

SyCart Mechanics

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1 Introduction

The SyCart has four DC-motors arranged like the corner points of a square. Each of the motors has a gearbox built in which transmits the torque and speed with a calculated gear ratio.

2 Acting forces

3 Gearbox

The gear ratio of the gear box is defined as following

$$i_G = \frac{\omega_{in}}{\omega_{out}} = \frac{n_{in}}{n_{out}} = \frac{M_{out}}{M_{in}} \quad (1)$$

Dimension by desired speed (ω_{des})

Assuming the speed of the motor is given by

$$i_G = \frac{\omega_M}{\omega_{des}} \quad (2)$$

Dimension by desired torque (M_{des})

4 Electronics