TECHNICAL NOTE
MOTION PRODUCT AND ENGINEERING GROUP

YASKAWA
A World of Automation Solutions™

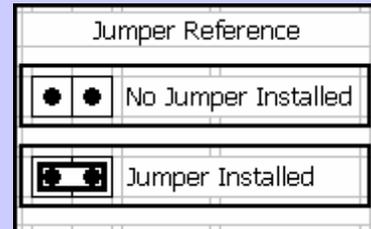**Subject:** Jumper Setting Options

Product: SMC-4000

Status: Released

**Summary:** This document describes the available jumper settings for an SMC-4000 series motion controller.

Requirements:
  SMC-4000 with firmware version 1.0c or later
  Applicable model numbers: SMC-4020, SMC-4040, SMC-4020W & SMC-4040W

| Jumper Reference	
● ●	No Jumper Installed
�	Jumper Installed

Circuit Board Layout:

There are three main circuit boards in an SMC-4000 controller including two that have jumper settings that may be set. The first is the bottom board of the motion controller (DMC-2143) and it has two jumper banks with user configurable settings. The other is the top board (SMC 40x0 PWR), as it has one jumper bank with user-configurable settings. The third board (SMC 40x0 I/O) does not have any user configurable jumper settings. The circuit board configuration is highlighted in the image below.
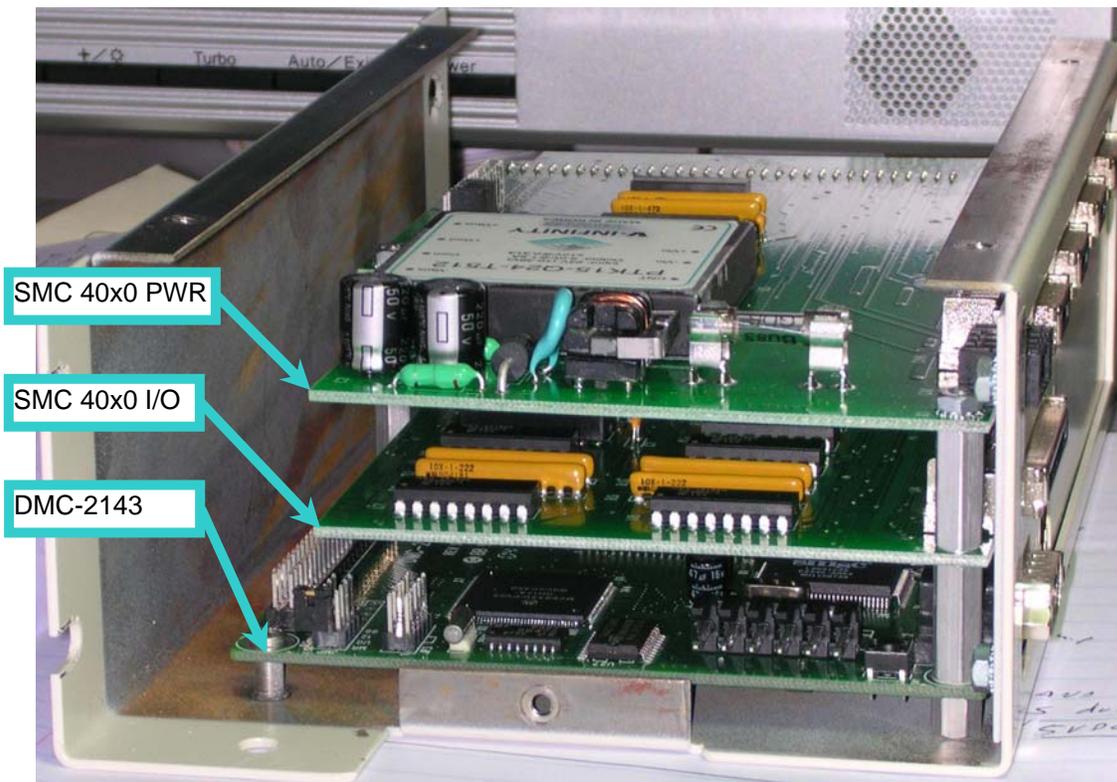
SMC 40x0 PWR
SMC 40x0 I/O
DMC-2143

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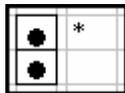(800) YASKAWA - Fax (847) 887-7280

DMC-2143 Circuit Board Jumper Layout:

