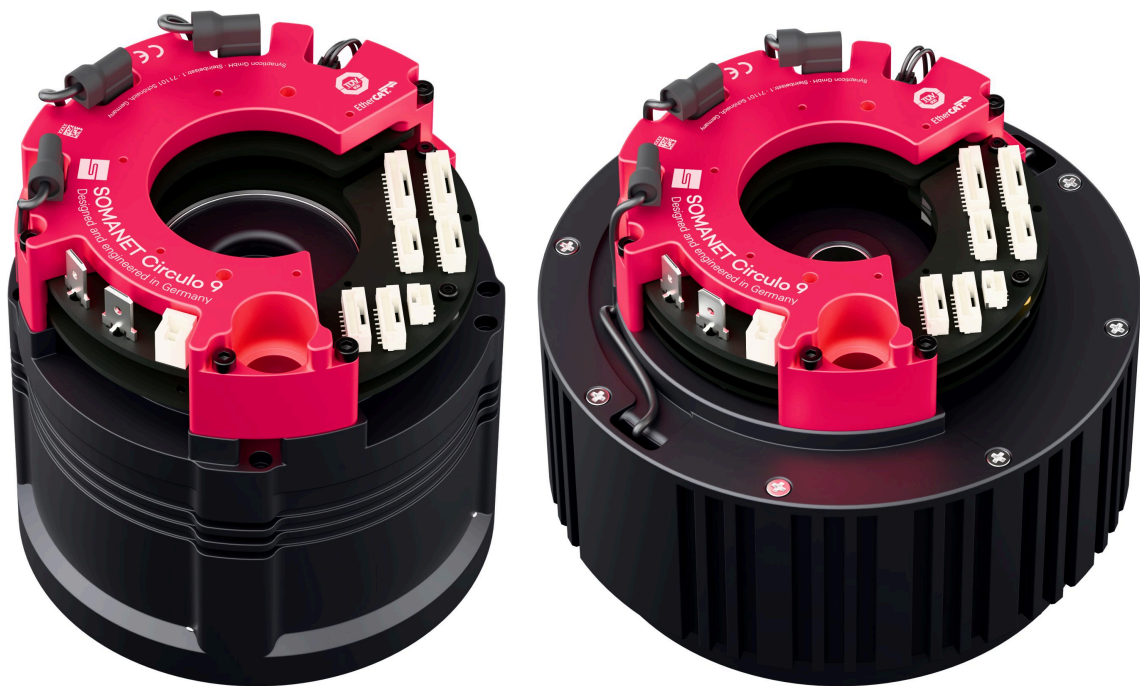


ACTILINK-JD DUO **DUAL-STAGE ACTUATOR**

HOLLOW-BORE DESIGN WITH DUAL-STAGE PLANETARY GEARBOX
AND HIGH-TORQUE MOTORS, FULL ETHERCAT & FSOE SUPPORT



- **High-torque actuators** for humanoid robots and quadruped robots
- **Two frame sizes** — 10 / 12 DUO
- **Dual-stage planetary gearbox** — high torque density, low backlash
- **Hollow-bore output** — Ø 12.6 mm for cable routing, integrated cross-roller output bearing
- **SOMANET™ software** — easy-to-use, EtherCAT, high-performance motion control
- **Functional safety** — STO + SBC standard, Safe Motion via FSoE option



OVERVIEW

The ACTILINK-JD DUO series pairs a high-torque motor with a low-backlash dual-stage planetary gearbox and an integrated SOMANET™ Circulo drive for high torque density in a compact, hollow-bore package — for humanoid and quadruped robots where output torque and stiffness are decisive.

	ACTILINK-JD10 DUO	ACTILINK-JD12 DUO
Product variant	AJB-10-120-150	AJB-12-200-120
Supply voltage	24–48 V, 48 V nominal, 60 V peak	
Torque density (peak)	77.8 Nm/kg	86.5 Nm/kg
Rated output power	477 W	628 W
Max. acceleration torque	120 Nm	215 Nm
Rated torque ‡	43 Nm	95 Nm
No-load speed	170 rpm	120 rpm
Rated-load speed	120 rpm	100 rpm
Outer diameter	96 mm	124 mm
Length	101.3 mm	102.2 mm
Weight *	1542 g	2485 g
Hollow bore	Ø 12.6 mm	Ø 12.6 mm
Gear type	Dual-stage planetary	
Reduction ratio	19.612 : 1	20 : 1
Integrated drive	Circulo 9	Circulo 9
Motor encoder	20 bit abs.	20 bit abs.
Output encoder	20 bit absolute, battery multi-turn (D1 variant)	
Communication	EtherCAT (DS402)	
Safety functions	STO-SBC / Safe Motion (FSOE)	

* Weight is for the ECD1SS build; ECD1SM (Safe Motion) adds ~25 g (outer diameter and length are identical across ECD1 builds). ‡ Rated torque is speed-dependent; value shown at the lowest rated speed — see per-variant pages for the full speed/torque points. Performance data at 48 V supply.

