Stepping Motors

Controllers

Overview of Controllers

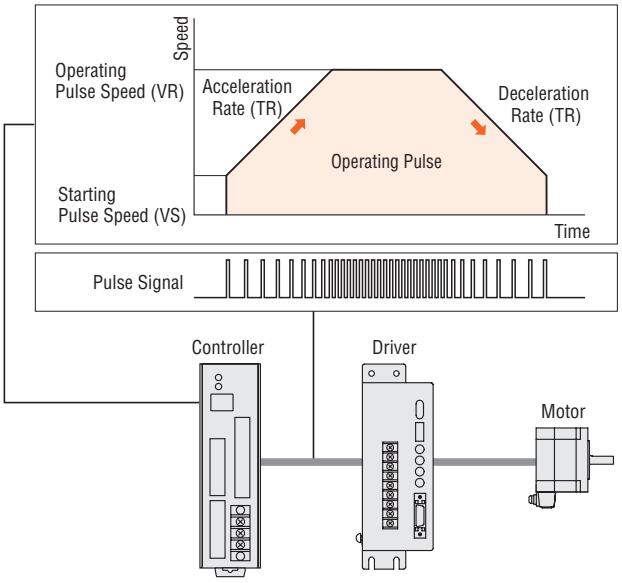
At Oriental Motor, a device that outputs pulse signals needed to operate a stepping motor is called a controller. Controllers let you make various settings to control your motor and also permit connection with a host programmable controller, and sensors or PC. Select a controller that best suits your system.

Features

Setting Positioning Operation Parameters

You can set desired positioning operation parameters (number of operation pulses, starting pulse speed, operating pulse speed, acceleration/deceleration rate, etc.).

◇Data Setting



● Starting Pulse Speed (VS) [Hz]
The frequency at which output of pulse signals is started. The controller starts outputting pulse signals at the frequency specified by the starting pulse speed, and increases the frequency along the slope specified by the acceleration/deceleration rate.

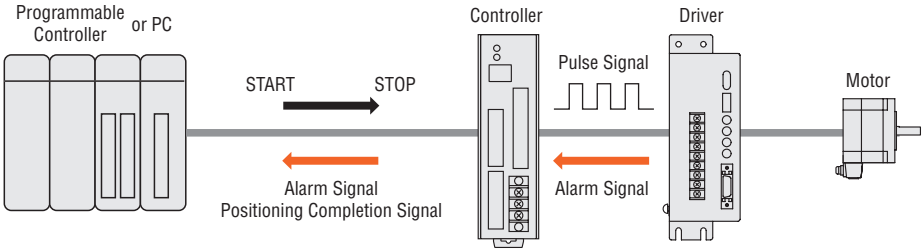
● Operating Pulse Speed (VR) [Hz]
The target pulse signal frequency. This frequency dictates the operating speed of the motor.

● Acceleration/Deceleration Rate (TR) [msec/kHz]
The slope along which the pulse signal frequency is raised (acceleration) or lowered (deceleration). At Oriental motor, the time needed to raise (or lower) the frequency by 1 kHz is expressed in units of msec/kHz.

● The specific method for setting data varies from one product to another depending on, for example, whether a dedicated operator interface unit is used or a computer is used. For details, refer to the page explaining each product.

Operation System

When the equipment is to be operated automatically, provide a programmable controller, or PC to serve as the host of your controller.



● The specifics vary depending on the product. For details, refer to the page explaining each product.

●Jerk Limiting Control Function for Suppressing Vibration

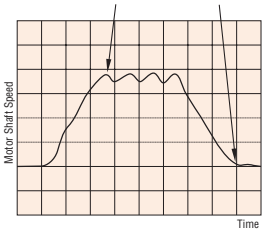
The jerk limiting control function lets you suppress vibration that otherwise occurs when the motor is being driven or stopped.
For example, this function is particularly useful when a belt pulley is used to drive the motor and you want the load to be moved with low vibration.

