S120 驱动第三方同步伺服电机

创建项目,在线自动配置之后(此时除电机及编码器参数外,其它参数都已经进入项目)。此时 COPY RAM TO ROM, LOAD TO PG,然后离线,开始配置电机及编码器。

第一步,离线状态下



1.2, 进入电机配置界面, 选择永磁同步旋转电机



1.3, 根据电机铭牌输入电机参数

Power unit BICO techn Power unit connection	Motor dat			
]Power unit connection Motor	motor dat	a Sunchronous motor (rotaru):	Tem	plate
Motor	Data D	input according to data sheet	~	
li i a sa i	COst			
Motor data	U Data	Input with subsequent motor identifica	tion	od s
]Motor holding brake	Paramet	t Parameter text	Value	Unit
]Encoder	p305[0]	Rated motor current	1.40	Arms
Drive functions	p311[0]	Rated motor speed	6000.0	rev/min
PROFIBUS process da	p314[0]	Motor pole pair number	3	1
Summary	p316[0]	Motor torque constant	0.46	Nm/A
	p322[0]	Maximum motor speed	10000.0	rev/min
	p323[0]	Maximum motor current	7.50	Arms
	p338[0]	Motor limit current	3.00	Arms
	p341[0]	Motor moment of inertia	2.8e-005	kgm2
			~	
	The moto	r data must be entered completely!	Ť	
	The moto	r data must be entered completely!	Ŭ	
	The moto	r data must be entered completely! Ir change available optional data	Ŭ	
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	The moto Use of Note: Deselecti irrevocab Motor ide deselecte diagram d	r data must be entered completely! Ir change available optional data on of the optional or equivalent circui ly. ntification is required when the equiva ed. Motor identification is optional whe lata is entered.	diagram data resi Ilent circuit diagra n the equivalent c	ets these m data is sircuit

对于电机转子转动惯量,如果找不到相应参数,可以输入一个较小的数值,在线后 通过电机参数静态识别进行计算。 可选参数可以不输入,即不勾选该项。

1.4, 输入电机定子电阻和定子漏抗



同样,如果找不到定子电阻和定子漏抗参数,也可以输入一个较小的数,然后通过 设置 P340=1 来完成计算。注意不要输入太大的数,否则如果不进行 P340=1 的 步骤而直接通过 P1910 进行电机动态参数辨识时,驱动器会输出较高的电压而导 致电机电流超限。

1.5,设置是否进行电机参数计算,即 P340



如果选择"No calculation",则 P340=0;如果选择"Complete calculation without equivalent circuit diagram data",则 P340=3。 P340 也可以在线修改。

1.6 根据实际情况选择编码器



1.7, 选择是否进行电机参数辨识, 即 P1910



"None"表示 P1910=0。

此时电机的配置已经结束,可以保存参数并在线了。

第二步,在线状态下:

2.1, 电机参数及控制参数计算

下载驱动部分,打开专家参数列表。此时驱动的 P340 会自动置 3 (因为离线配置 选择了 Complete calculation without equivalent circuit diagram data),几秒钟之后自 动置 0。

此时我们可以手动将 P340 置 1,完成静态参数辨识过程,此时会重新计算上述参数,并且还会计算等效电路参数,包括电机定子电阻及定子漏抗等。



SINAMICS Integrated	Parameter	D	+	+ Parameter text	Value SERVO_03	Unit	Modifiable t	Acce
> Overview	r1969			Moment of inertia identified	0.00000	kgm2		3
> Configuration	r1973[0]		+	Encoder, pulse number identified, Ro	0			3
> Topology	p1980[0]	М		Pole position identification technique	No technique selected (99) 💌		Operation	3
U CU_I_003	p1981[0]	М		Pole position identification maximum	10		Operation	3
📩 Insert DCC charts 👘	p1982[0]	М		Pole position identification selection	Pole position identification of		Ready to run	3
E 222 TB30_04	p1983			Pole position identification, test	0		Operation	3
> Configuration	r1984			Pole position identification, angular d	i 0.00	0		3
> Control logic	r1985			Pole position identification, saturatio	0	Arms		3
S- Inputs/outputs	r1987			Pole position identification trigger ch	0	%		3
🗉 ≫ Communication 🛛 🔍	p1990			Encoder adjustment, determine angu			Operation	3
Diagnostics	p1991[0]	M	_	Motor changeover, angular commuta	0	•	Ready to run	3
Infeeds	r1992			+ Pole position identification diagnostic	1E00H Value: 0 (min: -18)	l: max:	180)	3
Input/output component	p1993[0]	М		Pole position identification current, m	1.12	Arms	Operation	3
Drives	p1994[0]	М		Pole position identification rise time	100	ms	Operation	3
📩 Insert drive	p1995[0]	М		Pole position identification gain, moti	0.055	Nms/ra	Operation	3
SERVO_02	p1996[0]	М		Pole position identification, integral ti	2.9	ms	Operation	3
SERVO_03	p1997[0]	М		Pole position identification, smoothin	0.0	ms	Operation	3
🔁 📩 Insert DCC chart	p2000			Reference speed reference frequen	6000.00	rev/min	Ready to run	2
💥 Drive navigator 🔚	p2001			Reference voltage	1000	Vrms	Ready to run	3
Configuration 🞽	<							