There are two main user-configurable jumper settings on the DMC-2143 circuit board, which are highlighted in the image below.
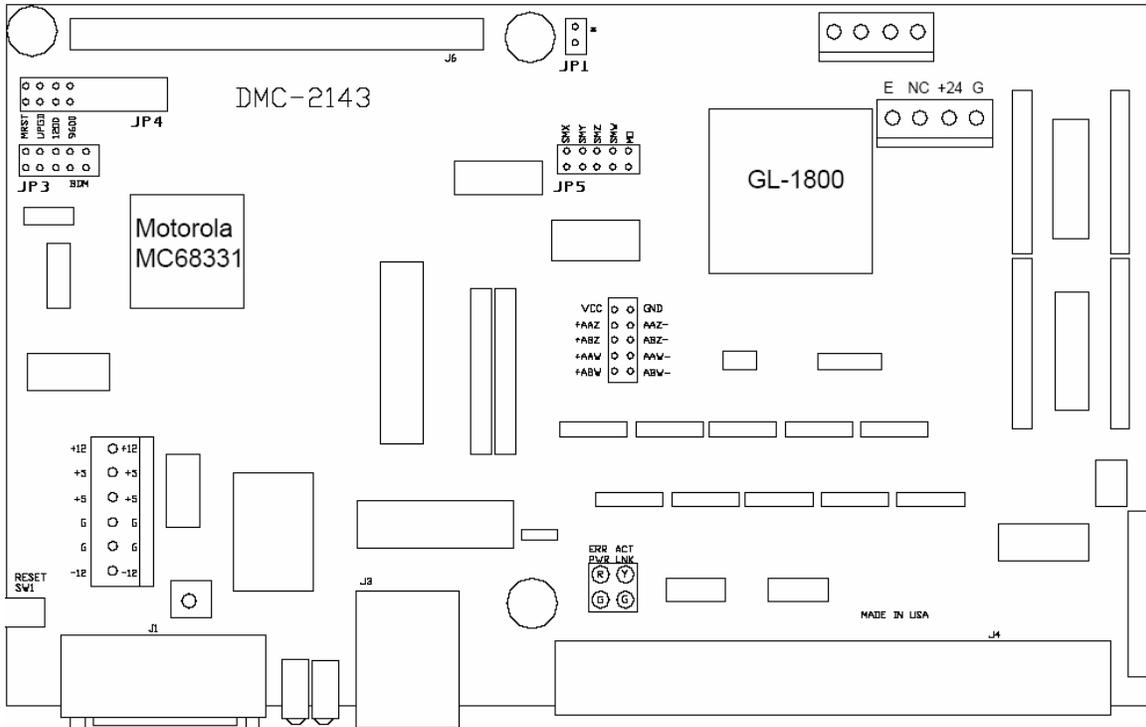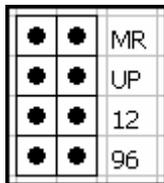

JP1

Jumper bank 1 has one jumper location.

⇒   If this jumper is the reset, input on the controller chip is activated (like pressing the reset (RST) button.

JP4

Jumper bank 4 has four jumper locations.

⇒ **MR** – The MR jumper is the Master Reset jumper. When MR is connected, the controller will perform a master reset upon power up or upon the reset input going low. Whenever the controller has a master reset, all programs, arrays, variables, and motion control parameters stored in EEPROM will be ERASED

⇒ **UP** – The UP jumper enables the user to unconditionally update the controller's firmware. Although it is not necessary for firmware updates when the controller is operating normally, but may be necessary in cases of corrupted EEPROM. EEPROM corruption should never occur. However, it is possible if there is a power fault during a firmware update. If EEPROM corruption occurs, your controller may not operate properly. In this case, contact Yaskawa to reload the system firmware.

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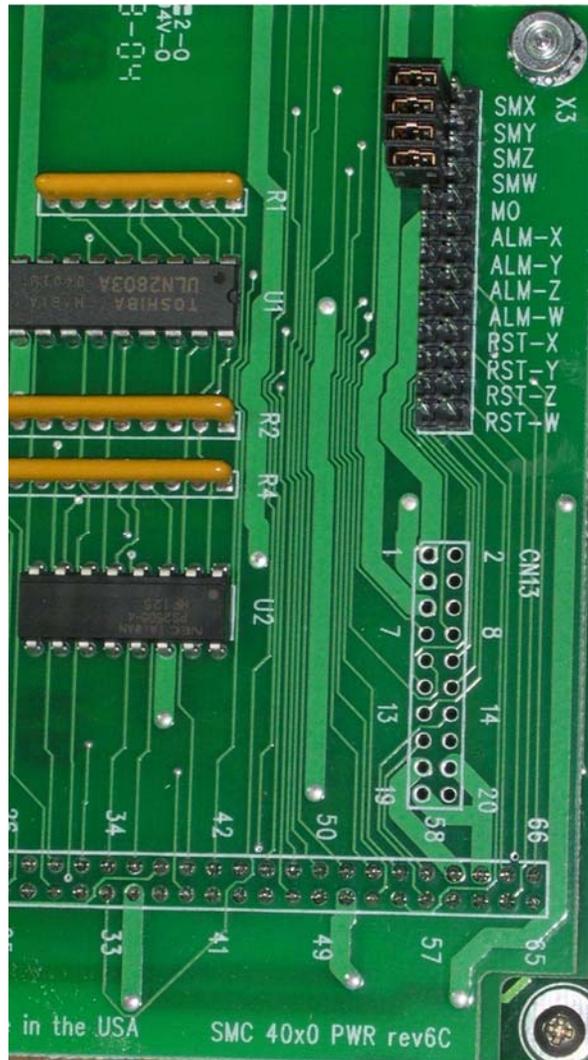(800) YASKAWA - Fax (847) 887-7280

⇒ **96 & 12** – These jumpers can be arranged to configure the baud rate for the serial port (CN6) for 1200, 9600, or 19200 (default). The table below shows the various configurations.

