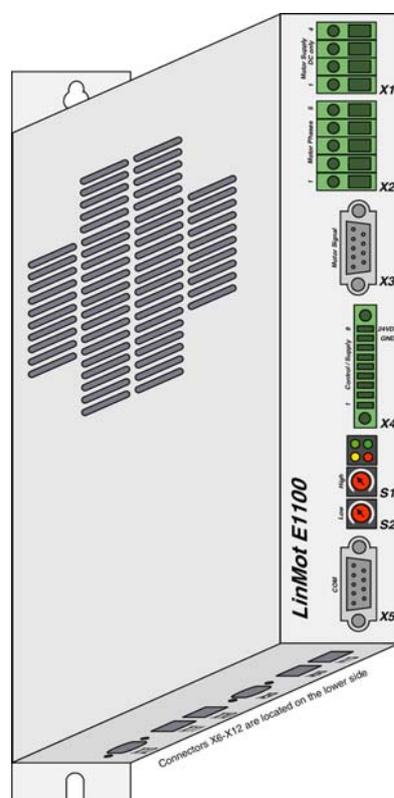




## ***EC Motors with LinMot Controllers***

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



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

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Note

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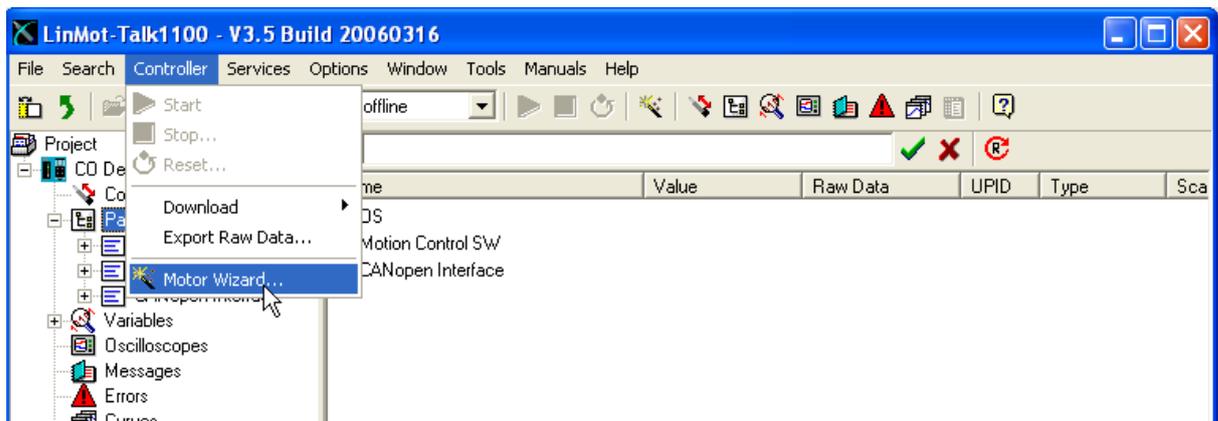
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## 1 Introduction

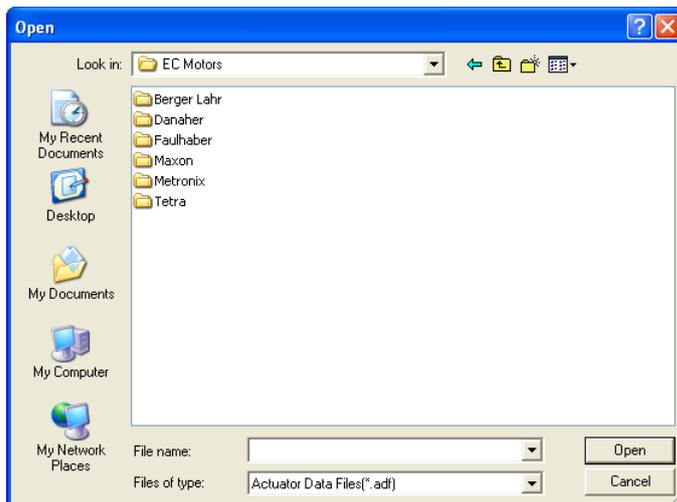
Since LinMot-Talk1100 software release 3.4 it is possible to run 3 phase rotary EC motors on E1100 series servo controllers. B1100 controllers support this feature as well since software release 3.7.