●Measurement Conditions

Mechanism: Belt drive
Operation Mode: Positioning operation
Load: 10 kg (22 lb.)

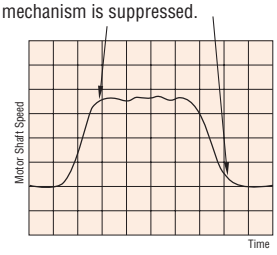
●These graphes are provided only as a reference. The actual effect of this function will vary depending on the mechanism of your equipment.

Vibration that occurs when the operation mode is switched from acceleration/deceleration to constant speed manifests as vibration of the mechanism.



Linear Acceleration/Deceleration Pattern

By suppressing vibration that otherwise occurs when the operation mode is switched from acceleration/deceleration to constant speed, vibration of the mechanism is suppressed.

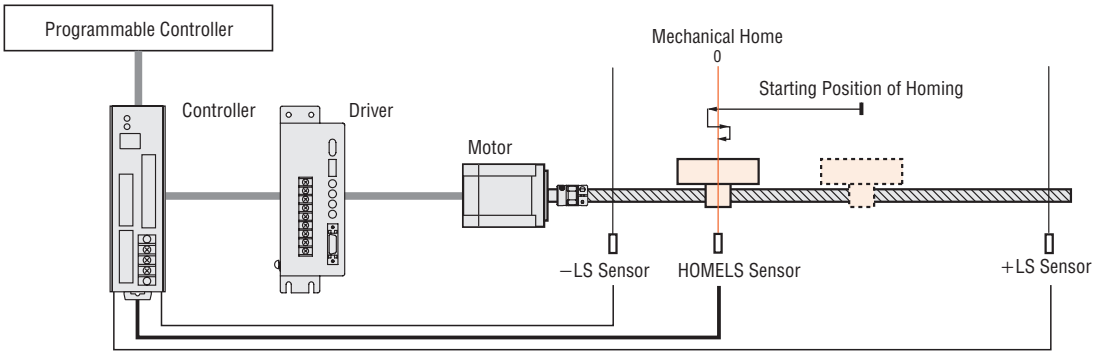


Jerk Acceleration/Deceleration Pattern

●Offering Functions to Facilitate Motor Control

◇Return to Mechanical Home Function

To perform accurate positioning operation, the mechanical home that defines the reference point must be determined accurately.
Oriental Motor's controllers are equipped with the automatic return to home function. All you need is to wire a home sensor and you can utilize this home detection function right away.



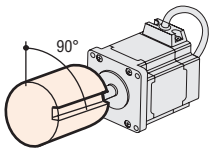
◇I/O Check Function

You can check the connection (I/Os) with the programmable controller.

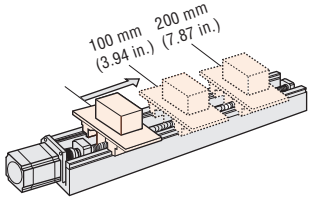
◇Travel Amount Setting in Multiple Units Such as mm

You can set travel amounts in degrees and mm in addition to pulses.

· Setting in degrees



· Setting in mm

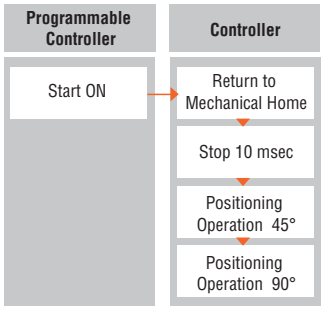


●The specifics vary depending on the product. For details, refer to the page explaining each product.

Types of Controller

Stored Program Controllers

This type of controller allows you to set motor positioning parameters as well as programming how the motor should operate in response to the status of general purpose inputs and controlling external devices with the general purpose outputs.



- Sequence functions are provided, such as conditional branching and internal timer processing.

