



**Nippon Pulse**  
Your Partner in Motion Control

## PCL6000 Series

Advanced Motion Controllers for  
Stepper and Servo Motors



The PCL6000 series features an arsenal of advanced functions that enable the user to easily configure even the most complicated motion control systems. This pulse generator ASIC is designed to contend with almost every impediment that could arise in complex motion systems.

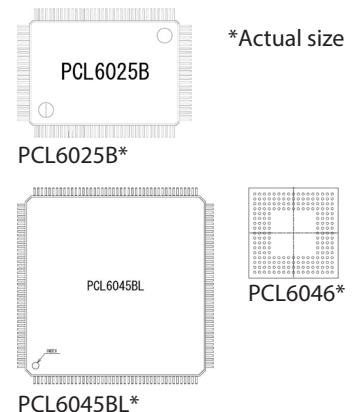
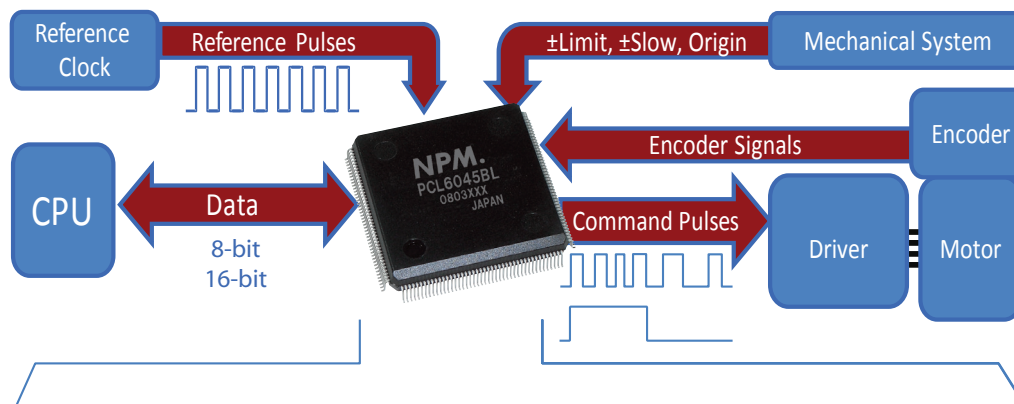
The PCL6000 Series is the world's most advanced pulse generator from the world's leading manufacturer of motion control ASICs.

### Features:

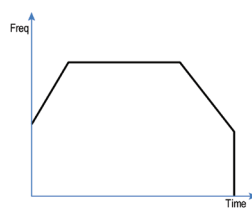
- Out-of-Step detection
- Pre-buffering for continuous motion
- Linear and circular interpolation
- Anti-jerk drive correction
- Fully customizable Linear and S-curve acceleration/deceleration
- Backlash/Slip correction
- Vibration reduction
- Built-in homing routines
- Programmable soft limits
- On-the-fly override of speed or target position

### Applications:

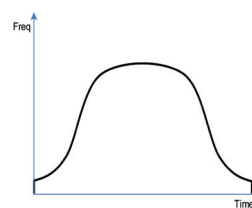
- Laser cutting/engraving machines
- CNC machines
- 3D printing/scanning machines
- Semiconductor manufacturing



