YASKAWA

Quick Reference Guide

MPiec Series Controllers

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Web Sever Procedures

MP2000iec Series Controllers

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KEY INFORMATION The controller will be comissioned for a new project.
Scenario 1: Controller new in box
Scenario 2: Controller with unknown configuration

Step	Description	Detail
1	Install option modules	Use the battery cover to remove the module cover and module, if required, as illustrated in manual YEA-SIA-IEC-2 section 5.1.5.
2	Verify DIP switch setting	SW1 = all off except CNFG on. SW2 = all off. See table 1.03 below for more details.
3	Wire 24V DC Power	Wire and install according to the hardware manual YEA-SIA-IEC-2
4	Establish ethernet communication with controller	See procedure 1.4 - type controller IP address into Internet Explorer
5	Login to Webserver	Login as Admin/MP2300S (case sensitive) See procedure 2.1.
6	Set IP address	Select "Ethernet Config". Enter IP address and Subnet Mask. Click "Update Built-in Ethernet Settings".
7	Set default gateway	Select "Ethernet Config". Enter Default Gateway. If not gateway device exists on the network, enter the same address as the IP address. Click "Update Built-in Ethernet Settings".
8	Set date and time	Select "Set Clock". Adjust the date and time. Check box "auto-run". Click "Set Date/Time" to apply.
9	Reboot Controller	Under "Maintenance" -> reboot, then "Reboot Controller" and "OK" to confirm. Wait 45 seconds for reboot.
10	Upgrade firmware	The latest firmware should be loaded before application development. For field replacement the firmware may be matched to the original firmware level. (See procedure 2.5)

1.1   Set up the MP2600Siec controller (Firmware 2.x)

KEY INFORMATION The controller will be comissioned for a new project.
Scenario 1: Controller new in box
Scenario 2: Controller with unknown configuration

Step	Description	Detail
1	Install Battery for SRAM	Refer to Manual YEA-SIA-IEC-6 section 7. Remove case, insert metal bracket, secure battery holder with screw. Connect battery extension, slide battery in holder. Replace case, connect the battery.
2	Verify DIP switch setting	SW1 = all off except CNFG on. SW2 = all off. See table 1.03 below for more details.
3	Wire and Install Servo	Wire and install according to the corresponding Sigma-5 Option Manual such as SIEPS80000060, SIEPS80000066, SIEPS80000089, SIEPS80000098
4	Establish ethernet communication with controller	See procedure 1.4 - type controller IP address into Internet Explorer to open the controller's built in webserver.
5	Login to Webserver	Login as **Admin/MP2600** (case sensitive)
6	Set IP address	Select "Ethernet Config". Enter IP address and Subnet Mask. Click "Update Built-in Ethernet Settings".
7	Set default gateway	Select "Ethernet Config". Enter Default Gateway. If no gateway device exists on the network, enter the same address as the IP address. Click "Update Built-in Ethernet Settings".
8	Set date and time	Select "Set Clock". Adjust the date and time. Check box "auto-run". Click "Set Date/Time" to apply.
9	Initialize SRAM	Initialize SRAM -> Re-initialize SRAM, OK
10	Reboot Controller	Under "Maintenance" -> reboot, then "Reboot Controller" and "OK" to confirm. Wait 45 seconds for reboot.
11	Upgrade firmware	The latest firmware should be loaded before application development. For field replacement upgrade to the original firmware level. (See procedure 2.5)

1.2 Set the Front Panel Switches

Switch	Normal Setting	Detail
STOP	OFF	Immediately stops the program from executing. *Required for test run from Hardware Configuration or Web Interface*
SUP	OFF	Boots the controller in "Supervisor mode" before a firmware update. *Supervisor mode can also be activated through the web interface*
INIT	OFF	Initializes SRAM contents, including retained variable data, clock, and absolute encoder offsets. *Useful when SRAM has been corrupted when lithium battery has been disconnected for a long time.* Controller uses "default" hardware configuration. *Useful to recover if invalid "startup" configuration has been saved to controller.*
CNFG	ON	Discovers option modules and Mechatrolink devices at power-up. May remain on. *The discovered "disco" configuration is not used when the saved "startup" configuration exists. The discovered configuration may be saved using MotionWorks IEC Hardware Configuration.*
MON	OFF	For "network boot" or "ROM boot". Leave OFF
TEST	OFF	For "system use" or "normal operation". Leave OFF
E-INIT	OFF	Temporarily override the IP addresss with 192.168.1.1. Configured IP address is not affected. MP2600iec Port B is set to 192.168.2.1
E-TEST	OFF	Self Diagnosis of Ethernet. Leave OFF>

1.3 Set IP Address of PC (Windows 7)

Step	Description	Detail
1	Open Network Connections	In windows 7, go to control panel, network and internet, network and sharing center, and on the left choose change adapter settings. *Alternative: Type "ncpa.cpl" in windows search.*
2	Open Properties of the Connection	Find the connection you're using, such as Local Area Connection and right-click to choose properties
3	Enter static IP address in TCP/IPv4 properties.	Find "Internet Protocol Version 4 (TCP/IPv4)", then properties. Change to "use the following IP address" and type in an IP address on the same subnet as the controller. Example: If the MPiec controller is 192.168.1.1 by default, then the PC can be for example 192.168.1.50 . The subnet mask will autofill with 255,255,255,0. Click ok for the setting to take effect.
4	Troubleshoot	Under the start button, type c-m-d. Type ipconfig. IP address information about your PC appears.

