cpc 直得科技股份有限公司
CHIEFTEK PRECISION CO., LTD.

AC Linear Motor Servo Driver

TC-01-QB1-EN

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TC SERIES

AC Servo Driver

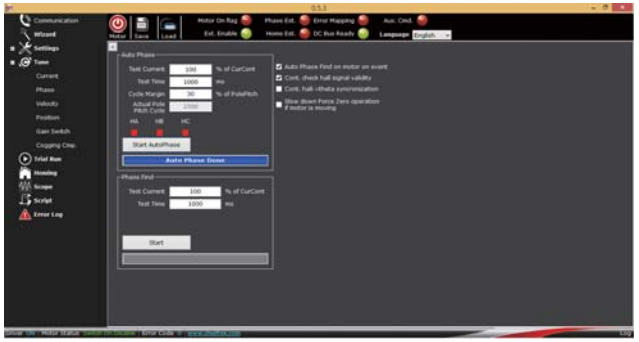
Wizard

Step by step setup interface

Auto tune

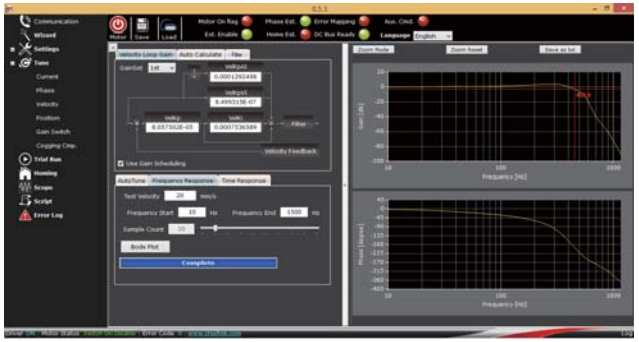
- Auto tuning
- Visualized control loop
- User-friendly interface
- Highly efficient tuning algorithm
- Short tuning time
- Can tune for stable or fast system response

Auto phasing



- Auto phasing
- Hall sensor or forcecommutation
-Step by step phasing progress prompt

Auto tune(velocity)



- Fast control loop up to 10k Hz
- Can test 3 groups of gain set
- Easy to fine tune
- Feedforward signal path
- Response Bode plot
- Bandwidth label
- Input response test with step/sine/triangle
- 3 filters on force output

Auto tune(position)

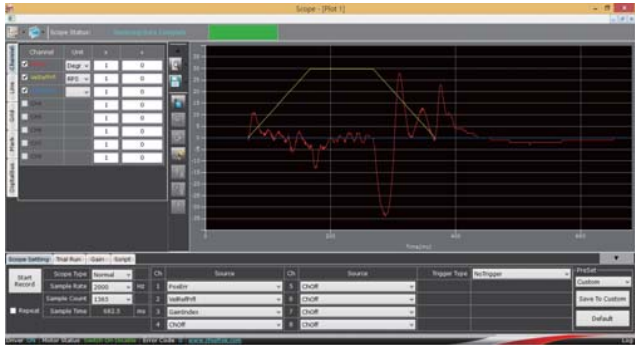
- Fast control loop up to 5k Hz
- Can test 3 groups of gain set
- Feedforward signal path
- Easy to fine tune
- Input response with profile position

Gain switch

- 3 groups of position and velocity gains can be switched
- Gain-switch rule: Demand, Feedback, Error, Target, and Digital input
- Easy to fine tune for different application

Gain switch Test

- Distance:0.6m
- Velocity:3m/s
- Acceleration:3g
- Deceleration:3g

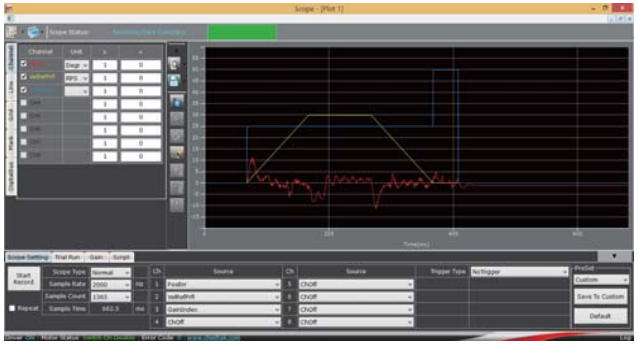


Performance without Gain-switch

Yellow: velocity profile
Red: Position Error [+- 35 count]

Gain switch Test

- Distance:0.6m
- Velocity:3m/s
- Acceleration:3g
- Deceleration:3g



Performance with Gain-switch

Yellow: velocity profile
Red: Position Error [± 11 count]

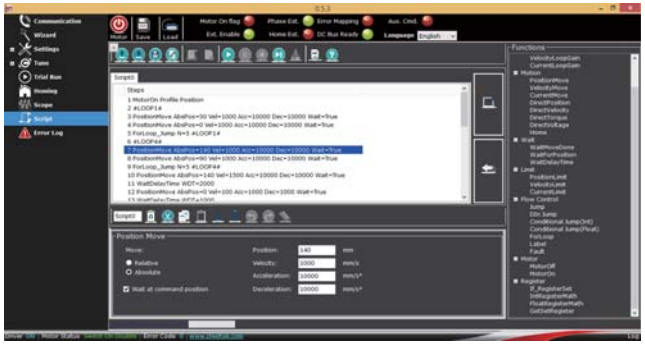
Scope

- Scope provides a real time monitor of driver information.
- User could inspect motion detail without an oscilloscope.

