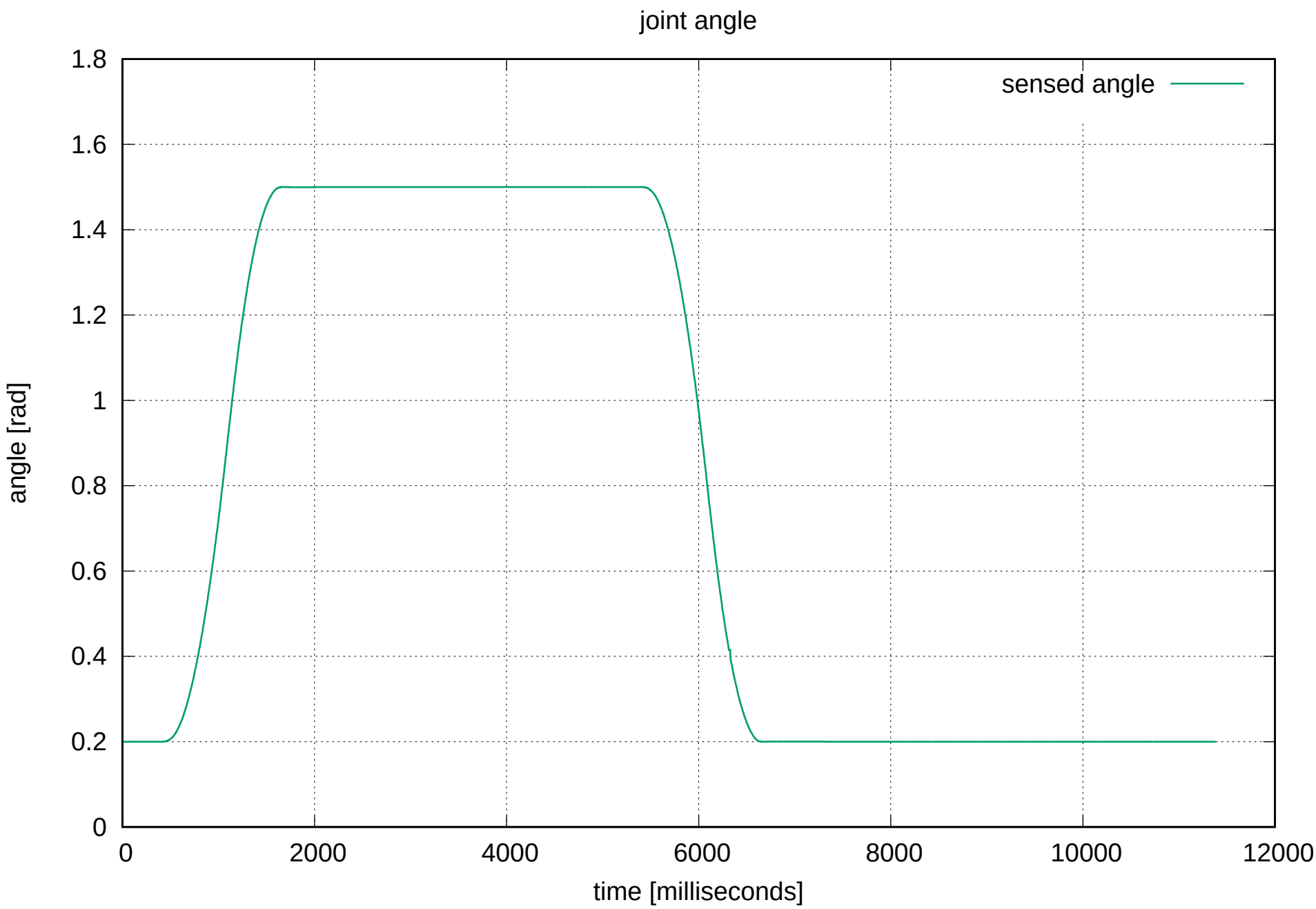
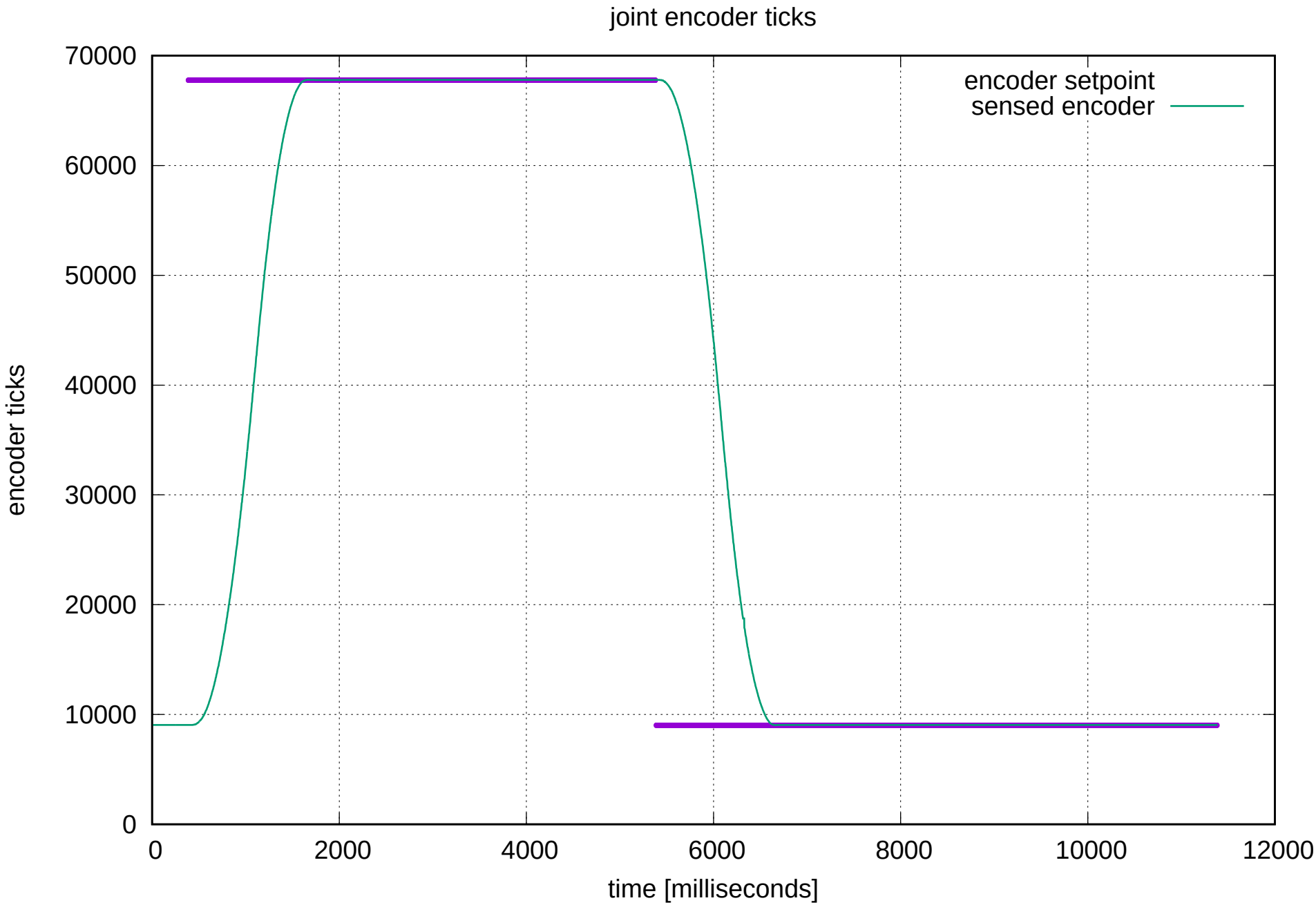
