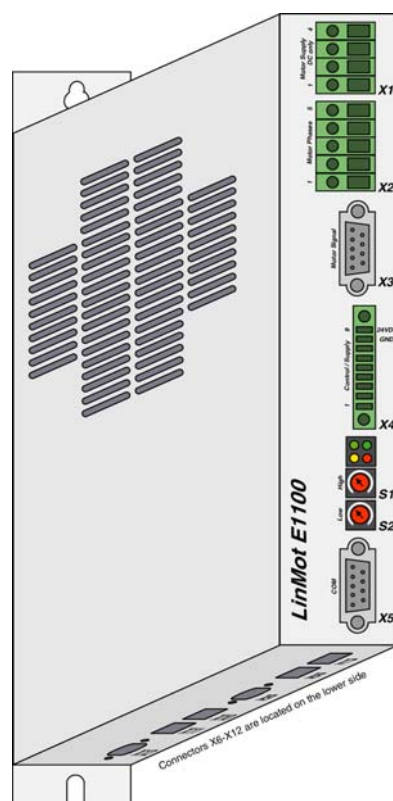




EC Motors with LinMot Controllers

**Documentation of how to drive EC Motors with
E1100/E1200/B1100 Servo Controller Series**



**EC Motors with
E1100/E1200/B1100
Series Controllers**

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Note

The information in this documentation reflects the stage of development at the time of press and is therefore without obligation. NTI AG. Reserves itself the right to make changes at any time and without notice to reflect further technical advance or product improvement.

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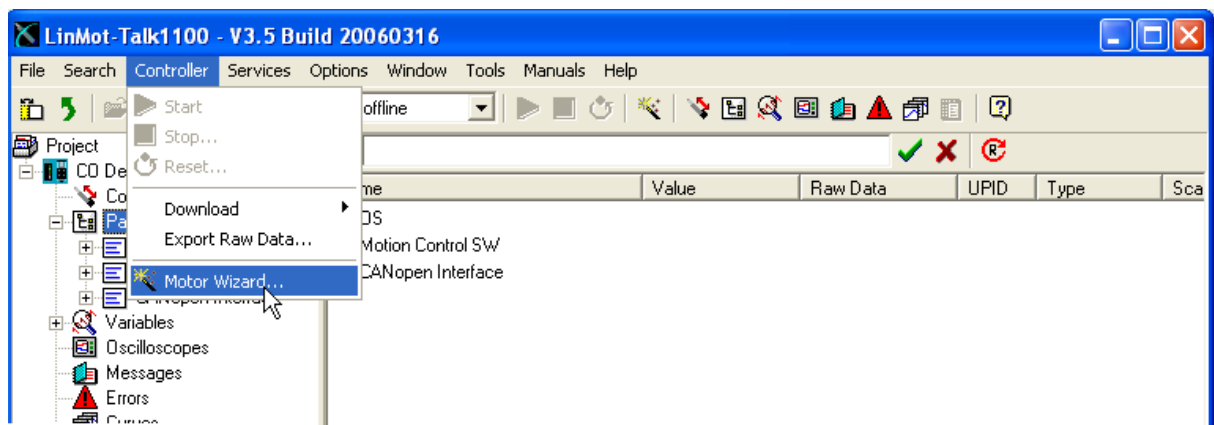
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1 Introduction

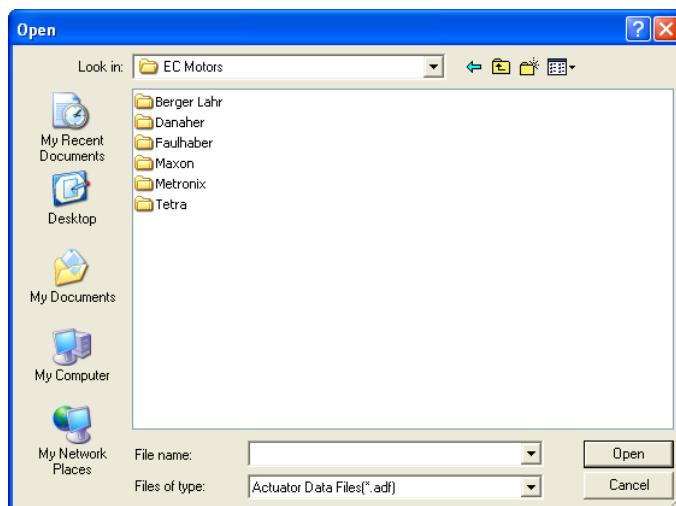
Since LinMot-Talk software release 3.4 it is possible to run 3 phase rotary EC motors on E1100 series servo controllers. B1100 controllers support this feature as well since software release 3.7. E1200 series controllers can drive EC motors from software release 3.11.