## 2 Configuration

The rotary EC motors are configured by using the LinMot-Talk1100 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-Talk1100 software.



You will find the EC motor ADF-files in the subdirectory \Motors\Other Motors\EC Motors of your LinMot-Talk1100 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:	- Motor Phases U,V,W and PE Earth to X2 (X3 alternatively) - Hall Switches U, V, W to X10 (X13 on B1100) (U->A, V->B, W->Z) - RS422 ABZ Encoder Signals to X12 (X13 on B1100) - Sensor supply (5V) from X12 (X13 on B1100) - see also cap. "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:	- Motor Phases A,B,C to X3 (X2 alternatively) (A-> U, B->V, C->W) - Hall Sensors A,B,C to X3 (A->X3.4, B->X3.9, C->X3.5) - Optional Encoder to X12 (X13 on B1100)

### 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: - Motor Phases 1,2,3 to X2 (X3 alternatively), (1 -> U, 2->V, 3->W)  
 - Use Maxon motor chokes:



- 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.

- Hall Switches 1, 2, 3 to X3  
 (1 -> X3.4, 2->X3.9, 3->X3.5)
- RS422 ABZ Encoder Signals to X12 (X13 on B1100)
- Sensor supply (5V) from X12 (X13 on B1100)

### **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:	- Motor Phases U,V,W and Ground to X2 (X3 alternatively) - Hall Switches U, V, W to X10 (X13 on B1100) (U->A, V->B, W->Z) - RS422 ABZ Encoder Signals to X12 (X13 on B1100) - Sensor supply (5V) from X12 (X13 on B1100) - see also cap. "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:	- Motor Phases U,V,W and Earth to X2 (X3 alternatively) - Hall Switches U, V, W to X10 (X13 on B1100) (U->A, V->B, W->Z) - RS422 ABZ Encoder Signals to X12 (X13 on B1100) - Sensor supply (5V) from X12 (X13 on B1100)

### 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: - Motor Phases U, V, W and Earth to X2 (X3 alternatively)  
(U -> W, V -> V, W -> U)  
- Hall Switches U, V, W to X10 on E1100 (U->A, V->B, W->Z),  
X13 on B1100.  
- RS422 ABZ Encoder Signals to X12 on E1100, X13 on B1100

Encoder Pinout	
Signal	Color
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

- Sensor supply (5V) from X12 on E1100, X13 on B1100
- PTC on X4.10/X4.11 on E1100
- see also cap. "Sensor and differential Hall Switches wiring"

## 4 Sensor and differential Hall Switches wiring

Signal	B1100		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 sensor and differential hall switches wiring