Homing

- Setup interface provides 35 kinds of homing methods.
- Also, the vivid animations explain how a homing method is performed.

Scripting

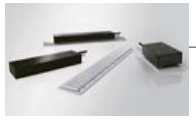


Script could program motor motion with user-friendly interface.

Ordering Information

TC1-	B	9	P	/230 -	H	R	E
							□ : CANopen(Note1) E : EtherCAT
						□: No Resistor(Note1) R: Brake Resistor	
					□: No heatsink(Note1) H : Passive heatsink F : Heatsink with fan		
				AC supply: 230VAC			
			□: Normal P : Extended peak current(Note2)				
		Continuous current (Amps): 8, 20 (A-type only) 3, 9 (B-type only)					
	□: A-type B: B-type						
Servo Driver							

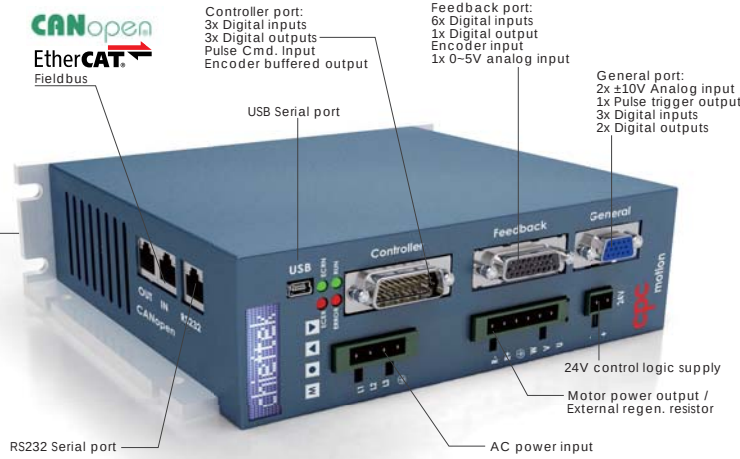
Product Overview TC1-B


LM-Ironcore

LM-Ironless

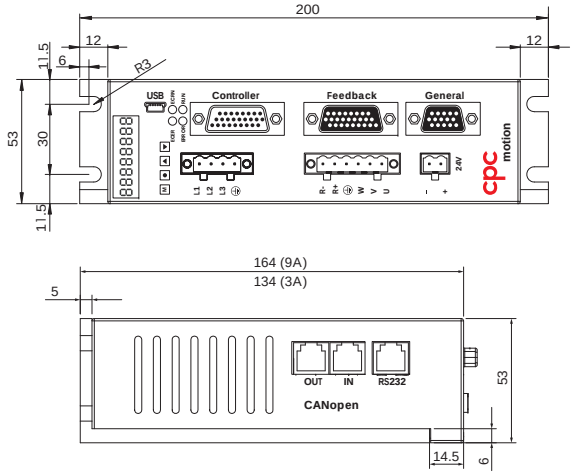
DD Motor

Linear motor Stage



EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

Dimension



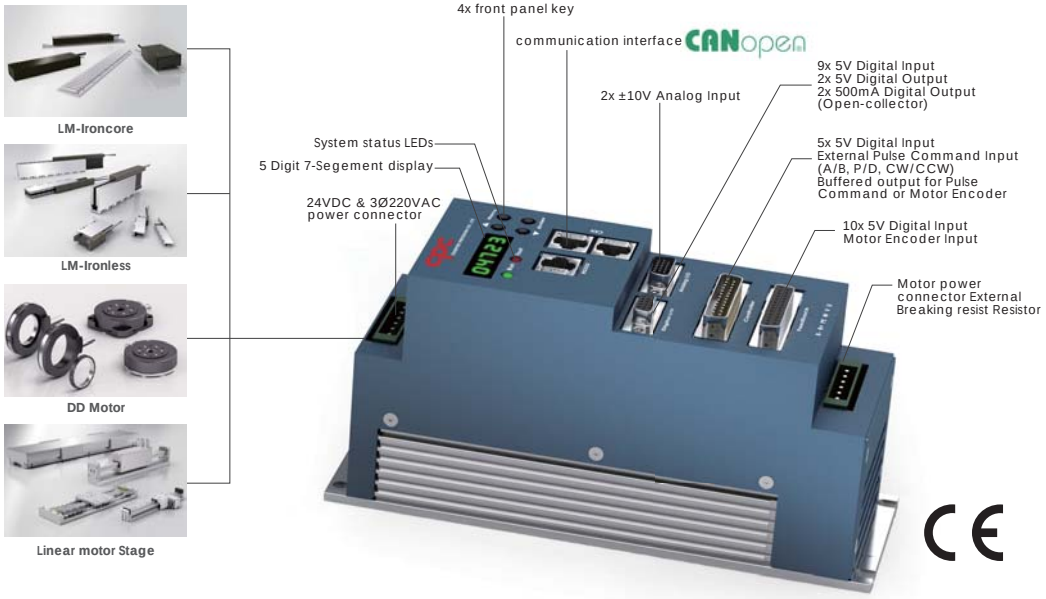
Specification

Model			TC1-B3/230	TC1-B3/230-E	TC1-B9/230	TC1-B9/230-E	TC1-B9P/230	TC1-B9P/230-E
Input Power	Voltage and Phase		1Φ 230 VAC		3Φ 230 VAC			
	DC Bus Peak Voltage (VDC)		390					
	Frequency (Hz)		50 to 60					
	Power Rating (W)		1125		3375			
Control Logi Power	Voltage Range (VDC)		24 VDC					
	Current (A)		> 0.5					
Peak power output (kW)			1.3		4.4		6.6	
Peak current output (A)			6		20		30(Note2)	
Cont. current output (A)			3		9(Note3)		9(Note3)	
Regenerative resistor	Resistance (Ohm)		60 (option)					
	Continuous dissipation (Watt)		100 (option)					
	Pulse Braking Energy		5000 (option)					
Regenerative resistor switch cont. current (A)			10		20			
Fieldbus (DS402 V3.0)			CANopen	EtherCAT	CANopen	EtherCAT	CANopen	EtherCAT
DS402 Operation modes			PP, PV, PT, HM, CST, CSV, CSP					
Serial bus			RS232					
Motor type			Linear/Rotary PMSM					
Encoder Input	Digital	Type	A/B Incremental (RS422 signaling)					
		Work Frequency	Max. 20 Mega counts/s					
		Count Rage	$\pm 2^{31}$ counts					
