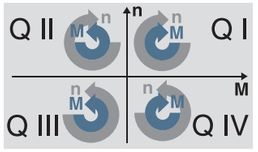
# 4-Q-DC Servoamplifier

**4-quadrant DC amplifiers accelerate and decelerate brushed DC motors in both rotating directions. The power stages are controlled on a linear or pulsed basis.**

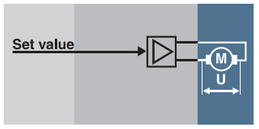
## 4-Quadrant operation

— Controlled acceleration and braking operation in both rotating directions (all 4 quadrants)

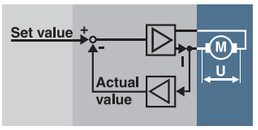



## Operating modes

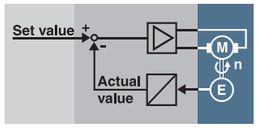
**Voltage regulator**
The motor is fed with a controlled voltage proportional to the set speed value. Load changes are not compensated.



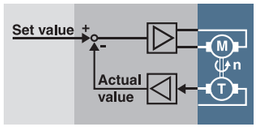

**IxR compensation**
As with voltage regulator however, load changes are additionally compensated. Suitable for average speed constancy demands.



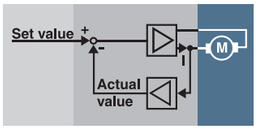

**Encoder – Speed control**
The speed controller compares the digital speed signal with the set value and adjusts the speed dynamically if there is a difference. Excellent control with long service life.




**DC tacho – Speed control**
Classical speed control using analogue actual value measurement. High speed dynamic possible.




**Current control**
The current controller keeps the motor current (torque) at the predetermined set value. Suitable for applications with a superior position controller.




**Details on controllers can be found in the catalogue and under www.maxonmotor.com**

# **LSC** 4-Q-DC Servoamplifier

**The LSC 30/2 (Linear Servo Controller) is a linear 4-Quadrant Servoamplifier used to control permanent magnet activated DC motors up to approx. 50 watts.**

**Linear power stage**
Ideally suited for small outputs power, low electromagnetic emission, no motor choke required.

**Operating modes**
Voltage regulator, IxR compensation, encoder speed control, DC tacho speed control or current control adjustable with a switch from outside.

**Design**
Robust metal housing with variable installation options on assembly plate or 19“ rack.

**Set value input**
Via external potentiometer, external set value voltage or using internal potentiometer.

**Easy start-up procedure**
Pluggable screw type terminal block, simple set-up with potentiometer, robust designed PI controller.

| Electrical Data | LSC 30/2 |
|---|---|
| Supply voltage $V_{CC}$ | 12 - 30 VDC |
| Max. output voltage | $V_{CC}$ - 5 V |
| Max. output current $I_{max}$ | 2 A |
| Continuous output current $I_{cont}$ | 2 A |
| **Mechanical Data** | |
| Weight | approx. 330 g |
| Dimensions (LxWxH) | 103x100x34 mm |
| Mounting | Flange for M4-screws |
| **Order Number** | |
| **250521** | LSC 30/2 4-Q-DC Servoamplifier in modular housing |

# **ADS** 4-Q-DC Servoamplifier


**145391** **201583**

**The ADS is a powerful pulse-width modulated (PWM) Servoamplifier for controlling permanent magnet activated DC motors of 10 – 500 watts. Available in modular housing as Standard and Power Version.**

**Pulsed output stage**
Suitable for controlling low and high output power. 95% efficiency thanks to state-of-the-art MOSFET technology.

**Operating modes**
IxR compensation, encoder speed control, DC tacho speed control or current control adjustable with a switch from outside.

**Design**
Robust metal housing in module form offers several mounting options.

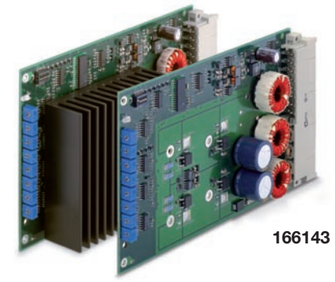
**Excellent control characteristics**
Stable speed behaviour when set value and disturbance variable change, fast current controller.

**Protection circuit**
Protected against over current, overheating and short-circuit of motor cable.

**Set value input**
External potentiometer or external set value voltage.

| Electrical Data | ADS 50/5 | ADS 50/10 |
|---|---|---|
| Supply voltage $V_{CC}$ | 12 - 50 VDC | 12 - 50 VDC |
| Max. output voltage | 0.9 x $V_{CC}$ | 0.9 x $V_{CC}$ |
| Max. output current $I_{max}$ | 10 A | 20 A |
| Continuous output current $I_{cont}$ | 5 A | 10 A |
| **Mechanical Data** | | |
| Weight (approx.) | 400 g | 400 g |
| Dimensions (LxWxH) | 180x103x26 mm | 180x103x26 mm |
| Mounting | Flange for M4-screws | |
| **Order Numbers** | | |
| **145391** | ADS 50/5 4-Q-DC Servoamplifier Standard Version in module housing | |
| **201583** | ADS 50/10 4-Q-DC Servoamplifier Power Version in module housing | |
| **Accessories** | | |
| **235811** | DSR 70/30 Shunt regulator | |

# **ADS_E** 4-Q-DC Servoamplifier



**168049** **166143**

**The ADS_E is a powerful pulse-width modulated (PWM) Servoamplifier for controlling permanent magnet activated DC motors of 10 – 500 watts. Available in Eurocard format as Standard and Power Version.**

**Pulsed output stage**
Suitable for controlling low and high output power. 95% efficiency thanks to state-of-the-art MOSFET technology.