1.4 Establish Ethernet Communication between Controller and PC

Step	Description	Detail
1	Determine and set IP address of PC	See procedure above for PC. Set IP address with required subnet, often the subnet is 1
2	Connect Ethernet Cables and apply power	If possible, simplify the ethernet connection by disconnecting the controller from any network, and connect directly to the PC.
3	Determine IP address of Controller	Method 1: MotionWorks IEC project -> project tree, physical hardware, right click resource, and choose settings. Method 2: MotionWorks IEC hardware configuration, TCP/IP settings Method 3: Reboot controller with E-INIT switch ON to set 192.168.1.1 (MP2600iec Port A is 192.168.1.1 and Port B is 192.168.2.1).
4	Open Webserver	Microsoft Internet Explorer, address bar, type the IP address of controller. Default is 192.168.1.1
5	Troubleshoot	Ping Test. Under the start button, type c-m-d. Type ping followed by the ip address of the controller. For example, 192.168.1.1. Ping test determines if there is any level of communication between PC and controller.

1.5 Login to Webserver
KEY INFORMATION

Step	Description	Detail
1	Establish ethernet communication with controller	See procedure 1.4 - type controller IP address into Internet Explorer to open the controller's built in webserver.
2	Enter Login Credentials	Login: **Admin** (case sensitive). Password: **MP2300S** (all caps, for MP2300Siec and MP2310iec). Password: **MP2600** (all caps, for MP2600iec). Password: **MP3200** (all caps, for MP3200iec)
	Troubleshoot	The login configuration may have been customized. Obtain the login information from the network administrator. Otherwise, the controller may be reset to factory default using Motionworks IEC. See procedure __

1.6 Set IP Address of Controller
KEY INFORMATION

Step	Description	Detail
1	Login to Webserver	See Procedure. Login: Admin. Password: MP2300S, MP2600, MP3200, MP3300
2	Open "Ethernet Config"	On the left side
3	Set IP address	Select "Ethernet Config". Enter IP address and Subnet Mask. Click "Update Built-in Ethernet Settings" to save.
4	Set default gateway	Select "Ethernet Config". Enter Default Gateway. If not gateway device exists on the network, enter the same address as the IP address. Click "Update Built-in Ethernet Settings" to save.
5	Turn off E-INIT switch	E-INIT must be off for configured ethernet settings to take effect at next reboot. If E-INIT is left on, the address will be 192.168.1.1 regardless of the Ethernet Config settings.
6	Reboot Controller	Under "Maintenance" -> reboot, then "Reboot Controller" and "OK" to confirm. Wait 45 seconds for reboot. The settings do not take effect until the controller is rebooted with E-INIT off.

1.7 Update firmware

KEY INFORMATION

Do **NOT** update firmware in the field unless directed by Yaskawa.
DO update firmware before code development begins on new application.

Step	Description	Detail
1	Establish ethernet communication with controller	See procedure 1.4 - type controller IP address into Internet Explorer to open the controller's built in webserver.
2	Determine current firmware version	The webserver welcome page lists the firmware version number, build number, and build date
3	Acquire a firmware zip file	yaskawa.com/iecfw to download firmware files. Must log in to yaskawa.com
4	Login to Webserver	See Procedure. Login: Admin. Password: MP2300S, MP2600, MP3200, MP3300
5	Stop all motion	Operate the machine according to existing program.
6	Enable supervisor mode	Under "Maintenance" -> "Update Firmware", then click "enabled via software" and "reboot controller". Wait 45 seconds for reboot.
7	Load firmware zip file	Under "Maintenance" -> "Update Firmware", then browse for firmware file, and "upload". Upload takes about 1 minute. *Do not attempt to unzip the firmware file.*
8	Update firmware	Confirm the update version. Then click "update" button. The update takes about 2 minutes. Do not use the controller during this time.
9	Reboot Controller	Under "Maintenance" -> reboot, then "Reboot Controller" and "OK" to confirm. Wait 45 seconds for reboot.

1.8 Save Project Archive (Backup controller and servo parameters)

KEY INFORMATION The project archive contains the critical data for the controller and servopacks. Save this archive at time of machine comissioning and after any change is made.

