

Smart Pushbutton Module User Manual

Contents

[Overview](#)

[Features](#)

[Included in the Box](#)

[Physical Interface](#)

[Status LED Indicators](#)

[Applications](#)

[Connecting to](#)

[MachineMotion 2 \(directly\)](#)

[Connecting to](#)

[MachineMotion 2 \(daisy chain\)](#)

[Setting the address configuration switches](#)

[Configuring the Smart Push-button Module in Control Center](#)

[Programming the Smart Push-button Module with](#)

[MachineLogic](#)

[Using the Smart Push-button with](#)

[the Python API](#)



Overview

The Smart Pushbutton Module, CE-MD-004-0000, extends MachineMotion 2's functionality with two latching (alternate action) pushbuttons. This plug-and-play module only requires a single connection to the MachineMotion 2 controller. Compatible modules, such as the Smart Power Switch (CE-MD-005-0000) & additional Pushbutton modules can also be daisy chained to each other, making it possible to connect up to eight modules per MachineMotion 2 controller.

Features

- Includes two latching pushbuttons
- Connects (daisy chain) with compatible modules
- Configurable address
- Plug-and-play access from the Control Center, MachineLogic, and Python API

Included in the Box

Part Number	Description	Quantity
CE-MD-004-0000	Smart Pushbutton Module	1

Part Number	Description	Quantity
CE-CA-022-5000	Control Device Extension Cable, 5m	1
CE-JP-001-0001	Module Termination Jumper	1
HW-FN-003-0018	M8 x 18-mm Screw	2
HW-FN-002-0001	M8 Drop-in Spring-Loaded T-Nut	2

Physical Interface



Figure 1: Pushbutton Module physical interface.

Status LED Indicators

Name	LED Color	Indicated (when ON)
POWER	White	24 VDC supplied to module
COMM	Yellow and Blue	RS-485 communication functional
FUSE	Red	Module internal fuse tripped

Applications

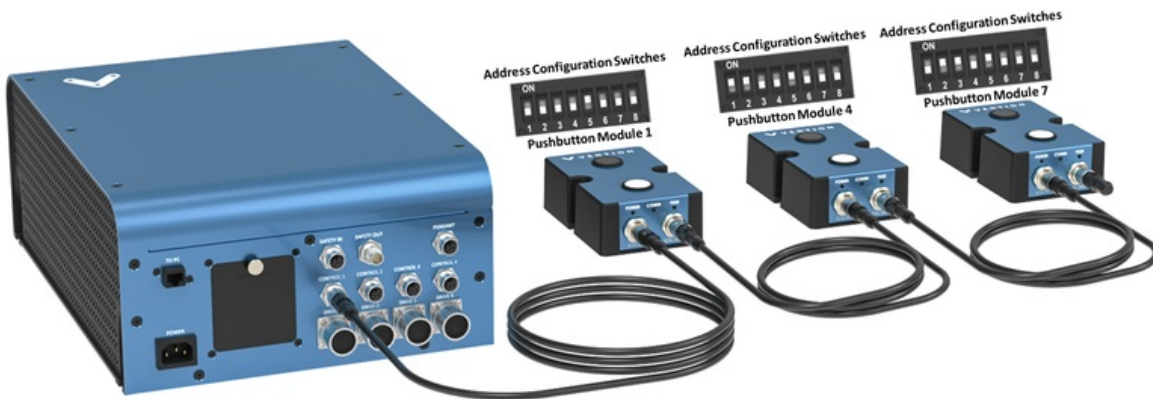
Connecting to MachineMotion 2 (directly)



To connect a Pushbutton Module directly to MachineMotion 2 (see Figure 2):

1. Set the address of the Pushbutton Module, as explained in the *Setting the address configuration switches* section below.
2. Using the Control Device Extension Cable (CE-CA-022-5000):
 1. Connect the male end to any *CONTROL* port on MachineMotion 2.
 2. Connect the female end to the *CTRL IN* port on the Pushbutton Module.
3. Connect the Module Termination Jumper (CE-JP-001-0001), to the *CTRL OUT* port on the Pushbutton Module.

Connecting to MachineMotion 2 (daisy chain)



Compatible modules, including the Smart Pushbutton Module, can also be connected via daisy chain 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 switches*).

To connect several modules in a daisy chain:

1. Set a distinct address for every module of the daisy chain, as explained in the section *Setting the address configuration switches*.
2. Using a Control Device Extension Cable (CE-CA-022-5000):
 1. Connect the male end to any *CONTROL* port on MachineMotion 2.
 2. Connect the female end to the *CTRL IN* port on the first module of the daisy chain.

3. For every additional module to be connected in the daisy chain, repeat this step using an additional Control Device Extension Cable (CE-CA-022-5000):
 1. Connect the male end to the *CTRL OUT* port on the previous module in the daisy chain.
 2. Connect the female end 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.

Setting the 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 are located at the back of the Pushbutton 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 Pushbutton Module. An individual switch is considered ON when the selector is slid up and OFF when the selector is slid down.