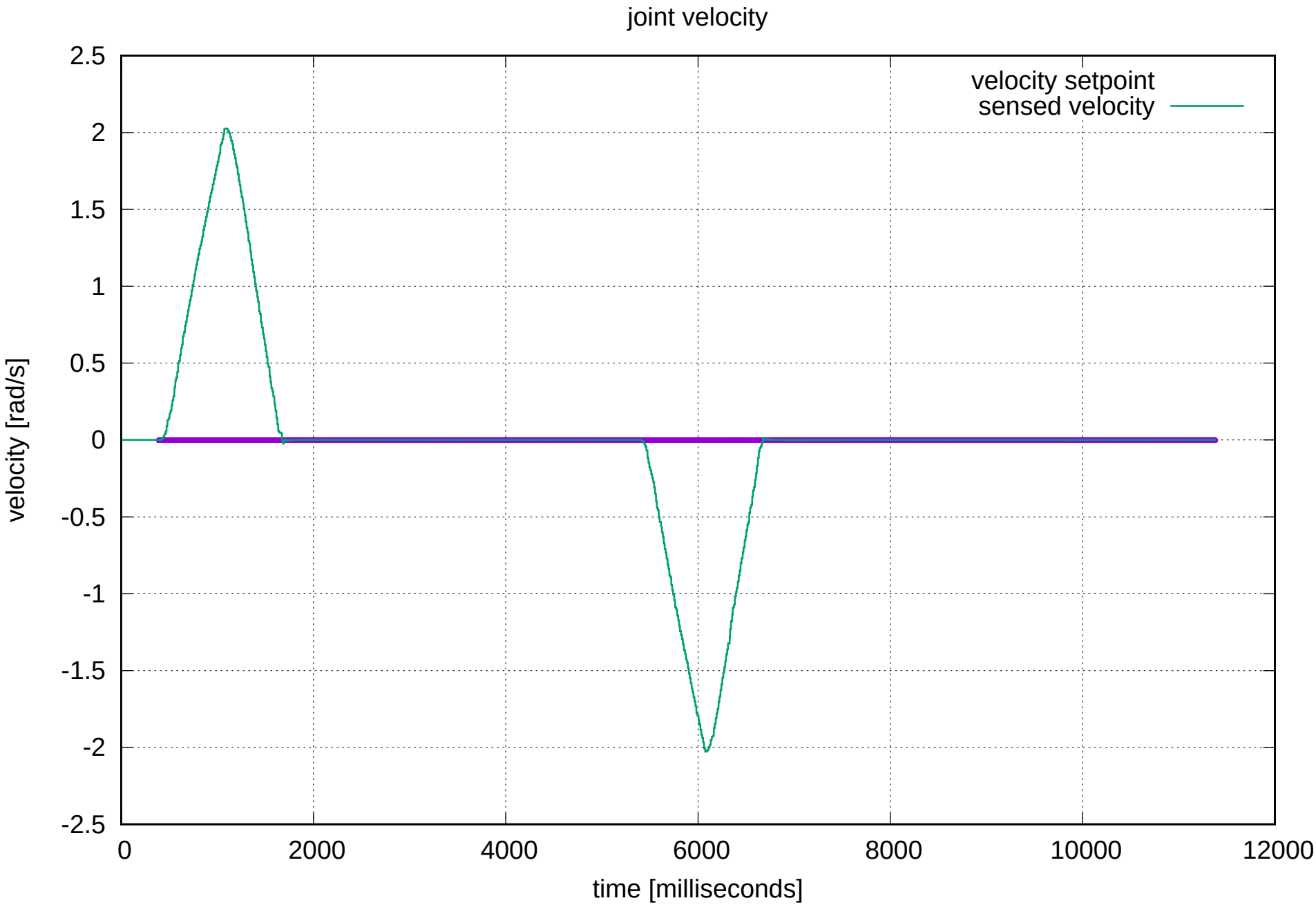
