

Motor type

- maxon DC motor
- maxon EC motor with or without sensor

Type of control

- Speed
- Position
- Current

Feedback

- Encoder
- DC Tacho
- IxR compensation
- Hall sensors
- Resolver

Power amplifiers

- Linear
- Pulsed
- 1 quadrant
- 4 quadrant

Circuit technology

- Digital
- Analog

Program

maxon motor control

4-Q servoamplifiers for DC motors

Sensorless controllers for EC motors

1-Q and 4-Q servoamplifiers for EC motors

Position controllers for DC and EC motors

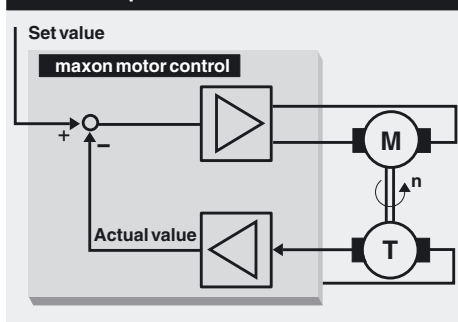
maxon motor control

DC tacho control

The motor must be equipped with a DC tachometer that provides a speed proportional signal. In the maxon modular system, the tachometer rotor is mounted directly on the through motor shaft, resulting in a high resonant frequency.

- Classical solution of a very precise control
- Limited service life of the DC tacho generator
- Not suitable for positioning tasks
- Only for analog controllers
- Only for DC motors
- Ideal for stringent demands on speed dynamics

Principle: DC tachometer control



Operating quadrant

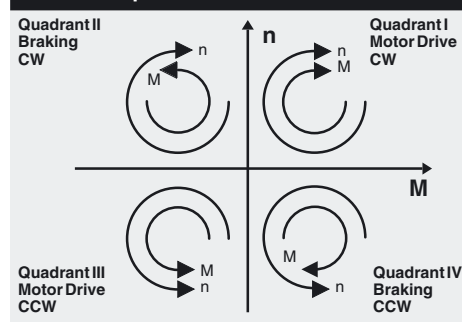
4-Q operation:

- Controlled motor operation and braking operation in both rotation directions
- A must for positioning tasks

1-Q operation:

- Only motor operation (Quadrant I or Quadrant III)
- Direction reverse via digital signal
- Typical: amplifier for EC motors

Principle: DC tachometer control



Power amplifiers

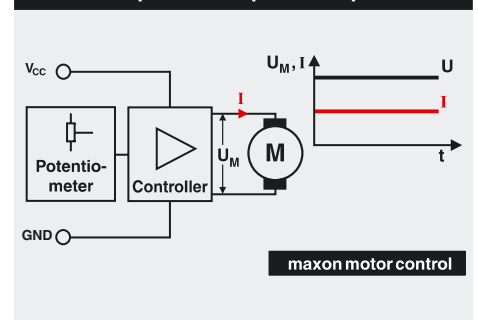
One of the following two principles to control the power stage transistors is used in maxon controllers:

Linear power stage

The operating voltage is divided between the motor and the power amplifier. The controller changes the voltage on the motor (U_M) linearly and proportionally. The voltage applied to the power amplifier (U_T) causes power dissipation

- High currents and low motor voltages cause significant power dissipation
- Simple and favorably priced design of the power amplifier

Principle: Linear power amplifier



Pulsed power stage (PWM)

The controller switches the motor on and off in short intervals (pulses / cycles). If the off interval is longer, the motor loses speed. The decisive average value of the voltage changes in relation to the on-to-off time. Only little energy is converted into heat.

- More expensive power amplifier
- High efficiency

Principle: Pulsed power amplifier

