AMOR Kinematics, Transmission Ratios and Joint Limits

If there are any questions or comments regarding this document, please feel free to contact the Exact Dynamics support department. Contact details are listed below.

Exact Dynamics BV

Kervel 4, 6942 SC DIDAM, The Netherlands

Phone: +31 316 334 114

Fax: +31 316 331 327

E-mail: support@exactdynamics.nl

Internet: www.exactdynamics.nl

document version 20120321

MOTOR VOLTAGE AND CURRENT LIMITS

The robot arm transforms requested torques and voltages using the maximum/minimum currents and maximum/minimum voltages given in Table 1.

	A1	A2	A2.5	A3	A4	A5	A6
Voltage max/min	+/-24V	+/-24V	+/-12V	+/-12V	+/-9V	+/-9V	+/-9V
Current max/min	+/-560mA.	+/-2030mA.	+/-1500mA.	+/-2030mA.	+/-960mA.	+/-990mA.	+/-475mA.

Table 1 AMOR maximum motor voltages and currents, which are used to translate motor torques and velocities requested with the MOTOR_COMMAND message to the corresponding voltages and currents.

DENAVIT-HARTENBERG PARAMETERS

The kinematic structure of AMOR, represented as the widely used Denavit-Hartenberg parameters, is given in Table 2.

i	a_i	α_i	d_i	θ_i
1	155	$\pi/2$	62.3	θ_1
2	0	$-\pi/2$	0	θ_2
2.5	419.46	$\pi/2$	97	$\theta_{2.5}$
3	0	$-\pi/2$	0	θ_3
4	358.2	$\pi/2$	50.2	θ_4
5	0	$\pi/2$	0	θ_5
6	70	0	0	θ_6

Table 2 AMOR Denavit-Hartenberg parameters

TRANSMISSION RATIOS AND JOINT LIMITS

Joint	Transmission Ratio	Range	Neutral Position	Joint Limits*
A1	636:1	∞	0°	$-\infty, +\infty$
A2	980:1	165°	-90°	-35°/+130°
A2.5	594:1	300°	0°	-150°/+150°
A3	396:1	154°	-90°	-88°/+66°
A4	666:1	∞	0°	$-\infty/\infty$
A5	550:1	180°	180°	-180°/+0°
A6	706:1	∞	90°	$-\infty/+\infty$

* **with respect to the joint neutral position**

Table 3 AMOR transmission ratios, neutral position angles and joint limits

MOTION DIAGRAMS

In the Figure 1 the joint angle directions are shown. Please note that AMOR is shown in its neutral position, which corresponds to the joint angles that are given in Table 3.

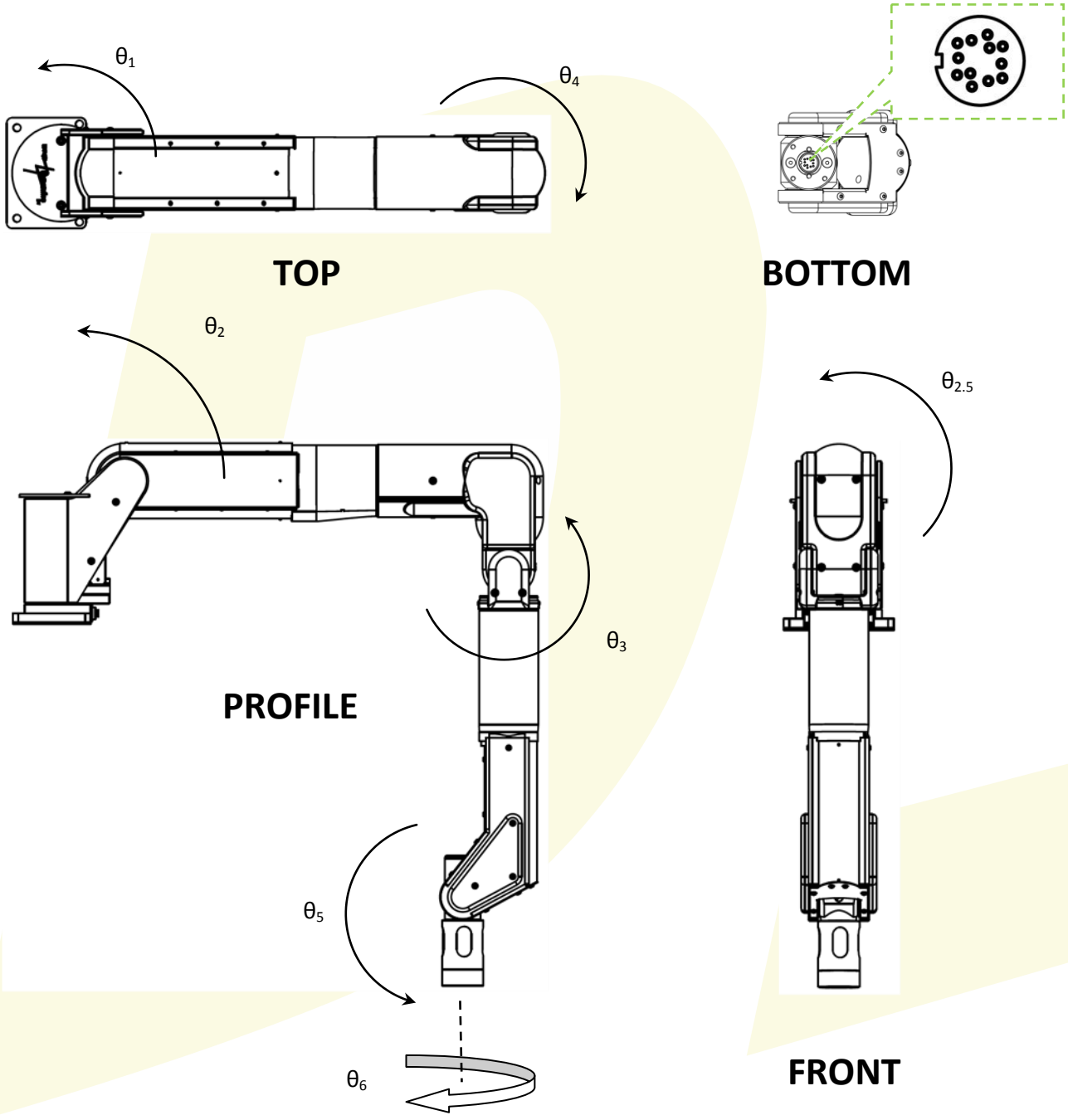

Figure 1 AMOR Motion Diagrams. Arrows indicate the direction of rotation when a positive angle change is commanded to the respective joint. Note that the AMOR shown in this figure is positioned in its neutral position. See Table 3 for details.