## 5 Hall Switches vs. Commutation Angle

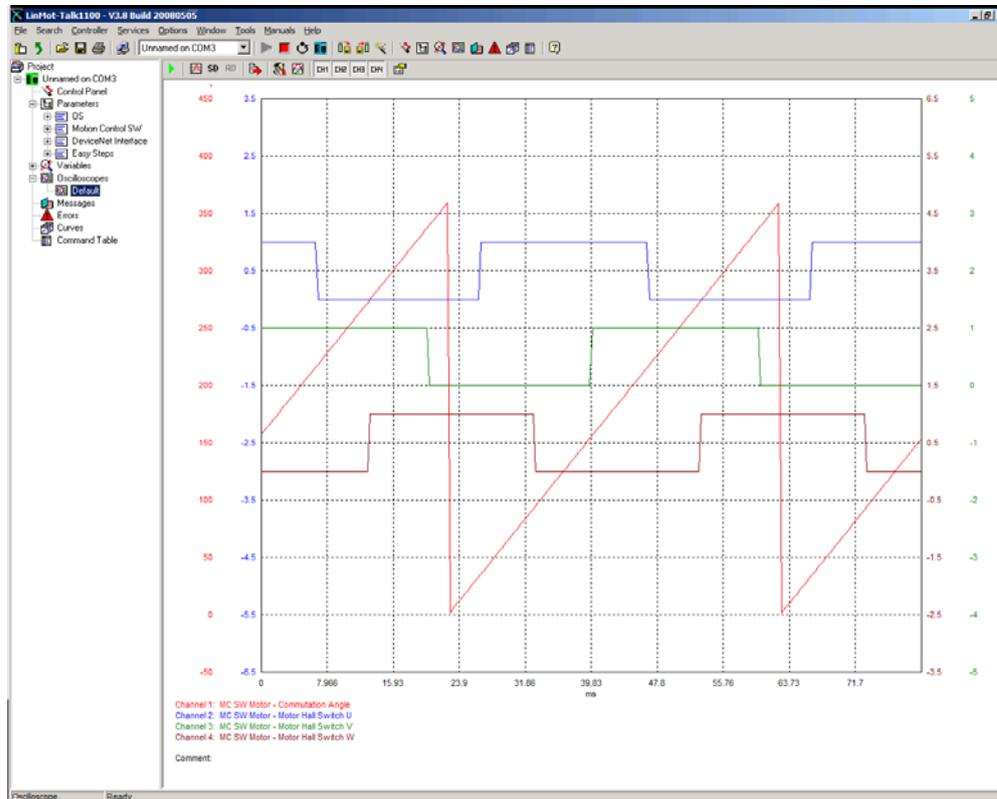


Figure 2: Hall switches vs. commutation angle situation 1

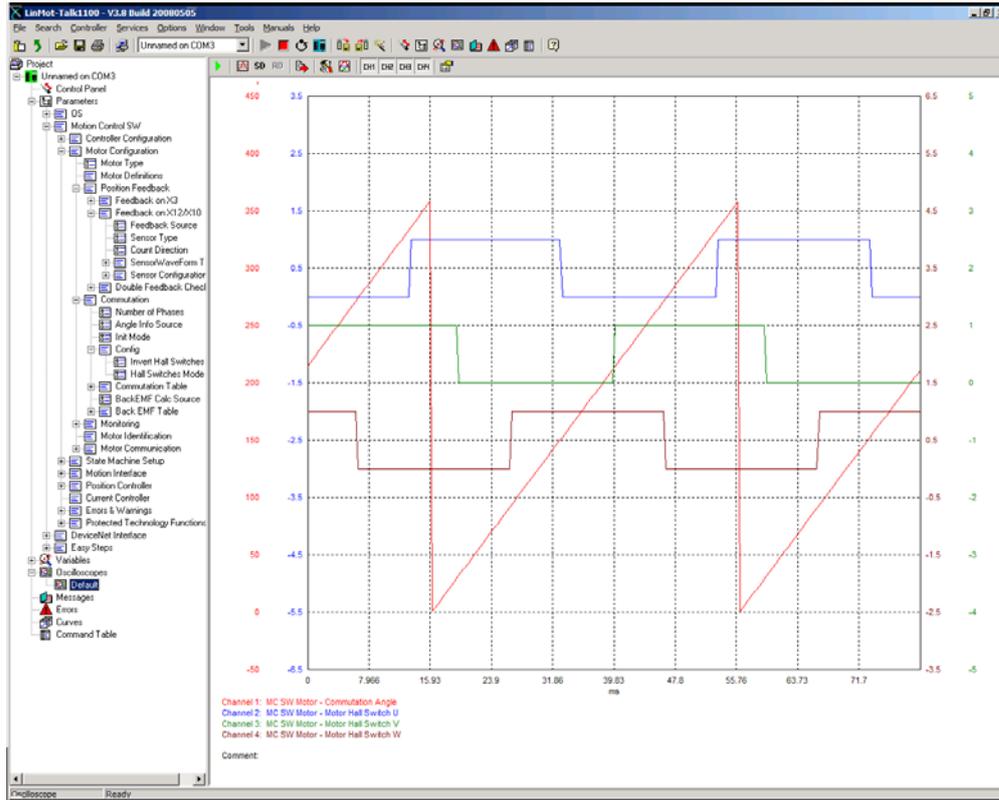


Figure 3: Hall switches vs. commutation angle situation 2 with changed direction

## 6 Contact Addresses

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