

TB0371 Setup of Beckoff EP7041 Stepper Controller

Tuning of EP7041 box is tricky, but following a step through telephone call with Etienne at Beckhoff, it was successful with the following steps

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EP7041 Setup

Set up Remote Box CoE Online Tab

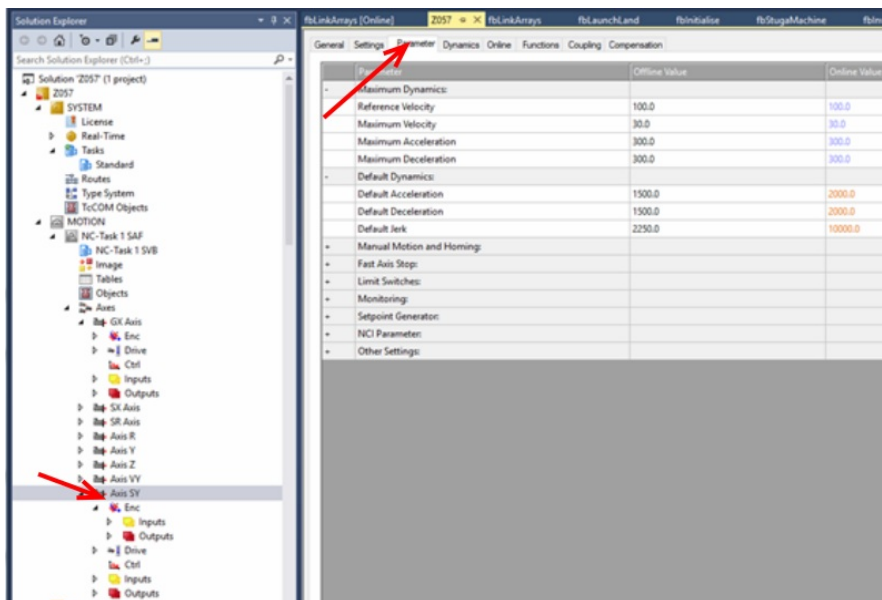
The screenshot shows the Beckhoff TwinCAT software interface. On the left is the Solution Explorer, and on the right is the CoE - Online tab. The CoE - Online tab displays a table of CoE objects.

Index	Name	Flags	Value	Unit
1C12:0	RxPDO assign	RW	> 3 <	
1C13:0	TxPDO assign	RW	> 2 <	
1C32:0	SM output parameter	RO	> 32 <	
1C33:0	SM input parameter	RO	> 32 <	
6000:0	ENC Inputs Ch.1	RO	> 22 <	
6010:0	STM Inputs Ch.1	RO	> 21 <	
6020:0	POS Inputs Ch.1	RO	> 34 <	
7000:0	ENC Outputs Ch.1	RO	> 17 <	
7010:0	STM Outputs Ch.1	RO	> 33 <	
7020:0	POS Outputs Ch.1	RO	> 36 <	
7021:0	POS Outputs 2 Ch.1	RO	> 36 <	
8000:0	ENC Settings Ch.1	RW	> 14 <	
8010:0	STM Motor Settings Ch.1	RW	> 17 <	
8010:01	Maximal current	RW	0x1388 (5000)	
8010:02	Reduced current	RW	0x09C4 (2500)	
8010:03	Nominal voltage	RW	0xC350 (50000)	
8010:04	Motor coil resistance	RW	0x001C (28)	
8010:05	Motor EMF	RW	0x0000 (0)	
8010:06	Motor fullsteps	RW	0x00C8 (200)	
8010:07	Encoder increments (4-fold)	RW	0x1000 (4096)	
8010:09	Start velocity	RW	0x0000 (0)	
8010:10	Drive on delay time	RW	0x0064 (100)	
8010:11	Drive off delay time	RW	0x0096 (150)	
8011:0	STM Controller Settings Ch.1	RW	> 8 <	
8012:0	STM Features Ch.1	RW	> 58 <	
8013:0	STM Controller Settings 2 Ch.1	RW	> 8 <	
8020:0	POS Settings Ch.1	RW	> 16 <	
8021:0	POS Features Ch.1	RW	> 22 <	
9010:0	STM Info data Ch.1	RO	> 19 <	
9020:0	POS Info data Ch.1	RO	> 4 <	