Switches								Module Address
Device ID				Device Type				
1	2	3	4	5	6	7	8	
OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	Pushbutton Module 1
ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	Pushbutton Module 2
OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	Pushbutton Module 3
ON	ON	OFF	OFF	ON	OFF	OFF	OFF	Pushbutton Module 4
OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	Pushbutton Module 5
ON	OFF	ON	OFF	ON	OFF	OFF	OFF	Pushbutton Module 6
OFF	ON	ON	OFF	ON	OFF	OFF	OFF	Pushbutton Module 7
ON	ON	ON	OFF	ON	OFF	OFF	OFF	Pushbutton Module 8

Table 1: Pushbutton module configurable addresses.

Configuring the Smart Push-button Module in Control Center

If you would like to configure your smart push-button and utilize MachineLogic to program your push-button, 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 MachineMotion 2 Pendant.
2. Go to the **Configuration** tab and click **Add Input**.
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 **Push Button**
 - **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.
 - **Color:** Select the push-button color you would like to configure.

Actuators

→ **Inputs**


Push-Button (Black)


Push-Button (White)

→ **Outputs**

Inputs

Name	Module Type	Device	Color
→ Push-button (black)	Push Button	1	Black
→ Push-button (white)	Push Button	1	White


 Add Actuator


 Add Input







 Add Output


Figure 4: Push-button configuration

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


Available Actuators



-  **AxisX**
Timing Belt Drive 1
-  **AxisY**
Electrical Cylinder Drive 2
-  **AxisZ**
Custom Drive 3
-  **AxisW**
Roller Conveyor Drive 4

Inputs


 **Digital IO Module 3** HW v1n FW v 1.12

(My input)	Pin 0	Pin 1	Pin 2	Pin 3
	0	0	0	1


 **Push Button Module 2** HW v1n FW v 1.12

 Black button		 White button	
STATUS	PUSH COUNTER	STATUS	PUSH COUNTER
Pushed	2	Released	12


Available Control Modules

-  **Digital Inputs/Outputs**

Outputs

 **Digital IO Module 3** HW v1n FW v 1.12

Pin 0	Pin 1	(My output) Pin 2	Pin 3
<input type="checkbox"/> 0	<input type="checkbox"/> 0	<input type="checkbox"/> 0	<input checked="" type="checkbox"/> 1

 **Power Switch Module 4** HW v1n FW v 1.12

(My switch) Switch OFF

Figure 5: Push-button manual control

You could see the status of each button as “Pushed” or “Released”. The push counter allows you to test the push buttons in case the push button is installed far away from your HMI. The counter will go up each time the button is pressed.

Programming the Smart Push-button Module with MachineLogic

To program your smart push-button in MachineLogic, ensure you have completed the steps in [Configuring the Smart Push-button Module in Control Center](#).


1. Go to the **MachineLogic** tab.
2. There are a few commands that could be used for your push-button module. Click **Add command** > **Add Wait**:
 - Under **Wait For**, selecting **Digital Input** would allow your program to wait for a push button to be **Pushed** or **Released** before playing the next command


Push-Button Demo


Variables


Sequences

- ▾ Main Sequence
 - **Wait Input**
 - Wait Input
 - Wait Input
 - Wait Input Transition
 - Wait Input Transition
 - Wait Time
 - Wait Time
 - Wait Time
 - Wait Time
 - Wait Time
 - Wait Time
 - ↳ Digital Output


Upload/
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Add
Application


Add
Sequence


Add
Command

Name:

1	Wait For ?	Input Name	Level
⌚	Digital Input	Push-button (black)	Pushed
2	Wait For ?	Input Name	Level
⌚	Digital Input	Push-button (white)	Pushed
3	Wait For ?	Input Name	Level
⌚	Digital Input	Push-button (black)	Released
4	Wait For ?	Input Name	Edge
⌚	Digital Input Transition	Push-button (white)	Pushed to Released
5	Wait For ?	Input Name	Edge
⌚	Digital Input Transition	Push-button (black)	Released to Pushed

▶

◻

SW v21 & HW V2A

Figure 6: Wait for digital input

- Under **Wait For**, selecting **Digital Input Transition** would allow your program to wait for a push button to go from one state (pushed/released) to a different state (pushed/released) before playing the next command.

Push-Button Demo

Variables

Sequences

- Main Sequence
 - Wait Input
 - Wait Input
 - Wait Input
 - Wait Input Transition**
 - Wait Input Transition
 - Wait Time
 - Wait Time
 - Wait Time
 - Wait Time
 - Wait Time
 - Wait Time
 - Wait Time
 - Digital Output

Name:

#	Wait For	Input Name	Level
1	Digital Input	Push-button (black)	Pushed
2	Digital Input	Push-button (white)	Pushed
3	Digital Input	Push-button (black)	Released
4	Digital Input Transition	Push-button (white)	Pushed to Released
5	Digital Input Transition	Push-button (black)	Released to Pushed

SW v2.1 & HW V2A

Figure 7: Wait for digital input transition

Using the Smart Push-button with the Python API

See Python API reference [here](#)