Step	Description	Detail
1	Login to Webserver	See Procedure. Login: Admin. Password: MP2300S, MP2600, MP3200, MP3300
2	Verifiy Drive Parameters	Drive Parameters -> User Parameters, "verify" each axis. *Verify compares parameters in the archive with the current parameters in the servo.* IF Verify is successful, proceed to next step. IF Verify is not successful, then the archive drive parameters do not match the current parameters in the servos. Use MotionWorks IEC hardware configuration to import parameters to project archive.
3	Save archive from controller	Project Archive -> "Browse" and select the project archive file. Then "Receive from Controller". Navigate to directory on PC to save *.zip file.

1.9 Load Project Archive

KEY INFORMATION This procedure only sends the controller program and configuration.

Step	Description	Detail
1	Login to Webserver	See Procedure. Login: Admin. Password: MP2300S, MP2600, MP3200, MP3300
2	Obtain the project archive file	*.zip is the file extention. The project archive must have been previously saved from an existing controller. It can also be created by MotionWorks IEC.
3	Send archive to controller	Project Archive -> "Browse" and select the project archive file. Select "Clean Install" to delete any previous archive files. Then "Send to Controller", "OK". Wait 1-2 minutes. *When complete the button changes from "Wait" back to "Send to Controller".*
4	Reboot	Under "Maintenance" -> reboot, then "Reboot Controller" and "OK" to confirm. Wait 45 seconds for reboot.

1.A   Startup from Project Archive

KEY INFORMATION Project Archive contains all required data including servo parameters. Archive is not active until reboot.

Step	Description	Detail
1	Set up the controller	See procedure 1.0, for new controllers.
2	Stop all motion	Operate the machine according to existing program.
3	Login to Webserver	See Procedure. Login: Admin. Password: MP2300S, MP2600, MP3200, MP3300
4	Obtain the project archive file	*.zip is the file extention. The project archive must have been previously saved from an existing controller. It can also be created by MotionWorks IEC.
5	Send archive to controller	Project Archive -> Browse, select the project archive file. "Clean Install" to delete any previous archive files. Then "Send to Controller", "OK". Wait 1-2 minutes. *When complete the button changes from "Wait" back to "Send to Controller".*
6	Send Drive Parameters	Drive Parameters -> User Parameters, "verify" each axis. *Verify compares parameters in the archive with the current parameters in the servo.* "Write" and "OK" to send parameters from archive to servo. *Takes just a couple seconds to write.*
7	Reboot #1	Under "Maintenance" -> reboot, then "Reboot Controller" and "OK" to confirm. Wait 45 seconds for reboot.
8	Initialize Absolute Encoders to clear A.810, A.820, A.CC0	Machine Operations. Determine which axis number has the alarm. Drive PN tab -> pull down to select the axis number. Click **"abs encoder init"** then **"Multiturn Reset".** *Clears alarms A.810 and A.CC0.*
9	Reboot #2	Under "Maintenance" -> reboot, then "Reboot Controller" and "OK" to confirm. Wait 45 seconds for reboot.
10	Zero-Set / Home and machine calibration	Follow steps according to application programming of machine. *Home offsets for absolute encoder are stored in SRAM of controller*.

1.B Clear Alarm A.810 (Initialize Absolute Encoders)

KEY INFORMATION

Alarm A.810 means that the absolute encoder of the servomotor lost the position during power off because BATTERY power was lost to the servomotor, invalidating the absolute position.
The alarm can by cleared by: 1) Web Server. 2) Y_ResetAbsoluteEncoder function block, 3) SigmaWin+ software, 3) Fn008 (Digital Operator).

Step	Description	Detail
1	Login to Webserver	See Procedure. Login: Admin. Password: MP2300S, MP2600, MP3200, MP3300
2	Initialize absolute encoder	Machine Operations. Determine which axis number has the alarm. Drive PN tab, pull down to select the axis number. Click **"abs encoder init"** button.
3	Reboot Controller and Sigma5 Servopack	Under "Maintenance" -> reboot, then "Reboot Controller" and "OK" to confirm. Wait 45 seconds for reboot.
4	Zero-Set / Home and machine calibration	Follow steps according to application programming of machine. *Home offsets for absolute encoder are stored in SRAM of controller*.

1.C Clear Alarm A.CC0

KEY INFORMATION

Alarm A.CC0 means that the servomotor's absolute encoder Multi-turn Limit (Rollover) setting does not match the Multi-turn Limit setting of the servopack (Pn205). The parameter can be sent from servopack to encoder by: 1) Web Server. 2) Y_ResetAbsoluteEncoder function block, 3) SigmaWin+ software, 3) Fn00C (Digital Operator).