MANUFACTURER PART NUMBER (MPN)

AJB	—	12-200-120	—	EC	—	D1	—	SM
PRODUCT FAMILY		OUTER Ø & TORQUE / SPEED CLASS		FIELDBUS		FEEDBACK ENCODER		SAFETY
AJB Actilink Joint Dynamic Duo		10-120-150 ≈100 mm · 120 Nm · 150 rpm		EC EtherCAT		D1 Dual — motor + output, internal		SS STO / SBC via IO
		12-200-120 ≈120 mm · 200 Nm · 120 rpm				D3 Other combinations		SM Safe Motion via FSOE
N	—	00	—	XXXX				
BRAKE		VERSIONING		CUSTOMIZATION				
N No brake		00 Default version		blank Standard				
S Spring-applied friction								
P Permanent-magnet friction								
M Synapticon Microcoil								

Contact Synapticon for custom configurations, lead times, and MoQs.

ACTILINK-JD10 DUO

ACTILINK-JD DUO · AJB-10-120-150



ESSENTIAL SPECIFICATIONS

Performance @ 48 V	
Rated torque	38 Nm @ 120 rpm 43 Nm @ 60 rpm
Max. acceleration torque	120 Nm
Rated output power	477 W
Torque density (peak)	77.8 Nm/kg
No-load speed	170 rpm
Rated-load speed	120 rpm
Output bearing	
Basic dynamic load rating	5680 N
Basic static load rating	8680 N
Roller pitch-circle Ø	67 mm
Bearing-centre to output	9.5 mm
Rated life	1,000,000 rev
Drivetrain & electronics	
Motor	20 pole-pairs (40 poles)
Torque constant	131.1 mNm/A _{rms}
Phase resistance	70 mΩ
Phase inductance	93 µH @ 1 kHz
Integrated drive	SOMANET™ Circulo 9 (CR9-48-60)
Supply voltage	24–48 V, 60 V peak

STANDARD CONFIGURATIONS

AJB-10... ECD1SS	Dual encoder, STO-SBC
AJB-10... ECD1SM	Dual encoder, Safe Motion

Mechanical	
Weight †	1542 g
Outer diameter	96 mm
Length *	101.3 mm
Hollow bore diameter	Ø 12.6 mm
Rotary inertia (after reduction)	0.07 kg·m²
Gear type	Dual-stage planetary
Reduction ratio	19.612 : 1
Backlash	< 10 arcmin

Feedback & safety	
Motor encoder	20 bit absolute
Output encoder	20 bit absolute, battery MT (D1 variant)
Communication	EtherCAT (DS402)
Safety functions	STO-SBC / Safe Motion (FSOE)

ENVIRONMENTAL

Operating temperature 0–50 °C (ambient air).
Storage temperature –30–70 °C.

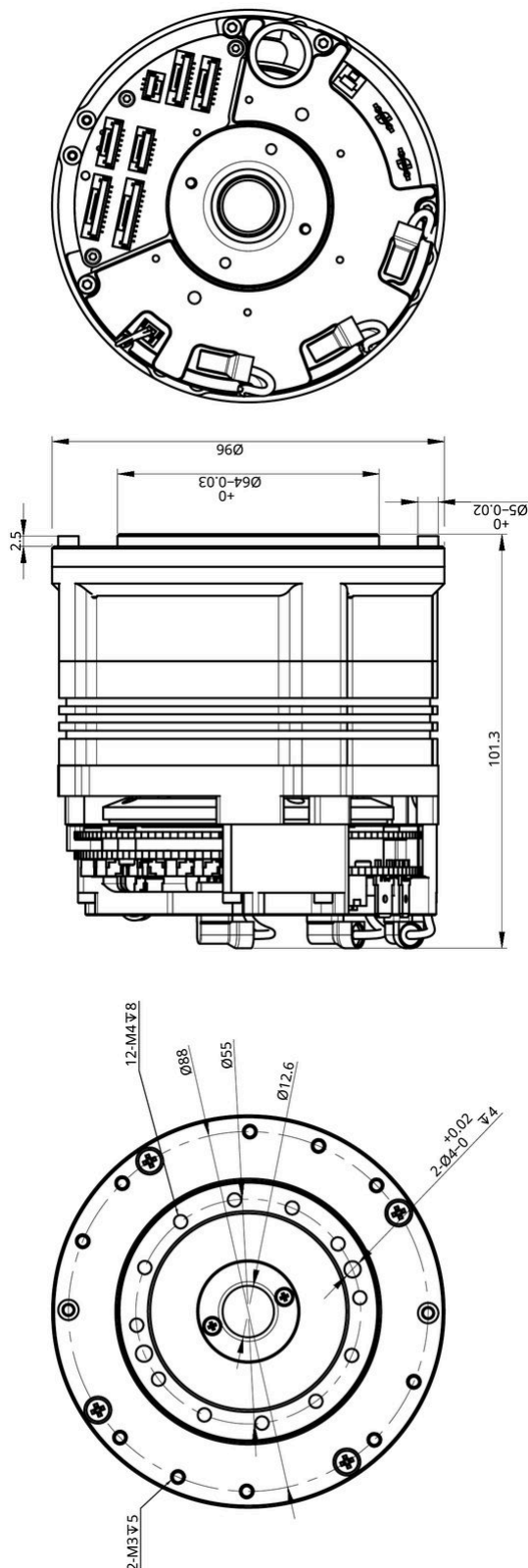
† ECD1SS build; ECD1SM 1567 g. * Length includes default connectors; custom connectors reduce it by up to 7 mm.

