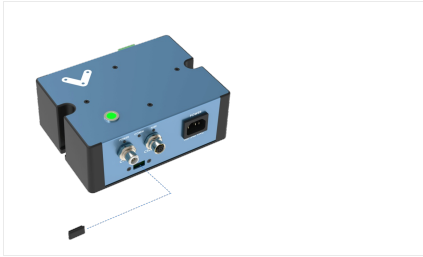


Power Switch Module User Manual



Overview

The Power Switch Module (CE-MS-000-0000) extends MachineMotion 2's functionality with an integrated solid-state relay, which lets you switch various AC-powered devices on and off.

This plug-and-play module requires just two connections: one to the MachineMotion 2 controller, one to an AC power outlet, and one to the device to control.

Compatible modules, including the Power Switch Module (CE-MS-000-0000), can also be daisy-chained one after the other, making it possible to connect up to eight modules per MachineMotion 2 controller.

Features

- Switch AC loads up to 15 A at 120 VAC or 10 A at 230 VAC
- Support various loads with two types of output connectors: one NEMA 5-15R, and one, terminal block
- Connect compatible modules in a daisy chain
- Configurable address
- Plug-and-play is accessible from the Control Center, MachineLog, and Python API

Included in the box

	Part Number	Description		Quantity
CE-MS-000-0000		Power Switch module	1	
CE-CA-000-0000		Control Device Extension Cable, 5m	1	
CE-JP-001-0001		Module Termination Jumper	1	
CE-CA-001-0001		BC C13 Cable, CAUS, 120 V, 3m	1	
CE-CA-001-0002		BC C13 Cable, EU, 230 V, 3m	1	
H08-FN-000-0018		M8 x 16-mm Screw	2	
H08-FN-000-0001		M8 Drop-In Spring-Loaded T-Nut	2	

WARNING: Important steps to avoid electric shock

The Power Switch Module operates at potentially life-threatening voltage levels. To prevent the risk of electric shock that could lead to serious injuries, follow the safety instructions below.

- When setting up the Power Switch Module connections, connect the type POWER only to the AC power outlet first. Connecting to the power outlet should always be your first step.
- If you're not using the OUT2 port, make sure the detachable plug stays mated to the feed module connector, to prevent an exposed lead with potential live power. This is important because the OUT1 and OUT2 ports act in parallel, meaning they are either both energized or both deenergized at the same time.

WARNING: Hot surface

The top aluminum enclosure of the Power Switch Module acts as a heat sink for the internal relay. The higher the current going through the module, the hotter the surface will become. Keep this in mind when doing large loads with the module. Maximum enclosure temperature rise from ambient is specified in the datasheet.

Choosing the appropriate output connector

The Power Switch Module has two parallel output connectors.

- Only use the OUT1 port with a standard NEMA 5-15P connector, and if the load operates at a max voltage of 120 VAC with a max current of 15 A.
 - The OUT1 ports are standard NEMA 5-15P connectors, compatible with 120 VAC devices for North America and capable of delivering up to 15 A.
- Use the OUT2 port with any other connector (not NEMA 5-15P), and/or if the load has an operating voltage higher than 120 VAC.
 - The OUT2 port is a two-part terminal block connector mating. The male connector is a fixed post (part of the module), whereas the female connector is detachable (plug) and provides three screw connections for flying leads (line, neutral, and earth).

Physical Interface

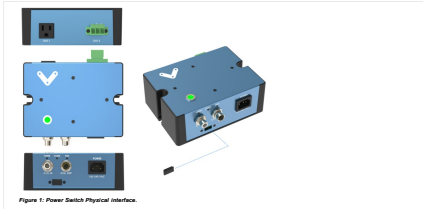


Figure 1: Power Switch Physical interfaces.

LED status indicators

Name	LED Color	Indicates (when ON)
SWITCH STATUS	Green	Power switch closed (active)
POWER	White	24 VDC supplied to module
COMM	Yellow and Blue	RS-485 communication functional
FUSE	Red	Module internal fuse tripped

Applications

Connecting to MachineMotion 2 (direct connection)

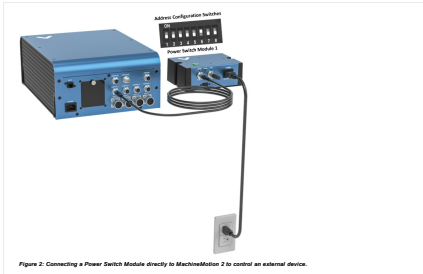


Figure 2: Connecting a Power Switch Module directly to MachineMotion 2 to control an external device.

To connect the Power Switch Module directly to a MachineMotion 2 controller (see Figure 2):

1. Set the Power Switch Module address, as explained in the Address configuration section.
2. Using the Control Device Extension Cable (CE-CA-000-0000):
 - a. Connect the male end to any CONTROL port on the MachineMotion 2 controller.
 - b. Connect the female and to the CTRL IN port on the Power Switch Module.
3. Connect the Module Termination Jumper (CE-JP-001-0001) to the CTRL OUT port on the Power Switch Module.
4. Connect the AC-powered device to be controlled to one of the Power Switch Module output ports, either OUT1 (US/Canada, NEMA 5-15R) or OUT2 (Terminal Block with Screw Connections).
5. Using an appropriate BC C13 cable (CE-CA-001-0001, CE-CA-001-0002, or other):
 - a. Connect the female and to the POWER port on the Power Switch Module.
 - b. Connect the male end to an AC power outlet.