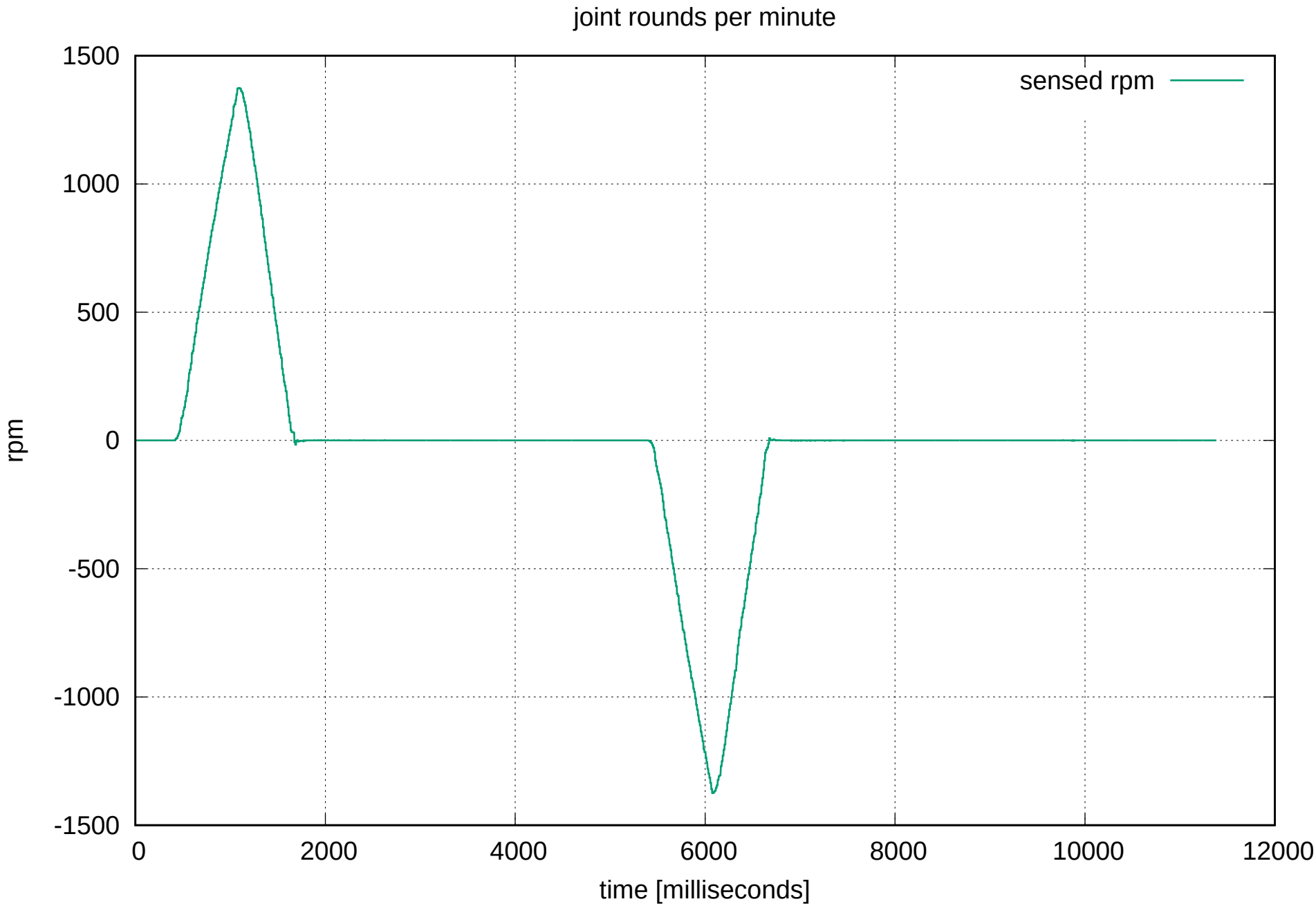
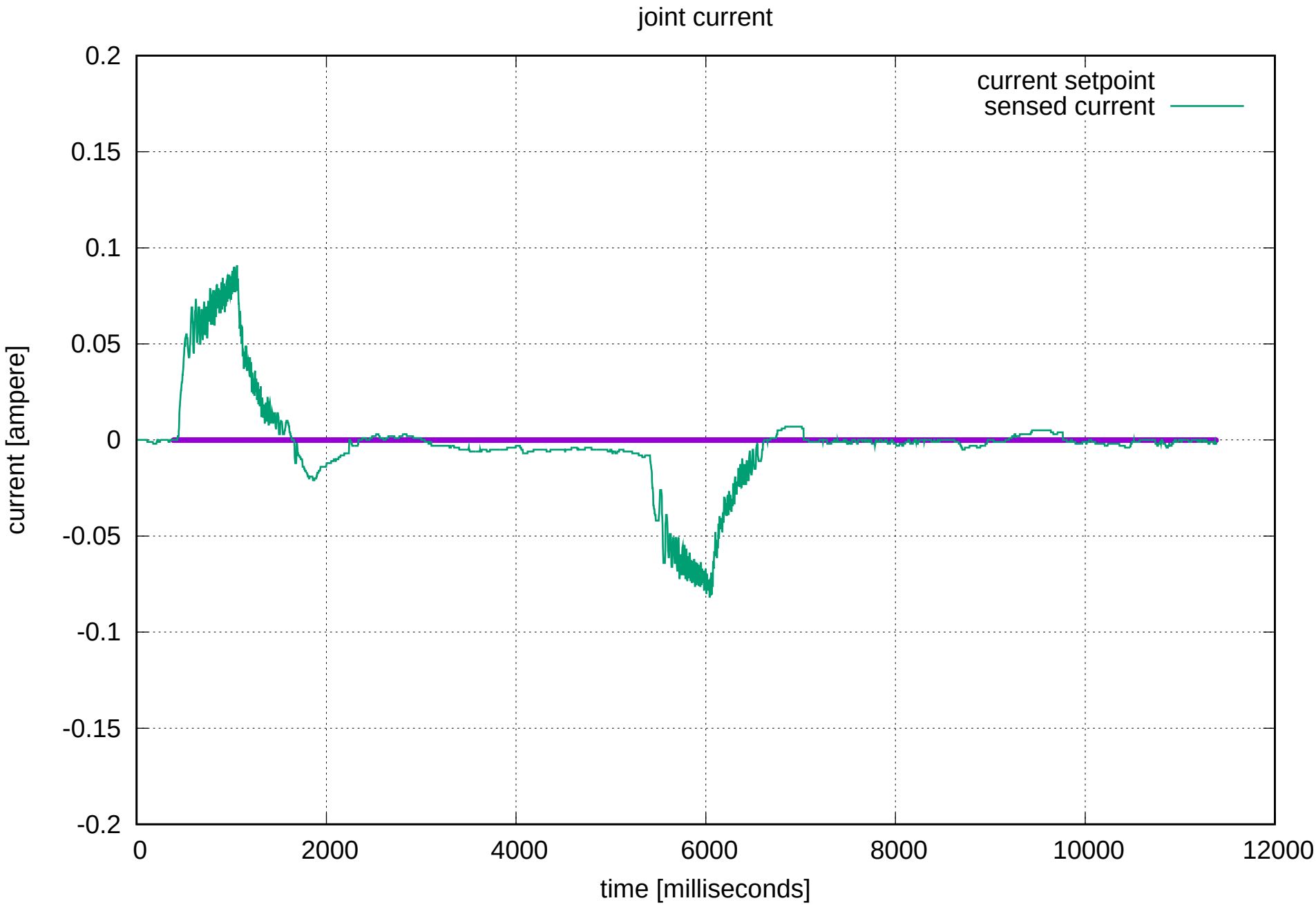
