter number was set.
Mechatrolink	4303	094B	Command input data is out of range.
Mechatrolink	4303	094C	Calculation error was detected.
Mechatrolink	4303	094D	Data size does not match.
Mechatrolink	4303	095A	Command was sent though command sending condition was not satisfied.
Mechatrolink	4303	095B	Unsupported command was sent.
Mechatrolink	4303	095C	Command condition is not satisfied for parameter settings.
Mechatrolink	4303	095D	Command, especially latch command, interferes.
Mechatrolink	4303	095E	Subcommand and main command interfere.
Mechatrolink	4303	0960	Communications error occurred during MECHATROLINK communications.
Mechatrolink	4304	0000	The base code for io warnings. The io's warning value is bitwise OR'd in with this base value.
Mechatrolink	4312	0000	The base code for inverter warnings. The inverter's warning value is bitwise OR'd in with this base value.
Mechatrolink	4312	0001	Reserved
Mechatrolink	4312	0002	Reserved
Mechatrolink	4312	0003	Reserved
Mechatrolink	4312	0004	Reserved
Mechatrolink	4312	0005	Reserved
Mechatrolink	4312	0006	Reserved
Mechatrolink	4312	0007	Reserved
Mechatrolink	4312	0008	Reserved
Mechatrolink	4312	0009	Reserved
Mechatrolink	4312	000A	Reserved
Mechatrolink	4312	000B	Reserved
Mechatrolink	4312	000C	Reserved

Mechatrolink	4312	000D	Reserved
Mechatrolink	4312	000E	Reserved
Mechatrolink	4312	0010	Reserved
Mechatrolink	4312	0011	Reserved
Mechatrolink	4312	0012	Reserved
Mechatrolink	4312	0013	Reserved
Mechatrolink	4312	0014	Reserved
Mechatrolink	4312	0017	Reserved
Mechatrolink	4312	0018	Reserved
Mechatrolink	4312	001A	Reserved
Mechatrolink	4312	001B	Reserved
Mechatrolink	4312	001C	Reserved
Mechatrolink	4312	001D	Reserved
Mechatrolink	4312	001E	Reserved
Mechatrolink	4312	001F	Reserved
Mechatrolink	4312	0022	Reserved
Mechatrolink	4312	0023	Reserved
Mechatrolink	4312	0024	Reserved
Mechatrolink	4312	0025	Reserved
Mechatrolink	4312	0026	Reserved
Mechatrolink	4312	0094	Reserved
Mechatrolink	4312	0095	Reserved
Mechatrolink	4312	0096	Reserved
Mechatrolink	4312	00E5	Reserved
app	4401	0008	Each call to groupAxes() must be matched by a corresponding call to ungroupAxes(). If a script exits without such a matching call (thus leaving an 'orphaned' group behind), this warning is issued. Clearing the warning also ungroups the orphaned group.
app	4401	0009	The debug stack trace was longer than expected. It may be clipped.

app	4403	0001	The event queue for the remote client was full, and an event was dropped. This is generally caused either by exceeding the network bandwidth or exceeding the general system processing power (starving the connection). When an event is dropped in this manner, the connection is terminated.
app	4403	0005	An RMI connection was attempted by an external client and rejected due to the concurrent connection limit.
app	4407	0001	The configuration file directory is read-only or resides on a read-only file system. Attempts to update the configuration or create directories will fail.
app	4407	0002	An attempt was made to write to a read-only configuration file. The write failed.
app	4407	0105	There was an indication that the SRAM battery backup power may have failed temporarily. SRAM data may have been compromised.
app	4408	0001	The alarm history was configured to use NVRAM storage, but either the available NVRAM was not sufficient to contain the configured buffer size, or the configured buffer size was not large enough to contain the configured number of records. The alarm history will contain fewer records than configured.
app	4408	0002	The alarm history was configured to use NVRAM storage and the data was found to be corrupted. The alarm history has been lost. NOTE: this alarm also occurs if the configured size of the alarm history has been changed.
app	440A	000C	The position and torque scales specified in the configuration file have different signs. As a result, a positive acceleration results in a negative torque, and position limits are opposite in sign as the torque limits.
app	440A	000F	The axis was temporarily disconnected from the servo network during reset. During this time, the feedback data is not valid and the axis cannot be moved.
app	440A	0011	The network I/O was temporarily disconnected from the servo network during reset. During this time, any network I/O state change will be unobservable to the controller.
app	440A	0019	The system was rebooted by the user.
app	440A	001A	The system failed to shut down gracefully during a reboot, although the reboot did occur. This does not necessarily indicate that the software is damaged.
app	440B	0001	The controller is running out of memory. Memory should be freed as soon as possible. Try closing connections to the controller or stopping scripts.
app	440B	0003	The largest free memory block is approaching the critical level. Memory should be freed as soon as possible. Try closing connections to the controller or stopping scripts.
app	440C	0105	Reserved
app	440C	1032	The configuration file version is not compatible with the firmware version. Please use the configuration tool to update the configuration files to match the the firmware version.

app	440C	1034	Some function blocks are not supported by the controller firmware. If these function blocks are used in the PLC application, then their ErrorID will always equal 60909. If these function blocks are needed, then please upgrade the controller's firmware.
app	4501	0000	A user script task posted a warning directly.