
**SYMBOLS AND GRAPHICAL
REPRESENTATION FOR MECHANICAL
AND MOTION CONTROL SCHEMATICS**
(Summary)

V0.3b

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1. Introduction







The development of a machine is a procedure that combines knowledge from different areas, which complement each other in order to obtain a design that is as suitable as possible to the requirements and objectives. This is the case of machines that combine mechanical and motion control technology. The different nature and objectives of the information makes it difficult to combine it into a single representation, even though both fields are complementary, as their technologies are.

Generally, different types of technical representations such as drawings can show the mechanical information of a machine. While on the other hand, the movements of servomechanisms or servo axes that drive the machine are described by text commands that are interpreted and run by a motion controller.

In order to cover these difficulties and propose a solution to the joint representation of information, a set of symbols is presented in this document.

2. Symbol table

Symbol	Name	Description
	Structural element	<i>This pattern is used for fill draws which represent structural elements</i>
	Active element	<i>This pattern is used for fill draws which represent active / moving elements</i>
	Guide element	<i>This pattern is used for fill draws which represent the guiding elements for the active elements. The places where the active elements can be positioned.</i>
	Linear Axis, side view	<i>Basic linear axis, side view.</i>
	Linear Axis, top view	<i>Basic linear axis, top view.</i>
	Linear Axis, front view	<i>Basic linear axis, front view.</i>
	Virtual Linear Axis, side view	<i>Virtual linear axis, top view.</i>
	Virtual Linear Axis, front view	<i>Virtual linear axis, side view.</i>
	Virtual Linear Axis, front view	<i>Virtual linear axis, front view.</i>
	Zero position axis	<i>The line should cross the point of the zero position for the axis</i>
	Positive direction	<i>Additional symbol for coordinate reference symbols.</i>

	Negative direction	<i>Additional symbol for coordinate reference symbols.</i>
	Center point	<i>It can be used for Tool Center Point (TCP), Object Center Point (OCP), etc.</i>
	Origin of coordinate system	<i>This symbol can be used combined with “Zero position axis” or alone.</i>
	Origin of coordinate system for machine vision cameras	<i>Specific symbol for the 0,0 pixel of a machine vision image.</i>
	TCP, OCP, trajectory	<i>Thin line with arrow for general motion of TCP or OCP</i>
	Virtual trajectory	<i>Dash line is used to represents virtual movements over the schematics.</i>