2 Configuration

The rotary EC motors are configured by using the LinMot-Talk software. For a couple of motor types LinMot provides actuator definition files (*.adf). With such an ADF-file the motor configuration can be done by using the *Motor Wizard* tool of the LinMot-Talk software.



You will find the EC motor ADF-files in the subdirectory \Motors\Other Motors\EC Motors of your LinMot-Talk installation.



After you have selected an EC motor ADF-file, the *Motor Wizard* will guide you step by step through the configuration.

3 Motors with ADF-File

3.1 Berger Lahr RECM

Supported Types: RECM 372/4 DC048 xl
 RECM 374/4 DC048 xl
 RECM 375/4 DC060 xl
 RECM 377/4 DC060 xl

Feedback: Hall switches & ABZ encoder

Commutation: - Based on hall switches until first Z pulse from encoder
 - Based on encoder signals afterwards (sine commutation)

Position Control: - Based on feedback from ABZ encoder

Wiring:

	B1100	E1100	E1200
Motor Phases U,V,W and PE Earth	X2 or X3	X2 or X3	X2
Hall Switches U, V, W	X13	X10 U → A V → B W → Z	X13
RS422 ABZ Encoder Signals	X13	X12	X13
Sensor supply (5V) from	X13	X12	X13

See also chapter 4 "Sensor and differential Hall Switches Wiring".

3.2 Faulhaber EC Motors

Supported Types: 1628 T 024 B K1155
2036 U 024 B K1155
2036 U 036 B K1155
2444 S 024 B K1155
2444 S 048 B K1155
3056 K 024 B K1155
3056 K 036 B K1155
3564 K 024 B K1155
3564 K 036 B K1155
4490 H 024 B K1155
4490 H 048 B K1155

Feedback: Analog hall sensors & optional encoder

Commutation: - Based on hall sensor signals

Position Control: - Based on hall sensor signals or optional encoder

Wiring:

	B1100	E1100	E1200
Motor Phases A,B,C A → U B → V C → W	X2 or X3	X2 or X3	X2
Hall Sensors A,B,C A → X3.4 B → X3.9 C → X3.5	X3	X3	X3
Optional Encoder	X13	X12	X13

3.3 Maxon EC Motors

Supported Types: EC 22 167129
 EC 32 118889
 EC 32 118890
 EC 40 118896
 EC 40 167181
 EC 45 136198
 EC 45 136209
 EC 45 flat 251601
 EC 60 167131
 EC 90 flat 24487
 EC-max 30 272770
 EC-max 40 283870

Feedback: Hall switches & ABZ encoder

Commutation: - Based on hall switches until first rising edge on hall switch 1
 - Based on encoder signals afterwards (sine commutation)

Position Control: - Based on feedback from AB encoder

Wiring:



Use Maxon motor chokes for motor phases:

- Choke module 3x0.25mH 5A; Maxon Art. Nr. 137303
- Choke module 3x0.15mH 10A; Maxon Art. Nr. 232359
- Add this inductance value (0.25mH/0.15mH) manually to the motor definition parameter: 'Phase Inductance' (UPID E1100: 11A0h; UPID B1100: 61B9h) for a better controller behaviour.

