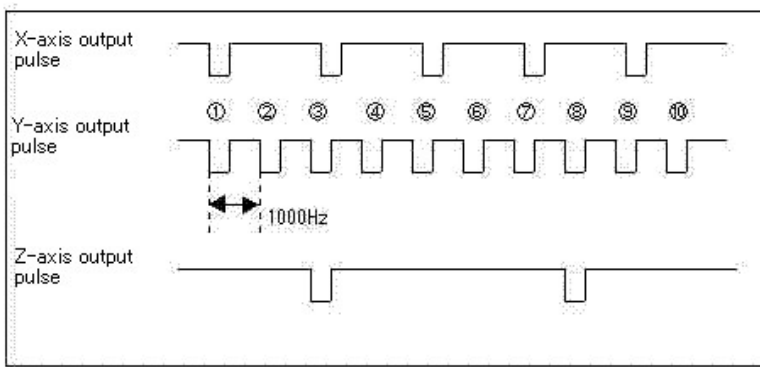# Linear Interpolation 1

Configurable number of axes	Two to four axes in the same controller can be configured.

Description	Operates the linear interpolation motion by specifying the moving quantity for multiple axes in the same controller. As it operates the linear interpolation motion for up to 4 axes in a controller, three-dimensional interpolation motion is also supported. * The linear interpolation 1 motion for any other axes cannot be operated while the linear interpolation motion is operating.	
Comments	1	Configure the moving velocity to the interpolation control axes, and configure the moving quantity (output pulse count) of all the interpolation axes.
	2	The axis whose moving velocity is largest is the master axis and the others are slave axes.
	3	The interpolation motion cannot be operated for the specified axis.
	4	When acceleration and deceleration is performed, the velocity is decelerated to the start-up velocity or the deceleration stops by inputting the deceleration signal (SD signal) of moving direction.
	5	The deceleration stops or immediately stops by the stop signal (EL signal) input of moving direction.
	6	The deceleration stops or immediately stops by the alarm signal (ALM signal) input.
	7	If any one axis in the interpolation axes stops in error, all interpolation axes stops as well. Confirm the error stop in "MTR_FINISH_STATUS" of the MtnGetStatus function. (except 0) For the axis which is the error stop factor, the factor bit is "1" and for the other interpolation axes, bit 15 is "1".
	8	"Constant velocity start", "Acceleration and deceleration start", and "Constant velocity-deceleration start" can be selected as a start operation.
	9	Even if the origin signal (ORG signal) is input, it is disregarded.
	10	The constant control of combining velocity is available.
	11	**Specify the "output pulse cycle completion " to the pulse output completion timing.**
Configuration Example	The linear interpolation 1 operates in the following configuration.	

	X-axis	Y-axis	Z-axis
Mode	Linear interpolation 1	Linear interpolation 1	Linear interpolation 1
Constant control of combining velocity	OFF	OFF	OFF
Moving pulse count	500	1000	200
Moving velocity	1000 pps		
Startup motion	Constant velocity start	Constant velocity start	Constant velocity start
Interpolation control axis	○		
Master/slave axis	slave axis	master axis	slave axis

The pulses are output in the following timing.

The following table shows the configurations of X-axis, Y-axis, and Z-axis.

Configured axis	X-axis	Y-axis	Z-axis
Motion	Linear interpolation 1		
Acceleration and deceleration	Linear acceleration and deceleration		
Initial rate	100		
Operating speed	1000		
Acceleration rate	5460(100ms)		
Deceleration rate	5460(100ms)		
Slow-down point	0		
S-curve range at acceleration			
S-curve range at deceleration			
Moving quantity	500	1000	200
Frequency scale	299	299	299

The unit for velocity is [pps].

The above table shows the register values set to the controller IC on the board.
Refer to the velocity calculation method for the relation among the register value, velocity, and acceleration and deceleration speed.

Multi-Function DLL
HANDLE hDeviceHandle; int nRet; MTNLINE Line; hDeviceHandle = MtnOpen("FBIMTN1", MTR_FLAG_NORMAL); : Line.wAxis = 0x07; Line.wClock = 299; Line.wMode = MTR_LINE; Line.wAccMode = MTR_ACC_NORMAL; Line.fLowSpeed = 100; Line.fSpeed = 1000; Line.dwAcc = 100; Line.dwDec = 100; Line.fSAccSpeed = 0; Line.fSDecSpeed = 0; Line.lStep[0] = 500; Line.lStep[1] = 1000;

```
Line.lStep[2] = 200;

nRet = MtnSetMotionLine( hDeviceHandle, MTR_LINE_NORMAL, &Line );
if(nRet != MTR_ERROR_SUCCESS) return -1;

nRet = MtnStartMotion( hDeviceHandle, 0x07, MTR_CONST, MTR_LINE );
```

* Operating linear interpolation 1 motion for the motors of X, Y, Z axes in hDeviceHandle.

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