



# ***Passion For Motion***

## ***Product Overview***

- ✓ Digital Servo Drive
- ✓ Motion Control
- ✓ Custom Solution



# Who we are

IMC is a company dedicated to the science of motion control since 2006. We design and produce off-the-shelf and customized solutions to answer the industry need for increasingly complex, high-tech motion control applications.

IMC's offering includes high performance - high power density servo drives and powerful control software for most motor technologies including servo motors (DC brush and brushless), microstepping, and step motors. Advanced features include field buses (CANopen, EtherCAT, Ethernet/IP), sinusoidal commutation, field oriented control, advanced PID filters and much more.

FIND OUT MORE AT  
[www.imc-automation.com](http://www.imc-automation.com)

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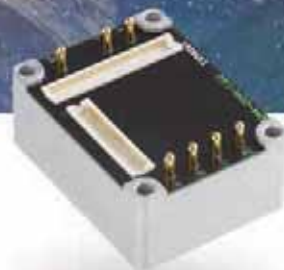
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# PEVE

WORLD'S SMALLEST SMART SERVO DRIVE



Redefine  
what a servo drive can do.

PEVE is an ultra-compact, super smart, high-powered servo drive. Due to its small size and rugged design it can be mounted virtually anywhere: collaborative robot joints, wearable robots, unmanned ground or aerial vehicles as well as inside motors. Everest, however, is not only a servo drive. We have embedded a full blown MCU to implement your own advanced algorithms whether you are working on image stabilization or walking robots. Everest also features the most advanced transistor technology in the world with the highest power density and efficiency while keeping negligible EMI and providing linear amplifier performance.

Weight 20 g

Size in mm 26 x 35 x 14

Up to 5 kW



World's highest power density smart servo drive



Wide voltage range for DC bus or battery operation



Low channel resistance for highest efficiency



Quickly customizable interface board

## MOST VERSATILE SERVO DRIVE IN ITS CLASS

PEVE is built on a shielded body construction which provides best-in-class heat dissipation and **ultra-low radiated emissions** and is packed with a whole lot of features for the most demanding applications.

Absolute Serial   EnDat 2.1   2.2   BiSS-C   SSI   Absolute A

Incremental   Digital Hall   Digital Encoder

Analog   Resolver   Sine Cosine   Analog Halls

Servo Loops   Torque   40 kHz > Velocity   20 kHz > Position   20 kHz

Switching Frequency   8 kHz   Configurable up to   100 kHz

Safety   STO   Quick Stop

Network   SPI   EtherCAT   PROFINET   EtherNet/IP   CANopen

Environment   -40 °C up to 110 °C   Vibration IEC 60068-2-6   Shock IEC 60068-2-27   Alt. IEC 60068-2-13

Current Resolution   0.10 mA   16 bit with automatic gain scheduling   1.44 mA

IO   6x Digital Outputs   6x Digital Inputs   2x 16 bit Analog Inputs   2x 14 bit Analog Outputs

Control Inputs   Analog   PWM   Step and Direction   E-Gearing

User Programmable   RTOS for application development   Host libraries   Python   C



- Wide feedback and motor support
- Easy to integrate due to small size
- Ready for harsh environments
- Advanced motion networking
- Dedicated MCU for user algorithms
- ✓ Ready to use development kit



In accordance with all safety requirements as per UL 61800-5-1



World's Smallest STO (SIL-3) certified servo.



In accordance with LVD 2014/35/EU and EMC Directive 2014/30/EU

## INTERFACE BOARD EXPRESS SERVICE

Our team will design your own interface board on a short lead time.



1 Select connectors, functions and shape for your board



2 Quote and detailed lead times in less than 48 hours



3 From concept to prototype in less than eight weeks

# PTRI

## PLUG-IN SERVO DRIVE

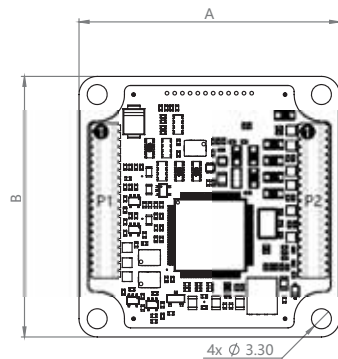
The micro servo drive PTRI provides top performance and fully featured motion controller. With a footprint of just 43 x 43 mm it can control multiple motor types and is ready to interface EtherCAT or CANopen networks.

- ✓ Ultra compact design
- ✓ CANopen and EtherCAT
- ✓ Standalone operation
- ✓ Ready to be integrated



Digital Servo Drive	Units	PTRI-1/48	PTRI-4/48	PTRI-7/48
Supply Voltage	V <sub>DC</sub>	8 - 48		
Maximum Phase Peak Current (2 s)	A <sub>RMS</sub>	1	4	13
Maximum Phase Continuous Current	A <sub>RMS</sub>	1	4	7
Standby Power Consumption	W	1.5		
Efficiency	%	>95		
Supported Motor Types		Rotary and Linear Brushless, Brush DC, Voice Coil		
Commutation		Sinusoidal and Trapezoidal		
Minimum Motor Inductance	μH	100		
Power Stage PWM Frequency	kHz	20, 80 (Configurable)		
Current Sensing		2Ø, ± 1% Accuracy, 10 bit		
Commutation Sensors		Digital Halls, Incremental Encoder, PWM, Analog		
Supported Feedback		SSI, Sin/Cos , Tacho, Digital/Analog Halls, Incremental Encoder, PWM, Analog Input, Resolver		
Torque Loop Update Rate	kHz	10		
Position and Velocity Update Rate	kHz	1		
Motion Modes		Cyclic Sync, Interpolated, Profilers (Position, Velocity, Torque), Homing, Open Loop		
Supported Command Sources		Network, USB, Serial, Analog Input, PWM , Encoder Follower/Electronic Gearing, Step and Direction, Standalone		
Motion Controller		Yes, Standalone Operation with 64 Macros of 64 Commands		
Digital Inputs		4		
Analog Inputs		2		
Digital Outputs		4		
User Configurable Protections		STO Full Functionality, Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload (I <sup>2</sup> T), Open Load Protection		
Hardware Protections		Short-circuit protections, ESD and EMI protections, Inverse Polarity Supply Protection, High Power Transient Voltage Suppressor for Short Braking		
Software Protections		Mechanical Limits for Homing Modes, Hall Sequence/Combination Error		
USB		Yes		
Serial		Yes		
CANopen		Yes (DS-301, DS-303, DS-305, DS-306, DS-402)		
EtherCAT		Yes (CoE)		
Ambient Air Temperature (operating)	°C	-40 to 100 (over 50 with current derating)		
Ambient Air Temperature (storage)	°C	-50 to 125		
Maximum Humidity (non-condensing)	%	5 to 85		
Dimensions	mm (in)	43 x 43 x 15.88 (1.69 x 1.69 x 0.63)		
Weight	g (oz)	34 (1.19)		

## DRAWINGS



Dimension (mm)	PTRI-X/48
A	43
B	43
C	15.88

## PINOUT

## P1 CONNECTOR

01	V_LOGIC	02	VBUS
03	VBUS	04	VBUS
05	GND_P	06	GND_P
07	GND_P	08	GND_P
09	PE	10	PE
11	PE	12	PE
13	PHASE_C	14	PHASE_C
15	PHASE_C	16	PHASE_C
17	PHASE_B	18	PHASE_B
19	PHASE_B	20	PHASE_B
21	PHASE_A	22	PHASE_A
23	PHASE_A	24	PHASE_A
25	SHUNT_DRIVER	26	NC
27	BROKEN_WIRE	28	GND_D
29	MOTOR_TEMP	30	HALL_1
31	HALL_2	32	HALL_3
33	GND_D	34	5V_D
35	ENC_A+	36	ENC_A-
37	ENC_I+	38	ENC_I-
39	ENC_B+	40	ENC_B-

## P2 CONNECTOR

01	OUTPUT_6	02	OUTPUT_5
03	OUTPUT_4	04	OUTPUT_3
05	GND_D	06	5V_D
07	OUTPUT_2	08	OUTPUT_1
09	ANALOG_IN_2	10	ANALOG_IN_1
11	HS_INPUT_2	12	HS_INPUT_1
13	LS_INPUT_4	14	LS_INPUT_3
15	3.3V_D	16	3.3V_REF_OUT
17	LS_INPUT_2	18	LS_INPUT_1
19	UART_TX	20	UART_RX
21	ABS_CS	22	GND_D
23	ABS_SDO	24	ABS_SCK
25	ABS_SDI	26	ENDAT_TX_EN
27	LED_CAN_RUN	28	CAN_TTL_RX
29	LED_CAN_ERR	30	CAN_TTL_TX
31	LED_FAULT/OK	32	GND_D
33	USB_DATA+	34	USB_SUPPLY
35	USB_DATA-	36	STO_IN
37	GND_D	38	5V_D
39	NC	40	NC

## PART NUMBERING INFORMATION

PTRI X / XX - Y

## Power model:

1/48 = 1 A cont, 1 A peak @ 8-48 VDC  
 4/48 = 4 A cont, 4 A peak @ 8-48 VDC  
 7/48 = 7 A cont, 13 A peak @ 8-48 VDC

## Interfaces:

S = Serial/USB  
 C = Serial/USB/CANopen  
 E = Serial/USB/EtherCAT

## Option

Customized Connector Board

## Part Number

ENG-TRI-CONBOARD

8-48  
V<sub>DC</sub>

7  
A<sub>RMS</sub>

350  
W



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# PTRIC

## DIGITAL SERVO DRIVE

The micro servo drive PTRIC provides top performance and fully featured motion controller. With a footprint of just 43 x 43 mm it can control multiple motor types and is ready to interface EtherCAT or CANopen networks.

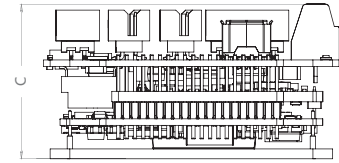
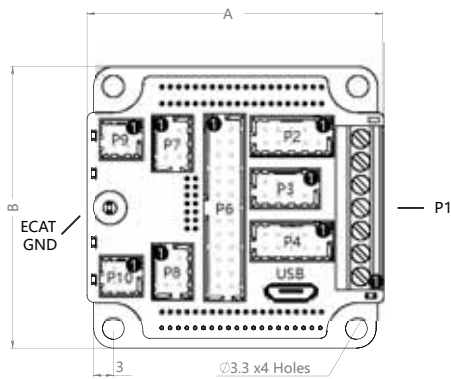
- ✓ Ultra compact design
- ✓ CANopen and EtherCAT
- ✓ Standalone operation
- ✓ Plug and Play



Digital Servo Drive	Units	PTRIC-1/48	PTRIC-4/48	PTRIC-7/48
Supply Voltage	V <sub>DC</sub>	8 - 48		
Maximum Phase Peak Current (2 s)	A <sub>RMS</sub>	1	4	13
Maximum Phase Continuous Current	A <sub>RMS</sub>	1	4	7
Standby Power Consumption	W	1.5		
Efficiency	%	>95		
Supported Motor Types		Rotary and Linear Brushless, Brush DC, Voice Coil		
Commutation		Sinusoidal and Trapezoidal		
Minimum Motor Inductance	μH	100		
Power Stage PWM Frequency	kHz	20, 80 (Configurable)		
Current Sensing		2Ø, ± 1% Accuracy, 10 bit		
Commutation Sensors		Digital Halls, Incremental Encoder, PWM, Analog		
Supported Feedback		SSI, Sin/Cos , Tacho, Digital/Analog Halls, Incremental Encoder, PWM, Analog Input		
Torque Loop Update Rate	kHz	10		
Position and Velocity Update Rate	kHz	1		
Motion Modes		Cyclic Sync, Interpolated, Profilers (Position, Velocity, Torque), Homing, Open Loop		
Supported Command Sources		Network, USB, Serial, Analog Input, PWM , Encoder Follower/Electronic Gearing, Step and Direction, Standalone		
Motion Controller		Yes, Standalone Operation with 64 Macros of 64 Commands		
Digital Inputs		4 (TTL and PLC)		
Analog Inputs		1 (±10 V), 1 (0-5 V)		
Digital Outputs		4 (TTL and PLC)		
User Configurable Protections		STO Full Functionality, Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload (I <sup>2</sup> T), Open Load Protection		
Hardware Protections		Short-circuit protections, ESD and EMI protections, Inverse Polarity Supply Protection, High Power Transient Voltage Suppressor for Short Braking		
Software Protections		Mechanical Limits for Homing Modes, Hall Sequence/Combination Error		
USB		Yes		
Serial		RS-485		
CANopen		Yes (DS-301, DS-303, DS-305, DS-306, DS-402)		
EtherCAT		Yes (CoE)		
Ambient Air Temperature (operating)	°C	-40 to 100 (over 50 with current derating)		
Ambient Air Temperature (storage)	°C	-50 to 125		
Maximum Humidity (non-condensing)	%	5 to 85		
Dimensions	mm (in)	43 x 45 x 23.5 (1.69 x 1.77 x 0.93)		
Weight	g (oz)	42 (1.48)		



## DRAWINGS



Dimension (mm)	PTRIC-X/48
A	45
B	43
C	23.5

## PINOUT

## P1 CONNECTOR

01	PH_A
02	PH_B
03	PH_C
04	PE
05	GND_P
06	SHUNT
07	+SUP

## P2 CONNECTOR

01	PE
02	+5V_OUT
03	GND_D
04	MOTOR_TEMP
05	GND_D
06	NC
07	HALL1
08	HALL2
09	GND_D
10	HALL3

## P3 CONNECTOR

01	PE
02	+3.3V_OUT
03	+5V_OUT
04	GND_D
05	CLK+
06	CLK-
07	DATA+
08	DATA-

## P4 CONNECTOR

01	PE
02	+5V_OUT
03	GND_D
04	+3.3V_OUT
05	ENC_A-
06	ENC_A+
07	ENC_B-
08	ENC_B+
09	ENC_Z-
10	ENC_Z+

## P6 CONNECTOR

01	PE
02	GND_D
03	DIFF_GPI1-
04	DIFF_GPI1+
05	HS_GPI2-
06	HS_GPI2+
07	LS_GPI1
08	LS_GPI2
09	LS_GPI3
10	LS_GPI4
11	GPO1
12	GPO2
13	GPO3
14	GPO4
15	GND_D
16	+5V_OUT
17	NC
18	AN_IN1
19	AN_IN2-

## P6 CONNECTOR

20	AN_IN2+
21	GND_D
22	GND_D
23	LED_RUN_K
24	LED_ERR_K
25	LED_LINK1_K
26	LED_LINK0_K

## P7 CONNECTOR

01	PE
02	GND_D
03	RX_485+
04	TX_485+
05	RX_485-
06	TX_485-

## P8 CONNECTOR

01	STO_COMMON
02	GND_D
03	STO_1
04	+5V_OUT
05	STO_2
06	+5V_OUT

## P9-P10 ETHERCAT

01	TX_D+
02	RX_D+
03	TX_D-
04	RX_D-

## P9-P10 CANOPEN

01	NC (P9)
01	CAN_TERM (P10)
02	CAN_GND
03	CAN_L
04	+CAN_H

## PART NUMBERING INFORMATION

## PTRIC X / XX - Y

## Power model:

1/48 = 1 A cont, 1 A peak @ 8-48 VDC  
 4/48 = 4 A cont, 4 A peak @ 8-48 VDC  
 7/48 = 7 A cont, 13 A peak @ 8-48 VDC

## Interfaces:

S = RS-485/USB  
 C = RS-485/USB/CANopen  
 E = RS-485/USB/EtherCAT

## Option

IO Starter Kit	A-IOKIT
Feedback Cable	C-TRIC-FEED
IO Cable	C-TRIC-IO
RS-485 Cable	C-TRIC-RS485
CAN Cable	C-TRIC-CAN

## Part Number

8-48  
V<sub>DC</sub>

7  
A<sub>RMS</sub>

350  
W



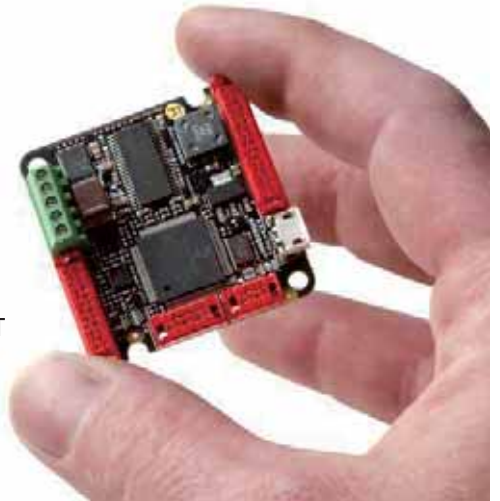
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# PNEP

## DIGITAL SERVO DRIVE

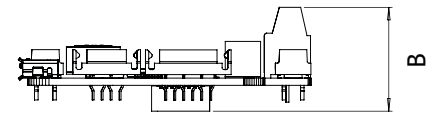
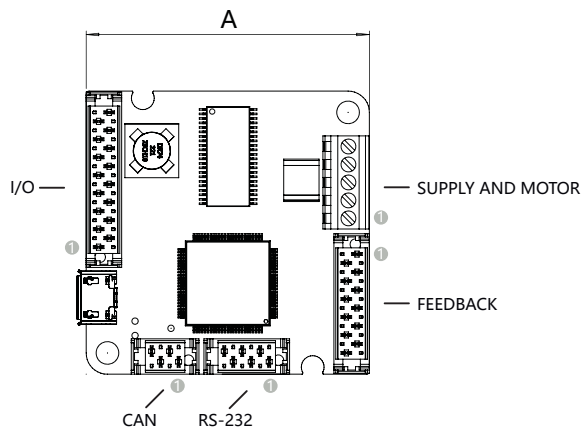
The micro servo drive PNEP has a foot print of just 40 x 40 mm and is capable of control motors with very low inductance without additional chokes due to its improved PWM algorithms. The Neptune is ready to interface EtherCAT or CANopen networks and includes standalone operation.