	Analog (sin / cos)	Amplitude	$1V_{p-p}$					
		Work Frequency	100 kHz, 4096 Cnt/Period Interpolation					
	Absolute	Type	BiSS-C, Tamagawa, EnDat 2.2, SSI					
Feedback position error mapping			Yes					
Current control	Loop Frequency		20 KHz					
	PWM modulation		SVPWM					
	Command input		Serial, Fieldbus, ±10 V Analog, internal software					
Velocity control	Loop Frequency		10 KHz					
	Command input		Serial, Fieldbus, ±10 V Analog, internal software					
	Output filter		x3 (Low-pass or Notch)					
	Counter range		−2 , 147 , 483 , 648 to 2 , 147 , 483 , 647 counts/second					
Position control	Loop Frequency		5 KHz					
	Command input		Pulse command (A/B, Step/Dir, CW/CCW), Serial, Fieldbus, ±10 V Analog, internal software					
	Trajectory generator		Trapezoidal with S-curve filter					
	Counter range		−2 , 147 , 483 , 648 to 2 , 147, 483 , 647 counts					
Analog Input	Input type		x1 (±10 V differential) , x1 (±10 V Single-end)					
	ADC resolution		12 bit					
Pulse command frequency	RS422		Max. 10 MHz					
	5V single-end		Max. 1 MHz					
	24V single-end		Max. 50 KHz					
Total Digital Inputs			x12 (5~24 V)					
Total Digital Outputs (open-collector)			x3 (24V, 400 mA), x3 (24 V, 200 mA)					
High speed Position compare output			x1 (RS422)					
Autotuner			Current/Velocity/Position loop gain, motor phasing setup, sin/cos encoder calibration					
Gain switch function			Yes					
Control panel			x1 (8 digit character LCD) x4 push buttons					
Software protection			Dynamic brake, motor over-current, over/under-position, over-velocity. Virtual/physical position limit switch, missing hall signal, externa fault trigger					
Hardware protection			Drive over-temperature (analog), 5V output short circuit, motor over-temperature (analog)					
Dimensions (LxHxW)(mm)			200 x 134 x 53		200 x 164 x 53 (excluding optional heatsink)			
Weight (Kg)			1.2		1.6 (excluding optional heatsink)			
Operating temperature			10~40 °C					