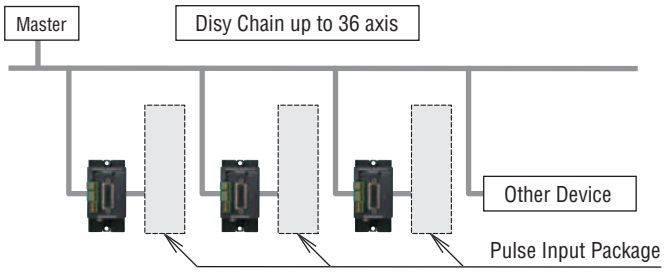
◇SCX10

Pulse Oscillation + Sequence Function + I/O Control + Encoder

The **SCX10** is capable of editing and executing sequences for a wide variety of functions. This highly functional and sophisticated stored program controller allows for selection and execution of any desired program or programs using an external input signal. While all commands for the **SCX10** can be executed using any general terminal software, a Windows based GUI called, the Immediate Motion Creator (IMC) for **CM**/**SCX** Series, is provided. The IMC features include: instant operation, easy programming and configuration without needing to know the **SCX10** commands, real time monitoring of position feedback and I/O status. Once you install the IMC on your computer, you can make your desired motion in a few seconds.

SCX10

- Advanced command set
- Single axis
- 100 programs
- Ability to program in user units (in, mm, stc.)
- GUI software for advanced programming
- USB / RS-232C / CANopen
- Daisy chain up to 36
- Encoder input



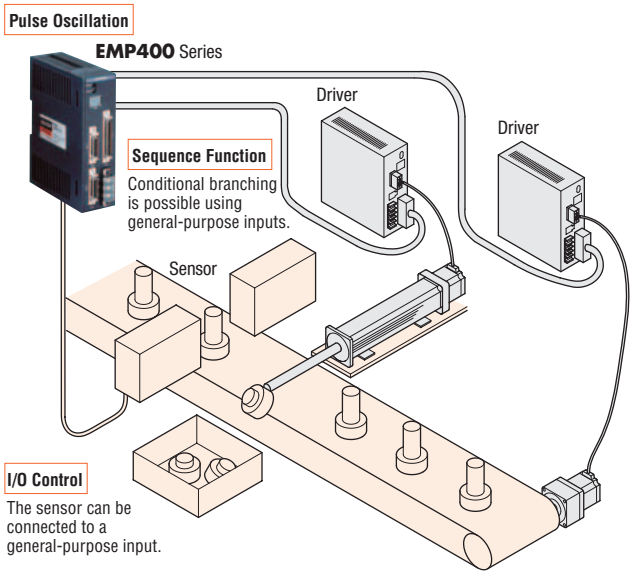
◇EMP400 Series

Pulse Oscillation + Sequence Function + I/O Control

The **EMP400** allows you to edit and execute stored sequences. The **EMP400** controller is capable of coordinating 2 axes of motion or can be used for a single axis control.

EMP400 Series

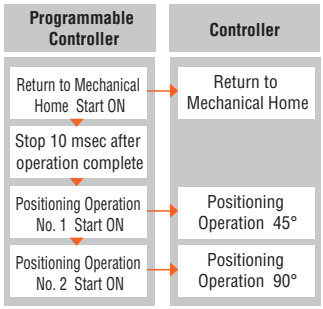
- Basic command set
- Single or dual axis
- 32 programs
- No software required
- RS-232C
- Jerk Limit Control



●Stored Data Controller

Pulse Oscillation

Available in two types, Data-Select positioning or Sequential positioning mode, this controller can easily be operated by issuing a start signal from the host controller as long as the speed, travel amount and other conditions for the motor operations have been set.