设置 P1990=1, 即选择电机换向角偏移量的自动辨识

第四步,在线并下载

4.1,此时 P431 的值为初始值 0 度,Warning 提示换向角偏移量检测已经激活,如下图所示:

	Parameter	D +	+ Parameter text		Online value S	ERVO 03	Unit	Modifiable	t Acc
	p424[0]	E	Encoder, linear ze	ro mark distance	0		mm	Commissioni	3
	p425[0]	E	Encoder, rotary ze	ro mark distance	2048			Commissioni	3
	p427[0]	E	Encoder SSI baud	rate	0		kHz	Commissioni	3
	p428[0]	E	Encoder SSI mono	flop time	0		US	Commissioni	3
	p429[0]	E	+ Encoder SSI confi	auration	OH			Commissioni	3
Insert DCC charts	p430[0]	E	- Sensor Module cu	- nfiguration	E0060000H			Commissioni	3
	p431[0]	E	Angular commutat	ion offset	0.00		•	Commissioni	3
	p432[0]	E	Gearbox factor, er	icoder revolutions				Commissioni	3
	p433[0]	E	Gearbox factor, m	otor/load revolutions	1		1	Commissioni	3
	p434[0]	E	Encoder SSI error	bit	0			Commissioni	3
	p435[0]	E	Encoder SSI alarm	bit	0			Commissioni	3
E Diagnostics	p436[0]	E	Encoder SSI parity	bit	0			Commissioni	3
The Providence of the Providen	p440[0]	E	Copy encoder ser	ial number	No action (0)	-		Commissioni	3
	p446[0]	E	Encoder SSI numb	er of bits before the absolute '	/al 0			Commissioni	3
	p447[0]	E	Encoder SSI numb	er of bits absolute value	0			Commissioni	3
				illi.			с.		20046
Command library	SERVO_	03							
•		•	Display information	Acknowledge	all	Acknowledge	э	+	Help f
vel Time	Source			Message			_		
Information (PG) 2009 3-30 12 46 14	D435			OK		<u>u 10 00 -</u>			
Warping 01 02 70 23 58 02 298	SINAMICS I	tograted	· CED\/0 02	7971 · Drive: Angular comm	utation offect deter	nination activate	od		

4.2, 进入控制面板, 为该驱动设置一个转速并启动:

Input/output component Drives Drives Drives Drives Drives Drives	Expert list Parameter	D 4		1				
Drives	Parameter	D +				-		
				Parameter text	Online value SERVO_03	Unit	Modifiable	t Ace
	p1981[0]	M		Pole position identification maximum distance	10		Operation	3
Insert DCC chart	p1982[0]	M		Pole position identification selection	Pole position identification of		Ready to run	n 3
Trive pavigator	p1983			Pole position identification, test	1		Operation	3
	r1984			Pole position identification, angular difference	0.00			3
> Control logic	r1985			Pole position identification, saturation characteristic	0	Arms		3
+ > Open-loop/closed	r1987			Pole position identification trigger characteristic	0	%		3
+ >> Functions	p1990			Encoder adjustment, determine angular commutatio	1		Operation	3
+ » Messages and m	p1991[0]	М		Motor changeover, angular commutation correction	0		Ready to run	n 3
Commissioning	r1992		+	Pole position identification diagnostics	1E00H			3
Control pane	p1993[0]	M		Pole position identification current, motion-based	1.12	Arms	Operation	3
> Trace	p1994[0]	M		Pole position identification rise time motion-based	100	ms	Operation	3
> Function gen	p1995[0]	M		Pole position identification gain, motion-based	0.055	Nms/ra	Operation	3
> Measuring fu	p1996[0]	M		Pole position identification, integral time motion-bas	2.9	ms	Operation	3
> Automatic co	p1997[0]	М		Pole position identification, smoothing time motion-b	0.0	ms	Operation	3
> Stationary/tu 🥃	p2000			Reference speed reference frequency	6000.00	rev/min	Ready to run	12
	<							
nd library	SERVO_	03 🔽						
tegrated - SEBVD_03				Help				
			setno					
CDS: 0 CDS: 0 S DDS: 0		Tur	seibo		0 rev/min 0% n x	7 10 100,0	0 % ·····	200%
	Anset Dec chart Anset Dec chart Configuration Configuration Control logic Open-loop/close Prunctions Messages and m Control pane Trace Function gen Automatic co Stationary/tr Automatic co Stationary/tr DS: DDS: DDS: DDS: DDS: D	Insert Occ Unit P1983 • Configuration • Control logic • Open-loop/closet • Punctions • Messages and m • Commissioning • Y function gen • Trace • Function gen • Trace • Function gen • Automatic co • Stationary/t.v • SERVO_03 p1983 1980 p1991[0] p1993[0] p1993[0] p1993[0] p1993[0] p1995[0]	A list of the control logic Torive navigator Configuration Configuration Configuration Control logic Sector of the control logic Tace Sector of the control pane Control pane Trace Sector of the control pane Sector of the contr	Anset Dec Chart P1983 P1983 P1983 P1983 P1984 P1983 P1984 P1983 P1985 P1985 P1991 P1991	Inservoce that Pole position identification, test Pole position identification, aquilar difference Control logic Pole position identification, saturation characteristic Pole position identification, saturation characteristic Pole position identification, saturation characteristic Pole position identification and trigger characteristic Pole position identification Pole position ident	Insert OCC Usit 1983 Pole position identification, test 1 Insert OCC Usit 1983 Pole position identification, test 1 Configuration Configuration 1983 Pole position identification, saturation characteristic 0 Open-loop/Closer Pole position identification, saturation characteristic 0 1987 Pole position identification, saturation characteristic 0 Image: Dopen-loop/Closer Image: Dopen-loop/Closer	Insert OCC Unit Part and the position identification, test 1 1983 Pole position identification, seturation characteristic O Open-loop/closex Pole position identification trigger characteristic O Pole position identification trigger characteristic D Pole position identification trigger characteristic D Pole position identification correction Pole position identification set Pole position identification set Pole position identification correction Pole position identification correction Pole position identification set Pole Pole Pole Pole	Insert Core Chain p1993 Pole position identification, test 1 Operation Prote position identification, angular difference 0.00 • • Prote position identification, angular difference 0.00 • Open-loop/close Pole position identification, angular difference 0.00 • • • Prote position identification, angular difference 0.00 • • • Prote position identification, tagger characteristic 0 • • • Prote position identification tagger characteristic 0 •

4.3,按下启动按钮后,电机最多旋转一周后停下来。此时换向角偏移量检测完成,P1990 会自动恢复为0,P431 会得到一个值:

🗄 🧰 Infeeds		7		- M 🛅 🖉 🖬	• <u>• • • • • • •</u>	ab	c / 10 P12
Input/output component	Expert list						
E A SERVO 02	Parameter	D +	+	Parameter text	Online value SERVO_03	Unit	Modifiable t Acc
	p424[0]	E		Encoder, linear zero mark distance	0	mm	Commissioni 3
Insert DCC chart	p425[0]	E		Encoder, rotary zero mark distance	2048		Commissioni 3
Trive navigator	p427[0]	E		Encoder SSI baud rate	0	kHz	Commissioni 3
	p428[0]	E		Encoder SSI monoflop time	0	μs	Commissioni 3
> Control logic	p429[0]	E	+	Encoder SSI configuration	OH		Commissioni 3
+ > Open-loop/closer	p430[0]	E	+	Sensor Module configuration	E0080000H		Commissioni 3
+ > Functions	p431[0]	E	11	Angular commutation offset	-2.64	•	Commissioni 3
+ » Messages and m	p432[0]	E		Gearbox factor, encoder revolutions	1	-	Commissioni 3
E-» Commissioning	p433[0]	E		Gearbox factor, motor/load revolutions	1		Commissioni 3
Control pane	p434[0]	E		Encoder SSI error bit	0		Commissioni 3
> Trace	p435[0]	E		Encoder SSI alarm bit	0		Commissioni 3
> Function gen	p436[0]	E		Encoder SSI parity bit	0		Commissioni 3
> Measuring fu	p440[0]	E		Copy encoder serial number	No action (0)	1	Commissioni 3
> Automatic co	p446[0]	E		Encoder SSI number of bits before the absolute val	0	-	Commissioni 3
> Stationary/tu 😱	p447[0]	E	3	Encoder SSI number of bits absolute value	0		Commissioni 3
	<						
* Command library	SERVO_	03					
JAMICS_Integrated - SERVO_03				Help			
Give up control priorityl	0	n :	setpo	n = 10	0 rev/min 0% n x	11)]0 % 200%

Copy Ram to Rom 并 load to PG。

另外,设 P1910=1,在控制面板里使能电机,设转速为 0,并点击启动按钮,可以做电机参数的动态辨识。