Connecting compatible modules (daisy chain)

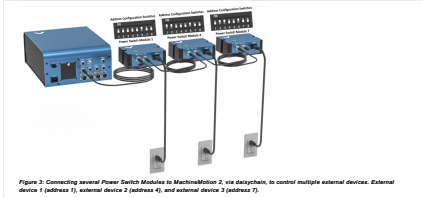


Figure 3: Connecting several Power Switch Modules to MachineMotion 2, via daisychain, to control multiple external devices. External device 1 (address 1), external device 2 (address 4), and external device 3 (address 7).

Compatible modules, including the Power Switch Module, can also be daisy-chained to a single CONTROL port on the MachineMotion 2 controller (see Figure 3). Across all four CONTROL ports, the controller supports up to eight modules at the same time, provided they all have distinct addresses (see Address configuration section).

To connect several modules in a daisy chain:

1. Set a distinct address for every module in the daisy chain, as explained in the Address configuration section.
2. Using a Control Device Extension Cable (CE-CA-000-0000):
 - a. Connect the male end to any CONTROL port on the MachineMotion 2 controller.
 - b. Connect the female and to the CTRL IN port on the first module in the daisy chain.
3. For every additional module to be connected, repeat the step using an additional Control Device Extension Cable:
 - a. Connect the male end to the CTRL OUT port on the previous module in the daisy chain.
 - b. Connect the female and to the CTRL IN port on the current module in the daisy chain.
4. Connect the Module Termination Jumper (CE-JP-001-0001) to the CTRL OUT port on the last module in the daisy chain.

Address configuration switches

Each module has an address with two components: device ID and device type. Both device ID and device type are set by changing the state of the address configuration switches, which was located at the front of the Power Switch Module under a removable rubber cap.

Switches 1 to 4 define the module device ID and allow the MachineMotion 2 controller to know which module it is communicating with. Every module connected to the same controller should have a **distinct device ID, regardless of its device type**.

Switches 5 to 8 define the module device type and their positions should remain identical for all modules of the same type.

The table below lists every valid address for the Power Switch Module. An individual switch is considered ON when the selector is slid up and OFF when the selector is slid down.

		Switches				Device Type				Module Address			
		1	2	3	4	5	6	7	8				
OUT1	OUT2	ON	OFF	ON	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	Power Switch Module 1
OUT1	OUT2	ON	OFF	ON	OFF	ON	OFF	ON	OFF	OFF	OFF	ON	Power Switch Module 2
OUT1	OUT2	ON	OFF	ON	OFF	ON	OFF	ON	OFF	OFF	ON	ON	Power Switch Module 3
OUT1	OUT2	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	ON	ON	Power Switch Module 4
OUT1	OUT2	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	Power Switch Module 5
OUT1	OUT2	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	OFF	Power Switch Module 6
OUT1	OUT2	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	ON	OFF	Power Switch Module 7
OUT1	OUT2	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	OFF	Power Switch Module 8

Table 1: Address configurations

Connecting a device to the OUT2 port

The OUT2 port is a two-part terminal block connector mating that can be used to control any AC-powered device within the Power Switch Module specifications (see Datasheet).

To connect a device to the OUT2 port:

1. Make sure the device has two wires (black and white) or three wires (black, white, and yellow/green).
2. Strip 7 mm of insulation off the device's wires.
3. Use the markings on the Power Switch Module to identify the line (L), neutral (N) and ground () terminals.
4. Remove the plug from the OUT2 port.
5. Insert and screw the black wire into the OUT2 plug L (line) terminal.
6. Insert and screw the white wire into the OUT2 plug N (neutral) terminal.
7. If available, insert and screw the yellow/green wire into the OUT2 plug () (ground) terminal.
8. Reinsert the plug from step 4 in the OUT2 port.

Configuring the Power-Switch Module in Control Center

If you would like to configure your power-switch module and allow MachineLogic to program your power-switch, follow the steps below:

1. Open the Control Center on a PC by entering 192.168.7.2 in the Google Chrome URL or use the MachineLogic 2 Pendant.
2. Go to the **Configuration** tab and click **Add Output**.
3. Fill out the following fields:
 - **Name:** Give your push-button a friendly name, which will be used to call the push button module in MachineLogic.
 - **Module Type:** In the drop-down menu, select **Power Switch**.
 - **Device:** Represents the device ID of your module. The device number is configured on the physical module using dip-switches, therefore, ensure the device ID configured in this dropdown matches the dip switches configured on the physical device.

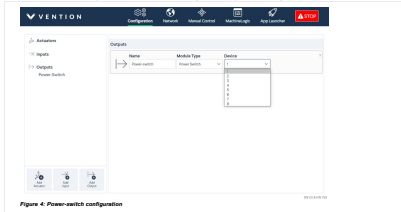


Figure 4: Power-switch configuration

1. To test the configured push-button, go to the **Manual Control** tab and navigate to the **Digital Inputs/Outputs** at the bottom left of the screen.
2. Under **Outputs**, you should see your configured power-switch module:

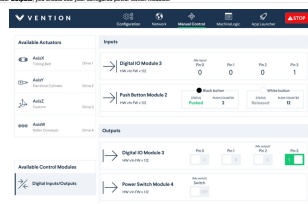


Figure 5: Power-switch manual control

You could test the configured power-switch module by clicking the toggle **OFF/ON** to check if the device connected to the power-switch toggles on and off.

Programming the Power-Switch Module with MachineLogic

To program your power-switch in MachineLogic, ensure you have completed the steps in [Configuring the Power-Switch Module in Control Center](#).

1. Go to the **MachineLogic** tab.
2. Click **Add comment** / **Add Output**.
 - Under **Output**, select the **Power-Switch** from the drop-down menu. Select the friendly name of your power switch under **Output Name** and select if you would like to turn your power-switch **On** or **Off**.

Using the Power-Switch Module with the Python API

See [Python API reference](#) [here](#).