Step	Description	Detail
1	Login to Webserver	See Procedure. Login: Admin. Password: MP2300S, MP2600, MP3200, MP3300
2	Initialize absolute encoder	Machine Operations. Determine which axis number has the alarm. Drive PN tab, pull down to select the axis number. Click **"Multiturn Reset"** button.
3	Reboot Controller and Sigma5 Servopack	Under "Maintenance" -> reboot, then "Reboot Controller" and "OK" to confirm. Wait 45 seconds for reboot.
4	Zero-Set / Home and machine calibration	Follow steps according to application programming of machine. *Home offsets for absolute encoder are stored in SRAM of controller*.

1.D Replace the controller

KEY INFORMATION

MotionWorks IEC software is NOT required
The new controller must match the old in the following areas:
1. IP address , 2. SRAM, 3. Firmware, 4.Project Archive

Step	Description	Detail
1	Set up the controller	See procedure 1.0
2	Load Project Archive	See procedure . Webserver: Project Archive -> "Browse", "Clean Install"
3	Reboot Controller	Under "Maintenance" -> reboot, then "Reboot Controller" and "OK" to confirm. Wait 45 seconds for reboot.
4	Zero-Set / Home and machine calibration	Follow steps according to application programming of machine. *Home offsets for absolute encoder are stored in SRAM of controller*.

1.E Replace a Servopack (Mechatrolink)

KEY INFORMATION:

The Servopack parameters can also be written
* From the controller, automatically, according to the controller program
* From MotionWorks IEC project file
* From a previously saved SigmaWin+ parameter file

Step	Description	Detail
1	Install the replacement servopack	Power supply, motor, encoder, Mechatrolink, IO, holding brake, regen resistors, etc
2	Set the Mechatrolink Address	Note the rotary address switch setting of existing servopack and set the same address to the replacement servopack.
3	Login to Webserver	See Procedure. Login: Admin. Password: MP2300S, MP3200, MP3300 Expect controller alarm 3301 000b "Pn002 not correctly initialized"
4	Send Drive Parameters	Drive Parameters -> User Parameters, "verify" each axis. *Verify compares parameters in the archive with the current parameters in the servo.* "Write" and "OK" to send parameters from archive to servo. *Takes just a couple seconds to write.*
5	Reboot	Under "Maintenance" -> reboot, then "Reboot Controller" and "OK" to confirm. Wait 45 seconds for reboot.

1.F   Replace ServoMotor

KEY INFORMATION:

Absolute encoder requires special consideration:

Power OFF

Install replacement motor (mount, couple, wire) and Power ON

Clear Alarm A.810 *(Absolute Encoder Only)*

Clear Alarm A.CC0 *(Only with Absolute Encoder and multi-turn limit Pn205 set)*

Cycle Power to finish clearing alarm A.810 / A.CC0

Re-Calibrate axis position to mechanical zero

Stores absolute encoder offset in controller SRAM. Updates incremental encoder offsets

Available methods to clear A.810 & A.CC0

1 Project: Integrate the Y_ResetAbsoluteEncoder function block into your code
2 WebServer: Machine Operations, DrivePn tab - select axis number, click **"Abs**
3 MWIEC Hardware Configuration: Online, Under Mechatrolink-II click on axis, click
4 SigmaWin+ : Setup - Absolute Encoder
5 Digital Operator: Fn008-> PgCl5 (and Fn013 (multi-turn reset)

1.G Replace Battery

KEY INFORMATION:

There is one battery in the controller, and also a battery in the cable of an absolute encoder motor

Replace absolute encoder battery while power is on - no further action required

Replace absolute encoder battery while power is off - See precedure 2.7 "replace servomotor"

Replace controller battery with power ON or OFF.

Do not leave controller power off without battery for more than 1 hour, to avoid corruption of SRAM data.

1.H Machine Operations and JAVA version

KEY INFORMATION:

JAVA is an ever-changing technology with security updates that compromise the functionality of the web server.

Search Yaskawa.com keyword "Java" for the latest fixes. (Example, FAQ #

Step	Description	Detail
1	Open Java Control Panel	Windows 7: Control Panel\Programs. Open "Java"
2	Change security to medium	Navigate to "security" tab. Set slider to medium.
3	Add controller IP address to Exception Site List	Click "Edit Site List", "Add", type "http://" in front of the IP address of the controller (eg. http://192.168.1.1). Click OK and continue to accept the warning.
4	Restart Internet Explorer	

MotionWorks IEC Procedures
For the MPiec Series Controllers

2.0 Start MotionWorks IEC

Step	Description	Detail
1	Double-Click the shortcut icon.	During installation, a shortcut is placed on the desktop. If the shortcut is not visible, find it under Start -> Programs -> Yaskawa

2.1 Open a saved project

KEY INFORMATION: Working projects constist of *.mwt (or *.mwe) file AND corresponding project folder.
The project may also be launched from Windows directly from the *.mwt (or *.mwe) file.