	B1100	E1100	E1200
Motor Phases 1,2,3 1 → U 2 → V 3 → W	X2 or X3	X2 or X3	X2
Hall Switches 1, 2, 3 1 → X3.4 2 → X3.9 3 → X3.5	X3	X3	X3
RS422 ABZ Encoder Signals	X13	X12	X13
Sensor supply (5V) from	X13	X12	X13

3.4 Metronix APM Servo Motors (e.g. from Elmo Motion Control)

Supported Types: APM SA01ACN-9
APM SB03ADK-9

Feedback: Hall switches & ABZ encoder

Commutation: - Based on hall switches until first Z pulse from encoder
- Based on encoder signals afterwards (sine commutation)

Position Control: - Based on feedback from ABZ encoder

Wiring:

	B1100	E1100	E1200
Motor Phases U,V,W and Ground	X2 or X3	X2 or X3	X2
Hall Switches U, V, W	X13	X10 U → A V → B W → Z	X13
RS422 ABZ Encoder Signals	X13	X12	X13
Sensor supply (5V) from	X13	X12	X13

See also chapter 4 "Sensor and differential Hall Switches Wiring".

3.5 Motor Power Company Tetra Brushless Servo Motors

Supported Types: T56SR1.35.E.L.08
T85SR2.2.E.L.12

Feedback: Hall Switches & ABZ Encoder

Commutation: - Based on Hall Switches until first Z pulse from Encoder
- Based on Encoder signals afterwards (Sine Commutation)

Position Control: - Based on feedback from ABZ encoder

Wiring:

	B1100	E1100	E1200
Motor Phases U,V,W and Earth	X2 or X3	X2 or X3	X2
Hall Switches U, V, W	X13	X10 U → A V → B W → Z	X13
RS422 ABZ Encoder Signals	X13	X12	X13
Sensor supply (5V) from	X13	X12	X13

3.6 Siboni Motors

Supported Types: B60L 585

Feedback: Hall Switches & ABZ Encoder

Commutation: - Based on Hall Switches until first Z pulse from Encoder
 - Based on Encoder signals afterwards (Sine Commutation)

Position Control: - Based on feedback from ABZ encoder

Thermal protection: - PTC

Wiring:

	B1100	E1100	E1200
Motor Phases U, V, W and Earth U → W V → V W → U	X2 or X3	X2 or X3	X2
Hall Switches U, V, W	X13	X10 U → A V → B W → Z	X13
RS422 ABZ Encoder Signals Supply +5V red GND black SHIELD SHIELD CH A blue CH /A blue/black CH B green CH /B green/black CH Z yellow CH /Z yellow/black Hall U brown Hall /U brown/black Hall V grey Hall /V grey/black Hall W white Hall /W white/black	X13	X12	X13
Sensor supply (5V) from	X13	X12	X13
PTC		X4.10/X4.11	X4.10/X4.11

See also chapter 4 "Sensor and differential Hall Switches Wiring".

4 Sensor and differential Hall Switches Wiring

Signal	B1100 & E1200	E1100	
	X13 - Pin	X12 - Pin	X10 - Pin
+5V	1	1	
/A	2	2	
/B	3	3	
/Z	4	4	
GND	5	5	
/U	6		2
/V	7		6
/W	8		5
A	9	6	
B	10	7	
Z	11	8	
Enc. Alarm	12	9	
U	13		1
V	14		3
W	15		4
Shield	case	case	case