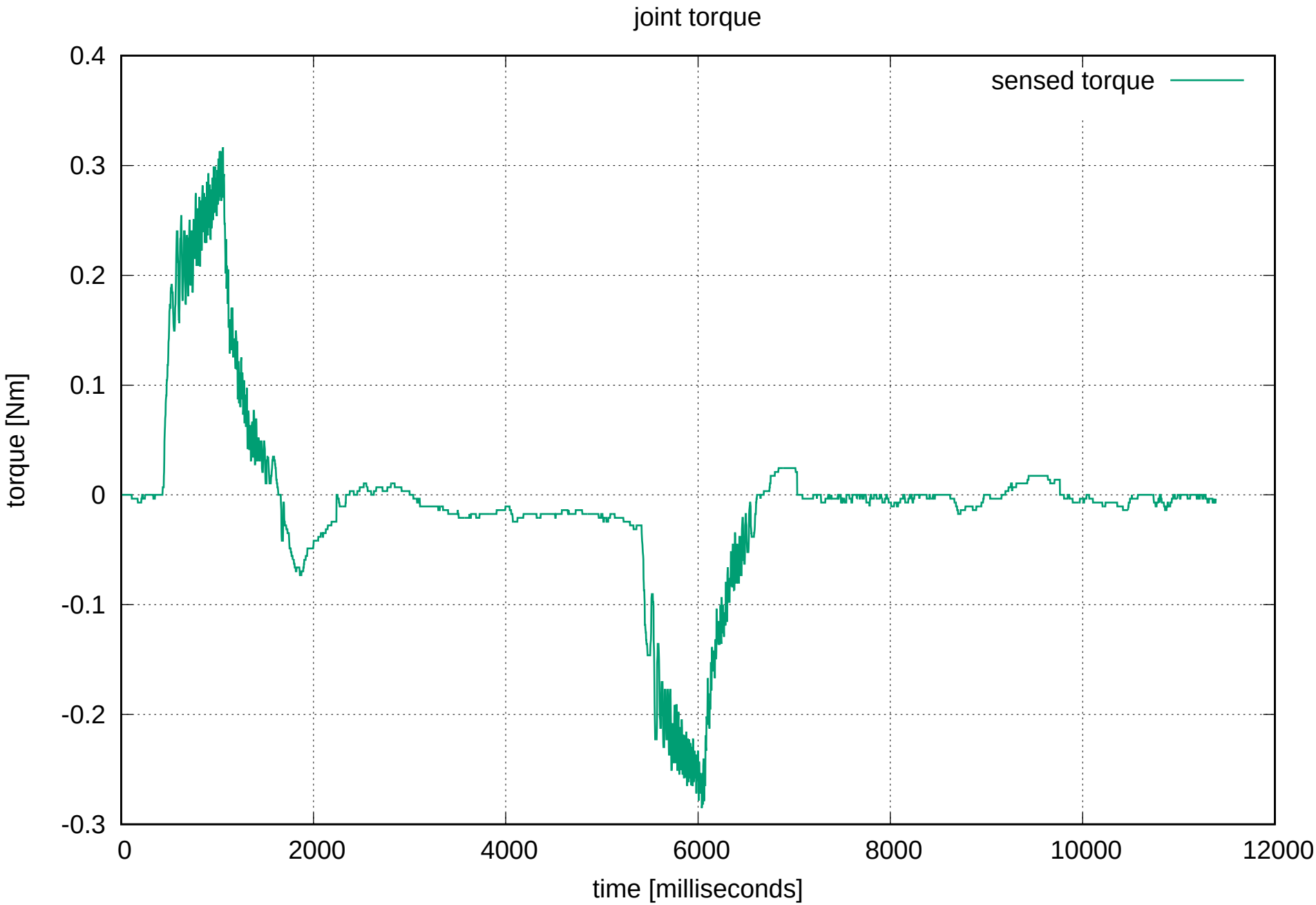

