Meridian ISC, Model M2xx/3xx-xBx

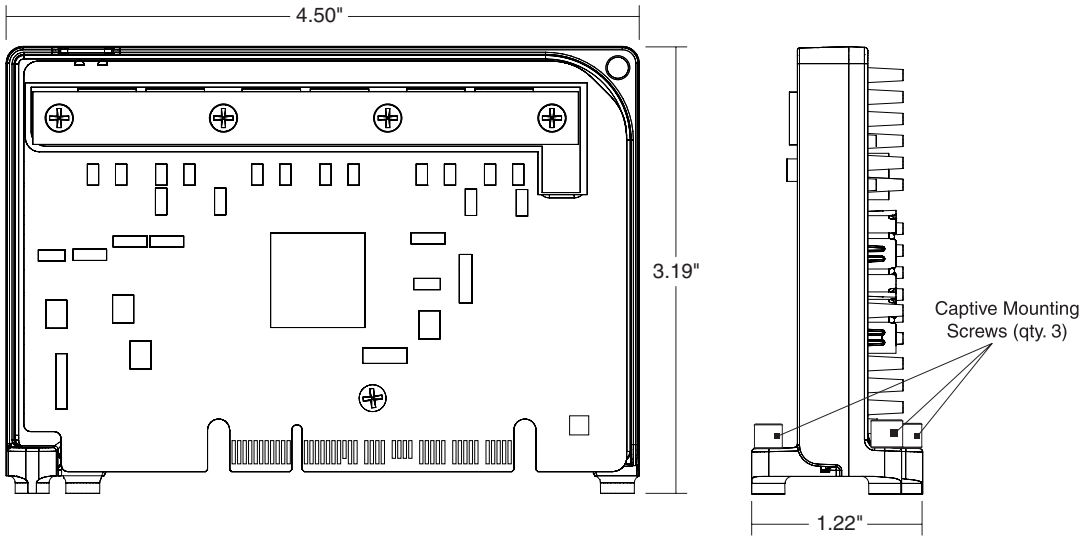
Board Mounted, DSP-Based Integrated Servo Controllers

MODEL LIST

Model	Peak Current [A]	RMS Current [A_{RMS}]	Bus Voltage [V_{DC}]
ISC-M255-KBx	16	4	24-90
ISC-M295-KBx	20	6	24-90
ISC-M355-RBx	25	8	24-90
ISC-M375-RBx	30	10	24-90

FEATURES

- Advanced trajectory generation includes multi-speed moves with head and tail ramps, asymmetric accel/decel, etc. with smooth jerk and higher order derivative energy limiting.
- Exceptional servo control, includes: advanced estimators, electronic inertia matching and smooth operating multi-state feed-forward terms.
- Integrated I/O control for high-speed response to input events and high speed output control based on internal events.
- Built-in user-programmable logic structure allows easy deterministic coordination of internal and external events, I/O and encoder capture/compare.
- g-Stop™ command tuning cures resonant vibration problems with negligible effects on throughput.
- I/O expansion up to 36 inputs/34 outputs (M3xx) up to 12 inputs/10 outputs (M2xx) using IEX bus.
- Easily embeddable on a backplane/motherboard using a single low cost PCI-Express connector
- Integrated cast "pin" heat-sink does not require additional heat sinking elements.
- Universal motor interface drives brush, 3-phase brushless, 2-phase brushless, stepper motors, voice-coils, etc.
- Closed loop vector drive of stepper motors enables reduced cost—yet high-torque—direct-drive applications.
- Full galvanic isolation between control signals and servo power/phases minimizes noise problems and speeds electrical and safety integration.