- ✓ Ultra compact and lightweight
- ✓ Low inductance motors
- ✓ CANopen and EtherCAT
- ✓ Standalone operation
- ✓ High frequency PWM



Digital Servo Drive	Units	PNEP-2/48
Supply Voltage	V <sub>DC</sub>	9 - 48
Maximum Phase Peak Current (1 s)	A <sub>RMS</sub>	5
Maximum Phase Continuous Current	A <sub>RMS</sub>	2.5
Standby Power Consumption	W	1.5
Efficiency	%	>95
Supported Motor Types		Rotary and Linear Brushless, Brush DC, Voice Coil
Commutation		Sinusoidal and Trapezoidal
Minimum Motor Inductance	μH	100
Power Stage PWM Frequency	kHz	40, 80 (Configurable)
Current Sensing		20, ± 1% Accuracy, 10 bit
Commutation Sensors		Digital Halls, Analog Halls, Incremental Encoder, PWM, Analog
Supported Feedback		DC Tachometer, Digital Halls, Analog Halls, Quadrature Incremental Encoder, PWM, Analog
Torque Loop Update Rate	kHz	10
Position and Velocity Update Rate	kHz	1
Motion Modes		Cyclic Sync, Interpolated, Profilers (Position, Velocity, Torque), Homing, Open Loop
Supported Command Sources		Network, USB, Serial, Analog Input, PWM, Encoder Follower/Electronic Gearing, Step and Direction, Standalone
Motion Controller		Yes, Standalone Operation with 64 Macros of 64 Commands
Digital Inputs		4 (TTL and PLC)
Analog Inputs		1 (±10 V), 1 (0-5 V)
Digital Outputs		2 (TTL and PLC)
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload (I <sup>2</sup> T), Open Load Protection
Hardware Protections		Short-circuit protections, ESD and EMI protections, Inverse Polarity Supply Protection, High Power Transient Voltage Suppressor for Short Braking
Software Protections		Mechanical Limits for Homing Modes, Hall Sequence/Combination Error
USB		Yes
Serial		RS-232 (daisy chain)
CANopen		Yes (DS-301, DS-303, DS-305, DS-306, DS-402)
EtherCAT		Yes (CoE)
Ambient Air Temperature (operating)	°C	-25 to 85 (over 50 with current derating)
Ambient Air Temperature (storage)	°C	-40 to 125
Maximum Humidity (non-condensing)	%	5 to 85
Dimensions	mm (in)	40 x 40 x 15 (1.57 x 1.57 x 0.59)
Weight	g (oz)	20 (0.7)

## DRAWINGS



Dimension(mm)	PNEP-2/48
A	40
B	15

## PINOUT

FEEDBACK		CAN		SUPPLY AND MOTOR		RS-232		I/O	
12	HALL_3	04	GND	05	+SUP	06	RET_TX	16	+5V_EXT
11	HALL_2	03	CAN_H	04	GND	05	GND	15	LS_GPI1
10	HALL_1	02	CAN_L	03	PH_C	04	TX	14	LS_GPI2
09	GND	01	GND	02	PC_B	03	RX	13	GND
08	ENC_Z- / REF-			01	PH_A	02	GND	12	AN_IN2+
07	ENC_Z+					01	RET_TX	11	AN_IN2-
06	ENC_B-							10	AN_IN1
05	ENC_B+							09	GND
04	ENC_A-							08	HS_GPI1- / PULSE- / PWM-
03	ENC_A+							07	HS_GPI1+ / PULSE+ / PWM+
02	GND							06	GND
01	+5V_OUT							05	GPO1
								04	GPO2
								03	GND
								02	HS_GPI2- / DIR-
								01	HS_GPI2+ / DIR+

## PART NUMBERING INFORMATION PNEP X / XX - Y - Z

**Power model:** \_\_\_\_\_  
 2/48 = 2.5A cont//5 A peak @ 9-48 VDC

**Interfaces:** \_\_\_\_\_  
 S = RS-232/USB  
 C = RS-232/USB/CANopen  
 E = RS-232/USB/EtherCAT

**Connectivity:** \_\_\_\_\_  
 S = Connectors  
 P = Pin headers

Option	Part Number
IO Starter Kit	A-IOKIT
Feedback Cable	C-NEP-FEED
IO Cable	C-NEP-IO
RS-232 Cable	C-NEP-RS232
CAN Cable	C-NEP-CAN

9-48  
V<sub>DC</sub>

2.5  
A<sub>RMS</sub>

120  
W



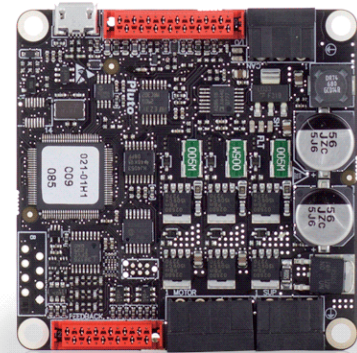
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# PPLU

## DIGITAL SERVO DRIVE

Ultra-compact, modular solution for control of rotary or linear brushless, brush DC or voice coil motors up to 800 W peak, with 8 A continuous output current and no heat sink needed. Accepts multiple command inputs including standalone operation.

- ✓ Compact design
- ✓ Multiple motors
- ✓ CANopen and EtherCAT
- ✓ Motion controller capabilities



Digital Servo Drive	Units	PPLU-1/48	PPLU-5/48	PPLU-8/48
Supply Voltage	V <sub>DC</sub>	10 - 48		
Maximum Phase Peak Current (2 s)	A <sub>RMS</sub>	2	10	16
Maximum Phase Continuous Current	A <sub>RMS</sub>	1	5	8
Standby Power Consumption	W	1		
Efficiency	%	>95		
Supported Motor Types		Rotary and Linear Brushless, Brush DC, Voice Coil		
Commutation		Sinusoidal and Trapezoidal		
Minimum Motor Inductance	μH	300		
Power Stage PWM Frequency	kHz	40, 20 (Configurable)		
Current Sensing		3Ø, ± 1% Accuracy, 10 bit		
Commutation Sensors		Digital Halls, Analog Halls, Incremental Encoder, PWM, Analog		
Supported Feedback		DC Tachometer, Digital Halls, Analog Halls, Quadrature Incremental Encoder, PWM, Analog		
Torque Loop Update Rate	kHz	10		
Position and Velocity Update Rate	kHz	1		
Motion Modes		Cyclic Sync, Interpolated, Profilers (Position, Velocity, Torque), Homing, Open Loop		
Supported Command Sources		Network, USB, Analog Input, PWM, Encoder Follower/Electronic Gearing, Step and Direction, Standalone		
Motion Controller		Yes, Standalone Operation with 64 Macros of 64 Commands		
Digital Inputs		4 (TTL and PLC)		
Analog Inputs		1 (±10 V), 1 (0-5 V)		
Digital Outputs		2 (TTL and PLC)		
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload (I <sup>2</sup> T)		
Hardware Protections		Short-Circuit Protections, ESD and EMI Protections, Inverse Polarity Supply Protection, High Power Transient Voltage Suppressor for Short Braking		
Software Protections		Mechanical Limits for Homing Modes, Hall Sequence/Combination Error		
USB		Yes		
Serial		-		
CANopen		Yes (DS-301, DS-303, DS-305, DS-306, DS-402)		
EtherCAT		Yes (CoE)		
Ambient Air Temperature (operating)	°C	-25 to 85 (over 50 with current derating)		
Ambient Air Temperature (storage)	°C	-40 to 125		
Maximum Humidity (non-condensing)	%	5 to 85		
Dimensions	mm (in)	60 x 60 x 15 (2.36 x 2.36 x 0.59)		
Weight	g (oz)	35 (1.23)		

FIND OUT MORE AT  
[www.imc-automation.com](http://www.imc-automation.com)



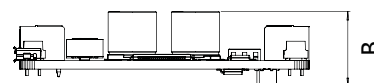
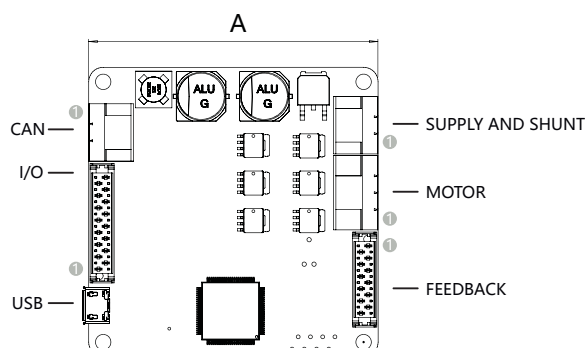
400  
W

8  
A<sub>RMS</sub>

10-48  
V<sub>DC</sub>



## DRAWINGS



Dimension(mm)	PLU-X/48
A	60
B	15

## PINOUT

FEEDBACK		CAN		SUPPLY AND SHUNT		MOTOR		I/O	
12	HALL_3	03	CAN_GND	03	SUP+	04	PE	16	+5V_EXT
11	HALL_2	02	CAN_L	02	SHUNT	03	PH_C	15	LS_GPI1
10	HALL_1	01	CAN_H	01	GND	02	PC_B	14	LS_GPI2
09	GND					01	PH_A	13	GND
08	ENC_Z- / REF-							12	AN_IN2+
07	ENC_Z+							11	AN_IN2-
06	ENC_B-							10	AN_IN1
05	ENC_B+							09	GND
04	ENC_A-							08	HS_GPI1- / PULSE- / PWM-
03	ENC_A+							07	HS_GPI1+ / PULSE+ / PWM+
02	GND							06	GND
01	+5V_OUT							05	GPO1
								04	GPO2
								03	GND
								02	HS_GPI2- / DIR-
								01	HS_GPI2+ / DIR+

## PART NUMBERING INFORMATION

PPLU X / XX - Y

## Power model:

1/48 = 1A cont//2 A peak @ 10-48 VDC  
 5/48 = 5A cont//10 A peak @ 10-48 VDC  
 8/48 = 8A cont//16 A peak @ 10-48 VDC

## Interfaces:

S = USB  
 C = USB/CANopen  
 E = USB/EtherCAT

## Option

## Part Number

IO Starter Kit	A-IOKIT
Feedback Cable	C-PLU-FEED
IO Cable	C-PLU-IO

10-48  
V<sub>DC</sub>

8  
A<sub>RMS</sub>

400  
W



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# PHYD

## DIGITAL STEPPER DRIVE

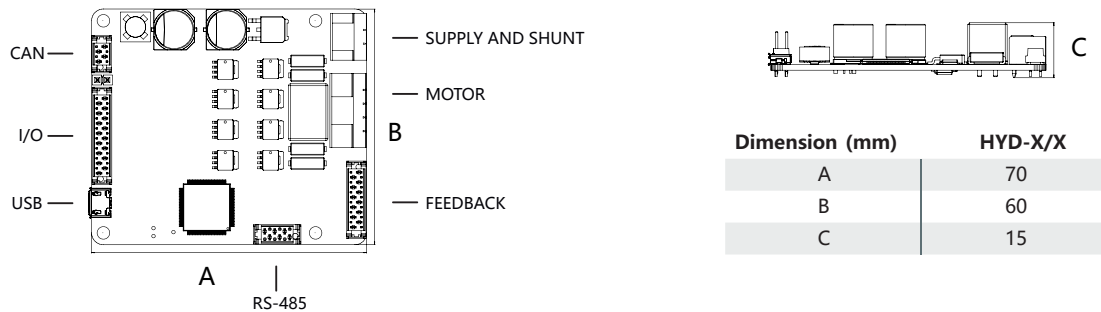
PHYD is a compact Servo Drive designed to achieve high precision positioning with stepper motors. The closed loop control results in a substantial increase of efficiency and a reduction of power consumption. The Hydra is easy to interface to external systems using RS-232, RS-485, USB, CANopen or digital signals.

- ✓ Closed loop stepper
- ✓ Smooth current control
- ✓ Extremely efficient
- ✓ True torque control
- ✓ Quiet operation and reduced resonance



Digital Servo Drive	Units	PHYD-8/48
Supply Voltage	V <sub>DC</sub>	12 - 48
Maximum Phase Peak Current (1 s)	A <sub>RMS</sub>	16
Maximum Phase Continuous Current	A <sub>RMS</sub>	8
Standby Power Consumption	W	1.5
Efficiency	%	>95
Supported Motor Types		2Ø Bipolar Stepper
Commutation		Open Loop, Closed Loop, Microstepping Control
Minimum Motor Inductance	µH	300
Power Stage PWM Frequency	kHz	20
Current Sensing		3Ø Low Side Sensing, ± 1% Accuracy, 10 bit
Commutation Sensors		Incremental Encoder
Supported Feedback		Incremental Encoder
Torque Loop Update Rate	kHz	20
Position and Velocity Update Rate	kHz	1
Motion Modes		Cyclic Sync, Interpolated, Profilers (Position, Velocity, Torque), Homing, Open Loop
Supported Command Sources		Network, USB, Serial, Analog Input, PWM, Encoder Follower/Electronic Gearing, Step and Direction, Standalone
Motion Controller		Yes, Standalone Operation with 64 Macros of 64 Commands
Digital Inputs		4 (TTL and PLC)
Analog Inputs		1 (±10 V), 1 (0-5 V)
Digital Outputs		2 (TTL and PLC)
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload (I <sup>2</sup> T), Open Load Protection
Hardware Protections		Short-Circuit Protections, ESD and EMI Protections, Inverse Polarity Supply Protection, High Power Transient Voltage Suppressor for Short Braking, Open Load Protection
Software Protections		Mechanical Limits for Homing Modes, Hall Sequence/Combination Error
USB		Yes
Serial		RS-485
CANopen		Yes (DS-301, DS-303, DS-305, DS-306, DS-402)
EtherCAT		-
Ambient Air Temperature (operating)	°C	-25 to 85 (over 50 with current derating)
Ambient Air Temperature (storage)	°C	-40 to 125
Maximum Humidity (non-condensing)	%	5 to 85
Dimensions	mm (in)	60 x 70 x 15 (2.36 x 2.76 x 0.59)
Weight	g (oz)	35 (1.23)

## DRAWINGS



## PINOUT

FEEDBACK		CAN		SUPPLY AND SHUNT		MOTOR		I/O	
12	HALL_3	04	GND	03	SUPPLY	05	PE	16	+5V_EXT
11	HALL_2	03	CAN_H	02	SHUNT	04	PH_D	15	LS_GPI1
10	HALL_1	02	CAN_L	01	GND	03	PH_C	14	LS_GPI2
09	GND	01	GND			02	PC_B	13	GND
08	ENC_Z- / REF-	RS-485				01	PH_A	12	AN_IN2+
07	ENC_Z+	08	TX-					11	AN_IN2-
06	ENC_B-	07	TX+					10	AN_IN1
05	ENC_B+	06	RET_TX					09	GND
04	ENC_A-	05	GND					08	HS_GPI1- / PULSE- / PWM-
03	ENC_A+	04	RX-					07	HS_GPI1+ / PULSE+ / PWM+
02	GND	03	RX+					06	GND
01	+5V_OUT	02	GND					05	GPO1
		01	RET_TX					04	GPO2
								03	GND
								02	HS_GPI2- / DIR-
								01	HS_GPI2+ / DIR+

## PART NUMBERING INFORMATION

PHYD X / XX - Y

**Power model:** \_\_\_\_\_  
 8/48 = 8A cont//16 A peak @ 12-48 VDC

**Interfaces:** \_\_\_\_\_  
 S = USB/RS-485  
 C = USB/RS-485/CANopen

## Option

## Part Number

IO Starter Kit	A-IOKIT
Feedback Cable	C-HYD-FEED
IO Cable	C-HYD-IO
RS-485 Cable	C-HYD-RS485
CAN Cable	C-HYD-CAN

12-48  
V<sub>DC</sub>

8  
A<sub>RMS</sub>

500  
W



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# PNIX

## DIGITAL SERVO DRIVE

Ultra-compact solution providing top performance, advanced networking and built in safety, as well as a fully featured motion controller. The PNIX can control multiple motor types and supports almost any feedback sensor including absolute serial encoders.