ACTILINK-JD10 DUO

DIMENSIONS — 2D DRAWING



ECD1 — DUAL ENCODER (MOTOR + OUTPUT), HOLLOW BORE · all dimensions in mm



ACTILINK-JD12 DUO

ACTILINK-JD DUO · AJB-12-200-120



ESSENTIAL SPECIFICATIONS

Performance @ 48 V

Rated torque	60 Nm @ 100 rpm
	75 Nm @ 30 rpm
	95 Nm @ 10 rpm
Max. acceleration torque	215 Nm
Rated output power	628 W
Torque density (peak)	86.5 Nm/kg
No-load speed	120 rpm
Rated-load speed	100 rpm

Output bearing

Basic dynamic load rating	6370 N
Basic static load rating	11300 N
Roller pitch-circle Ø	87 mm
Bearing-centre to output	10 mm
Rated life	1,000,000 rev

Drivetrain & electronics

Motor	20 pole-pairs (40 poles)
Torque constant	206.7 mNm/A _{rms}
Phase resistance	43 mΩ
Phase inductance	25 µH @ 1 kHz
Integrated drive	SOMANET™ Circulo 9 (CR9-48-60)
Supply voltage	24–48 V, 60 V peak

Mechanical

Weight †	2485 g
Outer diameter	124 mm
Length *	102.2 mm
Hollow bore diameter	Ø 12.6 mm
Rotary inertia (after reduction)	0.33 kg·m²
Gear type	Dual-stage planetary
Reduction ratio	20 : 1
Backlash	< 10 arcmin

Feedback & safety

Motor encoder	20 bit absolute
Output encoder	20 bit absolute, battery MT (D1 variant)
Communication	EtherCAT (DS402)
Safety functions	STO-SBC / Safe Motion (FSOE)

STANDARD CONFIGURATIONS

AJB-12... Dual encoder, STO-SBC
ECD1SS

AJB-12... Dual encoder, Safe Motion
ECD1SM

ENVIRONMENTAL

Operating temperature 0–50 °C (ambient air).
Storage temperature –30–70 °C.

† ECD1SS build; ECD1SM 2510 g. * Length includes default connectors; custom connectors reduce it by up to 7 mm.

DIMENSIONS – 2D DRAWING



DESIGNED FOR HIGH-TORQUE ROBOTICS



ACTILINK-JD DUO actuators suit joints that demand high output torque and stiffness with a compact envelope — humanoid hips and knees, and quadruped legs — combining a dual-stage planetary gearbox, a hollow-bore cross-roller output, and an integrated SOMANET™ Circulo drive.



HUMANOID ROBOTS



QUADRUPED ROBOTS

2

frame sizes

10 / 12 DUO

120–215 Nm

peak torque

RANGE

Universal

integrated drive

SOMANET™ CIRCULO

FULL-STACK HUMANOID SERVICE

Beyond the mechanics, Synapticon delivers drives, control and sensing through to whole-body safety — concepts, designs, feasibility and integration across the whole robot system.

CUSTOM OPTIONS

- Brake — friction brake or Synapticon Microcoil
- Integration-oriented mechanical design / interface
- Motor & gear selection (ratio, torque/speed class)
- Additional sensors — torque sensing, IMU
- Bearing & load-bearing structural design
- Thermal, e-stop and service-life tuning

Upon request; NRE fees may apply.