Step	Description	Detail
1	Start MotionWorks IEC	See procedure. Start -> Programs -> Yaskawa
2	Exit current project	File -> Close Project. You will be prompted to save changes. If appropriate, click "yes" to save the current project before closing.
3	Open Project	File -> Open Project. Navigate to project directory and open *.mwt file (*.mwe for Express version)

NOTE: Be sure there is no "dot" in the file path

2.2 Open a zipped project

KEY INFORMATION: Zipped projects consist of *.zwt (or *.zwe) file and must be extracted within MotionWorks IEC. DO NOT USE WinZip, WinRar, or other software.

Step	Description	Detail
1	Start MotionWorks IEC	See procedure. Start -> Programs -> Yaskawa
2	Exit current project	*(best practice)* File -> Close Project. You will be prompted to save changes. If appropriate, click "yes" to save the current project before closing.
3	Open Project	File -> Open Project. Navigate to project directory and open *.zwt file (*.zwe for Express version)
4	Choose unzip directory	Answer "NO" to the question *"would you like to unzip to the folder containint the .zwt file?"* Navigate to the desired unzip directory and Save.
5	User Library overwrite options	Usually answer "**No to all**" for Possible prompt "Library '<name>' already exists! Overwrite?
6	Firmware Library overwrite options	Usually answer "**Skip All**" for possible prompt "The project contains firmware libraries …"
7	Page Layout options	Answer "Yes to All" for pagelayout overwrite. *This feature is not used.*

2.3 Start a new project

Step	Description	Detail
1	Start MotionWorks IEC	See procedure. Start -> Programs -> Yaskawa
2	New Project	File -> New Project
3	Choose Template	Template according to controller type, OK
4	Rename Project	*(Best Practice)* File -> Save As

NOTE: Be sure there is no "dot" in the file path

2.4 Save and Backup Project

KEY INFORMATION: The project is automatically saved every time "Make" is performed.
'Save as Zip' during development as backup.

Step	Description	Detail
1	Save Project as Zip	File -> Save Project As / Zip Project As. Save as type 'Zipped Project Files (*.zwt)'.
2	Check Zip Options	By default check only '**Zip User-Libraries**' and '**Zip Frontend-Code**'. "*User-Libraries*" are the library project files you may have inserted into the Libraries folder of the project. "Frontend-Code" is the compiled code.
3	Adjust Name	If this is a backup, add a version number or description to the **file name.** Otherwise keep the name of the project.
4	Complete	Click **Save** to complete the zip operation. OK to message "Project successful zipped!"

2.5 Set Project IP Address (Connect project to controller)

KEY INFORMATION:

Step	Description	Detail
1	Establish ethernet communication with controller	See procedure 1.4 - type controller IP address into Internet Explorer to open the controller's built in webserver.
2	Start a new project or open saved project	See Procedure.
3	Open Resource Settings	Project Tree Window -> Hardware Tab, R-Click "Resource" -> choose "Settings"
4	Set controller IP address	Set the IP address "Parameter" to the address of the controller. *This is the same address used in the webserver in Step 1*
5	Open Resource Window	Online -> Project Control. Resource window opens. Resource is the controller (PLC). The project is now communicating with the PLC.

2.6 Reset the MPiec controller back to factory settings

KEY INFORMATION: Required only when starting a new application with a controller that is not new.
The controller, servopack and servomotor are reset individually in MotionWorks IEC

Step	Description	Detail
1	Establish ethernet communication with controller	See procedure 1.4 - type controller IP address into Internet Explorer to open the controller's built in webserver.
2	Start a new MotionWorks IEC Project	File -> New Project. Select template according to controller type, OK. File -> Save As. Navigate to required directory and name the project.
3	Open MotionWorks IEC Hardware Configuration	Click the Hardware Configuration Icon to open
4	Go Online with Hardware configuration	Enter the IP address of the controller. Then click the "connect" button. Select "Use Offline Configuration" or "Use Online Configuration" or "Use Startup Configuration"
5	Go Offline with Hardware Configuration	Click "Disconnect"
6	Open Controller Configuration Utilities	Select the menu "Online"-Controller Configuration Utilities. *Must be offline.*
7	Use the "Online" menu to restore to factory defaults	Execute "Restore controller to factory defaults then reboot controller", OK, Yes
8	Reboot controller	The controller reboots automatically

2.7 Reset connected Servos to factory settings

KEY INFORMATION: The controller, servopack and servomotor are reset individually in MotionWorks IE
Servopack and Servomotor must be installed and wired.