- ✓ High power density
- ✓ Ultra low profile
- ✓ High voltage variant
- ✓ Absolute feedbacks
- ✓ CANopen and EtherCAT
- ✓ Ready to be integrated

Digital Servo Drive	Units	PNIX-10/48	PNIX-5/170
Supply Voltage	V <sub>DC</sub>	10 - 48	10 - 170
Maximum Phase Peak Current (2 s)	A <sub>RMS</sub>	20	10
Maximum Phase Continuous Current	A <sub>RMS</sub>	10	5
Standby Power Consumption	W	1	
Efficiency	%	>95	
Supported Motor Types		Rotary and Linear Brushless, Brush DC, Voice Coil	
Commutation		Sinusoidal and Trapezoidal	
Minimum Motor Inductance	μH	300	
Power Stage PWM Frequency	kHz	40, 20 (Configurable)	
Current Sensing		3Ø, ± 1% Accuracy, 10 bit	
Commutation Sensors		Digital Halls, Analog Halls, Incremental Encoder, PWM, Analog	
Supported Feedback		DC Tachometer, Digital Halls, Analog Halls, Quadrature Incremental Encoder, PWM, Analog, Sin-Cos, Absolute Encoder (SSI, BiSS)	
Torque Loop Update Rate	kHz	10	
Position and Velocity Update Rate	kHz	1	
Motion Modes		Cyclic Sync, Interpolated, Profilers (Position, Velocity, Torque), Homing, Open Loop	
Supported Command Sources		Network, USB, Serial, Analog Input, PWM, Encoder Follower/Electronic Gearing, Step and Direction, Standalone	
Motion Controller		Yes, Standalone Operation with 64 Macros of 64 Commands	
Digital Inputs		4 (TTL and PLC)	
Analog Inputs		1 (±10 V), 1 (0-5 V)	
Digital Outputs		2 (TTL and PLC)	
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload (I <sup>2</sup> T)	
Hardware Protections		Short-Circuit Protections, ESD and EMI Protections, Inverse Polarity Supply Protection, High Power Transient Voltage Suppressor for Short Braking, Torque Off	
Software Protections		Mechanical Limits for Homing Modes, Hall Sequence/Combination Error	
USB		Yes	
Serial		RS-485	
CANopen		Yes (DS-301, DS-303, DS-305, DS-306, DS-402)	
EtherCAT		Yes (CoE)	
Ambient Air Temperature (operating)	°C	-25 to 85 (over 50 with current derating)	
Ambient Air Temperature (storage)	°C	-40 to 125	
Maximum Humidity (non-condensing)	%	5 to 85	
Dimensions	mm (in)	75 x 60 x 14 (2.95 x 2.36 x 0.55)	
Weight	g (oz)	86 (3.38)	

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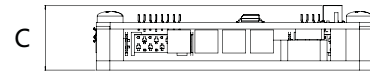
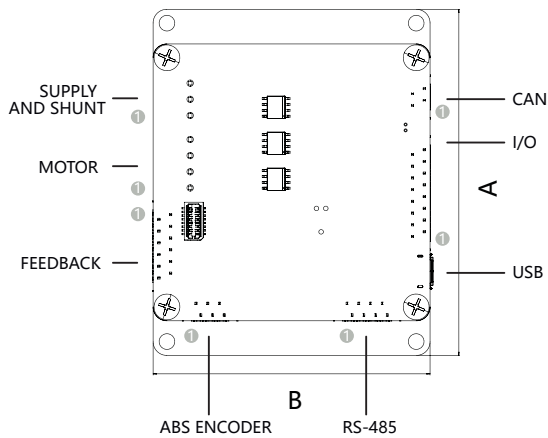
800  
W

10  
A<sub>RMS</sub>

10-170  
V<sub>DC</sub>



## DRAWINGS



Dimension (mm)	NIX-XX/XXX
A	75
B	60
C	14

## PINOUT

FEEDBACK		ABS ENCODER		CAN		MOTOR		I/O	
12	HALL_3	06	DATA-	04	GND	04	PE	16	+5V_EXT
11	HALL_2	05	DATA+	03	CAN_H	03	PH_C	15	LS_GPI1
10	HALL_1	04	CLK-	02	CAN_L	02	PC_B	14	LS_GPI2
09	GND	03	CLK+	01	GND	01	PH_A	13	GND
08	ENC_Z- / REF-	02	GND	RS-485		SUPPLY AND SHUNT		12	AN_IN2+
07	ENC_Z+	01	+5V_OUT					11	AN_IN2-
06	ENC_B-					03	POW_SUP	10	AN_IN1
05	ENC_B+					02	SHUNT/ LOGIC SUPPLY	09	GND
04	ENC_A-					01	GND	08	HS_GPI1- / PULSE- / PWM-
03	ENC_A+							07	HS_GPI1+ / PULSE+ / PWM+
02	GND							06	GND
01	+5V_OUT			08	TX-			05	GPO1
				07	TX+			04	GPO2
				06	RET_TX			03	GND
				05	GND			02	HS_GPI2- / DIR-
				04	RX-			01	HS_GPI2+ / DIR+
				03	RX+				
				02	GND				
				01	RET_TX				

## PART NUMBERING INFORMATION PNIX XX / XXX - Y

### Power model:

10/48 = 10A cont//20 A peak @ 10-48 VDC  
5/170 = 5A cont//10 A peak @ 10-170 VDC

### Interfaces:

S = USB/RS-485  
C = USB/RS-485/CANopen  
E = USB/RS-485/EtherCAT

## Option

## Part Number

IO Starter Kit	A-IOKIT
Feedback Cable	C-NIX-FEED
IO Cable	C-NIX-IO
RS-485 Cable	C-NIX-RS485
CAN Cable	C-NIX-CAN

10-170  
V<sub>DC</sub>

10  
A<sub>RMS</sub>

800  
W



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# PVEN

## DIGITAL SERVO DRIVE

The PVEN is a closed frame digital servo drive with standalone motion controller capabilities, that can drive most of motor topologies in today's market of up to 2 kW. Its design includes a wide set of external command inputs.



- ✓ Ip20 protection
- ✓ Ready to be integrated
- ✓ Expanded IOs
- ✓ Multiple command inputs
- ✓ CANopen
- ✓ Standalone

Digital Servo Drive	Units	PVEN-15/60
Supply Voltage	V <sub>DC</sub>	10 - 60
Maximum Phase Peak Current (1 s)	A <sub>RMS</sub>	30
Maximum Phase Continuous Current	A <sub>RMS</sub>	15
Standby Power Consumption	W	1.5
Efficiency	%	>98
Supported Motor Types		Rotary and Linear Brushless, Brush DC, Voice Coil
Commutation		Sinusoidal and Trapezoidal
Minimum Motor Inductance	μH	300
Power Stage PWM Frequency	kHz	40
Current Sensing		3Ø, ± 1% Accuracy, 10 bit
Commutation Sensors		Digital Halls, Analog Halls, Incremental Encoder, PWM, Analog
Supported Feedback		DC Tachometer, Digital Halls, Analog Halls, Quadrature Incremental Encoder, PWM, Analog
Torque Loop Update Rate	kHz	10
Position and Velocity Update Rate	kHz	1
Motion Modes		Cyclic Sync, Interpolated, Profilers (Position, Velocity, Torque), Homing, Open Loop
Supported Command Sources		Network, USB, Serial, Analog Input, PWM, Encoder Follower/Electronic Gearing, Step and Direction, Standalone
Motion Controller		Yes, Standalone Operation with 64 Macros of 64 Commands
Digital Inputs		4 (TTL and PLC)
Analog Inputs		1 (±10 V), 1 (0-5 V)
Digital Outputs		2 (TTL and PLC)
Analog Outputs		1 (0-5 V)
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload (I <sup>2</sup> T), Open Load Protection
Hardware Protections		Short-Circuit Protections, ESD and EMI Protections, Inverse Polarity Supply Protection, High Power Transient Voltage Suppressor for Short Braking, Onboard Shunt Resistor
Software Protections		Mechanical Limits for Homing Modes, Hall Sequence/Combination Error
USB		No
Serial		RS-232
CANopen		Yes (DS-301, DS-303, DS-305, DS-306, DS-402)
EtherCAT		No
Ambient Air Temperature (operating)	°C	-25 to 85 (over 50 with current derating)
Ambient Air Temperature (storage)	°C	-40 to 125
Maximum Humidity (non-condensing)	%	5 to 85
Dimensions	mm (in)	101.3 x 100 x 34 (3.99 x 3.94 x 1.34)
Weight	g (oz)	310 (10.93)

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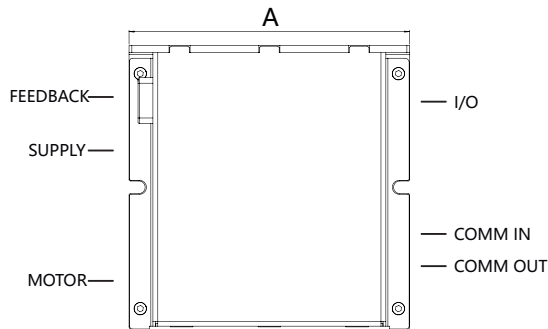


1000  
W

15  
A<sub>RMS</sub>

10-60  
V<sub>DC</sub>

## DRAWINGS



Dimension (mm)		VEN-15/60
A		100
B		34

## PINOUT

FEEDBACK		COMM IN		MOTOR		I/O			
11	GND	08	CAN_VCC	08	BRAKE-	18	GPO3_H	26	GP03_L
10	ENC_Z+	07	GND	07	BRAKE+	17	GP04_L	25	GP04_H
09	ENC_Z-	06	N.C.	06	PE	16	GP01_H	24	LS_GPI_COM
08	HALL_3	05	RS232_RX	05	PH_C	15	HS_GPI1-	23	LS_GPI4
07	HALL_2	04	RS232_TX	04	PH_B	14	HS_GPI2-	22	LS_GPI3
06	HALL_1	03	CAN_GND	03	PH_A	13	AN_GND	21	LS_GPI2
05	ENC_B+	02	CAN_L	02	SHUNT-	12	AN_GND	20	LS_GPI1
04	ENC_B-	01	CAN_H	01	SHUNT+	11	AN_IN2+	19	AN_OUT
03	ENC_A+	COMM OUT		SUPPLY		10	AN_IN2-		
02	ENC_A-					09	GPO2_L		
01	+5V_OUT					08	GPO2_H		
						07	GPO1_L		
						06	HS_GPI1+		
						05	HS_GPI2+		
						04	AN_IN3+		
		08	CAN_VCC	03	PE	03	AN_IN3-		
		07	GND	02	GND	02	AN_IN1+		
		06	N.C.	01	SUP+	01	AN_IN1-		
		05	N.C.						
		04	RS232_TX						
		03	CAN_GND						
		02	CAN_L						
		01	CAN_H						

## PART NUMBERING INFORMATION PVEN XX / XX - Y

**Power model:** \_\_\_\_\_  
15/60 = 15 A cont//30 A peak @ 10-60 VDC

**Interfaces:** \_\_\_\_\_  
S = RS-232  
C = RS-232/CANopen

## Option

Option	Part Number
Comm. Cable	C-VEN-COMM
Feedback Cable	C-VEN-FEED5
IO Cable	C-VEN-IO5

10-60  
V<sub>DC</sub>

15  
A<sub>RMS</sub>

1000  
W

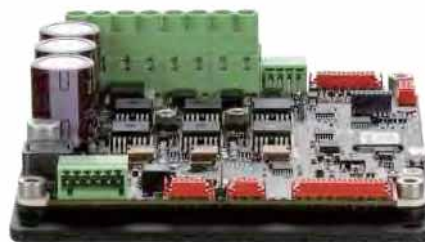


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# PJUP

## DIGITAL SERVO DRIVE

The PJUP Servo Drive provides OEMs with the flexibility to utilize any motor technology up to 4 kW on its whole operating temperature range. Its power range can be even extended with an optional base plate or fan. The Jupiter is ready to interface EtherCAT or CANopen networks.

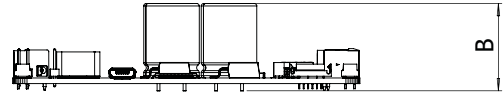
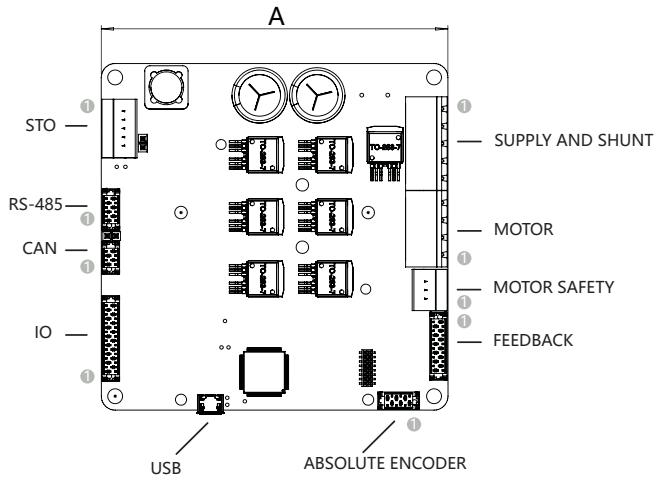


- ✓ High power density
- ✓ Multiple motors
- ✓ Multiple feedbacks
- ✓ Highly efficient
- ✓ CANopen and EtherCAT
- ✓ Ready to be integrated

Digital Servo Drive	Units	PJUP-20/80	PJUP-40/80	PJUP-15/130	PJUP-30/130
Supply Voltage	V <sub>DC</sub>	10 - 80	10 - 80	10 - 130	10 - 130
Maximum Phase Peak Current (2 s)	A <sub>RMS</sub>	40	80	30	60
Maximum Phase Continuous Current	A <sub>RMS</sub>	20	40	15	30
Standby Power Consumption	W	1.5			
Efficiency	%	>97			
Supported Motor Types		Rotary and Linear Brushless, Brush DC, Voice Coil			
Commutation		Sinusoidal and Trapezoidal			
Minimum Motor Inductance	μH	300			
Power Stage PWM Frequency	kHz	20, 40 (configurable)			
Current Sensing		3Ø, ± 1% Accuracy, 10 bit			
Commutation Sensors		Digital Halls, Analog Halls, Incremental Encoder, PWM, Analog			
Supported Feedback		DC Tachometer, Digital Halls, Analog Halls, Quadrature Incremental Encoder, PWM, Analog, Sin-Cos, Absolute Encoder (SSI, BiSS)			
Torque Loop Update Rate	kHz	10			
Position and Velocity Update Rate	kHz	1			
Motion Modes		Cyclic Sync, Interpolated, Profilers (Position, Velocity, Torque), Homing, Open Loop			
Supported Command Sources		Network, USB, Serial, Analog Input, PWM, Encoder Follower/Electronic Gearing, Step and Direction, Standalone			
Motion Controller		Yes, Standalone Operation with 64 Macros of 64 Commands			
Digital Inputs		4 (TTL and PLC)			
Analog Inputs		1 (±10 V), 1 (0-5 V)			
Digital Outputs		2 (TTL and PLC)			
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload (I <sup>2</sup> T), Motor Temperature			
Hardware Protections		Short-Circuit Protections, ESD and EMI Protections, Inverse Polarity Supply Protection, High Power Transient Voltage Suppressor for Short Braking, Torque Off			
Software Protections		Mechanical Limits for Homing Modes, Hall Sequence/Combination Error			
USB		Yes			
Serial		RS-485, RS-232 (Option)			
CANopen		Yes (DS-301, DS-303, DS-305, DS-306, DS-402). Onboard Termination Jumper			
EtherCAT		Yes (CoE)			
Cold Plate		No	Yes	No	Yes
Ambient Air Temperature (operating)	°C	-25 to 85 (over 50 with current derating)			
Ambient Air Temperature (storage)	°C	-50 to 100			
Maximum Humidity	%	5 to 85 (non-condensing)			
Dimensions	mm (in)	100 x 100 x 26 (3.93 x 3.93 x 1.02)	120 x 101 x 28.1 (4.72 x 3.98 x 1.10)	100 x 100 x 28 (3.93 x 3.93 x 1.10)	120 x 102 x 30.1 (4.72 x 4.01 x 1.18)
Weight	g (oz)	109 (3.84)	258 (9.10)	114 (4.02)	263 (9.28)



## DRAWINGS



Dimension(mm)	PJUP-20/80	PJUP-40/80	PJUP-15/130	PJUP-30/130
A	100	120	100	120
B	26	28.1	28	30.1