joint angle
sensed angle
angle [rad]
time [milliseconds]
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
0
2000
4000
6000
8000
10000
12000

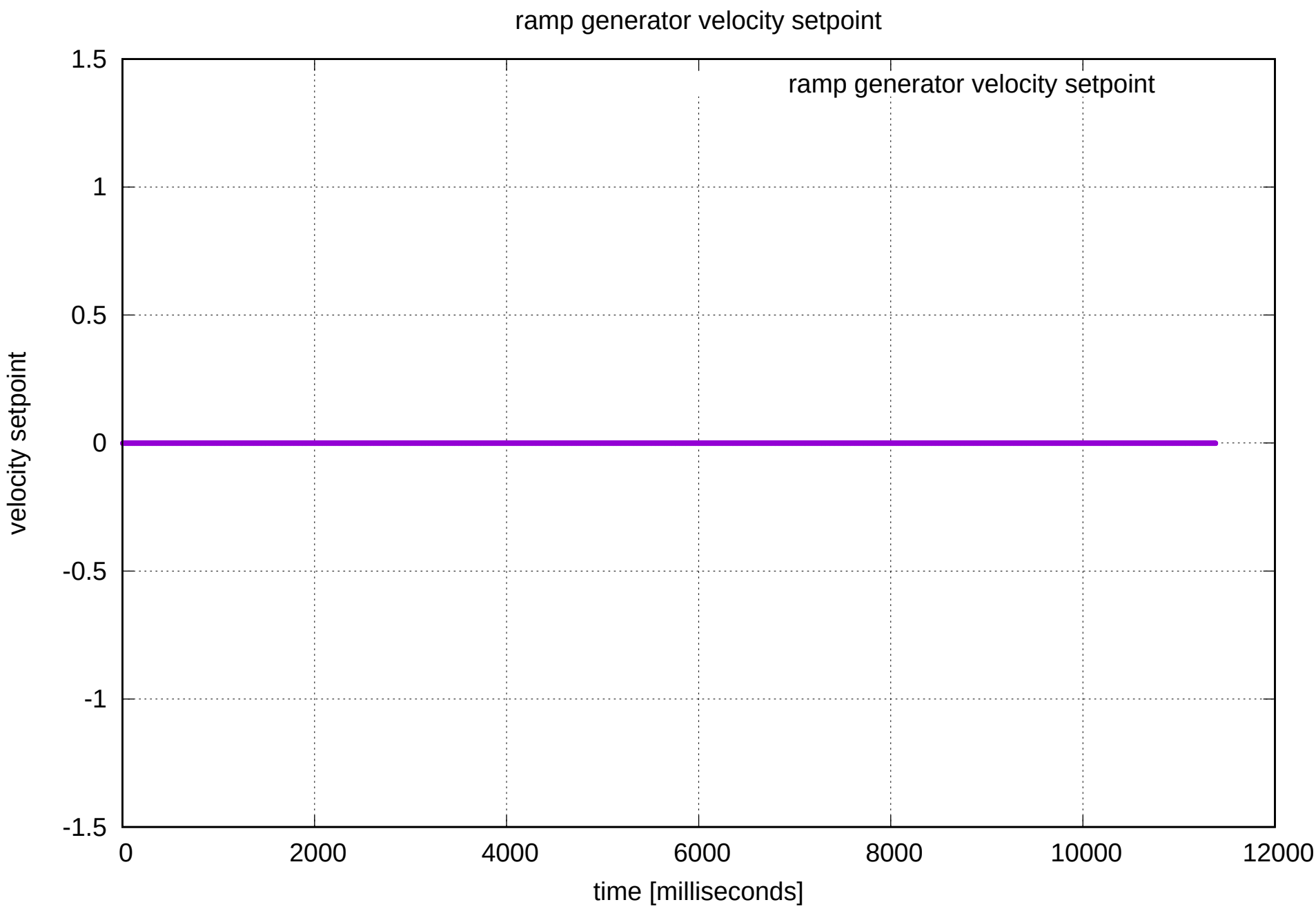

joint encoder ticks
encoder setpoint
sensed encoder
encoder ticks
time [milliseconds]
0
10000
20000
30000
40000
50000
60000
70000
0
2000
4000
6000
8000
10000
12000