Step	Description	Detail
1	Reboot controller CNFG on	CNFG should remain on. Discovers servos and LIO cards at power up.
2	Establish ethernet communication with controller	See procedure 1.4 - type controller IP address into Internet Explorer to open the controller's built in webserver.
3	Open MotionWorks IEC Hardware Configuration	Click the Hardware Configuration Icon to open
4	Connect to the controller	Enter the IP address of the controller. "Connect". In Configuration Comparison window, click "Use Autodiscovered Configuration" on right
5	Select required axis	Hardware tree, Mechatrolink-II (Motion Engine), click on an axis that requires factory reset of amplifier or motor.
6	Reset servo parameters	click Reset Default Pn Values
7	Reset absolute encoder	click Reset Absolute Encoder
8	Repeat for each required axis	Last 3 steps above. *(This step does not apply to MP2600iec)*
9	Online Save	File -> save while still online in Hardware Configuration
10	Reboot system	Online -> reboot controller. *Reboots controller and Sigma-5 Servos*
11	Clear Possible Alarm A.CC0	If the alarm A.CC0 is encountered, see procedure to clear in Web Server

2.8 Clear Alarm A.810 (Initialize Absolute Encoders)

Step	Description	Detail
1	Establish ethernet communication with controller	See procedure 1.4 - type controller IP address into Internet Explorer to open the controller's built in webserver.
2	Start a new MotionWorks IEC Project	File -> New Project. Select template according to controller type, OK. File -> Save As. Navigate to required directory and name the project.
3	Open MotionWorks IEC Hardware Configuration	Click the Hardware Configuration Icon to open
4	Connect to the controller	Enter the IP address of the controller. Then click the "connect" button. Select "Use Online Configuration" on right.
5	Reset absolute encoder	click Reset Absolute Encoder
6	Repeat for each required axis	Last 3 steps above. *(This step does not apply to MP2600iec)*
7	Reboot system	Online -> reboot controller. *Reboots controller and Sigma-5 Servos*

2.9   Extract/Open the project stored in the controller

1	Set Project IP Address	See Procedure. The webserver may remain open.
2	Open Resource Window	Online -> Project Control. Resource window opens. Resource is the controller (PLC). The project is now communicating with the PLC.
3	Upload Project Source	"Upload" -> Project Source. *The new project closes,* click "No" to save changes to Untitled. See procedure for opening zipped project.
4	Verify project IP address	See Procedure. Project Tree Window -> Hardware Tab, R-Click "Resource" -> choose "Settings"

2.A   Configure Axes / Servopacks

Servopack configuration depends on the servopack model.
Common settings are shown below.

Set Programming Units

Click the configuration tab
Set the Load Type. Set the mechanical gear ratio.
Select measurement unit, then set Feed Constant (units moved per gearbox output shaft revolution)
Machine Cycle only applies to Load Type = Rotary. Set to 360 for rotary tables with units of degrees.

Disable Overtravel Inputs

Click the I/O tab
Set over-travel parameters to "Set Signal Off"

Disable Absolute Encoder

Click the Absolute Encoder tab
Set Absolute Encoder Usage to "use absolute encoder as incremental encoder"

Set 3-phase SGDV servopack to run single phase
Click the Function tab
Set Power Selection to "Apply Single Phase Power"

Absolute Encoder Battery Alarm/Warining
Pn008

Regeneration Power
Pn600

Absolute Encoder Multi-Turn Limit
Pn205

File-> Save
If OFFLINE, use the menu Online - Controller Configuration Utilities, **Send Offline Configuration**
Cycle Power on controller and amplifiers.
Clear any alarms under the "alarms" tab

2.B **Download project to controller**
Go online with a project (see procedure 1.6)
Click the "MAKE" button
> A successful "Make" with zero errors is required before download. Correct all errors as required.

Option#2: Full Download (stop and restart)
Project Control -> Stop-> Download -> Download
Click the "cold" or "warm" button.
Close the project control box.
Option#1: Quick Download
Project Control -> Download -> Download Changes
Close the project control box.

2.C **Set program to auto-start**
KEY INFORMATION:

> The controller always starts the "boot project" saved in flash memory at power-up.

Project Control -> Stop-> Download ->
> Check "include bootproject"
> Download
> Close the project control box.

2.D **Save a copy of the project on the controller for future upload**
KEY INFORMATION:
> A separate file must be downloaded, called "Project Source"

Project Control -> Stop-> Download ->
> Check "Include Sources" to save a copy of the project for future upload
> Check "user libraries", "Page Layouts", and "Backend Code"
> Download
> Close the project control box.

2.E **Confirm motion is possible on each axis**
Use Config tool "test move" tab under Mechatrolink
> set test move parameters to appropriate value for machine
> Default units are Motor Revolutions and Seconds. Change units if desired.

2.F **Update the program (configuration or code)**
KEY INFORMATION:
> Configuration changes require an 1)online save followed by 2)Make and 3)Download.
> Code changes reequire Make and Download
> In the Download dialog, check Bootproject to retain changes after power cycle
> In the Download dialog, check Include Sources to apply changes to zipfile.zwt in project archive

2.G **Apply Password Protection to program.**
MotionWorks IEC- Express: There is no password protection at this time.
MotionWorks IEC- Pro:
> File - Password, enter and activate password
> R-Click on an item in project tree,

MODBUS

Overview

Data is sent over ethernet using two possible protocols; ModBus/TCP and Ethernet/IP. Modbus uses "Function Codes" and EIP uses "Instances" as channels of communication between the controller and another device. All configuration is accomplished using MotionWorks IEC Configuration Tool.