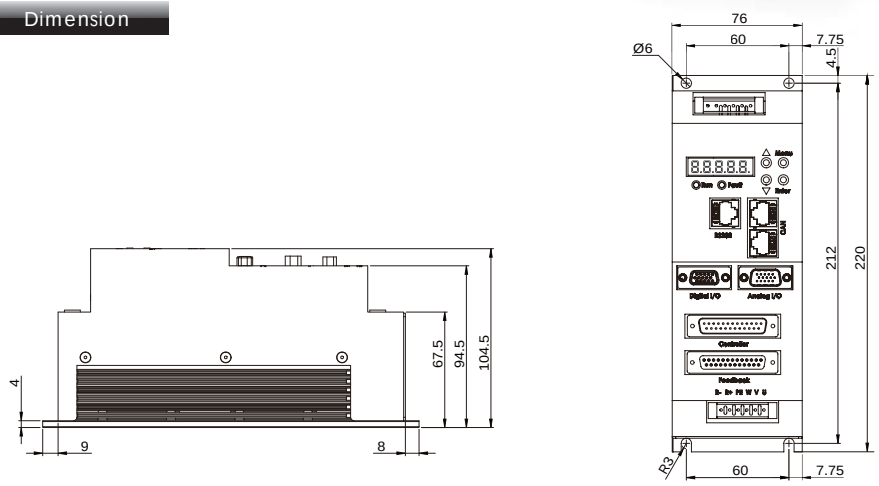
Note 1: Only applicable for the TC1-B series.
Note 2: Only applicable for the TC1-B series. Current sensor with a wider input range is used at the cost of additional signal noise and reduced resolution. This arrangement is suitable for applications where the motor mostly operates in short, high current bursts.
Note 3: Additional heatsink required to ensure continuous operation at rated output.

Product Overview TC1

- Auto Phasing
- Auto Tuning
- Auto Gain Switch
- Current Filter
- Oscilliscope
- S-curve Profile
- Anti-Cogging
- Scripting



Dimension



Specification

Model		TC1-8/230	TC1-20/230
Input Power	Voltage and Phase	3Φ 230 VAC	
	DC Bus Peak Voltage (V)	390	
	Frequency (Hz)	50 to 60	
	Power Rating (W)	3000	7500
Control Logi Power	Voltage Range (VDC)	24	
	Current (A)	> 0.5	
Peak power output (kW)		4.4	12
Peak current output (A)		20	60
Cont. current output (A)		8	20
Regenerative resistor	Resistance (Ohm)	60	25
	Continuous dissipation (Watt)	100	200
	Pulse energy capacity (Joule)	2500	10000
Regenerative resistor switch cont. current (A)		20	
Fieldbus (DS402 V3.0)		CANopen	
DS402 Operation modes		PP, PV, PT, HM, CST, CSV, CSP	
Serial bus		RS232	
Motor type		Linear/Rotary PMSM	
Encoder Input	A/B/Z (RS422)	20 MCnt/s	
	Sin/Cos ($1V_{pp}$)	-	
	SSI (RS422)	-	
	BiSS	-	
Feedback position error mapping		Yes	
Current control	Loop Frequency	20 KHz	
	PWM modulation	SVPWM	
	Command input	Serial, Fieldbus, ±10 V Analog, internal software	
Velocity control	Loop Frequency	10 KHz	
	Command input	Serial, Fieldbus, ±10 V Analog, internal software	
	Output filter	x3 (Low-pass or Notch)	
	Counter range	−2 , 147 , 483 , 648 to 2 , 147 , 483 , 647 counts/second	
Position control	Loop Frequency	5 KHz	
	Command input	Pulse command (A/B, Step/Dir, CW/CCW), Serial, Fieldbus, ±10 V Analog, internal software	
	Trajectory generator	Trapezoidal with S-curve filter	
	Counter range	−2 , 147 , 483 , 648 to 2 , 147 , 483 , 647 counts	
Analog Input	Input type	±10 V differential	
	ADC resolution	12 bit	
Pulse command frequency	RS422	Max. 10 MHz	
	5V single-end	Max. 1 MHz	
	24V single-end	-	
Total Digital Inputs		x22 (3.3~5 V)	
Total Digital Outputs (open-collector)		x2 (24 V, 500 mA), x6 (24 V, 20 mA)	
High speed Position compare output		-	
Total Analog Inputs		x2 (±10 V differential)	
Autotuner		Current/Velocity/Position loop gain, motor phasing setup, sin/cos encoder calibration	
Gain switch function		Yes	
Control panel		x1 (5 digit 7-segment LED) x4 push buttons	
Software protection		Dynamic break, motor over-current, over/under-position, over-velocity. Virtual/physical position limit switch, missing hall signal, externa fault trigger	
Hardware protection		Drive over-temperature (on/off), motor over-temperature (on/off)	
Dimensions (LxHxW)(mm)		220 x 105 x 76	270 x 195 x 94
Weight (Kg)		1.6	3.7
Operating temperature		10~40 °C	