Motion List

Independent Motions

Motion List		
Basic function of controller	Continuous motion	
	Homing	Homing
		Origin escaping
		Origin searching
	Positioning	PTP motion
		Zero point return motion
		Single step motion
		Timer motion
		Restart
Supported by software (Multi-function DLL: FBIMTN.DLL)	Homing	Control signal input reverse motion mode
	Positioning	CP motion
		Continuous PTP

Interpolation Motions

In addition to the independent motions of each axis, the following interpolation motions are available.

*1 The relation among interpolation control axis, master axis, and slave axis in the interpolation axes is important to configure interpolation motion.

*2 Constant control of combining velocity is available in linear interpolation 1, continuous linear interpolation 1 , and circular interpolation motions.

Motion List	
Basic function of controller	Linear interpolation 1
	Continuous linear interpolation 1
	Linear interpolation 2
	Continuous linear interpolation 2

	Circular interpolation
Supported by software (Multi-function DLL: FBIMTN.DLL)	Continuous interpolation

Interpolation Control Axis

In Linear interpolation 1, Continuous linear interpolation 1, and Circular interpolation motions, the velocity is set to only one axis, and the axis is called "interpolation control axis".
The interpolation control axis is the lowest number axis among the interpolation axes. (X, Y, Z, U order)
When the circular interpolation and linear interpolation are performed simultaneously, the number of the interpolation control axes is two.
In linear interpolation 2, each axis is interpolation axis.

X-axis : first axis
Y-axis : second axis
Z-axis : third axis
U-axis : fourth axis

[The relationship between interpolation motion and interpolation control axes]

No	Interpolation Motion	Interpolation Control Axis
1	Linear interpolation 1of X, Y, Z and U axes	X-axis
2	Linear interpolation 1of X, Y and Z axes	X-axis
3	Linear interpolation 1 of Y, Z and U axes	Y-axis
4	Linear interpolation 1of Y and U axes	Y-axis
5	Circular interpolation of X and U axes	X-axis
6	Circular interpolation of X and Z axes and linear interpolation 1 of Y and U axes	Circular interpolation: X-axis linear interpolation 1: Y-axis

"Master Axis" and "Slave Axes"

In linear interpolation motion, the axis whose specified moving quantity is largest is called **master axis** and the other axis is called **slave axis**.
When the configurations are the same between axes, the interpolation control axis is the master axis.
The master axis always outputs pulses and the slave axis outputs pulses in the timing of the ratio of the specified moving quantity of the master axis.

Relation of velocity between master axis and slave axis

$$\text{Velocity of slave axis} = \frac{\text{Slave axis pulse count configuration}}{\text{Master axis pulse cout configuration}}$$

$$\text{Combining velocity} = \text{Velocity of master axis} \times \frac{\sqrt{\text{Master axis pulse count configuration}^2 + \text{Slave axis pulse count configuration}^2}}{\text{Master axis pulse cout configuration}}$$

$$= \text{Velocity of master axis} \times \sqrt{1 + \left[\frac{\text{Slave axis pulse count configuration}}{\text{Master axis pulse cout configuration}}\right]^2}$$

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