## PINOUT

MOTOR SAFETY		CAN		MOTOR		FEEDBACK		SUPPLY, SHUNT AND MOTOR*		I/O	
04	BRAKE+	04	GND	04	PE	12	HALL_3	08	PE	16	+5V_EXT
03	BRAKE-	03	CAN_H	03	PH_C	11	HALL_2	07	LOGIC_SUP	15	LS_GPI1
02	GND	02	CAN_L	02	PC_B	10	HALL_1	06	GND	14	LS_GPI2
01	EXT_TEMP	01	GND	01	PH_A	09	GND	05	POW_SUP	13	GND
<b>STO</b>		<b>RS-485</b>		<b>ABS ENCODER</b>		08	ENC_Z- / REF-	04	SHUT_OUT	12	AN_IN2+
06	GND	08	TX-	06	DATA-	07	ENC_Z+ / REF+	03	PH_C	11	AN_IN2-
05	STO_SUP	07	TX+	05	DATA+	06	ENC_B- / COS-	02	PC_B	10	AN_IN1
04	STO2-	06	RET_TX	04	CLK-	05	ENC_B+ / COS+	01	PH_A	09	GND
03	STO2+	05	GND	03	CLK+	04	ENC_A- / SIN-	<b>SUPPLY AND SHUNT</b>		08	HS_GPI1- / PULSE- / PWM-
02	STO1-	04	RX-	02	GND	03	ENC_A+ / SIN+	05	PE	07	HS_GPI1+ / PULSE+ / PWM+
01	STO1+	03	RX+	01	+5V_OUT	02	GND	04	LOGIC_SUP	06	GND
		02	GND			01	+5V_OUT	03	GND	05	GPO1
		01	RET_TX					02	POW_SUP	04	GPO2
								01	SHUT_OUT	03	GND
										02	HS_GPI2- / DIR-
										01	HS_GPI2+ / DIR+

\* Only available on PJUP-40/80 and PJUP-30/130

## PART NUMBERING INFORMATION PJUP XX / XX - Y

### Power model:

20/80 = 20 A cont//40 A peak @ 10-80 VDC  
 40/80 = 40 A cont//80 A peak @ 10-80 VDC  
 15/130 = 15 A cont//30 A peak @ 10-130 VDC  
 30/130 = 30 A cont//60 A peak @ 10-130 VDC

### Interfaces:

S = USB/RS-485  
 C = USB/RS-485/CANopen  
 E = USB/RS-485/EtherCAT

### Option

### Part Number

IO Starter Kit	A-IOKIT
Feedback Cable	C-JUP-FEED
IO Cable	C-JUP-IO
Absolute Cable	C-JUP-ABS
RS-485 Cable	C-JUP-RS485
CAN Cable	C-JUP-CAN

10-130  
V<sub>DC</sub>

40  
A<sub>RMS</sub>

3900  
W



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# PTITC

## DIGITAL SERVO DRIVE

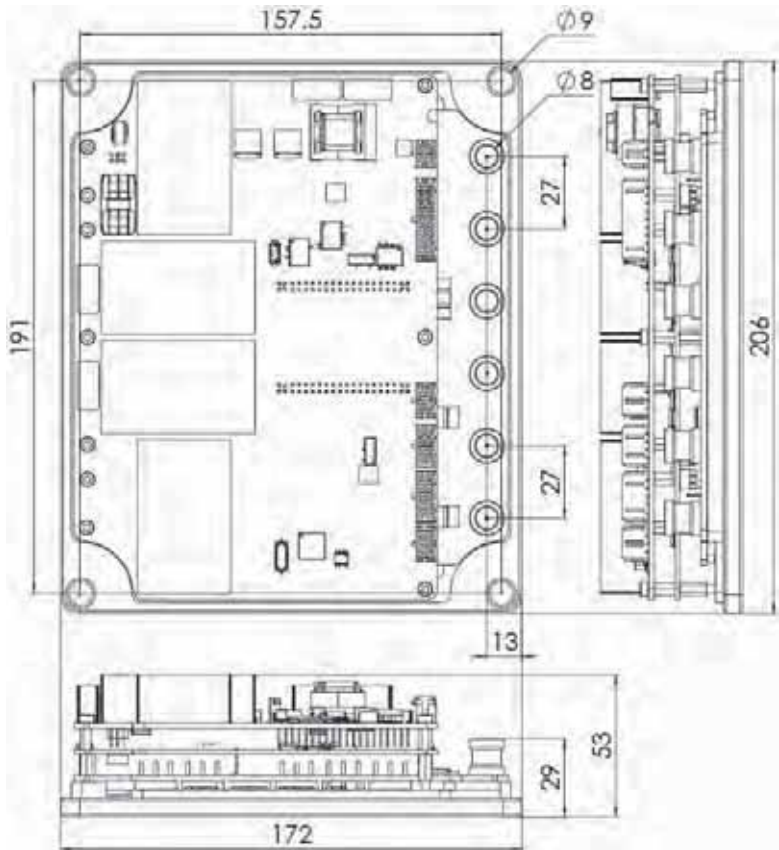
The PTITC Servo Drive is an high power density solution providing top performance, advanced networking and built-in hardware and firmware based safety, as well as a fully featured motion controller. It can control multiple motor types and supports almost any feedback sensor.

- ✓ High power density
- ✓ Ultra low profile
- ✓ High & Low temperature
- ✓ Encoder and resolver feedbacks
- ✓ USB, RS-485 and CANopen
- ✓ Ready to be integrated



Digital Servo Drive	Units	PTITC-100/200	PTITC-150/200	PTITC-100/400	PTITC-50/800
Supply Voltage	$V_{DC}$	10 - 200	10 - 200	10 - 400	10 - 800
Maximum Phase Peak Current (2 s)	$A_{DC}$	200	250	200	100
Maximum Phase Continuous Current	$A_{RMS}$	100	150	100	50
Standby Power Consumption	W	$\leq 10$ W			
Efficiency	%	$>97$			
Supported Motor Types		Rotary and Linear Brushless, Brush DC, Voice Coil			
Commutation		Sinusoidal and Trapezoidal			
Minimum Motor Inductance	$\mu H$	50			
Power Stage PWM Frequency	kHz	10, 20 (Configurable)			
Current Sensing		3 $\emptyset$ , $\pm 2\%$ Accuracy, 10 bit			
Commutation Sensors		Digital Halls, Analog Halls, Incremental Encoder, PWM, Analog, Resolver, Sensorless			
Supported Feedback		DC Tachometer, Digital Halls, Analog Halls, Quadrature Incremental Encoder, PWM, Analog, Sin-Cos, Absolute Encoder (SSI), Resolver			
Torque Loop Update Rate	kHz	10			
Position and Velocity Update Rate	kHz	1			
Motion Modes		Cyclic Sync, Interpolated, Profilers (Position, Velocity, Torque), Homing, Open Loop			
Supported Command Sources		Network, USB, Serial, CANopen, Analog Input, PWM, Encoder Follower/Electronic Gearing, Step and Direction, Standalone			
Motion Controller		Yes, Standalone Operation with 64 Macros of 64 Commands			
Digital Inputs		5 TTL			
Analog Inputs		1 ( $\pm 10$ V)			
Digital Outputs		1 TTL			
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload( $I^2T$ )			
Hardware Protections		Short-Circuit Protections, ESD and EMI Protections, High Power Transient Voltage Suppressor for Short Braking, Torque Off			
Software Protections		Mechanical Limits for Homing Modes, Hall Sequence/Combination Error			
USB		Yes			
Serial		UART			
CANopen		Yes (DS-301, DS-303, DS-305, DS-306, DS-402)			
EtherCAT		-			
Ambient Air Temperature (operating)	$^{\circ}C$	-40 to 110 (over 85 with current derating)			
Ambient Air Temperature (storage)	$^{\circ}C$	-40 to 125			
Maximum Humidity (non-condensing)	%	5 to 85			
Dimensions	mm (in)	206 x 172 x 55			
Weight	g (oz)	1878 (66.24)			

DRAWINGS



\* All dimensions are in mm. All tolerances  $\leq \pm 0.2$  mm.

PART NUMBERING INFORMATION

PTITC X / XX - Y - C - Z

Power model:

100/200 = 100 A cont//200 A peak @ 200 VDC  
150/200 = 150 A cont//250 A peak @ 200 VDC  
100/400 = 100 A cont//200 A peak @ 400 VDC  
50/800 = 50 A cont//100 A peak @ 800 VDC

Interfaces:

C = USB/RS-485/CANopen

Connectors:

C = Connector board with terminal blocks  
P = Pin headers

Extra features:

blank: none

-NP: no plate option. For applications with custom heatsinks.  
-CCMO: Additional 224 uF ceramic capacitors board.  
-SCC1: Additional conformal coating.

Option

IO Starter Kit	A-IOKIT
Feedback Cable	C-TITC-FEED
IO Cable	C-TITC-IO
Absolute Cable	C-TITC-ABS
RS-485 Cable	C-TITC-RS485
CAN Cable	C-TITC-CAN

Part Number

12-800  
V<sub>DC</sub>

200  
A<sub>RMS</sub>

40000  
W



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# Why go custom

Existing off-the-shelf products will not always fulfill the pricing or technical requirements of your applications. In such cases, customization provides an accurate solution to respond to any form, function or cost specification.





## YOUR BENEFITS

- ✓ Lower the system cost
- ✓ Optimize your machine
- ✓ Gain a competitive advantage in your industry
- ✓ Integrate other machine functions into the customization
- ✓ Improve your user's experience
- ✓ Offer a completely private labeled solution



## How it works

Our design teams are constantly working on improving the BUILDING BLOCKS, a rich library of optimized bullet-proof circuits that provide multiple motion control features. That includes our Motion Control IC block - the core of this modular approach.



**By combining the BUILDING BLOCKS we can easily build your motion control solution with zero design risk and in no time.**

## **PROCESS**

1. Tell us about your application. Our team will provide you with cost estimations and lead times.
2. Collaborate with our engineers and check your project progress through our online tools.
3. Validate the working prototypes delivered just in time.
4. Launch the production through one of our manufacturing options.

# Manufacturing options

From concept to production, we can handle the complete process. As an option, you can also use your own manufacturing resources for the production.

## SERVO

**WE** MANUFACTURE  
THE UNITS

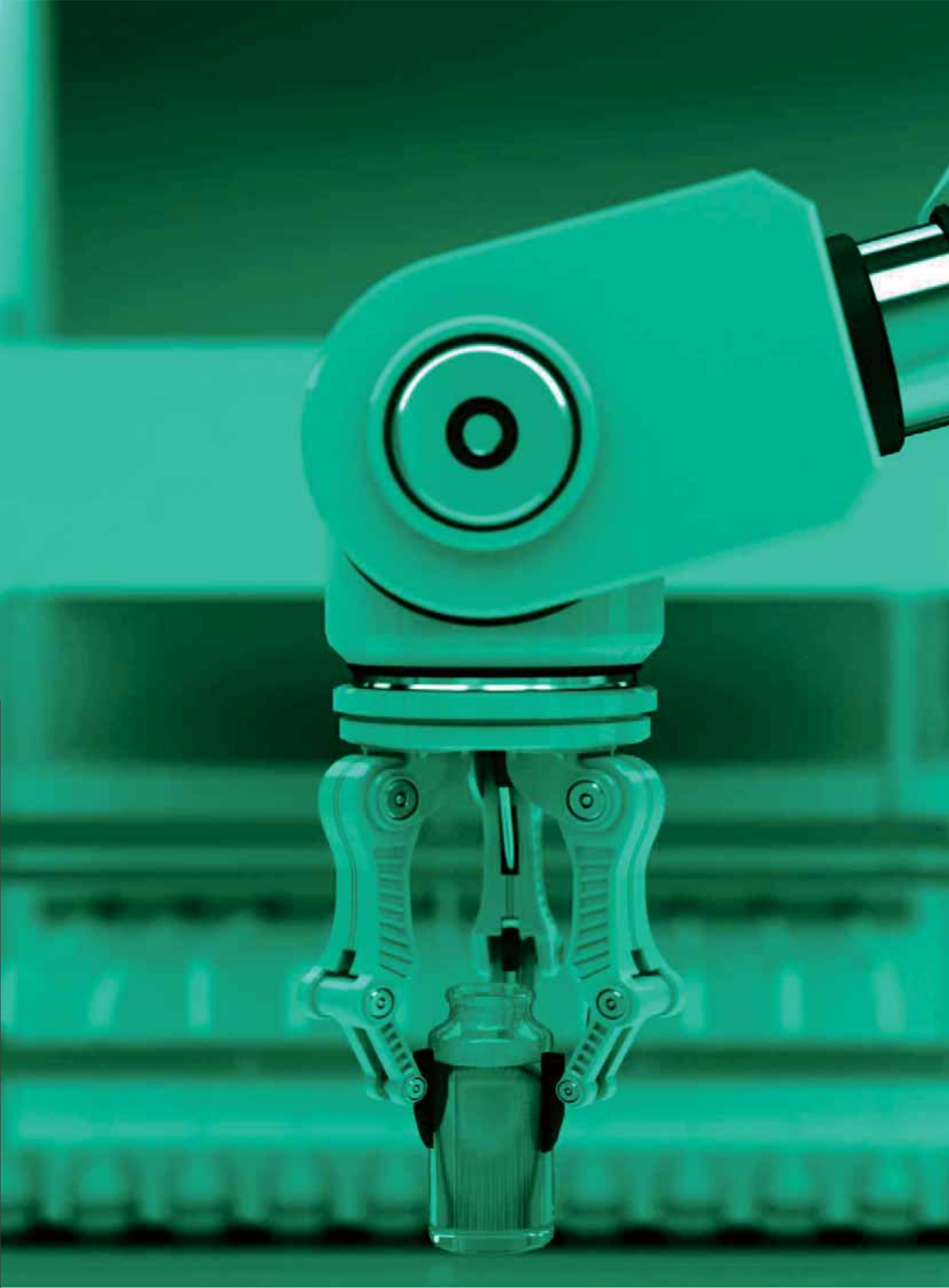
- IMC delivers finished products
- Low-mid production volumes
- Suitable for companies without electronics manufacturing capabilities
- QA by IMC with unitary manufacturing reports
- Delivery of unit 3D drawings
- 2 years warranty

## IC

**YOU** MANUFACTURE  
THE UNITS

- IMC delivers the Motion Control IC
- Mid-high production volumes
- Suitable for companies having their own team for electronics manufacturing
- Deliver tooling for your QA process
- Delivery of BOM, gerbers, pick&place, assembly drawings and panel
- Share IC among designs
- Reduce stock costs







# C01102

## DUAL AXIS SERVO DRIVE

The C01102 is a tiny DC Servo Drive to control the fingers movement of a humanoid hand. The unit can control 2 brush DC motors at a time via CANopen or SPI interface.

- ✓ Brush motors
- ✓ CANopen interface
- ✓ SPI interface
- ✓ Dual axis control



Custom Servo Drive	Units	C01102
Supply Voltage	V <sub>DC</sub>	24
Maximum Phase Peak Current (2 s)	A <sub>RMS</sub>	2 (per axis)
Maximum Phase Continuous Current	A <sub>RMS</sub>	1 (per axis)
Standby Power Consumption	W	1
Efficiency	%	>95
Supported Motor Types		Dual Brush DC
Commutation		-
Minimum Motor Inductance	μH	500
Power Stage PWM Frequency	kHz	20
Current Sensing		2Ø Low Side Sensing
Current Sensing Accuracy	%	± 1
Current Sensing Resolution	bit	10
Commutation Sensors (Brushless Motors)		-
Supported Feedback		Digital Encoder, Tachometer, Analog Sensor (force measurement)
Torque Loop Update Rate	kHz	10
Position and Velocity Update Rate	kHz	1
Motion Modes		Cyclic Sync and Profilers (Position, Velocity, Torque)
Supported Command Sources		SPI, CANopen
Digital Inputs		(2x) TTL Level - PLC Tolerant
Analog Inputs		(2x) Differential 0-10 V (12 bit)
Digital Outputs		(2x) 5 V Open Drain 1 A
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload (I <sup>2</sup> T), Motor Temperature
Hardware Protections		Inverse Polarity Supply Protection, High Power Transient Voltage Suppressor for Short Braking
Software Protections		Mechanical Limits for Homing Modes, Hall Sequence/Combination Error
SPI		Yes
RS-232		No
RS-485		No
CANopen		Yes (DS-301, DS-303, DS-305, DS-306 and DS-402)
EtherCAT		No
Ambient Air Temperature (operating)	°C	-10 to 85 (over 50 with derating)
Ambient Air Temperature (storage)	°C	-20 to 100
Maximum Humidity (non-condensing)	%	5 to 85
Dimensions	mm (in)	52 x 23 (2.04 x 0.90)



## NEW SENSITIVE GRIPPER HANDS FOR ROBOTICS

The human hand is one of the most universal and complex tools of nature. It's no wonder researchers are eager to apply the advantages of this evolutionary design to a new generation of robotic hands.

Nowadays, thanks to the latest advancements in micro and precise drive technology together with high-performance bus technology, new sensitive gripper hands can be developed with small footprint, light weight and including several degrees of freedom.

The motors in these applications are typically fitted directly into the fingers and every finger joint includes angle and torque sensors which must resolve very highly. Rapid feedback for comparing target and actual value is crucial for the function of the servo drive particularly in precise and delicate applications.

### ANGLE AND FORCE CONTROL

- ✓ Custom algorithms onboard
- ✓ Control based on measured force
- ✓ High resolution encoders
- ✓ Fast control loops
- ✓ CANopen, SPI

### CUSTOM SERVO DRIVES

## HOW IT WORKS

### YOUR CUSTOM SERVO DRIVE WITH NO RESTRICTIONS

Struggling with a particular need using standard products? A servo drive that suits your exact demands is all you need though it is not easy to get. Regardless of your requirements, making your own custom servo drive controller has never been so easy. IMC uses a modular design approach based on pre-tested circuits to reduce development time and guarantee an outstanding quality.

