Enhance your embedded solution

Kyros Series EtherCAT®

Features

- High resolution for the current value
  and fast current control loop.(Type Z)
- Four PCBs with heat-sink mounting
- Corresponded to
  EtherCAT CiA402 motion profile.
- Compact ($40 \times 60 \times 37.15$ mm)
  - ideal for robots and small size equipments
- Functional Safety (under application)
- Auto-tuning tool based on frequency
  response is available.
- Isolated power supply for high noise immunity.

Series comparison

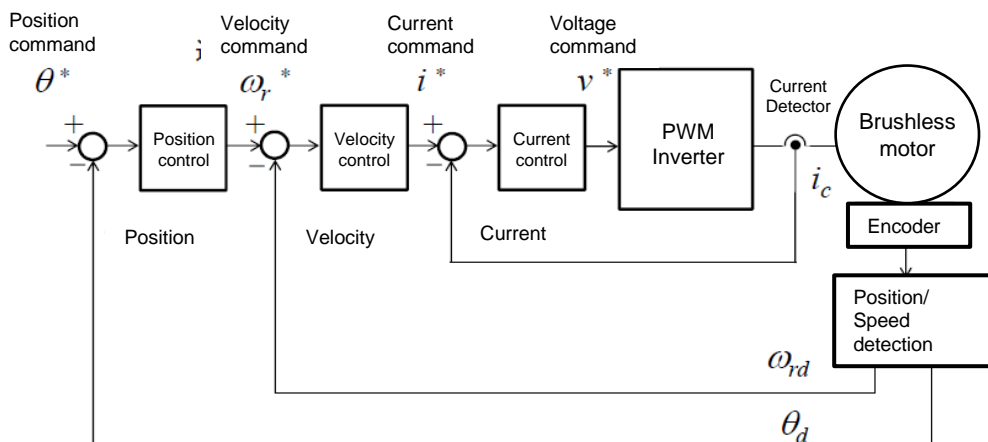|	KyrosZ	KyrosM	KyrosF
Control cycle	25/50 µsec	150 µsec	150 µsec
A/D converter resolution	16 bit	12 bit	12 bit
Functional Safety	Yes (In progress)	Yes (In progress)	No
Number of encoder channels	2 ch.	1 ch.	1 ch.

Model number

Kyros □ - □ □

1   2

1
Z : High performance type + *Functional Safety*
M: Standard type + *Functional Safety*
F : Standard type

2
02: Rated 2 Arms/ Peak 6 Arms
06: Rated 6 Arms/ Peak 18 Arms

Control loop

Position command θ^*

Velocity command ω_r^*

Current command i^*

Voltage command v^*

Position control → Velocity control → Current control → PWM Inverter → Current Detector → Brushless motor

Position

Velocity

Current

i_c

Encoder

Position/ Speed detection

ω_{rd}

θ_d

Common specifications (Z・M・F)

EtherCAT communication specifications	
Supported Communication Protocols	CoE, FoE
Synchronous mode	DC(Sync0), SM, FreeRun

I/O Signals (Pin functions can be assigned by settings)	

Input signals (DI 6 ch., AI 2 ch.)	**DI**
	・Limit signal +/- and Origin signal
	  (Limit 1: Stop in forward rotation by ON, Limit 2: Stop in reverse rotation by ON, etc.)
	・GPIO
	  Input status can be read by PDO/SDO (I/O) communication of EtherCAT.
	AI
	・16bit(Z) / 12bit(M・F) Analog input can be read by PDO/SDO (I/O) communication of EtherCAT.

Output signals (DO 4 ch.)	**DO**
	・Error signal 1 channel turns ON under any of the following conditions:
	  Parameter error, Power error, Overcurrent error, Limit error, Overload error and Encoder error. An error cause can be read by PDO/SDO communication of EtherCAT
	・GPIO
	  Can be output via PDO/SDO communication of EtherCAT as a general-purpose output.
	  Can be reserved for others (Brake signal, etc.) depends on user requirement.

Encoder specification Absolute encoder of SSI, BISS or incremental encoder of ABZ can be set.	
SSI encoder specification	Clock frequency 16/8/4/2/1/0.5 MHz, Data size 1 to 32-bit, Gray/Binary code
BISS encoders	Clock frequency 16/8/4/2/1/0.5 MHz, Data size 1 to 32 bits, CRC size 0 to 8 bits, Binary code
Incremental encoder specifications	A/B/Z differential encoder, Max-rate 20 Mbps, 32bit(Z) / 16bit(M・F) signed integer

Tuning tool	
By connecting to PC via mini USB, users can tune the control parameters and test a motor by KSJ auto-tuning tool.	

Other	
Control power supply	DC 10V to 24V ±10%
Motor power and current	DC 10V to 48V ±10% 02type: Rated current 2 Arms, Peak current 6 Arms 06type: Rated current 6 Arms, Peak current 18 Arms
PWM frequency	20 kHz typical
CE marking	Compliant
Size	60 × 40 × 37.15 mm (including sheet metal)

Sales window