3. Application examples

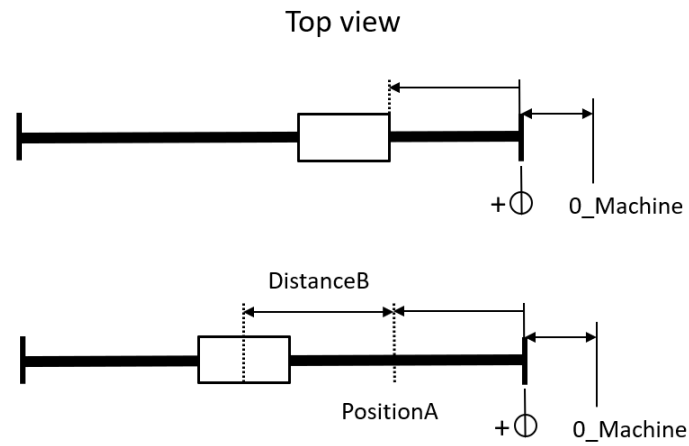


Figure 1 Basic linear axis

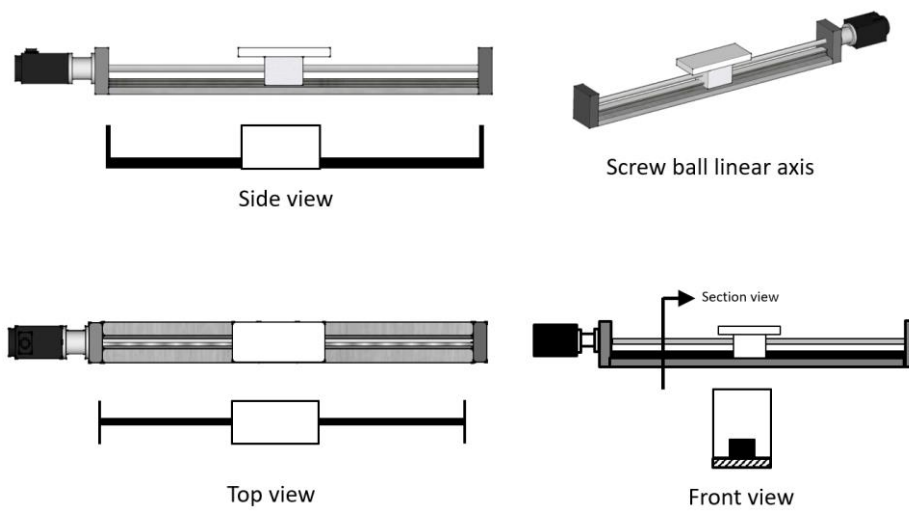


Figure 2 Basic linear axis, fixed guide, moving chart

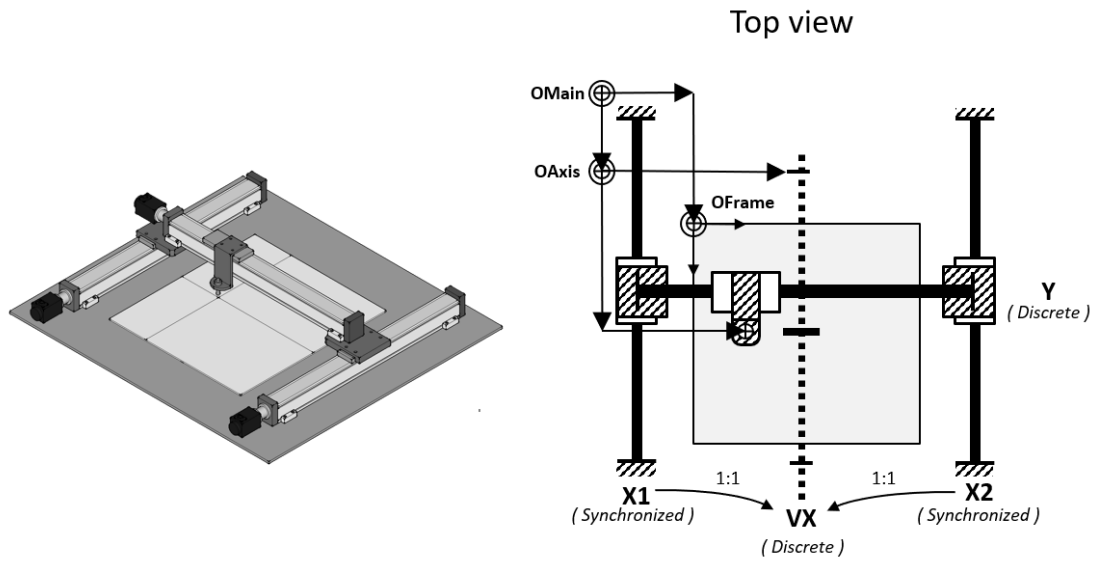


Figure 3 XY with gantry and virtual axis for synchronism purposes

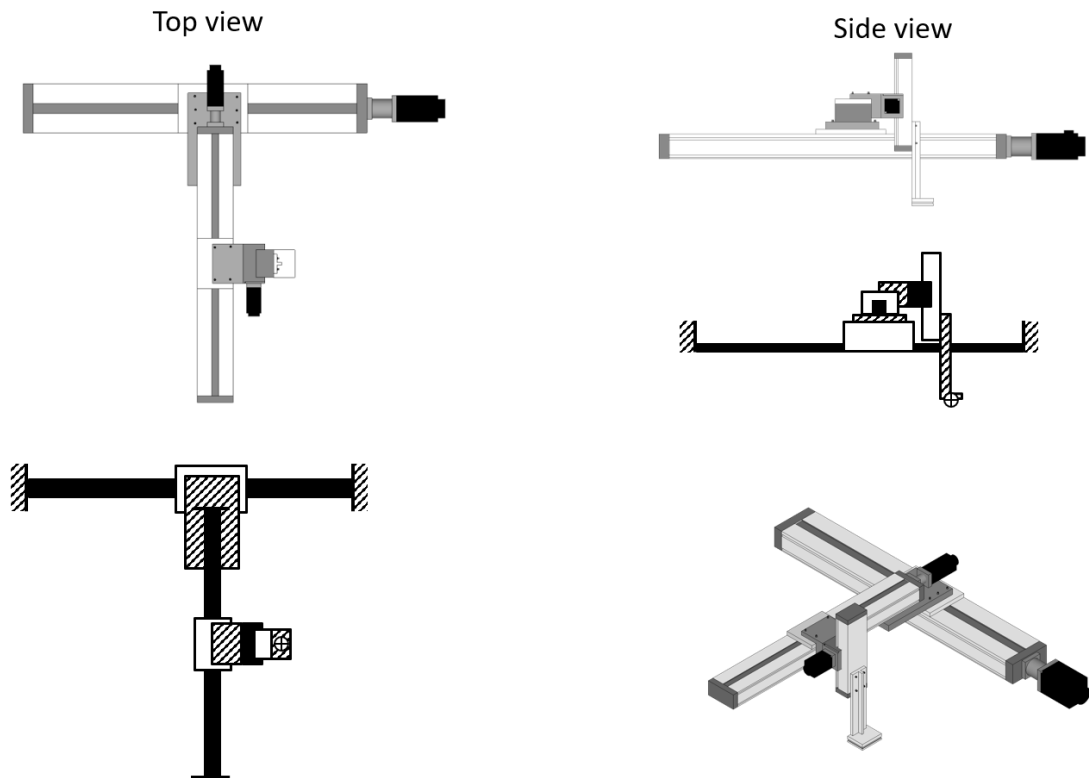