### YOUR BENEFITS

No matter the quantity or features needed, at **IMC we will help you to find the right solution** for your application.

- ✓ Reduced time to market
- ✓ Lower the system cost
- ✓ Optimize your machine
- ✓ Manufacturing outputs delivered

24  
V<sub>DC</sub>

1  
A<sub>RMS</sub>

50  
W

CANopen ↔ SPI

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# C01111

## CUSTOM SERVO DRIVE

The C01111 is a multi-board Servo Drive designed for rotary robotic modules. Its modular design allows to connect the main control board to three different power stage boards. The drive supports several feedbacks and offers industrial networking.

- ✓ Modular architecture
- ✓ Multiple power stages
- ✓ Brushless motor
- ✓ Onboard magnetic sensors
- ✓ Standard industrial networking



Custom Servo Drive	Units	C01111
Supply Voltage	V <sub>DC</sub>	8 - 48
Maximum Phase Peak Current (2 s)	A <sub>RMS</sub>	10
Maximum Phase Continuous Current	A <sub>RMS</sub>	5
Standby Power Consumption	W	1.2
Efficiency	%	>98
Supported Motor Types		Brushless
Commutation		Sinusoidal
Minimum Motor Inductance	μH	500
Power Stage PWM Frequency	kHz	20
Current Sensing		2Ø Low Side Sensing
Current Sensing Accuracy	%	± 1
Current Sensing Resolution	bit	10
Commutation Sensors (Brushless Motors)		Digital Encoder
Supported Feedback		Dual Encoder Feedback (onboard magnetic sensors)
Torque Loop Update Rate	kHz	10
Position and Velocity Update Rate	kHz	1
Motion Modes		Cyclic Sync and Profilers (Position, Velocity, Torque)
Supported Command Sources		CANopen
Digital Inputs		(2x) TTL Level - PLC Tolerant
Analog Inputs		(2x) Differential 0-10 V (12 bit)
Digital Outputs		(2x) 5 V Open Drain 1 A
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload (I <sup>2</sup> T), Motor Temperature
Hardware Protections		ESD and EMI protections, Inverse Polarity Supply Protection, High Power Transient Voltage Suppressor for Short Braking
Software Protections		Mechanical Limits for Homing Modes, Hall Sequence/Combination Error
USB		Yes
RS-232		No
RS-485		No
CANopen		Yes (DS-301, DS-303, DS-305, DS-306 and DS-402)
EtherCAT		Yes (CoE) - Optional
Ambient Air Temperature (operating)	°C	-10 to 85 (over 50 with derating)
Ambient Air Temperature (storage)	°C	-20 to 100
Maximum Humidity (non-condensing)	%	5 to 85
Dimensions	mm (in)	58 (2.28) Ø

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250  
W

5  
A<sub>RMS</sub>

8-48  
V<sub>DC</sub>



## A NEW LIFE FOR ROBOTIC JOINTS

Servo-electric rotary actuator enables the creation of reconfigurable modular robot structures. The individual modules can be assembled with complete freedom and flexibility using connecting parts to produce an individual lightweight arm. The rotary actuators are set in motion by a brushless servo-motor with Harmonic Drive transmission, already incorporated with the complete power, angle sensors and control electronics.

The modules are capable of positioning moves with ramp control and features monitoring of the end positions, voltage, current and temperature. Thanks to the use of lightweight, high-strength materials they can achieve a weight/payload ratio exceeding 2:1.

The power supply, control elements and universal communication interfaces are already integrated offering an ALL-IN-ONE solution.

## ALL-IN-ONE ROTARY MODULES

- ✓ Different sizes
- ✓ Lightweight design
- ✓ Maximum reliability
- ✓ Ultra quiet
- ✓ Harmonic Drive transmission
- ✓ Excellent weight-torque ratio
- ✓ Compact design

### CUSTOM SERVO DRIVES

## HOW IT WORKS

### YOUR CUSTOM SERVO DRIVE WITH NO RESTRICTIONS

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- ✓ Lower the system cost
- ✓ Optimize your machine
- ✓ Manufacturing outputs delivered

8-48  
V<sub>DC</sub>

5  
A<sub>RMS</sub>

250  
W



CANopen

EtherCAT

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# C09116

## CUSTOM SERVO DRIVE

The C09116 is one of the smallest servo drive in the world. Based on an innovative design concept to fit into a minimum space, this unit has been designed to precisely drive linear brushless motors and voice coils with integrated motion controller capabilities.



- ✓ Miniature size and lightweight
- ✓ High temperature
- ✓ Submicron encoder interface
- ✓ Linear brushless and voice coils
- ✓ RS-232 / CANopen / EtherCAT
- ✓ Standalone operation

Custom Servo Drive	Units	C09116
Supply Voltage	$V_{DC}$	8 - 48
Maximum Phase Peak Current (1 s)	$A_{RMS}$	4
Maximum Phase Continuous Current	$A_{RMS}$	3
Standby Power Consumption	W	1
Efficiency	%	>96
Supported Motor Types		Brushless, Linear Brushless (multi-coil), Voice Coil
Commutation		Sinusoidal
Minimum Motor Inductance	$\mu H$	300
Power Stage PWM Frequency	kHz	20
Current Sensing		3Ø Low Side Sensing
Current Sensing Accuracy	%	$\pm 1$
Current Sensing Resolution	bit	10
Commutation Sensors (Brushless Motors)		Incremental Differential Encoder
Supported Feedback		Incremental Differential Encoder
Torque Loop Update Rate	kHz	10
Position and Velocity Update Rate	kHz	1
Motion Modes		Cyclic Sync, Interpolated and Profilers (Position, Velocity, Torque)
Supported Command Sources		CANopen, RS-232, Standalone, EtherCAT (option)
Digital Inputs		(2x) Non-Isolated PLC Level
Analog Inputs		Single Ended TTL Level
Digital Outputs		(2x) 5 V Open Drain
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload ( $I^2T$ )
Hardware Protections		Short-circuit protections, ESD and EMI protections (Feedback, Motor Connections, Inputs, Outputs), Inverse Polarity Supply Protection, High Power Transient Voltage Suppressor for Short Braking
Software Protections		Mechanical Limits for Homing Modes, Hall Sequence/Combination Error
RS-232		Yes
RS-485		No
CANopen		Yes (DS-301, DS-303, DS-305, DS-306 and DS-402)
EtherCAT		Yes (CoE) - Optional
Ambient Air Temperature (operating)	$^{\circ}C$	-10 to 85 (over 50 with derating)
Ambient Air Temperature (storage)	$^{\circ}C$	-20 to 100
Maximum Humidity (non-condensing)	%	5 to 85
Dimensions	mm (in)	Unfolded: 45.7 x 28 x 7 (1.79 x 1.10 x 0.27) Folded: 20 x 28 x 16 (0.78 x 1.10 x 0.62)

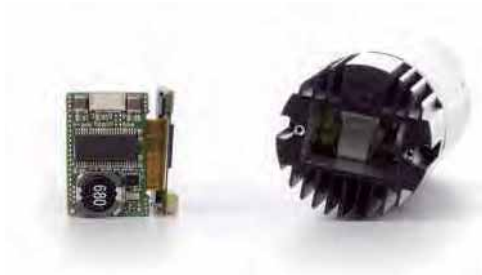




## NEXT GENERATION OF ACTUATORS FOR INDUSTRIAL AUTOMATION

Engineers have been using pneumatic actuators to move loads for decades. They are fast, powerful and engineers can easily fine-tune parameters by adjusting air pressure, valving, and bore size. However, while pneumatic component costs are low, maintenance and operating costs can be high.

In contrast to pneumatics, electric actuators provide precise control and positioning, help adapt machines to flexible processes and have low operating cost. They are most economical when deployed in a moderate scale in processes where their performance advantages can be a benefit and when the electronics are separate from the actuator to segment and minimize replacement costs. The trend is clearly toward electromechanical actuators, as they offer more energy efficiency, safety, better control of the motion profile, and lower cost of ownership over the course of the machine's lifetime.



### TAKING PRECISION TO THE NEXT LEVEL

- ✓ Extremely accurate sensing of product location or dimensions
- ✓ Exceptionally high speeds or very low speeds with sub-micron accuracy and repeatability
- ✓ Fully programmable
- ✓ Industrial field bus communications

#### CUSTOM SERVO DRIVES

### HOW IT WORKS

#### YOUR CUSTOM SERVO DRIVE WITH NO RESTRICTIONS

Struggling with a particular need using standard products? A servo drive that suits your exact demands is all you need though it is not easy to get. Regardless of your requirements, making your own custom servo drive controller has never been so easy. IMC uses a modular design approach based on pre-tested circuits to reduce development time and guarantee an outstanding quality.

#### YOUR BENEFITS

No matter the quantity or features needed, at **IMC we will help you to find the right solution** for your application.

- ✓ Reduced time to market
- ✓ Lower the system cost
- ✓ Optimize your machine
- ✓ Manufacturing outputs delivered

8-48  
V<sub>DC</sub>

4  
A<sub>RMS</sub>

200  
W



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# C01119

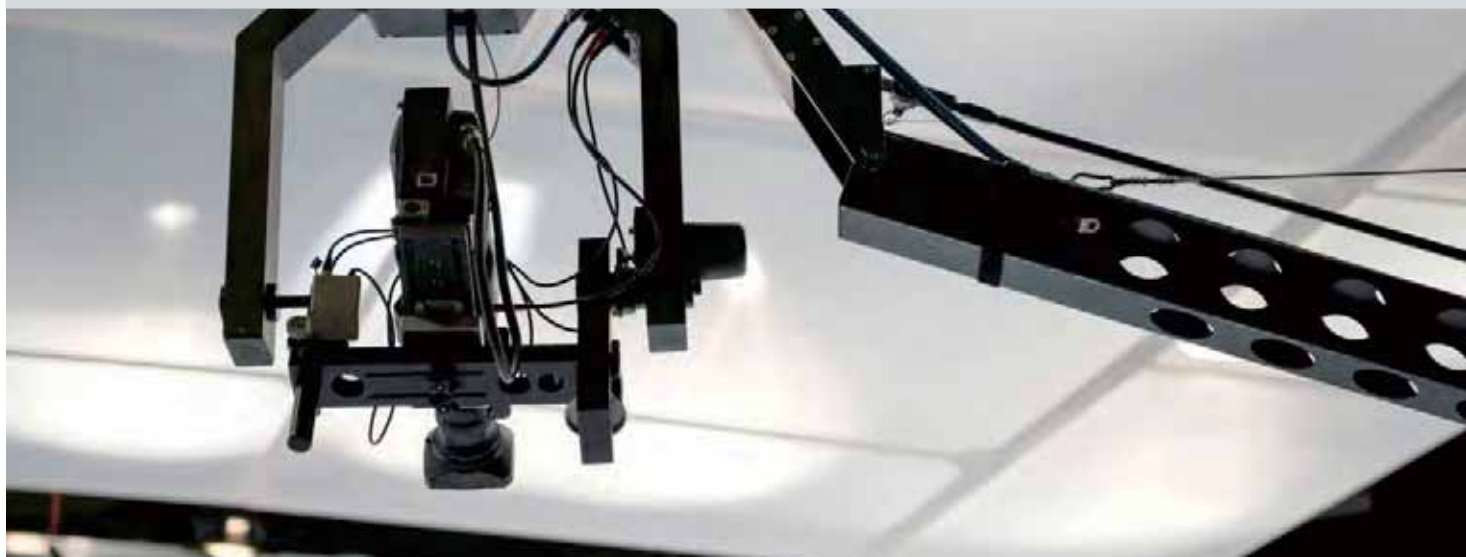
## ROUND COMPACT DRIVE

The C01119 is a round DC Servo Drive developed to be embedded at the back of a brushless motor. Its design includes specific functions and capabilities for pan&tilt camera operation.

- ✓ Brushless motors
- ✓ CANopen interface
- ✓ Digital encoder
- ✓ Built-in connectors
- ✓ Pressure tolerant versions



Custom Servo Drive	Units	C01119
Supply Voltage	V <sub>DC</sub>	12 - 48
Maximum Phase Peak Current (2 s)	A <sub>RMS</sub>	6
Maximum Phase Continuous Current	A <sub>RMS</sub>	3
Standby Power Consumption	W	1.2
Efficiency	%	>98
Supported Motor Types		Brushless, Brush DC
Commutation		Sinusoidal and Trapezoidal
Minimum Motor Inductance	μH	500
Power Stage PWM Frequency	kHz	20
Current Sensing		2Ø Low Side Sensing
Current Sensing Accuracy	%	± 1
Current Sensing Resolution	bit	10
Commutation Sensors (Brushless Motors)		Digital Halls, Digital Encoder
Supported Feedback		Digital Halls, Digital Encoder
Torque Loop Update Rate	kHz	10
Position and Velocity Update Rate	kHz	1
Motion Modes		Profilers (Position, Velocity, Torque)
Supported Command Sources		CANopen, Analog Input, RS-232
Digital Inputs		(2x) TTL Level
Analog Inputs		(2x) Differential ±10 V (12 bit)
Digital Outputs		(2x) 5 V Open Drain 1 A
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload (I <sup>2</sup> T)
Hardware Protections		Short-circuit Protections (Phase to GND, Phase to DC Bus, Phase to Phase), ESD and EMI Protections (Feedback, Motor Connections, Inputs, Outputs)
Software Protections		Mechanical Limits for Homing Modes, Hall Sequence/Combination Error
USB		No
RS-232		Yes
RS-485		No
CANopen		Yes (DS-301, DS-303, DS-305, DS-306 and DS-402). Hardware Node-ID
Ambient Air Temperature (operating)	°C	-10 to 85 (over 50 with derating)
Ambient Temperature (storage)	°C	-20 to 100
Maximum Humidity (non-condensing)	%	5 to 85
Maximum Hydrostatic Pressure (PT version)	bar	200 (operating) / 250 (storage)
Dimensions	mm (in)	55.88 (2.20) Ø



## ACCURATE, RUGGED AND RELIABLE PAN/TILT SYSTEMS

Pan/Tilt systems for security, industrial, and military applications have to move faster, smoother, and more accurately than ever before. Their speeds, accelerations, power levels and ranges of motion have to be all user programmable for flexible and dynamic operation. Continuous operation in harsh, all-weather environments, and 100% duty cycle needs to be assured to provide years of service without maintenance.

The Pan/Tilts need to be cost effective, easy to program, and easy to reconfigure. Compact and lightweight designs, with additional features for inertial stabilization and geopositioning are always appreciated.

## MORE THAN A MOTORIZED SYSTEM

- ✓ Low inertia slotless brushless motors
- ✓ Miniature and compact design
- ✓ Manual / Automatic tracking
- ✓ Optimized motion speed and smoothness
- ✓ Safety limits for joystick operation
- ✓ Programmable and multi-axis ready
- ✓ Real-time motion control with low-latency commands for smooth tracking
- ✓ Rugged and ready for high pressure environments
- ✓ Accurate and reliable absolute positioning

### CUSTOM SERVO DRIVES

## HOW IT WORKS

### YOUR CUSTOM SERVO DRIVE WITH NO RESTRICTIONS

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### YOUR BENEFITS

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- ✓ Reduced time to market
- ✓ Lower the system cost
- ✓ Optimize your machine
- ✓ Manufacturing outputs delivered

12-48  
V<sub>DC</sub>

3  
A<sub>RMS</sub>

150  
W



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# C01127

## CUSTOM SERVO DRIVE

C01127 is a brushless AC motor servo drive ready for operation at 1600 m deep, developed to control propulsion system on manned submersibles, AUVs and ROVs. Its sensorless flux-vector control allows for safe and efficient motor control without any feedback.