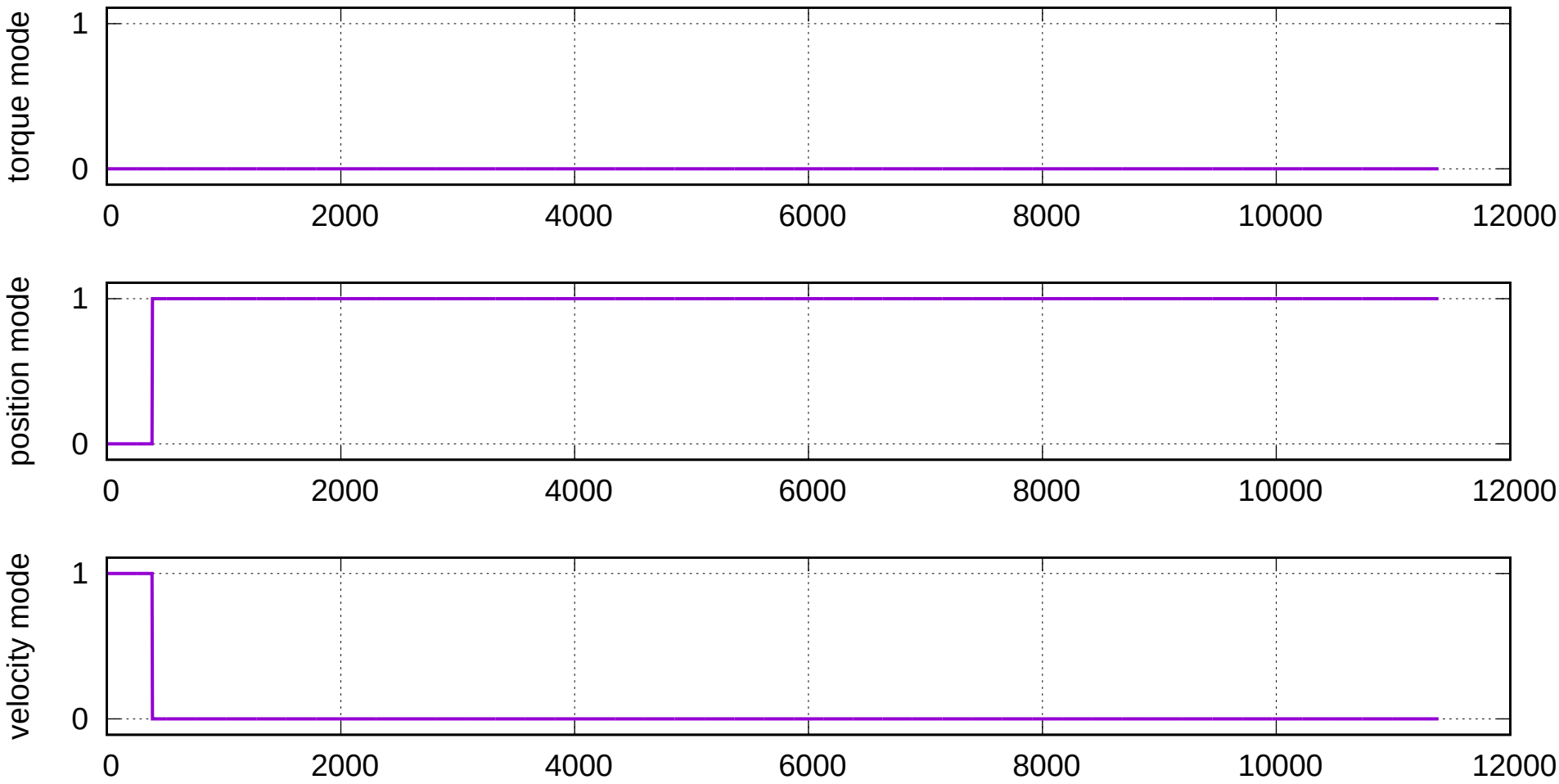

joint velocity
velocity setpoint
sensed velocity
velocity [rad/s]
time [milliseconds]
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
0
2000
4000
6000
8000
10000
12000