Figure 4 XYZ cartesian axes, vertical axis has a fixed guide with moving chart

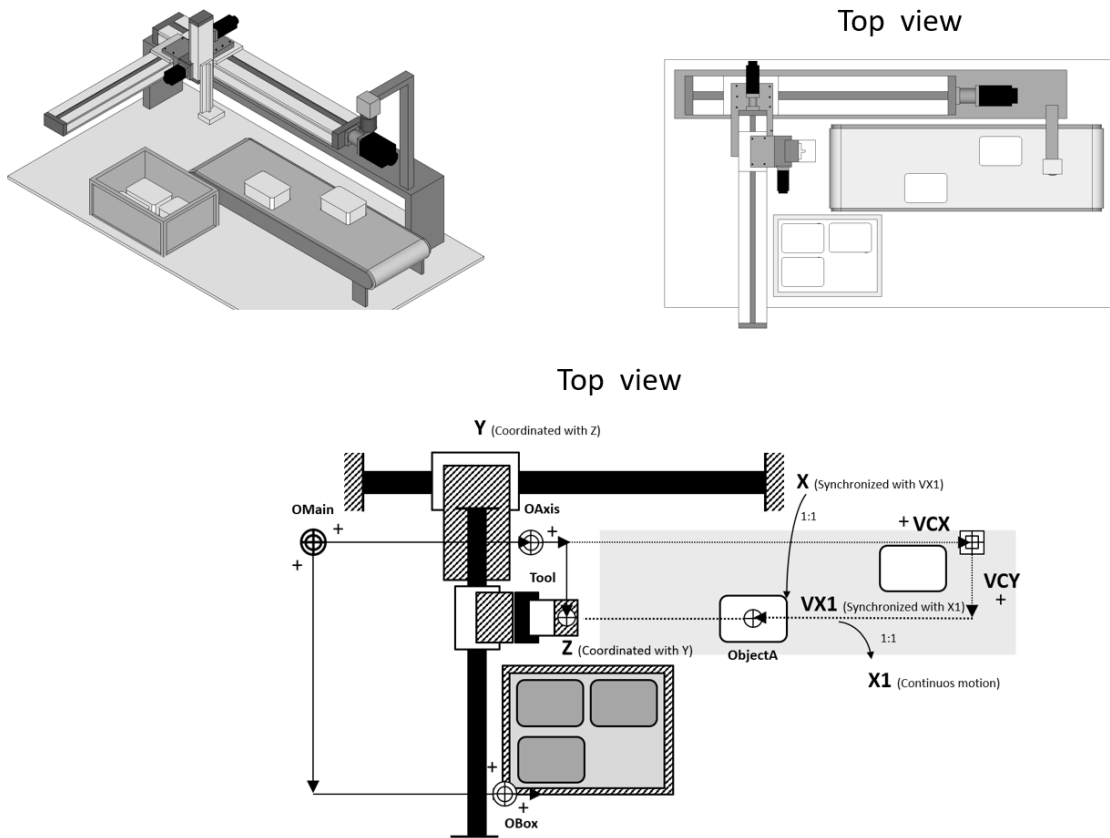


Figure 5 XYZ, with conveyor, machine vision, virtual axis parametrized respect camera axis

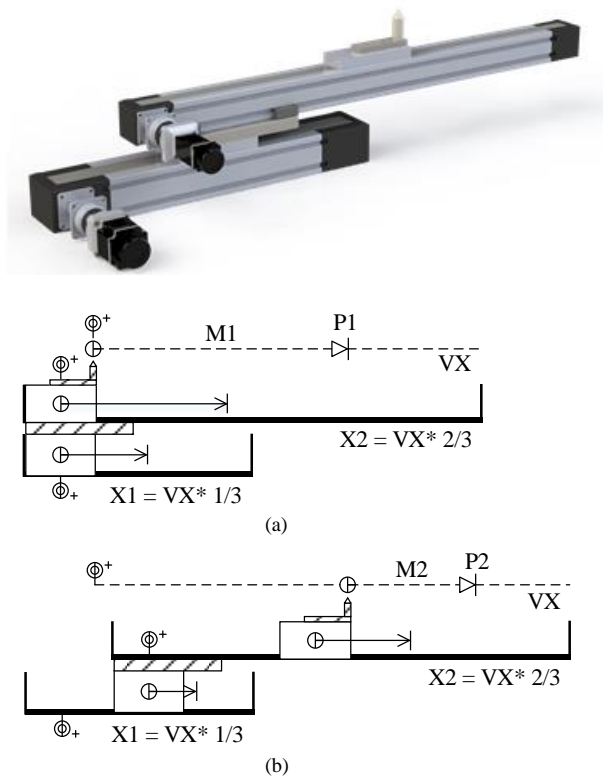


Figure 6 Telescopic axis, using virtual axis for simple kinematic transformation