Path Following Datasheet

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General Description

The Path following solution adds to Vention's manufacturing application portfolio by unlocking automatic path execution. The machine system comes as a comprehensive application kit, including MachineApp software for controls, 3-axis gantry robot, and optional gripper suggestions.

We offer both turn-key solutions and self-deployed solution for our path following applications. If you choose our turn-key solutions our team will provide end-to-end deployment support including: design validation, customization, pre-assembly, Factory Acceptance Test, commissioning, training & Site Acceptance Test. This ensures the delivery of a functional path following machine that performs according to the requirements defined in a project scope, from gripper validation to operator functionality.

Below are the supported shapes by the software infrastructure built to interpret paths, convert to 3D setpoints and stream to MachineMotion's CAN drives

- 3D linear segments
- 2D circular arcs

Controlling your path following machine is possible in one of two ways:

- Capabilities through G-codes commands by Python API
- Path following Machine App

Vention's path following Machine App offers unique features that fit any custom solution such as
Configuration & calibration of the workspace : mapping axes to drives, mapping digital output tools, configuring workspace dimensions
Configuration of the path: uploading G-code files, adding multiple paths to a workspace & visualization of the path
Execution of the path: dry run the job at a z-offset and slow speed, status of machine, ability to play/stop

Common applications using Vention Path Following software and hardware

Vention Path Following software and hardware can be used for several applications such as:

- Laser engraving
- Dispensing (glue, painting ...)
- CNC
- Milling
- Routing
- Drilling

Use your desired end of arm tool and mount it directly on your Machine.

Path following specifications

Specifications	Value	Notes
Linear Segments	3D	Linear Moves (G0 and G1) are supported for X, Y and Z axes Small segments can be blended to create curved 3d paths
Circular Arcs	2D	Arc Moves (G2 and G3): Support XY, YZ and ZX planar curves
Accuracy	+/- 0.1 mm	Tested on enclosed ball screw actuators Tolerance on blending between linear moves can be adjusted to prioritize TCP speed variability or accuracy Only characterized within 1000-3500 mm/min range
Min Arc Radius for constant speed	5 mm	Tested on enclosed ball screw actuators Tolerance on blending between linear moves can be adjusted to prioritize TCP speed variability or accuracy Only characterized within 1000-3500 mm/min range
TCP Speed Variability from Setpoint	+/- 10%	Tested on enclosed ball screw actuators Tolerance on blending between linear moves can be adjusted to prioritize TCP speed variability or accuracy Only characterized within 1000-3500 mm/min range

Linear actuators specifications

	Enclosed timing belt	Enclosed ball screw
Linear Actuator Type	12.5 kg	10 kg
Repeatability (mm)	Up to +/-0.025 mm	Up to +/-0.025 mm
Travel (mm);	585, 855, 1530, 2295	145, 370, 640, 1315, 2080
Speed (mm)	2000	Up to 750
Acceleration (mm/s2)	2000	500
Linear capacity (N)	1100	3250
	Learn more	Learn more

G-code interface

Vention's g-gode interface provides a set of machine instructions that allow a user to smoothly move multiple axes at once. There exist various different versions of g-code that are offered by industrial manufacturers. Vention's is based off RS-274-NGC g-code language and LinuxCNC. If using a CAM software to generate g-code, choosing either as a post-processor will ensure that it is compatible with MachineMotion. Vention does not support the entire list of g-code commands provided by RS-274-NGC or LinuxCnc, so some advanced codes (such as custom drilling routines or patterns) may not be recognized. The link below describes the two types of available g-code commands: operational mode commands and movement and tool commands.

Link

Path following MachineApp : Operate your machine through a GUI

Vention's Path following MachineApp is an easy-to-use and intuitive application to configure, program and operate your milling & drilling, dispensing, laser engraving machines. The app comes pre-loaded on the Vention pendant and can be accessed from the pendant or through a computer located on the same network. The Path following MachineApp includes features such as workspace and path configuration, path sequences setup, error and notification management, real-time process status and performance, simulation of your path and a visual display of the path following operations.

Path Following User Guide