

SGT-FDMSCK-YKD-AA

FOC Motor Driver

Precision BLDC position control for aerospace and defense actuation

The SGT-FDMSCK-YKD-AA is a field-oriented-control motor driver developed for precise position control of three-phase BLDC actuation motors. Its control architecture combines a cascaded position PID loop with current PI regulation, while integrated telemetry and configurable safety functions support reliable system-level integration.

Position-focused control

Target position commands with software limits and user-defined encoder zero.

Live tuning

PID/PI parameters can be updated during operation.

Integrated telemetry

Position, speed, Iq current, DC bus voltage and temperature reporting.

Multi-interface integration

RS-422, CAN, encoder and Hall sensor connectivity.

Safety functions

Emergency stop, enable control, braking and position limit management.

Data integrity

CRC-16 protected command and telemetry protocol.



At a glance

20-34 VDC

Operating DC bus input range

FOC

Cascaded Position PID -> Current PI control architecture

RS-422 + CAN

Differential serial communication and CAN connectivity

A/B/Z + Hall

Encoder and Hall feedback interfaces

10 ms

Default telemetry period; configurable from 5 to 10,000 ms or disabled

CRC-16

CRC-16-CCITT (XMODEM) message integrity protection

Technical Specifications

Selected public-facing specifications derived from the Rev.05 technical documentation.

Control & Motion

Control architecture	Cascaded Position PID -> Current PI
Commanded variable	Motor target position in encoder counts
Runtime configuration	PID/PI gains, encoder zero, position limits and telemetry period
Speed handling	Motor speed is measured and reported by telemetry; it is not a commanded control mode
Emergency control	Emergency stop and system enable commands

Power & Protection

DC bus input	20-34 VDC
Bus current protection	Software bus draw limit: 8 A
Regenerative limit	Approximately 0.5 A returned to the bus during deceleration
Undervoltage behavior	Torque derating below 22 V; torque reduced to zero below 19 V
Monitoring	DC bus voltage, Iq current and temperature

The current and voltage thresholds above are firmware protection limits described in Rev.05, not standalone hardware current ratings.

Interfaces

Motor output	Three-phase BLDC outputs: U / V / W
Encoder	A, B and Z / index inputs
Hall sensors	H1, H2 and H3 inputs
RS-422	115200 baud, 8 data bits, no parity, 1 stop bit
CAN	CAN High / CAN Low interface
Auxiliary power	3.3 V / 100 mA and 5 V / 200 mA outputs available on the main interface

Communications

Framing	SOF + LEN + CMD + PAYLOAD + CRC16
Start-of-frame	0xAA
Payload length	Up to 32 bytes
CRC	CRC-16-CCITT (XMODEM), polynomial 0x1021
Byte order	Little-endian for multi-byte numeric fields
Telemetry timing	Default 10 ms; configurable 5-10,000 ms or disabled

Telemetry Data

Parameter	Data Type	Unit	Description
Position	int32	Encoder count	Position relative to the user-defined zero point
Speed	int16	RPM	Measured output-shaft speed
Iq current	int16	mA	Measured q-axis current
DC bus voltage	uint16	mV	Measured and filtered bus voltage
Temperature	int16	0.1 °C	Board temperature telemetry

Integration note. The controller supports software-defined position limits, encoder-zero assignment and live control-loop parameter updates. These functions allow the driver to be adapted to different actuator mechanics and control-system requirements without changing the communication architecture.

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www.saglamtek.com
SGT-FDMSCK-YKD-AA REV05
Product datasheet.