

Brush D.C. motors with Servostar

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Introduction

Servostar drives are designed to run 3 phase DC brushless motors, however, It is possible to run a brush motor with encoder as well as single phase limited travel brushless . This document describes the work around settings for doing that. This work-around is a temporary solution until firmware support is completed.

Wiring

- Connect (+) terminal of motor to phase A
- Connect (–) terminal of motor to phase B
- Leave Servostar phase C unconnected.
- Do not connect the halls in the feedback connector C2
- Positive direction for motor and encoder is assumed CW viewed from shaft side.

Motor parameters

In the user defined motor screen set the motor's parameters. Following is an example:

Motor Parameters

Motor Type: ☒ PM Rotary ☐ Linear

Motor Model	brushmotor	
Peak Current	11.5	amps
Cont. Current	3.5	amps
Max Speed	6000	rpm
Back EMF	20	Vrms/1000 rpm
BEMF Comp%	50	percent
Rotor Inertia	0.00012	kg-m ²
Min Inductance	3.0	millihenries
Motor Poles	2	mag.poles
AGain at Peak I	100	percent
AGain at Cont I	100	percent
AGain at Zero I	100	percent
Torque Adv P	0	elec. degrees
Torque Adv C	0	elec. degrees
Speed Adv at V	0	elec. degrees
Speed Adv 1/2 V	0	elec. degrees

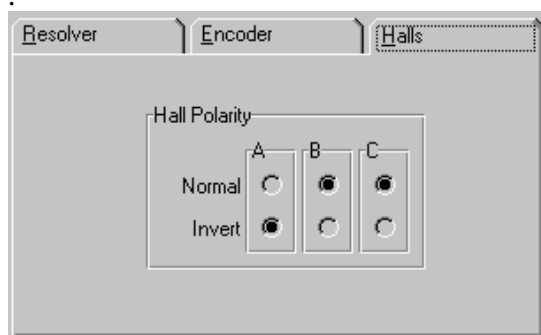
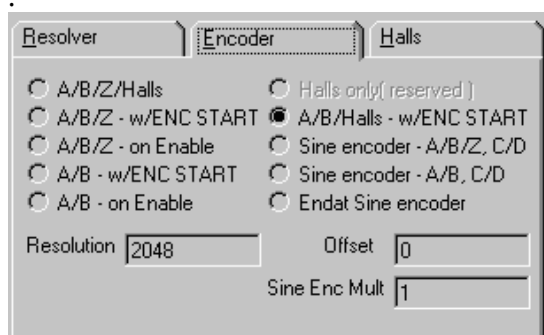
Note:

- The parameters which are marked in the table have to be set according to motor data.
- The motor's DC peak current in r.m.s. units should be multiplied by 1.15. Hence a motor with peak current of 10 amp r.m.s should be entered as 11.5 amp peak
- Inductance value is the line to line value.
- Phase advance and speed advance should be set to zero.

Encoder and halls

In the encoder and halls tabs set the following:

- Select A/B/halls (MENCTYPE=6)
- Set the encoder resolution according to the feedback device used, offset does not have effect.
- Resolver operation is not possible at this stage.
- Invert the hall-A (MHINVA=1)



Operation

The setting above causes the drive to have a fixed commutation angle. Since the hall sensors are not connected, there is no hall transition and the motor remains uncommutated. The max current is 0.866 of MIPEAK ($\cos(30^\circ)$) and therefore in order to use full current the MIPEAK has to be increased by the inverse of this factor.

Notes

- An encoder index pulse can be present, but the drive ignores it due to the encoder type setting (MENCTYPE=6). The index pulse can still be used for homing process.
- Since the commutation sequence remains uncompleted, the PRD position variable remains zero.

For more information please contact:

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