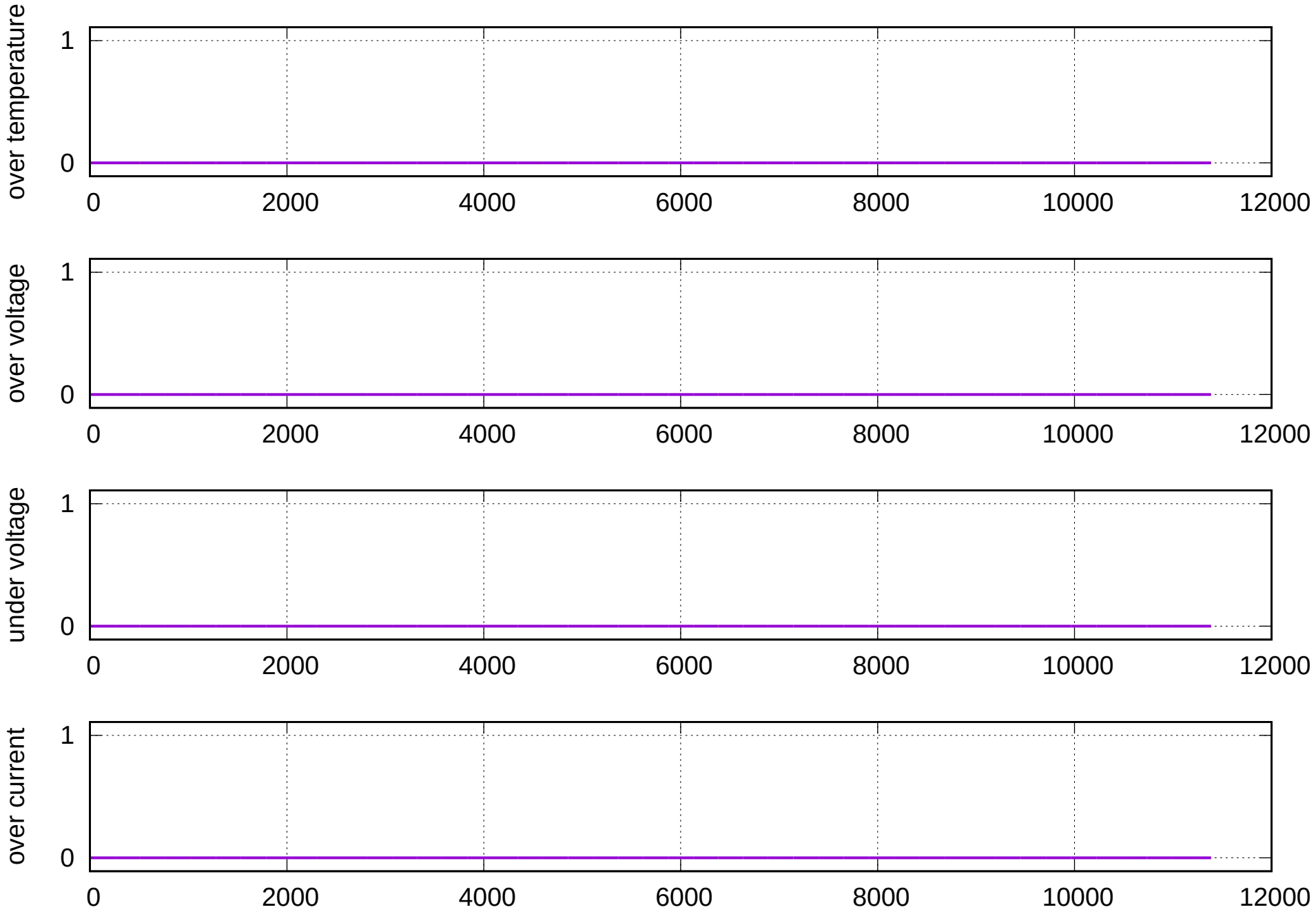

joint rounds per minute
sensed rpm
rpm
1500
1000
500
0
-500
-1000
-1500
0
2000
4000
6000
8000
10000
12000
time [milliseconds]