- ✓ Increased reliability
- ✓ Sensorless FOC
- ✓ Pressure tolerant
- ✓ Ready for subsea
- ✓ Easy integration



Custom Servo Drive	Units	C01127
Motor Supply Voltage	$V_{DC}$	128 - 168
Logic Supply Voltage	$V_{DC}$	14 - 32
Maximum Phase Peak Current (60 s)	$A_{RMS}$	25
Maximum Phase Continuous Current	$A_{RMS}$	20
Efficiency	%	>98
Supported Motor Types		Brushless
Commutation		Sinusoidal
Power Stage PWM Frequency	kHz	20
Current Sensing		3Ø Low Side Sensing
Current Sensing Accuracy	%	$\pm 1$
Current Sensing Resolution	bit	10
Commutation Sensors (Brushless Motors)		Digital Halls, Sensorless FOC, Resolver (optional)
Supported Feedback		Digital Halls, Sensorless FOC, Resolver (optional)
Torque Loop Update Rate	kHz	10
Position and Velocity Update Rate	kHz	1
Motion Modes		Profilers (Position, Velocity, Torque), Open Loop Scalar and Vector
Supported Command Sources		CANopen, Analog Input
Digital Inputs		(4x) Optically Isolated TTL Level - PLC Tolerant
Analog Inputs		(2x) 0-10 V Differential (12 bit) (2x) 0-5 V (11 bit)
Digital Outputs		(4x) Optically Isolated TTL Level - PLC Tolerant
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload ( $I^2T$ )
Hardware Protections		Short-circuit protections, ESD and EMI protections (Feedback, Motor Connections, Inputs, Outputs and USB), Inverse Polarity Supply Protection, Power Stage Solid State Relay for Full Disconnection from Mains
Software Protections		Hall Sequence/Combination Error
RS-232		No
RS-485		No
CANopen		Yes (DS-301, DS-303, DS-305, DS-306 and DS-402). Isolated with Onboard Switch for 120 $\Omega$ Termination
EtherCAT		No
Base Plate Temperature (operating)	$^{\circ}C$	-10 to 85
Base Plate Temperature (storage)	$^{\circ}C$	-20 to 100
Maximum Hydrostatic Pressure	bar	160 (operating) / 250 (storage)
Dimensions	mm (in)	230 x 124 x 77 (9.05 x 4.88 x 3.03)

FIND OUT MORE AT  
[www.imc-automation.com](http://www.imc-automation.com)

**CANopen**

**3360**  
W

**20**  
 $A_{RMS}$

**128-168**  
 $V_{DC}$





## HOW DEEP DO YOU WANT TO GO?

Submersibles allow marine scientists to go down to great depths for viewing and sampling. As with spaceships, deep-sea submersibles must be engineered to accommodate innumerable challenges, including dramatic changes in pressure and temperature and total absence of sunlight.

Historically, electronic systems for deep water applications have been installed inside low pressure vessels. Working with pressure tolerant electronics open new doors to the world of manned submersible design.



## SOLUTIONS THAT WITHSTAND PRESSURE

- ✓ Increased reliability
- ✓ Volume and weight reduction of containers
- ✓ Increased safety
- ✓ Less complex cooling systems
- ✓ Reduced system cost and complexity

### CUSTOM SERVO DRIVES

## HOW IT WORKS

### YOUR CUSTOM SERVO DRIVE WITH NO RESTRICTIONS

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- ✓ Reduced time to market
- ✓ Lower the system cost
- ✓ Optimize your machine
- ✓ Manufacturing outputs delivered

128-168  
V<sub>DC</sub>

20  
A<sub>RMS</sub>

3360  
W

CANopen

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# C07134

## CUSTOM SERVO DRIVE

C07134 is a servo drive controller for space and cost critical applications, offering a high power integration for analog hall-sensor equipped brushless motors in a narrow shape, open frame servo drive. The integration of Bluetooth communications allows for wireless control.



- ✓ Ultra-compact
- ✓ High power density
- ✓ Cost-effective
- ✓ Standalone operation
- ✓ DIP switches for commissioning
- ✓ RS-232 and Bluetooth
- ✓ Built-in customer algorithms
- ✓ Analog halls fine positioning

Custom Servo Drive	Units	C07134
Supply Voltage	$V_{DC}$	12 - 48
Maximum Phase Peak Current (2 s)	$A_{RMS}$	12
Maximum Phase Continuous Current	$A_{RMS}$	6
Standby Power Consumption	W	1.5
Efficiency	%	>95
Supported Motor Types		Linear Brushless
Commutation		Sinusoidal
Power Stage PWM Frequency	kHz	20
Current Sensing		3Ø Low Side Sensing
Current Sensing Accuracy	%	$\pm 1$
Current Sensing Resolution	bit	10
Commutation Sensors (Brushless Motors)		3x Analog Hall (with interpolation)
Supported Feedback		3x Analog Hall (with interpolation)
Torque Loop Update Rate	kHz	10
Position and Velocity Update Rate	kHz	1
Motion Modes		Profiled Velocity, Position, Torque
Supported Command Sources		Bluetooth, Standalone (64 macros of 64 commands)
Digital Inputs		(4x) TTL Level
Switches		(4x) Onboard DIP Switch for Pre-set Configuration
Digital Outputs		(4x) 5 V General Purpose
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload ( $I^2T$ )
Hardware Protections		Short-circuit protections, ESD and EMI protections (Feedback, Motor Connections, Inputs, Outputs), Inverse Polarity Supply Protection, High Power Transient Voltage Suppressor for Short Braking
Software Protections		Mechanical Limits for Homing Modes, Hall Sequence/Combination Error
USB		No
RS-232		Yes
Bluetooth		Yes
Operating Environment		Air
Ambient Air Temperature (operating)	$^{\circ}C$	-10 to 85 (over 50 with derating)
Ambient Air Temperature (storage)	$^{\circ}C$	-20 to 100
Maximum Humidity (non-condensing)	%	5 to 85
Dimensions	mm (in)	149 x 36 x 20 (5.86 x 1.41 x 0.78)



## OPENING DOORS TO NEW BUSINESS

Automatic doors are movable doors that close or open automatically at a walkway and are normally used for entrances and exits. These systems are complex and can be potentially hazardous pieces of equipment. In deferred condition, automatic doors can exhibit significant forces that can lead to life threatening injuries.

This is why the emphasis on safety is the primary basis for automatic door standards, and the reason that improved designs and newer technology products have taken over.

One of the latest technologies released for automatic doors is related to motor and electronics technology used.

New concepts based on moving-coil linear motors with built-in drive electronics, have been used resulting in more compact and more silent mechanisms, with smoother movements and with an increased reliability. The required maintenance and wire harness have been reduced dramatically.

## LINEAR MOTOR TECHNOLOGY FOR DOORS

- ✓ Increased safety
- ✓ Compact solution
- ✓ Silent and smooth motion
- ✓ High reliability
- ✓ Sliding and pocket sliding doors
- ✓ Cost-effective
- ✓ Zero maintenance
- ✓ Simplify wiring harness

### CUSTOM SERVO DRIVES

## HOW IT WORKS

### YOUR CUSTOM SERVO DRIVE WITH NO RESTRICTIONS

Struggling with a particular need using standard products? A servo drive that suits your exact demands is all you need though it is not easy to get. Regardless of your requirements, making your own custom servo drive controller has never been so easy. IMC uses a modular design approach based on pre-tested circuits to reduce development time and guarantee an outstanding quality.

### YOUR BENEFITS

No matter the quantity or features needed, at **IMC we will help you to find the right solution** for your application.

- ✓ Reduced time to market
- ✓ Lower the system cost
- ✓ Optimize your machine
- ✓ Manufacturing outputs delivered

12-48  
V<sub>DC</sub>

6  
A<sub>RMS</sub>

300  
W



FIND OUT MORE AT  
[www.imc-automation.com](http://www.imc-automation.com)

# C01139

## CUSTOM SERVO DRIVE

The C01139 is a simple yet powerful servo drive for ink dosing subsystems in the printing market. Its design is compact, reliable and ready for single-axis brush DC motor operation through a CANopen network.



- ✓ Miniature size
- ✓ Ultra low cost
- ✓ Brush DC
- ✓ Built-in potentiometer for servo loop control
- ✓ CANopen with DIP switch Node ID selection

Custom Servo Drive	Units	C01139
Supply Voltage	$V_{DC}$	15 - 30
Maximum Phase Peak Current (1 s)	$A_{RMS}$	1
Maximum Phase Continuous Current	$A_{RMS}$	0.5
Standby Power Consumption	W	1.5
Efficiency	%	>95
Supported Motor Types		Brush DC
Commutation		-
Minimum Motor Inductance	$\mu H$	300
Power Stage PWM Frequency	kHz	40
Current Sensing		Single Resistor Low Side Sensing
Current Sensing Accuracy	%	$\pm 1$
Current Sensing Resolution	bit	10
Commutation Sensors		-
Supported Feedback		Integrated Potentiometer on Board
Torque Loop Update Rate	kHz	10
Position and Velocity Update Rate	kHz	1
Motion Modes		Cyclic Sync, Interpolated and Profilers (Position, Velocity, Torque)
Supported Command Sources		CANopen, RS-485
Digital Inputs		-
Analog Inputs		-
Digital Outputs		-
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload ( $I^2T$ )
Hardware Protections		Short-Circuit Protections, ESD and EMI Protections (Feedback, Motor Connections, Inputs, Outputs and USB), Inverse Polarity Supply Protection
Software Protections		Mechanical Limits for Homing Modes, Hall Sequence/Combination Error
RS-232		No
RS-485		No
CANopen		Yes(DS-301, DS-303, DS-305, DS-306 and DS-402). DIP Switch for Node Selection
EtherCAT		No
Ambient Air Temperature (operating)	$^{\circ}C$	-10 to 85 (over 50 with derating)
Ambient Air Temperature (storage)	$^{\circ}C$	-20 to 100
Maximum Humidity (non-condensing)	%	5 to 85
Dimensions	mm (in)	35 x 83 (1.37 x 3.26)



## MOTION SUBSYSTEMS THAT ADD VALUE TO MACHINES

Embedding mechanical motion subsystems into machines improves performance and reduces cost.

Rather than a collection of electromechanical components, which may or may not work well together, embedded motion systems function as true plug-and-play machine subsystems. They are typically assembled and tested as a system before integration on the production machine, thus avoiding any commissioning failures.

In addition, the cost reduction can skyrocket well above 50% when you factor in all the hidden cost components associated with building and installing a motion system.

Embedded motion systems are engineered to fit within a predefined physical space on a machine and tied into the machine's motion control system, ready to accept commands from an industrial network such as CANopen, EtherCAT or Ethernet/IP.

- ✓ Cost reduction
- ✓ Mechanical performance
- ✓ Improved machine throughput
- ✓ Seamless commissioning
- ✓ Reliability

### CUSTOM SERVO DRIVES

## HOW IT WORKS

### YOUR CUSTOM SERVO DRIVE WITH NO RESTRICTIONS

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### YOUR BENEFITS

No matter the quantity or features needed, at **IMC we will help you to find the right solution** for your application.

- ✓ Reduced time to market
- ✓ Lower the system cost
- ✓ Optimize your machine
- ✓ Manufacturing outputs delivered

15-30  
V<sub>DC</sub>

0.5  
A<sub>RMS</sub>

15  
W

CANopen

FIND OUT MORE AT  
[www.imc-automation.com](http://www.imc-automation.com)



# C01144

## CUSTOM SERVO DRIVE

C01144 is a 250 W DC servo drive to be integrated directly into brushless motors. It contains a motion controller, communications, I/Os and Hall-sensors (sensors and circuitry) in one small and compact unit which can be mounted directly to the rear of a rotary motor.



- ✓ Ultra-compact
- ✓ Cost-effective
- ✓ Onboard hall sensors
- ✓ CANopen / Modbus
- ✓ Built-in customer algorithms
- ✓ Extended temperature range

Custom Servo Drive	Units	C01144
Supply Voltage	V <sub>DC</sub>	12 - 24
Maximum Phase Peak Current (15 s)	A <sub>RMS</sub>	30
Maximum Phase Continuous Current	A <sub>RMS</sub>	10
Standby Power Consumption	W	1.5
Efficiency	%	>95
Supported Motor Types		Brushless
Commutation		Trapezoidal
Minimum Motor Inductance	μH	500
Power Stage PWM Frequency	kHz	20
Current Sensing		3Ø Low Side Sensing
Current Sensing Accuracy	%	± 1
Current Sensing Resolution	bit	10
Commutation Sensors (Brushless Motors)		Onboard Digital Hall Sensors
Supported Feedback		Onboard Digital Hall Sensors
Torque Loop Update Rate	kHz	10
Position and Velocity Update Rate	kHz	1
Motion Modes		Profiled Velocity, Position, Torque
Supported Command Sources		CANopen, Analog Input, Standalone (64 macros of 64 commands)
Digital Inputs		(5x) PLC Level (1x) Emergency Stop PLC Level - Torque Off
Digital Outputs		(4x) 24 V General purpose
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload (I <sup>2</sup> T)
Hardware Protections		Short-Circuit Protections, ESD and EMI Protections (Feedback, Motor Connections, Inputs, Outputs and USB), Inverse Polarity Supply Protection, Power Supply Protection for Fast Braking
Software Protections		Mechanical Limits for Homing Modes, Hall Sequence/Combination Error
RS-232		No
Modbus RTU		Yes
CANopen		Yes (DS-301, DS-303, DS-305, DS-306 and DS-402). Isolated Self Powered CAN Bus
Operating Environment		Air
Base Plate Temperature (operating)	°C	-35 to 100 (over 50 with derating)
Base Plate Temperature (storage)	°C	-40 to 125
Maximum Humidity (non-condensing)	%	5 to 85
Dimensions	mm (in)	126 x 51 x 20 (4.96 x 2.01 x 0.78)





## TOWARDS A GREENER FUTURE

Global warming and the drive to minimise greenhouse gas emissions has put the focus on how to make the most of natural energy sources. Solar tracking is an obvious way to improve the efficiency of solar power plants. As the sun moves across the sky, an electric actuator system makes sure that the solar panels follow automatically and maintain the optimum angle to make the most of the sunbeams.

In today's distributed control design of tracking arrays, brushless DC motors with embedded intelligence can be networked with economic off-the-shelf PLCs having solar tracking function blocks.

The embedded intelligence can serve also as master control to host and run programs in the event of network interruptions. Macro-like commands can be used to trigger messages that initiate complex functions.

In addition, diagnostic functions may take place over the network to report on motor status and health.

Onboard inclinometer or direct inclinometer input is a trend in latest All-in-One electric actuator systems.

### IMPROVING ENERGY EFFICIENCY

- ✓ Increased reliability
- ✓ Harsh environments
- ✓ Field bus communication
- ✓ Space saving
- ✓ Cost-effective
- ✓ Simple installation
- ✓ Minimum downtime
- ✓ Embedded intelligence

### CUSTOM SERVO DRIVES

## HOW IT WORKS

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### YOUR BENEFITS

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- ✓ Reduced time to market
- ✓ Lower the system cost
- ✓ Optimize your machine
- ✓ Manufacturing outputs delivered

12-24  
V<sub>DC</sub>

10  
A<sub>RMS</sub>

250  
W

CANopen

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[www.imc-automation.com](http://www.imc-automation.com)

# C01146

## CUSTOM SERVO DRIVE

The C01146 is a high-performance DC servo drive, developed to meet requirements of Oil & Gas market. It's a fully custom design to be paired with high power brushless motors driving ROV thrusters under extreme pressure environments.



- ✓ Ready for ROV thrusters
- ✓ Rugged design
- ✓ Pressure tolerant version
- ✓ Fully programmable profiles
- ✓ RS-485 & CANopen
- ✓ Sensorless & Resolver options

Custom Servo Drive	Units	C01146
Supply Voltage	V <sub>DC</sub>	180 - 300
Maximum Phase Peak Current (5 s)	A <sub>RMS</sub>	140
Maximum Phase Continuous Current	A <sub>RMS</sub>	120
Standby Power Consumption	W	3
Efficiency	%	>95
Supported Motor Types		Brushless
Commutation		Sinusoidal and Trapezoidal
Minimum Motor Inductance	μH	300
Power Stage PWM Frequency	kHz	8
Current Sensing		On Phase
Current Sensing Accuracy	%	± 1
Current Sensing Resolution	bit	10
Commutation Sensors (Brushless Motors)		Digital Halls, Sensorless (FOC), Resolver
Supported Feedback		Digital Halls, Sensorless (FOC), Resolver
Torque Loop Update Rate	kHz	10
Position and Velocity Update Rate	kHz	1
Motion Modes		Profilers (Position, Velocity, Torque), Open Loop Scalar and Vector
Supported Command Sources		CANopen, RS-485, Analog Input and Standalone
Digital Inputs		(1x) TTL Level - PLC Tolerant
Analog Inputs		(1x) Differential ±10 V (12 bit)
Digital Outputs		Open Drain Output with 10 kΩ Pull-Up Resistor to 5 V Supply (PLC Tolerant)
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload (I <sup>2</sup> T)
Hardware Protections		Short-Circuit Protections, ESD and EMI Protections (Feedback, Motor Connections, Inputs, Outputs and USB), Inverse Polarity Supply Protection
Software Protections		Hall Sequence/Combination Error
USB		No
RS-232		No
RS-485		Yes
CANopen		Yes (DS-301, DS-303, DS-305, DS-306 and DS-402). Isolated CAN
Base Plate Temperature (operating)	°C	-10 to 85 (over 50 with derating)
Base Plate Temperature (storage)	°C	-20 to 100
Maximum Humidity (non-condensing)	%	5 to 85
Dimensions	mm (in)	180 x 260 x 68 (7.08 x 10.23 x 2.67)

FIND OUT MORE AT  
[www.imc-automation.com](http://www.imc-automation.com)



36  
kW

120  
A<sub>RMS</sub>

180-300  
V<sub>DC</sub>



## MOTION SYSTEMS FOR OIL & GAS EXPLORATION

The Oil and Gas industry presents some of the harshest challenges for electronic motion control. From off-shore drilling to the frigid environment of the Canadian oil sands, electric motors and servo drives are a critical lifeline to the operation of these facilities.

In the Subsea segment, remote operating vehicles (ROV) require accurate directional and lift control during underwater maneuvering and precision in robotic tasks, while keeping weight at the minimum.

