

Parameterization of rotative motor on servocontroller XENAX® Xvi75V8

Edition April 2011

General

The servo controller XENAX® Xvi75V8 supports motion control of rotative AC / DC / EC motors.

With brush-type DC servomotors an incremental encoder is necessary. With brushless AC / EC servomotors 3 phase commutation signals (hall) and incremental encoder are necessary.

Get parameters from datasheet

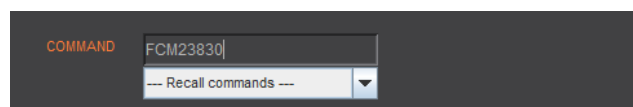
Motor parameter	Unit	Scale	Command
Torque constant	Nm/A	*10 ⁶	FCM
Rotor moment of inertia	Kg*m ²	*10 ⁹	MAMO
Number of pole pairs	1	-	POL
Phase to Phase resistance	mΩ	-	RPH
Phase to Phase inductance	μH	-	LPH
Nominal current	A	*10 ²	IN
Peak current	A	*10 ²	IP
Encoder Resolution Edge = *4	1	-	ENC
Phase direction	1	-	PHD
Phase offset	[°]	-	PHO

Parameter setting of XENAX® with WebMotion

Set motor type in menu *setup / motor to* „OTHER“.



The motor parameterization can be done in menu *online control / terminal*.



Parameter Friction (Default)

The default could be adopted as it stands.

Friction	Unit	Scale	Command	Default
Dynamical	mN/m/s	-	FFDY	10'000
Static	mN	-	FFST	0

Example Faulhaber motor 4490 H 024B

Motor parameter	Datasheet	XENAX [®] Conversion	Command Terminal
Torque constant	23,83 mNm/A	0,02383 Nm/A *10 ⁶ = 23'830	FCM23830
Rotor moment of inertia	130 gcm ²	0,000013 kgm ² *10 ⁹ = 13'000	MAMO13000
Number of pole pairs	1 For brush-type DC motor, set value to 0	1	POL1
Phase to Phase resistance	0.237 Ω	237 mΩ	RPH237
Phase to Phase inductance	76 μH	76 μH	LPH76
Nominal current	8.62A Thermic acceptable continuous current	8.62A *10 ²	IN862
Peak current	12A (selected) Depends on the application. Limit for acceleration and deceleration, temporary active.	12A*10 ²	IP1200
Encoder resolution	4000 INC/REV One turn of motor shaft clockwise will increment position counter by 4000 INC.	4000	ENC4000
Phase direction	1 0: Hall sequence UVW: 110-010-011-001-101-100 1: Hall sequence UVW: 100-101-001-011-010-110	1	PHD1
Phase offset	0 ° For the most products, phase offset is set to 0 ° Harmonic Drive: 330 °	0	PHO0

After parameterization, switch power OFF / ON.

Afterwards, motion control is possible in menu *online control / motion*.

The motor parameters are integral part of the application data and can be saved in menu *loading / application / SaveFile*.

Adjustment for coupled load

Moment of inertia	Unit	Scale	Input
Inertia	Kg*m ²	*10 ⁹	ML resp. Shift register by closed loop/INERTIA

Notice:

If a gear box is placed between the motor and the coupled load, you must attend the coupled load moment of inertia to convert to the gear box.

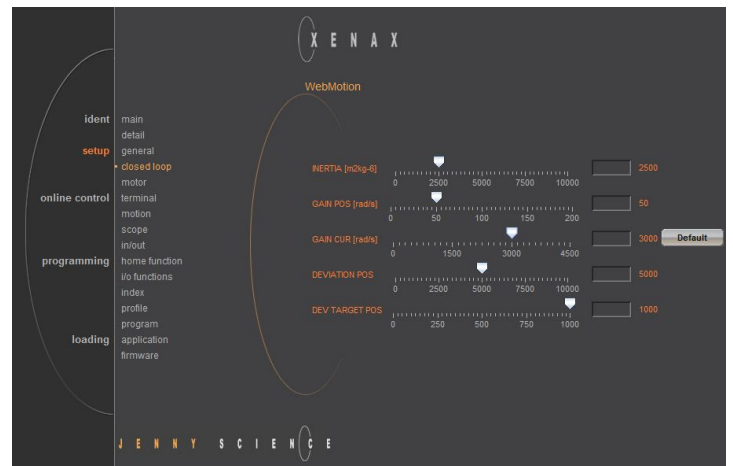
The gear transmission ratio is quadratic to the weight.

For example:

When we have a gear box with a transmission from 20:1, then the Motor need 20 revolutions to do, for one revolution on the load.

In this case, the coupled load moment of inertia is about the factor 400 (20²) to reduce.

This value is for the coupled load of inertia (ML).



Optimization during operation

Oscillation and overshoot can be optimized during operation in menu *setup/closed loop* with following parameters:

Bandwidth of position controller GAIN POS
 Increasing: closed loop stronger, weighted on position
 Decreasing: closed loop smoother, weighted on velocity.

Bandwidth of current controller GAIN CUR
 Oscillation affinity can be reduced by adapting this parameter.

XENAX® Xvi75V8

Parameters of rotative motor

Type:

Motor parameter

Parameter	Data-sheet	Unit	Scale	Command	Value
Torque constant scaled		[Nm/A]	*10 ⁶	FCM	
Rotor moment of inertia scaled		[Kg*m ²]	*10 ⁹	MAMO	
Number of pole pairs		[1]	-	POL	
Phase to Phase resistance		[mΩ]	-	RPH	
Phase to Phase inductance		[μH]	-	LPH	
Nominal current		[A]	*10 ²	IN	
Peak current		[A]	*10 ²	IP	
Increments / Revolution		[1]	-	ENC	
Phase direction		[1]	-	PHD	
Phase offset		[°]	-	PHO	

System parameter

Parameter	Unit	Command	Default	Value
moment of inertia load scaled (INERTIA)	[Kg*m ²]	ML	-	
Bandwidth of position controller (GAIN POS)	[Hz]	BWP (old WSF)	-	
Bandwidth of current controller (GAIN CUR)	[Hz]	BWC (old WFF)	1500	
Dynamic friction	[mN/m/s]	FFDY	10'000	
Static friction	mN	FFST	0	