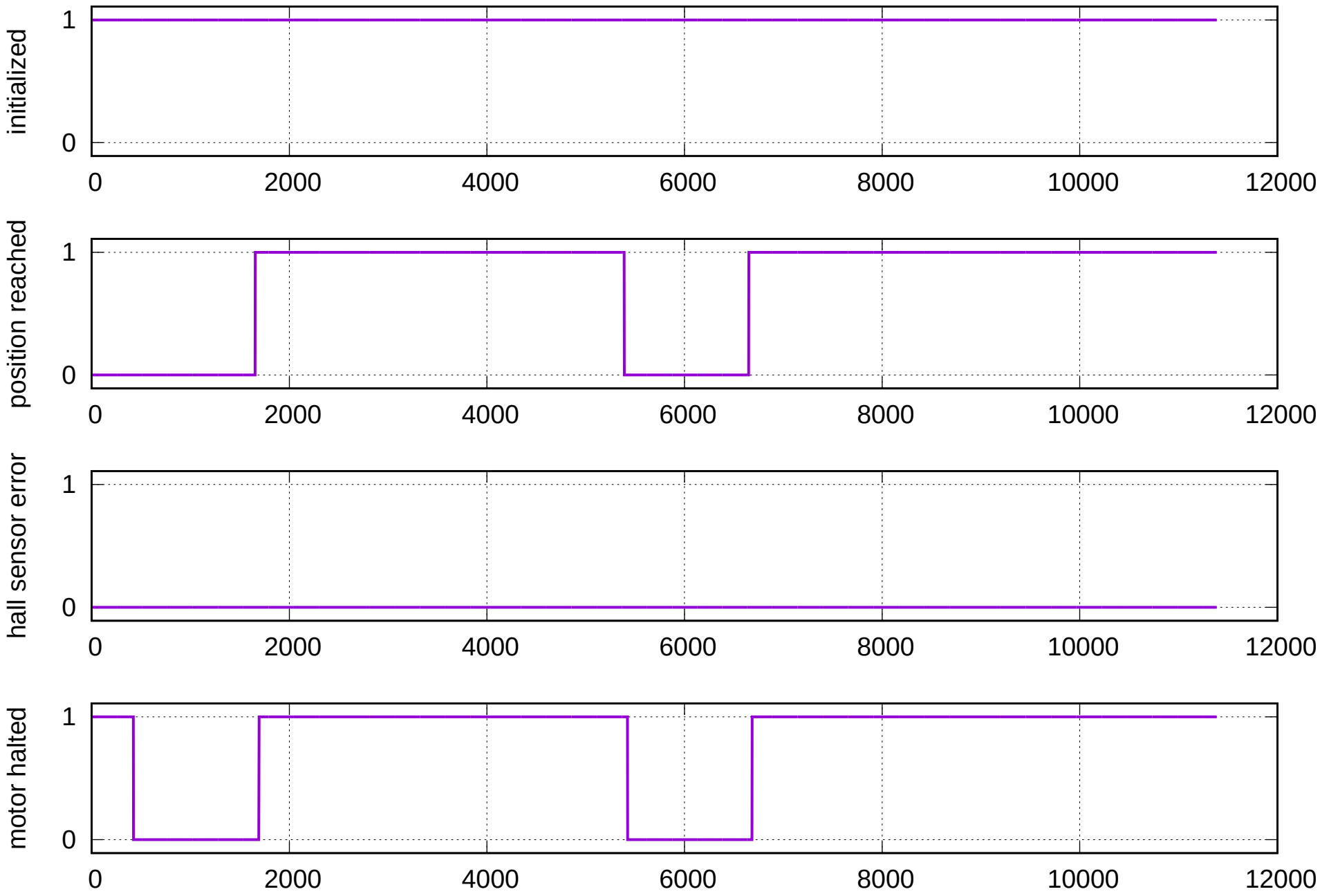

joint current
current setpoint
sensed current
current [ampere]
time [milliseconds]
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
-0.2
0
2000
4000
6000
8000
10000
12000

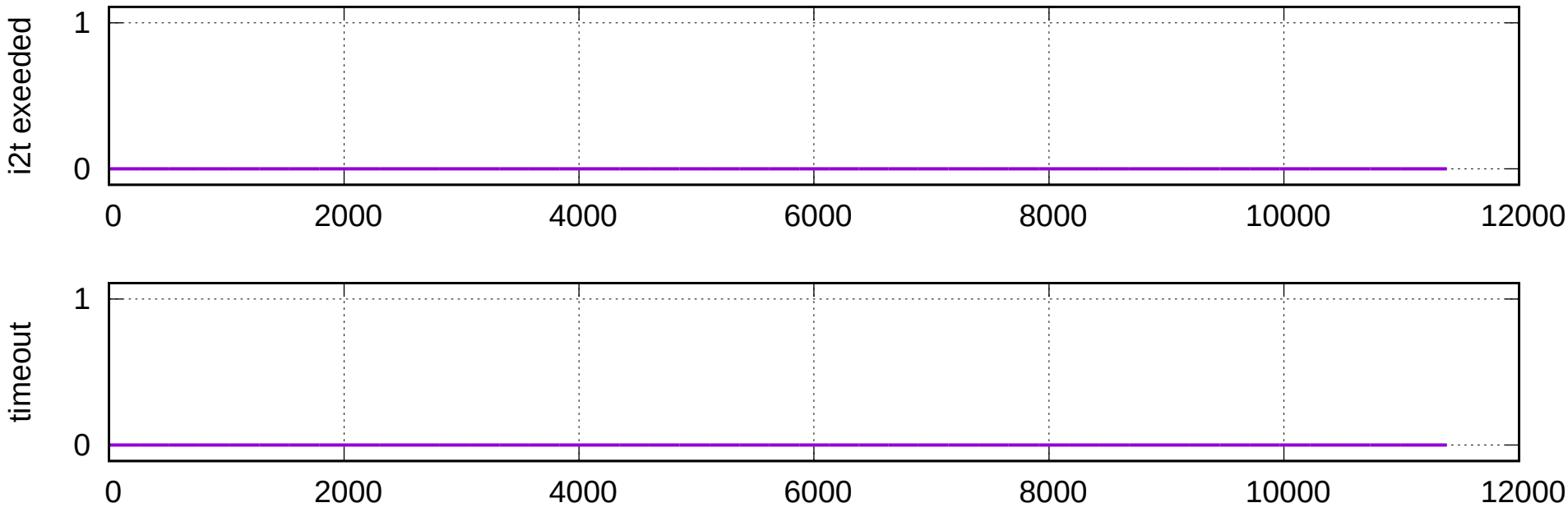

joint torque
sensed torque
torque [Nm]
time [milliseconds]
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
0
2000
4000
6000
8000
10000
12000


ramp generator velocity setpoint
ramp generator velocity setpoint
1.5
1
0.5
0
-0.5
-1
-1.5
velocity setpoint
0
2000
4000
6000
8000
10000
12000
time [milliseconds]


torque mode
1
0
0
2000
4000
6000
8000
10000
12000
position mode
1
0
0
2000
4000
6000
8000
10000
12000
velocity mode
1
0
0
2000
4000
6000
8000
10000
12000


over temperature
1
0
0
2000
4000
6000
8000
10000
12000
over voltage
1
0
0
2000
4000
6000
8000
10000
12000
under voltage
1
0
0
2000
4000
6000
8000
10000
12000
over current
1
0
0
2000
4000
6000
8000
10000
12000


initialized
position reached
hall sensor error
motor halted
1
0
0
2000
4000
6000
8000
10000
12000


i2t exeeded
1
0
0
2000
4000
6000
8000
10000
12000
timeout
1
0
0
2000
4000
6000
8000
10000
12000