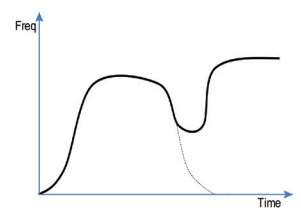
Constant Speed



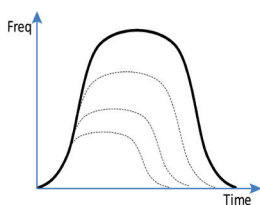
Trapezoidal Profile



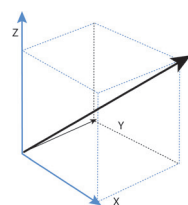
S-Curve Profile



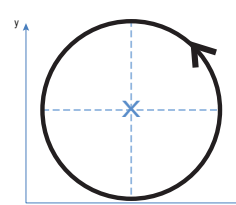
On-the-Fly Adjustment



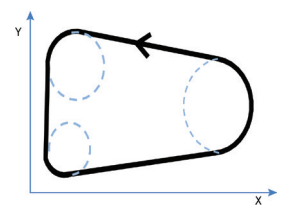
Anti-Jerk Drive  
Correction



Linear Interpolation



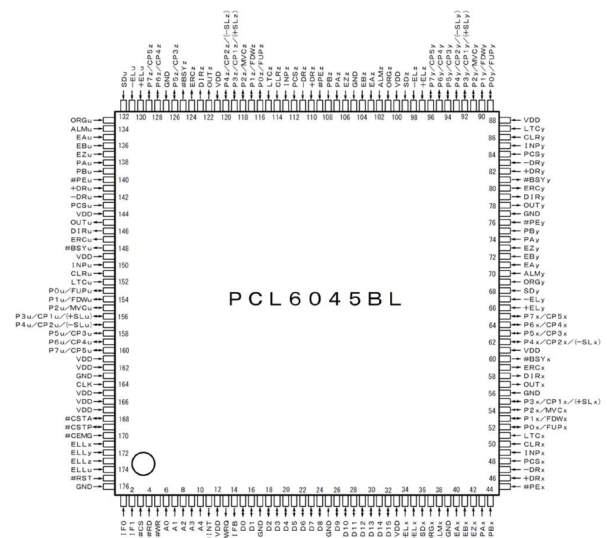
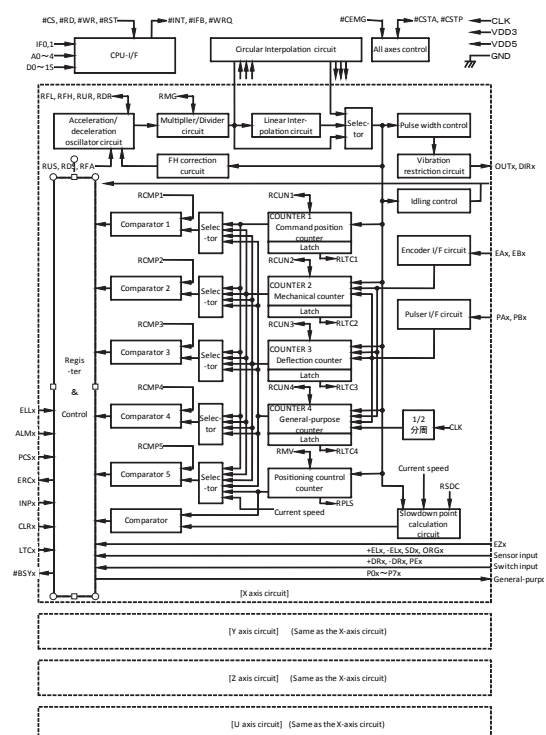
Circular/Arc  
Interpolation



Continuous Linear/  
Circular Interpolation

## General Specifications

Item	Description
Available Configurations	2 or 4 axis
Max Output Speed	PCL6025B/6045BL: 6.5 Mpps (with 19.6608 MHz reference clock) PCL6046: 10 Mpps (with 30 MHz reference clock)
Position Range per Axis	PCL6025B/6045BL: -134,217,728 to +134,217,727 (28-bit) PCL6046: -2,147,483,648 to +2,147,483,647 (32-bit)
Speed Range per Axis	1 to 65,535 (16-bits)
Acceleration Rate Range per Axis	1 to 65,535 (16-bits)
Deceleration Rate Range per Axis	1 to 65,535 (16-bits)
Mechanical Sensor Input per Axis	ORG, +EL, -EL, SD
Servomotor I/F per Axis	INP, ERC, ALM servomotor inputs
Encoder Input Max Frequency	1 count per reference clock cycle with filter, 1 count per 3 reference clock cycles
Typical operations	<ul style="list-style-type: none"> <li>- Continuous operation</li> <li>- Positioning operation</li> <li>- Continuous operation using a <math>\pm</math>DR switch</li> <li>- Origin return operation</li> <li>- Timer operation</li> <li>- Continuous operation using a pulsar input</li> </ul>
Typical functions	<ul style="list-style-type: none"> <li>- Immediate stop and decelerating stop</li> <li>- Speed change</li> <li>- External start and external stop function</li> <li>- Idling pulse output function</li> <li>- Continuous circular and linear interpolation</li> </ul>
Number of Registers for Speed Setting per Axis	3 (FL, FH, FA)
CPU Interface	8-bit, 16-bit
Power Supply	PCL6025B: 3.0 to 3.6 V and 4.5 to 5.5 V PCL6045BL/PCL6046: 3.0 to 3.6 V
Package	PCL6025B: 128-pin QFP (mold section :20.0× 14.0 mm) PCL6045BL: 176-pin QFP (mold section :24.0× 24.0 mm) PCL6046: 208-pin BGA (mold section :12.0× 12.0 mm)
Chip design	CMOS (Complementary Metal-Oxide Semiconductor)



Note: Pin number 1 is to the lower left of the LSI when you see the model name "PCL6045BL" marked on the chip at the front

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