Step	Description	Detail
1	Add slave device to controller (master)	Go Online. Under Modbus TCP, "Add Slave Device". Enter Name, IP Address of device. Name the global status variable that will display the connection status of the device. Set update interval at or higher than the task scan time.
2	Add input and output data blocks to the device	Click on the device under ModBus TCP. Click "Add Data Block" Enter the I/O Group name that will appear as a header in the global variable list for that data block. Choose the desired function code. FC#4 is Read Input Registers. FC#16 is Write Multiple Registers Starting address already includes any modbus offset, so use address 1 for the first modbus data in the device. # of Items is number of modbus words (16 bit word).
3	Enable Slave Device	Some slave devices are enabled when powered on. When another MP2300Siec is used as a modbus slave, it must be enabled by checking "enable controller as a modbus slave"
4	Activate changes to controller*	(A) Save, (B) Make, (C) Download, (D) Cycle Power. Be sure controller is in RUN mode. If the slave device is another MP2300Siec, do the same to activate changes on the slave controller.
5	Verify communication to device	Monitor the staus variable that was named in Step 1. Expect value of 16#1000 or 16#1400 indicating connected status.
6	Create variables in controller (master)	In global variable list, note the address range for each data block as given in the gray Group heading. (%IB for inputs, and %QB for outputs) Create variables with addresses in the range listed. R-click "create variable set" to create several variables quickly.
7	Create variables in controller (slave)	If the slave device is another MP2300Siec, also go to its global variable list. Note the address range for each data block given in the gray Group heading. (%IB for inputs, and %QB for outputs) Create variables with addresses in the range listed. R-click "create variable set" to create several variables quickly.
8	Activate changes to controller	Make and run the program with the new variabels. Monitor the communication of variables and test operation of slave device. If the data type is chosen as "word" or "byte", individual bits can be selected in the variable declaration window. For example "Var.X0" for bit zero of Variable "Var".

Common Mistakes
1. The controller is not in RUN mode (see resource tab)
2. Variables have the wrong address, or wrong type (I or Q)
3. I/O Driver Error - Repeat step 4 (Save, Make, Download, Cycle Power)

*   It is important to Save, Make, Download, Cycle Power in this order. **Save** creates controller configuration files, and also creates I/O drivers in for the program. **Make** is required before cycling power, or else the controller will run the old bootproject, which does not have the drivers to run the new hardware configuration (I/O driver Error).
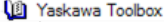
User Libraries

Overview

User Libraries are just normal project files imported into another project file as a library.
"Application Code Toolboxes" from Yaskawa are simply User Libraries created at Yaskawa

Create a Library

Step	Description	Detail
1	Rename the project and save in the Libraries folder (Optional, Best Practice)	File -> Save As.File -> Save Project As / Zip Project As… Navigate to Libraries folder Edit the file name to reflect the intended usage as a user library and revision control. For example, "TrainingLibrary_V001"
2	Delete unnecessary POUs and datatypes (Optional, Best Practice)	In project tree leave one LD program POU with an instance of each user FU/FB. Leave one ST program POU with data initialization. Leave 1-2 tasks to run both programs (for compile). I/O assigned to unused tasks must be reassigned.
3	Prefix all POUs and Datatypes (Optional, Best Practice)	Example Prefix: "YTTS_". Typical to leave LD programs YTTS_Palette and YTTS_Init running in YTTS_Tsk, using YTTS_CustomDatatypes.
4	MAKE the library project	Click "MAKE" and resolve all errors. A project that has only been renamed requires a new "MAKE"
5	Save the library project as ZIP (Optional, Best Practice)	File -> Save Project As / Zip Project As... Navigate to the Libraries folder (for organization purposes) Choose ZIP as the file type Best Practice: Do NOT change the name when zipping. Change the name in Step1 and re-MAKE first. Under "Zip Options" check boxes for "User Libraries" and "Front-end Code". Click the Zip button. *Single portable library file with revision name is produced*