The drive electronics for the ROV thrusters and manipulators need to include redundancy to assure fail-safe operations, as the last thing a service provider wants is to have their system stop because of a component failure, particularly with the high financial and reputation costs associated with recovery.

The pressure tolerant capability is an increasing demand for these electronics as it allows to dramatically simplify the machine construction and thus reduces its overall costs.

### BOOST YOUR PRODUCTIVITY

- ✓ Increased reliability
- ✓ Improved energy efficiency
- ✓ Rugged for harsh environments
- ✓ Pressure tolerant electronics
- ✓ Reduce system cost and complexity

#### CUSTOM SERVO DRIVES

### HOW IT WORKS

#### YOUR CUSTOM SERVO DRIVE WITH NO RESTRICTIONS

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#### YOUR BENEFITS

No matter the quantity or features needed, at **IMC we will help you to find the right solution** for your application.

- ✓ Reduced time to market
- ✓ Lower the system cost
- ✓ Optimize your machine
- ✓ Manufacturing outputs delivered

180-300  
V<sub>DC</sub>

120  
A<sub>RMS</sub>

36  
kW



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[www.imc-automation.com](http://www.imc-automation.com)

# C02146

## CUSTOM SERVO DRIVE

The C02146 is a modular, high performance DC servo drive developed to fit AUV applications in the subsea market. It is a fully custom design to be integrated with a range of brushless motors conforming an electric thruster module.

- ✓ Designed for AUV thrusters
- ✓ Rugged design
- ✓ Modular for multiple powers
- ✓ RS-485 & CANopen
- ✓ Sensorless & Resolver options



Custom Servo Drive	Units	C02146
Supply Voltage	$V_{DC}$	120 - 400
Maximum Phase Peak Current (2 s)	$A_{RMS}$	10
Maximum Phase Continuous Current	$A_{RMS}$	8
Standby Power Consumption	W	1.5
Efficiency	%	>95
Supported Motor Types		Brushless
Commutation		Sinusoidal and Trapezoidal
Minimum Motor Inductance	$\mu H$	300
Power Stage PWM Frequency	kHz	15
Current Sensing		On Phase
Current Sensing Accuracy	%	$\pm 1$
Current Sensing Resolution	bit	10
Commutation Sensors (Brushless Motors)		Digital Halls, Sensorless FOC
Supported Feedback		Digital Halls, Sensorless FOC
Torque Loop Update Rate	kHz	10
Position and Velocity Update Rate	kHz	1
Motion Modes		Profilers (Position, Velocity, Torque), Open Loop Scalar and Vector
Supported Command Sources		CANopen, RS-485, Analog Input, Standalone
Digital Inputs		(1x) TTL Level - PLC Tolerant
Analog Inputs		(1x) Differential $\pm 10 V$ (12 bit)
Digital Outputs		Open Drain Output with 10 k $\Omega$ Pull-Up Resistor to 5 V Supply - PLC Tolerant
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload ( $I^2T$ )
Hardware Protections		Short-Circuit Protections (Phase to GND, Phase to DC Bus, Phase to Phase), ESD and EMI Protections (Feedback, Motor Connections, Inputs, Outputs and USB), Inverse Polarity Supply Protection, High Power Transient Voltage Suppressor for Short Braking
Software Protections		Hall Sequence/Combination Error
USB		No
RS-232		No
RS-485		Yes
CANopen		Yes (DS-301, DS-303, DS-305, DS-306 and DS-402)
Ambient Air Temperature (operating)	$^{\circ}C$	-10 to 100
Ambient Air Temperature (storage)	$^{\circ}C$	-20 to 125
Maximum Humidity (non-condensing)	%	5 to 85
Dimensions	mm (in)	60 $\varnothing$ x 54 height (2.36 x 2.12)

FIND OUT MORE AT  
[www.imc-automation.com](http://www.imc-automation.com)



3200  
W

8  
 $A_{RMS}$

120-400  
 $V_{DC}$



## AUV ELECTRIC PROPULSION

Automated Underwater Vehicle (AUV) technology has come a long way in the past decade. AUV endurance and range, however, are still limited by the size and capacity of the onboard batteries. Advanced battery systems are typically used to find a system that balances maximal energy storage with low recharge time.

The propulsive efficiency of the AUV affects the amount of power storage required to achieve a specific mission. As the efficiency increases, the level of energy being stored decreases which allows for a smaller vehicle requiring less thrust to attain a specific speed.

The small package of the propulsion module is also a must in these kind of automated vehicles as it simplifies their construction and thus reduces its overall costs.

### EFFICIENT SUBSEA APPLICATIONS

- ✓ Maximum propulsion efficiency
- ✓ Silent operation
- ✓ High reliability
- ✓ Cost effective
- ✓ Compact solution

### CUSTOM SERVO DRIVES

## HOW IT WORKS

### YOUR CUSTOM SERVO DRIVE WITH NO RESTRICTIONS

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### YOUR BENEFITS

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- ✓ Reduced time to market
- ✓ Lower the system cost
- ✓ Optimize your machine
- ✓ Manufacturing outputs delivered

120-400  
 $V_{DC}$

8  
 $A_{RMS}$

3200  
W



FIND OUT MORE AT  
[www.imc-automation.com](http://www.imc-automation.com)



# C01150

## CUSTOM SERVO DRIVE

The C01150 is a high power density digital servo drive for a battery operated power ascender. The design includes an embedded Arduino platform for user interfacing (buttons, LCD) and multiple security mechanisms and redundant protections to assure maximum reliability.



- ✓ Cost efficient
- ✓ High power density
- ✓ Multiple protection mechanisms
- ✓ Compact design
- ✓ Arduino inside for an easy user interface

Custom Servo Drive	Units	C01150
Supply Voltage	$V_{DC}$	36 - 54
Maximum Phase Peak Current (1 s)	$A_{RMS}$	57
Maximum Phase Continuous Current	$A_{RMS}$	24
Standby Power Consumption	W	1.5
Efficiency	%	>95
Supported Motor Types		Brush DC and Brushless
Commutation		Sinusoidal and Trapezoidal
Minimum Motor Inductance	$\mu H$	500
Power Stage PWM Frequency	kHz	20
Current Sensing		On Phase
Current Sensing Accuracy	%	$\pm 1$
Current Sensing Resolution	bit	10
Commutation Sensors (Brushless Motors)		Digital Halls
Supported Feedback		Digital Halls
Torque Loop Update Rate	kHz	10
Position and Velocity Update Rate	kHz	1
Motion Modes		Cyclic Sync and Profilers (Position, Velocity, Torque), Open Loop Scalar and Vector
Supported Command Sources		USB, Internal UART Link, Standalone
Digital Inputs		(3x) TTL Level - 54 V Tolerant
Analog Inputs		Motor Temperature PTC
Digital Outputs		5 V "Health", Buzzer, RGB LEDs
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload ( $I^2T$ ), Motor re-injection (external shunt resistor)
Hardware Protections		Short-Circuit Protections, ESD and EMI Protections (Feedback, Motor Connections, Inputs, Outputs and USB), Inverse Polarity Supply Protection, High Power Transient Voltage Suppressor for Short Braking
Software Protections		Mechanical Limits and Rope Knot Stop, Hall Sequence/Combination Error
USB		Yes
RS-232		No
RS-485		No
Supported external systems		48 V @ 1 A Brake Mechanism, Common cathode RGB LED, SD Memory Card, LCD Serial Display
Ambient Air Temperature (operating)	$^{\circ}C$	-10 to 85 (over 50 with derating)
Ambient Air Temperature (storage)	$^{\circ}C$	-20 to 100
Maximum Humidity (non-condensing)	%	5 to 85
Dimensions	mm (in)	160 x 100 x 23 (6.29 x 3.93 x 0.90)





## POWER ASCENDERS THAT SIMPLIFY COMPLEX TASKS

The powered rope ascenders are pieces of stunning, modern technology that allow people –and sometimes people in specialized professions such as soldiers– to rappel both up and down some pretty impossible vertical faces . Their compact size enable easy operation in confined spaces and challenging maneuvers. These devices need to be lightweight, ergonomic, portable and powered by batteries.

Typical applications where they can be found are:

- Cleaning and maintenance of facades (industrial, residential, ....)
- Inspection and repair operation of wind turbines
- Inspection and lightweight work on bridges, towers and other high rise structures
- Search and rescue operations
- Geotechnical operations

### WORK AT HEIGHT

- ✓ Lightweight and compact
- ✓ Portable, autonomous
- ✓ High reliability
- ✓ Intuitive use for short set-up time
- ✓ Clean and silent operation
- ✓ High lifting capacity
- ✓ Multiple safety mechanisms

### CUSTOM SERVO DRIVES

## HOW IT WORKS

### YOUR CUSTOM SERVO DRIVE WITH NO RESTRICTIONS

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### YOUR BENEFITS

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- ✓ Reduced time to market
- ✓ Lower the system cost
- ✓ Optimize your machine
- ✓ Manufacturing outputs delivered

36-54  
V<sub>DC</sub>

24  
A<sub>RMS</sub>

1300  
W



FIND OUT MORE AT  
[www.imc-automation.com](http://www.imc-automation.com)

# C01154

## CUSTOM SERVO DRIVE

The C01154 is a modular and high power density servo drive for defense and security robotics applications. The system supports resolver, digital halls and SSI absolute encoders and can drive brushless and brush motors.



Custom Servo Drive	Units	C01154-H2	C01154-H3
Supply Voltage	V <sub>DC</sub>	10 - 70	
Maximum Phase Peak Current	A <sub>RMS</sub>	12 (2 s)	70 (30 s)
Maximum Phase Continuous Current	A <sub>RMS</sub>	6	35
Standby Power Consumption	W	2	
Efficiency	%	>97	
Supported Motor Types		Brush DC and Brushless	
Commutation		Sinusoidal and Trapezoidal	
Minimum Motor Inductance	μH	500	
Power Stage PWM Frequency	kHz	20	
Current Sensing		3Ø Low Side Sensing	
Current Sensing Accuracy	%	± 1	
Current Sensing Resolution	bit	10	
Commutation Sensors (Brushless Motors)		Digital Halls, Incremental Encoder, SSI Absolute Encoder, Resolver	
Supported Feedback		Digital Halls, SSI Absolute Encoder, Incremental Encoder, Resolver	
Torque Loop Update Rate	kHz	10	
Position and Velocity Update Rate	kHz	1	
Motion Modes		Cyclic Sync, Interpolated and Profilers (Position, Velocity, Torque)	
Supported Command Sources		USB, CANopen, Standalone, Analog Input	
Digital Inputs		(2x) Single Ended TTL Level - PLC Tolerant	
Analog Inputs		(2x) 0-10 V Single Ended (12 bit)	
Digital Outputs		(2x) Open Drain with a Weak Pull-Up to 5 V. 1 A Short-Circuit and Over-Current Rugged	
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload (I <sup>2</sup> T), Motor Temperature	
Hardware Protections		Short-Circuit Protections, ESD and EMI Protections (Feedback, Motor Connections, Inputs, Outputs and USB), Inverse Polarity Supply Protection, High Power Transient Voltage Suppressor for Short Braking	
Software Protections		Mechanical Limits for Homing Modes, Hall Sequence/Combination Error	
USB		Yes	
RS-232		No	
RS-485		No	
CANopen		Yes (DS-301, DS-303, DS-305, DS-306 and DS-402). Onboard switch for 120 Ω termination	
EtherCAT		No	
Ambient Air Temperature (operating)	°C	-10 to 85 (over 50 with derating)	
Ambient Air Temperature (storage)	°C	-20 to 100	
Maximum Humidity (non-condensing)	%	5 to 85	
Dimensions	mm (in)	60 x 60 x 26 (2.36 x 2.36 x 1.02)	130 x 90 x 28 (5.11 x 3.54 x 1.10)

FIND OUT MORE AT  
[www.imc-automation.com](http://www.imc-automation.com)



4800  
W

80  
A<sub>RMS</sub>

10-70  
V<sub>DC</sub>



## EXTREME POWER, OUTSTANDING PRECISION

Robotics has been a staple of advanced manufacturing for over half a century. As robots and their peripheral equipment become more sophisticated, reliable and miniaturized, these systems are increasingly being utilized for military and law enforcement purposes. From patrol to dealing with potential explosives. All the electronics embedded in a military and security robotics need to be rugged, precise and extremely reliable due to the sensitiveness of the task they carry out. The compactness and versatility are also very appreciated features due to the space restrictions and variability of motion subsystems existing in these kind of mobile robots.



### ONE CORE FOR ANY POWER

- ✓ Versatility
- ✓ Ultra high power density
- ✓ Rugged for harsh environments
- ✓ Easy integration into the robot
- ✓ Improved maneuverability
- ✓ Multi-axis synchronization

### CUSTOM SERVO DRIVES

## HOW IT WORKS

### YOUR CUSTOM SERVO DRIVE WITH NO RESTRICTIONS

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### YOUR BENEFITS

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- ✓ Reduced time to market
- ✓ Lower the system cost
- ✓ Optimize your machine
- ✓ Manufacturing outputs delivered

10-70  
V<sub>DC</sub>

80  
A<sub>RMS</sub>

4800  
W



FIND OUT MORE AT  
[www.imc-automation.com](http://www.imc-automation.com)

# C02154

## CUSTOM SERVO DRIVE

The C02154 is a four-quadrant servo drives designed and built to operate today's modern mobile electric vehicular platforms (AGVs, UGVs and RUVs). Its design includes an ultra efficient power output stage, multiple command inputs and plenty of safety mechanisms.

- ✓ Increased reliability
- ✓ Rugged design
- ✓ Four-quadrant operation
- ✓ Brush DC and brushless
- ✓ High power break output
- ✓ CANopen



Custom Servo Drive	Units	C02154
Supply Voltage	V <sub>DC</sub>	12 - 60
Maximum Phase Peak Current (5 s)	A <sub>RMS</sub>	300
Maximum Phase Continuous Current	A <sub>RMS</sub>	150
Standby Power Consumption	W	2
Efficiency	%	>98
Supported Motor Types		Brush DC and Brushless
Commutation		Sinusoidal and Trapezoidal
Minimum Motor Inductance	μH	500
Power Stage PWM Frequency	kHz	20, 10 (configurable)
Current Sensing		3Ø Isolated
Current Sensing Accuracy	%	± 1
Current Sensing Resolution	bit	10
Commutation Sensors (Brushless Motors)		.
Supported Feedback		Digital Hall, Incremental Encoder, Tachometer, Resolver, Absolute Encoder
Torque Loop Update Rate	kHz	10
Position and Velocity Update Rate	kHz	1
Motion Modes		Profilers (Position, Velocity, Torque)
Supported Command Sources		CANopen, Analog Input, Standalone
Digital Inputs		(2x) Single Ended TTL Level - PLC Tolerant
Analog Inputs		(2x) Single Ended 0-10 V (12 bit)
Digital Outputs		(2x) Open Drain with a Weak Pull-Up to 5 V. 1 A Short-Circuit and Over-Current Rugged
Brake Output		High Power Electromechanical Brake Output
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload (I <sup>2</sup> T), Motor Temperature
Hardware Protections		Short-Circuit Protections, ESD and EMI Protections (Feedback, Motor Connections, Inputs, Outputs and USB), Inverse Polarity Supply Protection, High Power Transient Voltage Suppressor for Short Braking
Software Protections		Mechanical Limits for Homing Modes, Hall Sequence/Combination Error
USB		Yes
RS-232		No
RS-485		No
CANopen		Yes (DS-301, DS-303, DS-305, DS-306 and DS-402). Onboard switch for 120 Ω termination
Base Plate Temperature (operating)	°C	-10 to 85
Base Plate Temperature (storage)	°C	-20 to 100
Dimensions	mm (in)	107 x 110 x 40 (4.21 x 4.33 x 1.57)

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9000  
W

150  
A<sub>RMS</sub>

12-60  
V<sub>DC</sub>





## THE POWER OF A TRACTOR WITH THE PRECISION OF A ROBOT.

There are many benefits of operating electric vehicles when compared to traditional combustion engine vehicles. They are more quiet, there is no fuel odor and they are extremely much more energy efficient. Also by correctly using regenerative braking, they can achieve greater brake life as well as create energy through kinetic energy.

AGVs, UGVs and RUVs are examples of electric vehicles in the robotics market. They are typically used for industrial, agriculture or military applications where it may be inconvenient, dangerous, or impossible to have a human operator present. In all them, the use of battery operated servo drives, extremely easy to operate and integrate is essential for the success of the vehicle's motion.



### ROBOTIC VEHICLES THAT ADDS VALUE

- ✓ Ultra Efficient
- ✓ Compact and small
- ✓ Rugged for Harsh Environments
- ✓ Traction / Propulsion, Steering or Lifting
- ✓ High Safety
- ✓ Regenerative Breaking

#### CUSTOM SERVO DRIVES

### HOW IT WORKS

#### YOUR CUSTOM SERVO DRIVE WITH NO RESTRICTIONS

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#### YOUR BENEFITS

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- ✓ Reduced time to market
- ✓ Lower the system cost
- ✓ Optimize your machine
- ✓ Manufacturing outputs delivered

12-60  
V<sub>DC</sub>

150  
A<sub>RMS</sub>

9000  
W



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# C01159

## CUSTOM SERVO DRIVE

The C01159 is a servo drive designed for orbital welding equipment offering high precision positioning with multiple motors and feedback combinations. The drive has been prepared to work in noisy and emission-critical environments.