◇SG8030J

- Easy to use, front panel touch input
- Single axis
- Stored data of up to 4 positions
- Front panel display
- Jerk Limit Control

DIN Rail Mounting Model

Recessed Mounting Model

SG8030J

Lineup

			Stored Program Controller	
			SCX10	**EMP400** Series
				
Program	Number of Programs		100	32
	Capacity		2 kB maximum for total compiled sequences 4 kB maximum for 1 sequence (text and compiled data)	1000 commands
	Input Method		Graphical User Interface Software or terminal program	RS-232C
Communication			USB, RS-232C, CANopen	RS-232C
Positioning Data	Number of Data Sets		–	–
	Setting Mode		–	–
Oscillator Specifications	Number of Axes		Single axis	Single axis, Dual axis
	Pulse Output Mode		1-pulse output/2-pulse output mode Line Driver Output (Linear receiver input/ Photo-coupler input compatible)	1-pulse output/2-pulse output mode
	Acceleration/Deceleration Pattern		Linear	Linear, Jerk limiting control
Operation Pattern	Relative Positioning Operation		Available	Available
	Absolute Positioning Operation		Available	Available
	Continuous Operation		Available	Available
	Return to Mechanical Home Operation		Available	Available
	Dual Axis Liner Interpolation Operation		–	Available
	Multistep Speed-Change Operation		Available	Available
	Operating Mode		Incremental/Absolute	Incremental/Absolute
	Positioning Range	incremental	−2 147 483 648～+2 147 483 647 pulses	−16 777 215～+16 777 215 pulses maximum
		absolute		−8 388 608～+8 388 607 pulses
Features			Multiple serial interfaces, Powerful, expanded easy to use command set, External feedback input, Programmable I/O	RS-232C compatible, Flexible command set, Programmable I/O Control, Dual axis control, Linear interpolation, Multi-speed Operation
External Encoder Input			A-Phase, B-Phase, Index Max, Frequency 1 MHz	–
I/O	Dedicated	Inputs	6 (ASG, BSG, ZSG, TIM, END, ALARM)	3 (START, E-STOP, S-STOP)
		Outputs	8 (PLS, DIR, CON, CS, MBFREE, COFF, ALMCLR)	6 (ALM, MOVE, READY, END, CW pulse, CCW pulse)
	General Purpose	Inputs	9	8
		Outputs	4	6
	External Encoder Input		ASG, BSG, ZSG	–
Multi Axis Operation			RS-232C (Daisy Chain): 36 maximum nodes CANopen: 127 maximum nodes USB: up to the # of COM ports on the master controller (PC)	2 axes
General Specifications	Power Source		24 VDC	
	Dimensions	W	43 mm (1.69 in.)	40 mm (1.57 in.)
		D	116.5 mm (4.59 in.)	100 mm (3.94 in.)
		H	85 mm (3.35 in.)	135 mm (5.31 in.)
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			Stored Data Controller
			SG8030J
			
Program	Number of Programs		–
	Capacity		–
	Input Method		–
Communication			–
Positioning Data	Number of Data Sets		4 steps Sequential positioning type Data-select positioning type
	Setting Mode		Set with touch pads on front panel
Oscillator Specifications	Number of Axes		Single axis
	Pulse Output Mode		1-pulse output/2-pulse output mode
	Acceleration/Deceleration Pattern		Linear, Jerk limiting control
Operation Pattern	Relative Positioning Operation		Available
	Absolute Positioning Operation		–
	Continuous Operation		Available
	Return to Mechanical Home Operation		Available
	Dual Axis Liner Interpolation Operation		–
	Multistep Speed-Change Operation		–
	Operating Mode		Incremental
	Positioning Range	incremental	1～99 999 pulses maximum
		absolute	–
Features			Simple touch pad programming, sequential positioning
External Encoder Input			–
I/O	Dedicated	Inputs	6 (Operation mode, HOMELS, Start, Extarnal stop, CW scan, CCW scan)
		Outputs	3 (BUSY, CW pulse, CCW pulse)
	General Purpose	Inputs	–
		Outputs	–
	External Encoder Input		–
Multi Axis Operation			–
General Specifications	Power Source		24 VDC
	Dimensions	W	48 mm (1.89 in.) *
		D	48 mm (1.89 in.) *
		H	83.7 mm (3.30 in.) *
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*Except for the socket