Parameter	Notes	ZX5 SY AS2023-H	ZX5 SY	AF2 SY	AF2 GY	AF2 GZ
8010 - 04	Motor Coil Resistance (AS1050 28 [0.28Ohm])	32	28	36	36	36
8010 - 06	Motor FullSteps - always 200 for Beckhoff Steppers	200	200	200	200	200
8010 - 07	Encoder Increments - always 4096 for Beckhoff Steppers	4096	4096	4096	4096	4096
8012 - 05	Speed range is max speed in motor steps, calculated from pitch, max speed etc. Needs to tie up with Ref velocity in NC Parameters - see below	2000	2000	1000	1000	1000
8012 - 08	Feedback type Encoder feedback is best as it closes the loop. For open loop, use Internal, but this can lose steps / position	Encoder	Encoder	Encoder	Encoder	Encoder
8013:01	Kp Factor	500				

 ...Following Any CoE change you need to do Online reset for EtherCAT master [Right click on Device] NC Axis setup

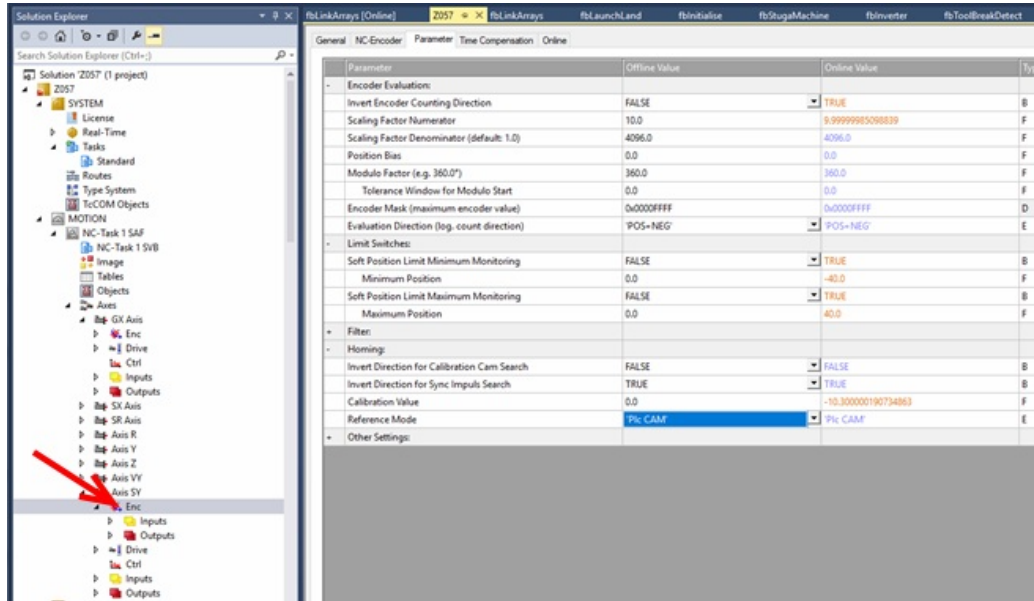
Axis Parameters (Under NC Task)



Parameter	Notes	ZX5 SY AS2023-H	ZX5 SY	AF2 SY	AF2 GY	AF2 GZ

Ref velocity	in user units – has to match speed range 8012:05. 2000 Steps/sec =50mm per sec on 10mm pitch, doubled for Centraliser with 200 steps/rev 2000/200	50	50	500	500
Max Velocity	Stuga Limit (less than Ref velocity)	15	15	25	100


Encoder Setup – Enc



Parameter	Notes	ZX5 SY AS2023-H	ZX5 SY	AF2 SY	AF2 GY	AF2 GZ
Numerator	Pitch of leadscrew	10	10	10	100	100
Denominator	Encoder counts per rev (if feedback is Encoder)	4096	4096	4096	4096	4096
Scale		819.2	*819.2	409.6	45.86	45.86

Note – the above two parameters will be overwritten by the Scale factor from the front end each time the front end is reset

*Note the original value of 819.6 was incorrect. It should be 819.2 for 10mm pitch leadscrew

 ...Activate the configuration at the end

Addendum For SANMOTION 103-H7126-6640



Apply KV value of 20

Parameter	Offline Value	Online Value
- Monitoring:		
Position Lag Monitoring	TRUE	TRUE
Maximum Position Lag Value	5.0	5.0
Maximum Position Lag Filter Time	0.02	0.02
- Position Control Loop:		
Position control: Proportional Factor Kv	20.0	20.0
Feedforward Velocity: Pre-Control Weighting [0.0 ... 1.0]	1.0	1.0
+ Other Settings:		