Use a Library

Step	Description	Detail
1	Acquire a ZWE (Express) or ZWT (Pro) file	Use your own, or download from Yaskawa.com Product Page Follow links to save the file In Windows Explorer, copy the file to C:\Documents and Settings\All Users\Documents\MotionWorks IEC xxx\Libraries (For oranization purposes)
2	Unzip the library project to the library directory	In MotionWorks IEC... File-> Open Project / Unzip Project Click "Yes" to unzip to the Library directory (File was copied here in previous step) or click "No" if opening directly from CD or Download folder "Skip All" to Extracting Firmware Libraries dialog "Yes to All" to Overwrite Page Layout
3	Check for Dependent Libraries	Project Tree -> Project Tab, Expand Libraries folder 📖 Yaskawa Toolbox Take note of any User Libraries, indicated by the "blue book" icon. Or special Firmware libraries such as "Ymotion", indicated by the "red book" icon 📕
4	Start new / open existing project	File -> New, or File -> Open
5	Insert the Library and any dependent libraries	In Project Tree, "Project" tab, R-Click "Libraries" -> Insert -> User Libraries Navigate to find the Library (if you unzipped it to the "libraries" folder, you will see it right away) Also insert any dependent libraries noted in Step 3
6	Delete duplicate project data types	In Project Tree, "Project" tab, expand "Data Types" folder for both the user library and the project library. Delete any duplicates of "PLCTaskInfoTypes" or "MotionBlockTypes" from the project library. R-click -> delete (or open, delete text) *These data types are already defined within the imported library. Repeating the definition here causes compile errors since the same data types would be defined two times, even though the definitions are identical.*
7	Use FB from new group in edit wizard	Click on programming worksheet whitespace. Open Edit Wizard and the group dropdown list will have the library name. User Library blocks appear as Blue by default Help for Yaskawa "Application Code Toolbox" user libraries is available on the website, but is not integrated with the Right-Click menu as it is for the pink colored Firmware Library function blocks.

* If you wish to use a Yaskawa "Application Code Toolbox" user library in a project along with your own custom library project, you must insert the Yaskawa library directly in your custom library project. You may NOT insert both libraries individually into a new project.
A project with two libraries that both have the same datatype definitions will not compile, and so both libraries must be combined into a single library.
Specifically, your library project will have the MotionBlockTypes and PLCTaskInfoTypes defined, which are also defined in a Yaskawa library, such as PLCopenPlus Toolbox or Cam Toolbox. Insert one library into another and delete the duplicate datatypes for a successful MAKE.

OPC Server

Overview

The OPC Server is a Yaskawa software package that communicates variables between the controller and the Windows environment according to the OPC standard. This allows a "client" software package to have easy access to the controller data.

| Step	Description	Detail
1	Install the OPC Server software	Obtain software PDE-U-OPCPA and install. A serial number is required. With no serial number it functions as a 30-day demo.
2	Confirm ethernet communication betwe	Connect simultaneously to each controller via the web interface. Note the IP address of each controller.
3	Disable firewall	Open windows network connections and set to off
4	Configure OPC Server	Run OPC Configurator: R-click OpcProject, select resource type = MP2000, click settings, set IP address of controller, rename "new resource" as desired by clicking 2x slowly. Repeat above for additional controllers.
5	Run Server	Start-Program Files - Yaskawa - MWIEC OPC Server - OPC Server 2.1
6	Monitor Server	R-click green OPC icon in system tray, select "Info - Statistics". This tells you connection status of "resources" (controllers) and "clients" (windows software). Repeat above to refresh

Logic Analyzer

Overview

Logic analyzer graphs any controller variable at a cyclic task rate

Step	Description			Detail
1	Add Variables			Toggle Debug Mode = ON. Right-click a variable and select "Add to Logic Analyzer". The variable may be selected from the code, watch page, or variable list.
2	Adjust Window size			menu "View" - Logic Analyzer. By default the window is docked and very small. Right-click on the window title bar and uncheck "allow docking". Resize the window by click & drag on corners.
3	Open Trigger Configuration			Right-click the tab in the logic analyzer window "Configuration:Resource" and select Trigger Configuration.
4	Sampling			Time [in ms] between cycles is the task "interval", or scan time. (To view the task interval, toggle Debug Mode = OFF, Right-click a task, and choose Settings). "Pre-recording cycles" buffers a number of samples before the trigger condition is true. Post-recording cycles is the number of samples after the trigger is true.
5	Trigger conditions			The controller will start to capture the value of the added variables when the Pre-recording cycles buffer is full and the Trigger conditions are met. Select one of the variables from the dropdown list, an Operator, and a variable. A literal such as LREAL#0.0 or TRUE may also be entered directly.
6	Data collection			In MWIEC-Pro, the data can be collected synchronous with any of the cyclic tasks. The interval of the selected task x the total Pre/Post recording cycles gives the total time of the logic analyzer.
7	Capture Data			Right-click the tab in the logic analyzer window "Configuration:Resource" and select Start Recording. Pro also has a handy button with the red "record" dot on it.
8	Zoom			Click and drag on the horizontal axis or vertical axis. Left click & drag zooms one half, Right click & drag zooms the other half.
9	Cursors			Move the mouse pointer near the horizontal or vertical axis. The mouse pointer icon changes. Click and drag a single cursor onto the display area.