SPECIFICATIONS

GENERAL	Dimensions, in (mm):	4.5 (114.3) x 3.25 (82.6) x 1.22 (31.0)
	Weight, oz (g):	5.0 (142)
ENVIRONMENTAL	Operating Temperature:	0-40°C
	Humidity:	0-90%, non-condensing
COMPLIANCE	Electrical safety:	EN61010, UL508C
	EMI:	EN 61326
	Machine safety:	EN 954-1, with proper power control
EXTERNAL FAN	Optional	See documentation for cooling requirements
OUTPUT POWER	PWM ripple frequency:	28kHz, center balance vector type
	Conversion efficiency:	>99%
COMPENSATOR	TSPD:	35µS
	Position/velocity control:	Enhanced PIV with proprietary velocity, acceleration and jerk estimators, Inertia Matching Technology (IMT), and Anti-Hunt. Provides velocity, acceleration, jerk and friction feed-forward gains.
	Torque control:	Synchronous vector with DQ decoupling, SmartSaturation, and auto calibration
ENCODER	Primary (Motor) Interface:	Single-ended or differential (user-selectable)
	Secondary (Load) Interface:	Differential
	Max count rate:	24 MHz, quadrature, count rate
	Features:	Bad sequence detection, digital filtering adjustable from 100kHz to 40MHz
MOTOR COMPATIBILITY	Requirements:	Rotary brush, 3-phase brushless, 2-phase brushless, stepper motors, voice-coils, etc.
LIMIT INPUTS	Interface:	TTL with 2kΩ pull-up, digitally filtered
HALL SENSOR INPUTS	Specifications:	5kΩ pull-up to +5VDC
	Features:	Digitally filtered, used to set torque/force vector on initialization (drive may also operate in sensorless mode)
GENERAL PURPOSE INPUTS	Interface:	Two (2) high speed uncommitted 2-pin opto-isolator inputs similar to a solid state relay. GPI-0 can initiate capture of the motor or load encoder position to the count. 4-24V input range.
GENERAL PURPOSE OUTPUTS	Interface:	Two (2) high-current, high speed, opto isolated transistor outputs with active clamping and short circuit & over current protection. Will directly drive 24V inductive loads. Outputs can be triggered under host program control, from encoder counter compare or via user-definable logic functions.
	Output Ratings:	GPO-0: 625mA (15W @ 24V); GP0-1: 208mA (5W @ 24V).
REAL-TIME MONITOR PORT	Features:	Configurable filtering, sync pulse, scaling/zoom, non-volatile
	Output variables:	Position error, actual velocity, commanded velocity, velocity error, commanded torque/force, actual torque/force, SGN velocity, SGN position, measured position, commanded jerk, commanded acceleration, max phase voltage
PROTECTION AND SAFETY FUNCTIONS	Drive protection:	Short circuit (phase-to-phase, phase-to-ground), over-temperature, over voltage, over current, protected for open windings, fused
	Motor protection:	True RMS torque/force limiting, automatic speed-limit, motor jam detection, over temperature
	Mechanical safeguards:	Hardstop detection, limit switch servoing, adjustable tracking error limit and shutdown thresholds, adjustable torque/force limits, adjustable speed limits
	Electrical isolation:	1.0mm (0.0394")
INPUT SUPPLY	Main DC (bus) power supply:	24-90 VDC @ Up to 6.75A RMS, 15A peak (application dependant)
	5VDC (logic) power supply:	4.5-5.5VDC @ 650mA per drive
COUNTRY OF ORIGIN	Manufactured in:	USA
WARRANTY	Duration:	3-year standard, 5-year optional

EDGE CONNECTOR PINOUT

Pin Pos.	Signal	Pin Pos.	Signal
A1	+5VDC in	B1	BLADE_PRESENT
A2	+5VDC in	B2	GND
A3	GND	B3	GND
A4	GND	B4	GPI0
A5	GPO0/BRAKE	B5	GPI1
A6	GPO1	B6	GPI2/+LIMIT
A7	IEX_DATAOUT~	B7	GPI3/-LIMIT
A8	IEX_LOAD~	B8	TXD1
A9	IEX_CLK~	B9	TXD0
A10	IEX_DATAIN	B10	MOTOR_OVERTEMP
A11	RXD1	B11	RXD0
A12	FAN_ON	B12	NO CONNECT
A13	LOAD_ENC_A	B13	NET_SUPPLY_OK~
A14	LOAD_ENC_I	B14	LOAD_ENC_B
A15	COMM. R-S	B15	COMM. T-R
A16	MTR_IN_I	B16	COMM. S-T
A17	MTR_IN_B	B17	MTR_IN_B~
A18	MTR_IN_A	B18	MTR_IN_A~
A19	DO NOT CONNECT	B19	+5VDC in
A20	DO NOT CONNECT	B20	DO NOT CONNECT
A21	CHASSIS	B21	CHASSIS
A22	REMOVE CONTACT	B22	REMOVE CONTACT
A23	V- (24-90VDC)	B23	V- (24-90VDC)
A24	V- (24-90VDC)	B24	V- (24-90VDC)
A25	V- (24-90VDC)	B25	V- (24-90VDC)
A26	V- (24-90VDC)	B26	V- (24-90VDC)
A27	DO NOT CONNECT	B27	DO NOT CONNECT
A28	V+ (24-90VDC)	B28	V+ (24-90VDC)
A29	V+ (24-90VDC)	B29	V+ (24-90VDC)
A30	V+ (24-90VDC)	B30	V+ (24-90VDC)
A31	V+ (24-90VDC)	B31	V+ (24-90VDC)
A32	DO NOT CONNECT	B32	DO NOT CONNECT
A33	MOTOR PHASE S	B33	MOTOR PHASE S
A34	MOTOR PHASE S	B34	MOTOR PHASE S
A35	MOTOR PHASE S	B35	MOTOR PHASE S
A36	MOTOR PHASE S	B36	MOTOR PHASE S
A37	MOTOR PHASE S	B37	MOTOR PHASE S
A38	DO NOT CONNECT	B38	DO NOT CONNECT
A39	MOTOR PHASE R	B39	MOTOR PHASE R
A40	MOTOR PHASE R	B40	MOTOR PHASE R
A41	MOTOR PHASE R	B41	MOTOR PHASE R
A42	MOTOR PHASE R	B42	MOTOR PHASE R
A43	MOTOR PHASE R	B43	MOTOR PHASE R
A44	DO NOT CONNECT	B44	DO NOT CONNECT
A45	MOTOR PHASE T	B45	MOTOR PHASE T
A46	MOTOR PHASE T	B46	MOTOR PHASE T
A47	MOTOR PHASE T	B47	MOTOR PHASE T
A48	MOTOR PHASE T	B48	MOTOR PHASE T
A49	MOTOR PHASE T	B49	MOTOR PHASE T