**Operating modes**
IxR compensation, encoder speed control, DC tacho speed control or current control adjustable with a switch from outside.

**Design**
Standardized Eurocard version (with accessories) for the installation in a 19“-Rack or in a plug-in card system.

**Excellent control characteristics**
Stable speed behaviour when set value and disturbance variable change, fast current controller.

**Protection circuit**
Protected against over current, overheating and short-circuit of motor cable.

**Set value input**
External potentiometer or external set value voltage.

| Electrical Data | ADS_E 50/5 | ADS_E 50/10 |
|---|---|---|
| Supply voltage $V_{CC}$ | 12 - 50 VDC | 12 - 50 VDC |
| Max. output voltage | 0.9 x $V_{CC}$ | 0.9 x $V_{CC}$ |
| Max. output current $I_{max}$ | 10 A | 20 A |
| Continuous output current $I_{cont}$ | 5 A | 10 A |
| **Mechanical Data** | | |
| Weight (approx.) | 175 g | 410 g |
| Dimensions (LxWxH) | 160x100x16 mm | 160x100x30.5 mm |
| Mounting | | Rack-Installation |
| **Order Numbers** | | |
| **166143** | ADS_E 50/5 4-Q-DC Servoamplifier Standard Version in Eurocard format | |
| **168049** | ADS_E 50/10 4-Q-DC Servoamplifier Power Version in Eurocard format | |
| **Accessories** | | |
| **167850** | Front panel 3HE, 5TE to ADS_E 50/5 | |
| **168910** | Front panel 3HE, 7TE to ADS_E 50/10 | |
| **166873** | Backplane with screw terminals | |

# 4-Q-DC Servoamplifier Data

**LSC 30/2** 4-Q-DC Servoamplifier
Linear 4-quadrant servoamplifier for permanent magnet activated DC motors up to approx. 50 watts.

**ADS 50/5** 4-Q-DC Servoamplifier
Powerful PWM servoamplifier for permanent magnet activated DC motors from 10 to approx. 250 watts output power. Available as Standard Version in module housing.

| **Operating modes** | | |
|---|---|---|
| | **IxR compensation, voltage regulator, encoder speed control, DC tacho speed control, current control** | **IxR compensation, encoder speed control, DC tacho speed control, current control** |
| **Electrical Data** | | |
| Operating voltage $V_{CC}$ | 12 - 30 VDC | 12 - 50 VDC |
| Max. output voltage | $V_{CC}$ - 5 V | 0.9 x $V_{CC}$ |
| Max. output current $I_{max}$ | 2 A | 10 A |
| Continuous output current $I_{cont}$ | 2 A | 5 A |
| Switching frequency of power stage | | 50 kHz |
| Max. efficiency | | 95 % |
| Built-in motor choke | | 150 µH / 5 A |
| **Input** | | |
| Set value | Configurable, -10 ... +10 V, -3.9 ... +3.9 V | -10 … +10 V |
| Enable | «Disable»<br>Disable min. $V_{CC}$ - 1 V, Enable max. GND + 1 V | «Enable»<br>+4 … +50 V |
| DC tacho | min. 2 VDC, max. 50 VDC | min. 2 VDC, max. 50 VDC |
| Encoder signals | Channel A and channel B, max. 100 kHz, TTL | Channel A, A\, B, B\, max. 100 kHz, TTL |
| **Output** | | |
| Status reading «Ready» | Open collector, max. 30 VDC ($I_L$ < 20 mA) | Open collector max. 30 VDC ($I_L$ < 20 mA) |
| Monitor current «Monitor I» | | -10 … +10 VDC (short circuit protected) |
| Monitor speed «Monitor n» | | -10 … +10 VDC (short circuit protected) |
| **Voltage outputs** | | |
| Auxiliary voltages | +3.9 VDC, -3.9 VDC, max. 2 mA | +12/-12 VDC, max. 12 mA (short circuit protected) |
| Encoder supply voltage | +5 VDC, max. 80 mA | +5 VDC, max. 80 mA |
| **Trim potentiometer** | IxR compensation, Offset, $n_{max}$, $I_{max}$, gain | IxR compensation, Offset, $n_{max}$, $I_{max}$, gain |
| **Protective functions** | Heat monitoring of power stage | Protected against thermal overload, overcurrent and short-circuit of motor cables |
| **Indicator** | Green LED = READY, red LED = ERROR | Bi-colour LED, green = READY, red = ERROR |
| **Ambient temperature / Humidity range** | | |
| Operation | 0 … +45°C | -10 … +45°C |
| Storage | -40 … +85°C | -40 … +85°C |
| No condensation | 20 … 80 % | 20 … 80 % |
| **Mechanical Data** | | |
| Weight | Approx. 330 g | Approx. 400 g |
| Dimensions (L x W x H) | 103 x 100 x 34 mm (see page 284) | 180 x 103 x 26 mm (see page 284) |
| Mounting threads | Flange for M4-screws | Flange for M4-screws |
| Connections | See page 284 | See page 284 |
| **Order Number** | | |
| | **250521** LSC 30/2, 4-Q-DC Servoamplifier in module housing | **145391** ADS 50/5, 4-Q-DC Servoamplifier Standard Version in module housing |
| **Accessories** | | |
| | | **235811** DSR 70/30 Shunt regulator |