

Absolute Calibration Quality Report

FAVERGES

26.01.2024

1. INFORMATION

From **Val3 S7.4** version the algorithms used by the absolute calibration have been improved. For a **better accuracy** the payload (mass and inertia) and the gravity vector must be defined correctly in relation to the application.

- The gravity is defined :
 - in "**cell.cfx**" file (see "**gravity**" tag).
- The payload is defined :
 - in "**cell.cfx**" file (see "**payloadDefined**", "**payloadMass**", "**payloadGravityCenter**" and "**payloadInertia**" tags).
 - or
 - with **\$setInertia()** addon Val3 function. This function updates in real time the definition of the payload. (see Technical data for more details).

2. OBJECTIVE

This document sums up all the results of absolute precision tests done after the "absolute calibration" operation. The objective of these tests is to measure the quality of the absolute calibration performed.

3. CONFIGURATION

3.1. Robot Configuration

Robot Type : TX2_90L-S2	Serial Number : F/24/0057726/A/001	Val3 Version : s8.17.1cs9_BS3807
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3.2. Absolute Calibration Software

Application Version : s1.15	Robot Library Version : 2.0
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3.3. Measurement system and Environment

Measurement system type : Laser Tracker	Precision in measurement volume : 0.046 mm
Mass of the payload : 1.16 kg	Temperature : 20 deg C

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4. RESULTS

The absolute precision values indicated in this sheet are static values. The absolute precision is defined by the error between the controller position and the position given by the measurement system.

4.1. Absolute precision in the whole workspace

Robot Configuration : Shoulder : **Righty and Lefty**
 Elbow : **Positive and Negative**
 Wrist : **Positive and Negative**

Number of points to validate calibration parameters : **391**

Mean precision [mm]	0.07 mm
Max@90% precision [mm]	0.11 mm

Note : Max@90% means that the precision of 90% of the points is below this value.



4.2. Absolute precision in the restricted volume

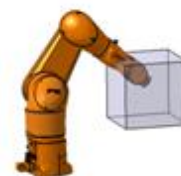
Robot Configuration : Shoulder : **Lefty**
 Elbow : **Positive**
 Wrist : **Positive and Negative**

Center of volume [mm] : **{ 687, 0, 0 }**

Size [mm] : **{ 508, 508, 508 }**

Number of points : **47**


Mean precision [mm]	0.05 mm
Max@90% precision [mm]	0.08 mm



4.3. Precision on straight line

The following values are static. A measure was done each two centimeters.

The control sequence performs a straight line in one way for each direction.

Direction	Start Position { X, Y, Z }	Length of straight line [mm]	Max Error [mm]	
\vec{X}_{Robot}	{ -242, -488, 505 }	700 mm	0.05 mm	
\vec{Y}_{Robot}	{ 406, -958, 252 }	700 mm	0.06 mm	
\vec{Z}_{Robot}	{ 50, -863, -413 }	700 mm	0.04 mm	