Figure 1: B1100, E1100 and E1200 sensor and differential hall switches wiring

5 Hall Switches vs. Commutation Angle

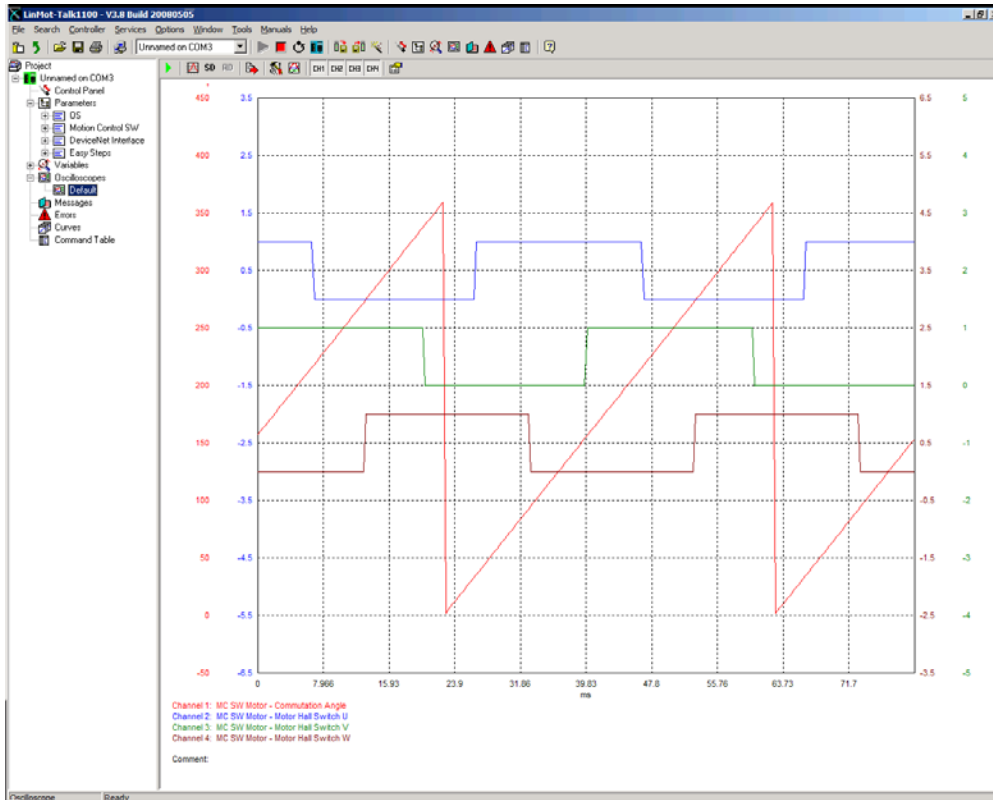


Figure 2: Hall switches vs. commutation angle situation 1

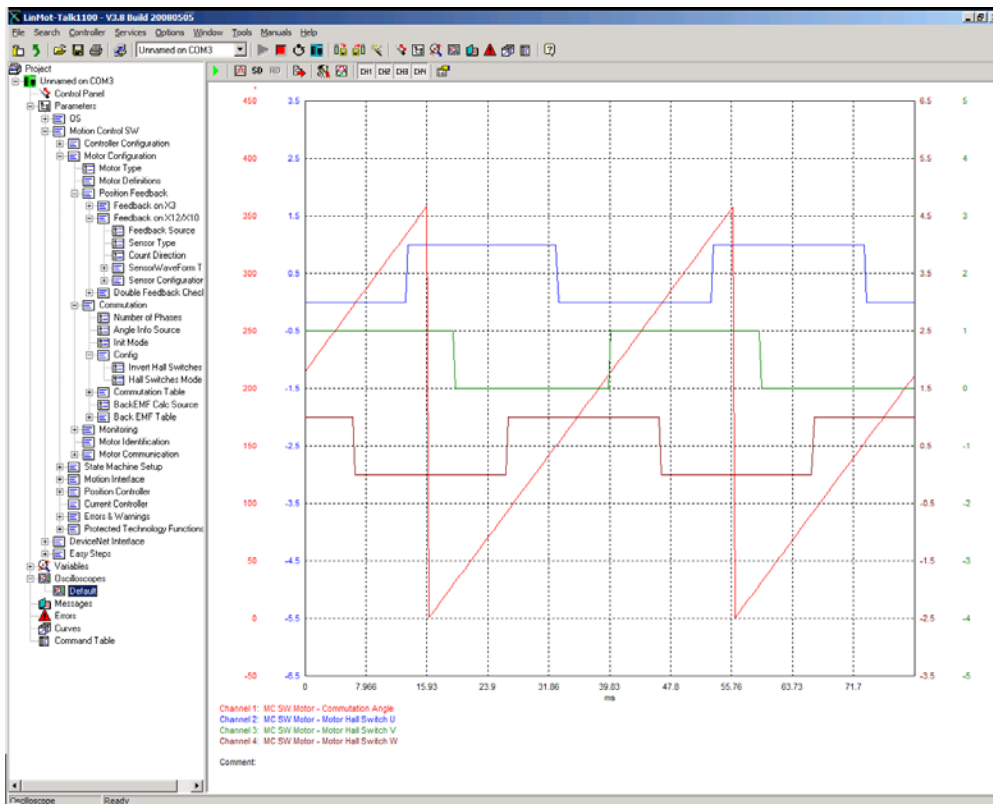


Figure 3: Hall switches vs. commutation angle situation 2 with changed direction

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