12	96	Baud Rate
ON	OFF	1200
OFF	ON	9600
OFF	OFF	19200

All other jumpers on the DMC-2143 circuit board should not be connected.

SMC 40x0 PWR Circuit Board Jumper Layout:

There is one main user-configurable jumper setting area on the SMC 40x0 PWR circuit board and it is highlighted in the image below.

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<u>CN5</u>

Jumper bank 5 has 13 jumper locations.

●	●	SMX
●	●	SMY
●	●	SMZ
●	●	SMW
●	●	MO
●	●	ALM-X
●	●	ALM-Y
●	●	ALM-Z
●	●	ALM-W
●	●	RST-X
●	●	RST-Y
●	●	RST-Z
●	●	RST-W

⇒ **SM (X, Y, Z, W)** – To configure the SMC-4000 for stepper motor operation, the controller requires a jumper for each stepper motor and the command, MT, must be given. For each axis that will be used for stepper motor operation, the corresponding stepper mode (SM) jumper must be connected. Connect step and direction signals from the controller to the motor amplifier and from the controller to respective signals on your step motor amplifier. (These signals are labeled STEP and DIR or pins 12 & 13 respectively on the axis connector).

⇒ **MO*** – *Note: This setting is not applicable to the SMC-4000. With a jumper installed at the MO location, the controller will be powered up in the "motor off" state. The SH command will need to be issued in order for the motor to be enabled. With no jumper installed, the controller will immediately enable the motor upon power up. The MO command will need to be issued to turn the motor off. Be careful when issuing the BN command after the SH command, as the state of the SH will saved in the Flash memory. When power is cycled the servo will be enabled before the user program is executed.

⇒ **ALM (X, Y, Z, W)** – To configure the ServoPack alarm (ALM: 1CN Pins 31 & 32) signal to be connected to the SMC-4000 digital inputs. Installing jumpers on these pins will connect Axis X, Y, Z, & W ALM signal to the SMC-4000 digital inputs 5, 6, 7, & 8 [5CN Pins 19, 32, 7, & 20] respectively.

⇒ **RST (X, Y, Z, W)** – To configure the SMC-4000 digital outputs to be connected to the ServoPack alarm reset (/ALM-RST: Pin 44) signal. Installing jumpers on these pins will connect the SMC-4000 digital outputs 5, 6, 7, & 8 [5CN Pins 9, 36, 22, 10] to Axis X, Y, Z & W /ALM-RST input signal.

All other jumpers on the SMC-40x0 PWR circuit board should not be connected.

Example to reduce SMC-4000 I/O usage

Alarm Reset

	RST-X
	RST-Y
	RST-Z
	RST-W
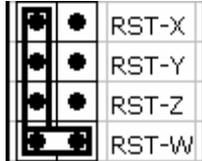
The reset inputs to the SGDH ServoPack units can be paralleled together, so that one SMC-4000 output activates all four SGDH /ALM-RST inputs. In the example to the right, SMC-4000 output 8 [5CN Pin 10] is used for this. Note: The alarm-reset signal is not used for SGDG (Legend) series ServoPack units, as recycling the enable signal can reset alarms in those units.

Alarm Input
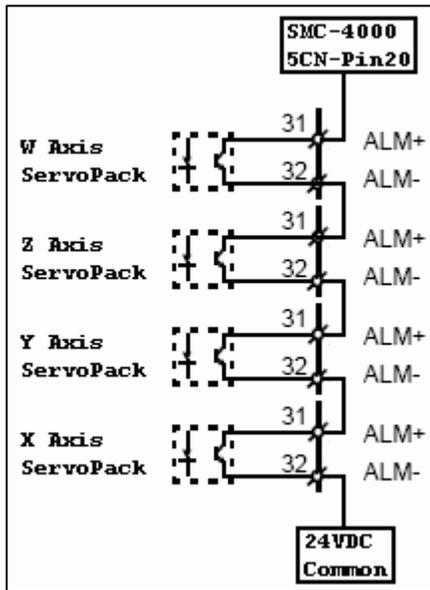
A similar configuration option for the ALM signals is not possible, as this would require all of the ALM outputs to be wired in a series from ServoPack to the next. All of the pins required for this configuration are not available on the circuit board. This could be accomplished by wiring the signal externally in series. An example-wiring diagram is provided to left. This diagram assumes that SMC-4000 digital input 8 is used as the combined alarm input. Of course, any of the SMC-4000 digital inputs could be used.