- ✓ Maximum efficiency
- ✓ Compact size
- ✓ Closed loop stepper control
- ✓ Brush DC and brushless
- ✓ CANopen, USB, RS-485



Custom Servo Drive	Units	C01159
Supply Voltage	V <sub>DC</sub>	12 - 48
Maximum Phase Peak Current (1 s)	A <sub>RMS</sub>	9
Maximum Phase Continuous Current	A <sub>RMS</sub>	5
Standby Power Consumption	W	1.5
Efficiency	%	>95
Supported Motor Types		2-Phase Bipolar Stepper, Brushless, Linear Brushless, Brush DC, Voice Coils
Commutation		Open Loop and Closed Loop (Stepper), Sinusoidal and Trapezoidal (Brushless)
Microstep Resolution		1 - 256
Minimum Motor Inductance	μH	300
Power Stage PWM Frequency	kHz	20
Current Sensing		3Ø Low Side Sensing
Current Sensing Accuracy	%	± 1
Current Sensing Resolution	bit	10
Commutation Sensors (Brushless Motors)		Digital Halls or Incremental Encoder
Supported Feedback		Digital Halls, Incremental Encoder, DC tachometer, Analog potentiometer
Torque Loop Update Rate	kHz	10
Position and Velocity Update Rate	kHz	1
Motion Modes		Cyclic Sync, Interpolated and Profilers (Position, Velocity, Torque)
Supported Command Sources		USB, CANopen, RS-485, Standalone, Analog input
Digital Inputs		(2x) Single Ended TTL Level - PLC Tolerant (2x) Non-Isolated High speed TTL Level - PLC Tolerant. 10 MHz Max Frequency
Analog Inputs		(1x) Differential ±10 V (12 bit) (1x) 0-5 V (12 bit)
Digital Outputs		(2x) Open Drain Digital Outputs, 5 V Weak Pull-up
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload (I <sup>2</sup> T), Open Load Protection
Hardware Protections		Short-circuit Protections (Phase to GND, Phase to DC Bus, Phase to Phase), ESD and EMI Protections (Feedback, Motor Connections, Inputs, Outputs and USB), Inverse Polarity Supply Protection, High Power Transient Voltage Suppressor for Short Braking
Software Protections		Mechanical Limits for Homing Modes, Hall Sequence/Combination Error
USB		Yes
RS-485		Optional
CANopen		Yes (DS-301, DS-303, DS-305, DS-306 and DS-402). Onboard Switch for 120 Ω Termination
EtherCAT		Optional
Ambient Air Temperature (operating)	°C	-10 to 85 (over 50 with derating)
Ambient Air Temperature (storage)	°C	-20 to 100
Maximum Humidity (non-condensing)	%	5 to 85
Dimensions	mm (in)	70 x 60 x 15 (2.75 x 2.36 x 0.59)



## ORBITAL WELDING TO INCREASE PRODUCTIVITY

Orbital welding consists of welding around an orb or a cylinder. Many times, this comes in the form of pipe welding, which can be a difficult process for the shape of the surface, the environment where it is exposed or for the uninterrupted operation at which the machine is exposed.

When performing an application like pipe welding (for water or gas lines), it is also very important for the welding torch arc to stay in contact with the work piece throughout the seam welding process. If the arc breaks contact with the surface of the work piece, it could mean a weak and inconsistent weld, one that could easily leak or crack.

This means that orbital welding needs to be performed with a great level of precision and consistency, something that can only be achieved through high performance automated equipment made up of reliable controllers and servo motors operating in closed loop.

### READY FOR EXTREME ENVIRONMENTS

- ✓ Short set-up time
- ✓ Precision and consistency
- ✓ Designed for durability and versatility
- ✓ Fully programmable
- ✓ Maintenance free
- ✓ Ready for harsh environments
- ✓ Full or semiautomatic welding
- ✓ Lightweight design

### CUSTOM SERVO DRIVES

## HOW IT WORKS

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### YOUR BENEFITS

No matter the quantity or features needed, at **IMC we will help you to find the right solution** for your application.

- ✓ Reduced time to market
- ✓ Lower the system cost
- ✓ Optimize your machine
- ✓ Manufacturing outputs delivered

12-48  
V<sub>DC</sub>

5  
A<sub>RMS</sub>

500  
W



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# C01161

## CUSTOM SERVO DRIVE

The C01161 is an advanced multi-axis motion system designed to work in a fiber multi-object spectrograph instrument of an European telescope used for astronomy and scientific research. The system can position miniature steppers and brush DC micro motors with submicron accuracy.



- ✓ Low energy consumption
- ✓ Multi-axis PCI backplane
- ✓ CANopen and USB
- ✓ 250 axis
- ✓ Closed loop steppers and brush DC motors
- ✓ High noise tolerant

Custom Servo Drive	Units	C01161
Logic Supply Voltage	$V_{DC}$	5
Power Supply Voltage	$V_{DC}$	5 - 24
Maximum Phase Peak Current (2 s)	$A_{RMS}$	0.5
Maximum Phase Continuous Current	$A_{RMS}$	0.25
Standby Power Consumption	W	5
Efficiency	%	>95
Supported Motor Types		2-Phase Bipolar Stepper, Brush DC
Commutation		Open Loop and Closed Loop
Power Stage PWM Frequency	kHz	20
Current Sensing		3Ø Low Side Sensing
Current Sensing Accuracy	%	$\pm 1$
Current Sensing Resolution	bit	10
Supported Feedback		Incremental Encoder (noise tolerant single ended)
Torque Loop Update Rate	kHz	10
Position and Velocity Update Rate	kHz	1
Motion Modes		Cyclic Sync, Interpolated and Profilers (Position, Velocity, Torque)
Supported Command Sources		CANopen, USB
Digital Inputs		(2x) TTL Level
Analog Inputs		(1x) 0-5 V (12 bits)
Digital Outputs		(2x) 5 V "Health"
User Configurable Protections		Bus Overvoltage and Undervoltage, Over and Under Temperature, Over Current, Overload ( $I^2T$ )
Hardware Protections		Short-Circuit Protections, ESD and EMI Protections (Feedback, Motor Connections, Inputs, Outputs and USB), Inverse Polarity Supply Protection, High Power Transient Voltage Suppressor for Short Braking
Software Protections		Mechanical Limits for Homing Modes
USB		Yes (self-powered)
RS-232		No
RS-485		No
CANopen		Yes (DS-301, DS-303, DS-305, DS-306 and DS-402). Node Id Address by Slot
EtherCAT		No
Ambient Air Temperature (operating)	$^{\circ}C$	--10 to 85 (over 50 with derating)
Ambient Air Temperature (storage)	$^{\circ}C$	-20 to 100
Maximum Humidity (non-condensing)	%	5 to 85
Dimensions	mm (in)	60 x 50 x 5 (2.36 x 1.96 x 0.19)





## INSTRUMENTS TO DISCOVER THE UNIVERSE

A fibre multi-object spectrograph is a facility instrument for telescopes, that consists of a complex fibre-optic positioning system mounted at the prime focus of the telescope. The instrument is used to look at the light from hundreds of stars or galaxies simultaneously over a wide field of view.

There are a number of key scientific programmes and teams using this kind of equipment. Their interest are around the study of galactic and extragalactic nebulae and the study of point-sources with intermediate-to-high surface densities.

The motion control positioning systems working in these instruments have to offer the maximum performance in the most compact package, and need to be virtually maintenance-free and available for 24/7 operation. A high resolution, and an excellent in-position stability, are also key features required for the success of the application.

### MOTION CONTROL FOR TELESCOPES

- ✓ Sub-micron accuracy
- ✓ Scalable multi-axis
- ✓ Excellent in-position stability
- ✓ Maintenance free
- ✓ Lowest cost of ownership

#### CUSTOM SERVO DRIVES

### HOW IT WORKS

#### YOUR CUSTOM SERVO DRIVE WITH NO RESTRICTIONS

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#### YOUR BENEFITS

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- ✓ Reduced time to market
- ✓ Lower the system cost
- ✓ Optimize your machine
- ✓ Manufacturing outputs delivered

5-24  
V<sub>DC</sub>

0.25  
A<sub>RMS</sub>

6  
W



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# C01145

## CUSTOM SERVO DRIVE

The C01145 is a PWM servo amplifier for the semiconductor market. Drives brushless linear motors commutated externally by digital control systems that output two  $\pm 10$  V signals corresponding to U and V windings. The amplifier synthesizes the current command for the W winding.



- ✓ Ready to work with Delta Tau, ACS and Galil controllers
- ✓ Smart power stage with different power ratings
- ✓ High bandwidth
- ✓ Extensive protection mechanisms

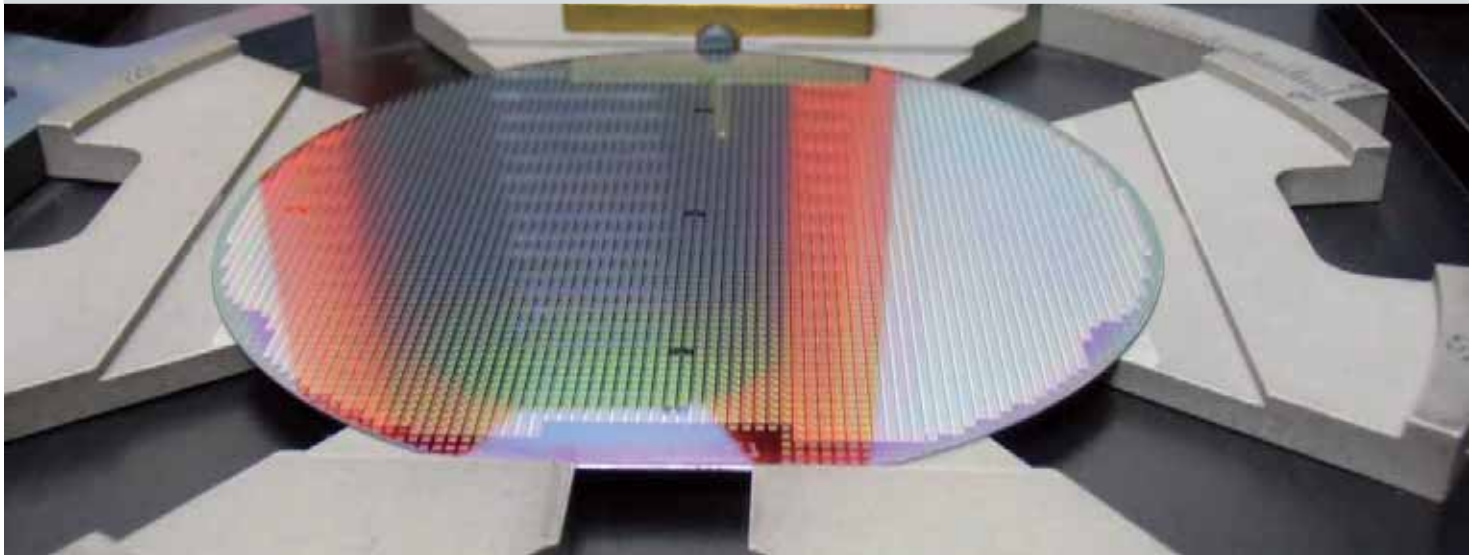
Custom Servo Drive	Units	C01145
Supply Voltage	V <sub>AC</sub>	60 - 265 (1Ø)
Supply Frequency	Hz	47 - 63
Inrush Current at Startup	A	≤ 37
External Mains Fuse Rating	A	20
Maximum Phase Peak Current (2s)	A <sub>RMS</sub>	20
Maximum Phase Continuous Current	A <sub>RMS</sub>	10
PWM Frequency	kHz	8, 10, 12, 15, 17, 20, 23, 25, 27, 30 (user selectable)
Minimum Motor Inductance	µH	400
Operating Mode		Current Control Loop
Command Source		±10 V Analog Inputs for U Current and V Current
Bandwidth	kHz	3
DC Power Outputs		(1x) +5 V @ 200 mA (1x) +10 V @ 10 mA (1x) -10 V @ 10 mA
Short Circuit Protection		Phase-Phase Phase-GND Phase-DC_BUS
Over Temperature Protection		Latching off at 85°C
Undervoltage Protection		Fault at DC bus < 45 V
Overvoltage Protection		Amplifier Fault at DC Bus > 400 V
Current Limiting		I <sup>2</sup> t Limit with Foldback After 2 s at 20 A (with current limit set to 10 A)
Signaling		Bi-Color LED for Status Signaling
Configuration Switches		Motor Resistance (10 pre-sets available) Motor Inductance (10 pre-sets available) ILimit (10 pre-sets available) Transconductance (10 pre-sets available) PWM Frequency (10 pre-sets available)
Base Plate Temperature (operating)	°C	-10 to 70 (over 50 with derating)
Base Plate Temperature (non-operating)	°C	-10 to 70
Maximum Humidity (non-condensing)	%	90
Dimensions (excluding heatsink)	mm (in)	65 x 150 x 55 (2.55 x 5.90 x 2.16)
Compatible Controllers		Delta Tau ACS Galil

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300  
W

10  
A<sub>RMS</sub>

265  
V<sub>AC</sub>



## MOVING SEMICONDUCTOR INDUSTRY TOWARD HIGHER PRODUCTIVITY

Historically, the semiconductor industry was driven by physics and chemistry, essentially perfecting the processes that have allowed the remarkable advances in microelectronic technology. The focus was mainly the process. What happened outside was far less important. With the transition of the semiconductor industry from "laboratory"-style manufacture to industrial-scale production, improving machine motion control offers opportunities for competitive differentiation and controlling the high cost of ownership — particularly for high performance, multi-axis, high throughput machines.



## AUTOMATION FOR SEMICONDUCTORS

- ✓ High throughput as key for productivity
- ✓ Keep focus on core engineering and differentials
- ✓ Emphasis on reliability
- ✓ Reduced downtime
- ✓ Distributed intelligence to increase capabilities

### CUSTOM SERVO DRIVES HOW IT WORKS

#### YOUR CUSTOM SERVO DRIVE WITH NO RESTRICTIONS

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- ✓ Reduced time to market
- ✓ Lower the system cost
- ✓ Optimize your machine
- ✓ Manufacturing outputs delivered

265  
V<sub>AC</sub>

10  
A<sub>RMS</sub>

3000  
W

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# C02145

## CUSTOM SERVO DRIVE

The C02145 is designed to interface to the Delta Tau PMAC2/UMAC motion controller, where the controller is generating PWM signals. The smart power stage is available in different power ratings. The C02145 includes extensive protection mechanisms and a display to show faults.

- ✓ Delta Tau compatible
- ✓ Smart power stage
- ✓ FAULT protections
- ✓ Onboard display
- ✓ Rotary switch setup



Custom Servo Drive	Units	C02145
Nominal Supply Voltage	V <sub>AC</sub>	230 (line to line 1 Ø, 3 Ø)
Rated Input Voltage	V <sub>AC</sub>	95 - 270 (line to line 1 Ø, 3 Ø)
Line Frequency	Hz	45 to 65
Inrush Current at Startup	A	≤ 30
Capacitor Charge Time	ms	< 250
External Mains Fuse Rating		50 A / 300 V
Logic Input Power		None. Power Supply Included
Maximum Phase Peak Current (2 s)	A <sub>RMS</sub>	100 (@ 8 kHz PWM, 3 Φ or DC in)
Maximum Phase Continuous Current	A <sub>RMS</sub>	50 (@ 8 kHz PWM, 3 Φ or DC in)
Maximum PWM Frequency	kHz	8, 10, 12, 15, 17, 20, 23, 25, 27, 30 (user selectable using rotary switch).
Output Fan Supply		24 V ± 10% @ 600 mA, Automatic Fan Control
Shunt Transistor Current	A	50
Operating Mode		PWM Amplifier with Independent High Side and Low Side Switch Control
Command Source		RS-485 Digital Signals for Each Phase High Side and Low Side
Current Readings		Phases A and B, 16 bit Resolution
Current Reading Range		± 162.338 A (full scale theoretical)
ADC Current Reading Ratio		4.9533 mA / ADC count
Current Sense Error		± 1% Worst Case
PWM to Power Switching Delay	ns	600 (symmetrical for on and off)
Recommended Dead Time	µs	2
Minimum Allowable Dead Time	µs	1 µs (dead time alarm protection)
Signalling		LEDs and 7 Segment Display (fault code reporting)
Torque Off Functionality		Safety Relay Disconnected Removes Power to Power Stage Drivers. 24 V Supply Voltage ± 10% Provided by Driver. 30 mA Typ Safety Relay Coil Current Consumption.
Protections		Short-Circuit Protections, Current Limiting (I <sup>2</sup> t limit alarm), Over Temperature, Undervoltage and Overvoltage, Frequency Protection Alarm, Shot-Through, UMAC Disconnection, Internal Supply Failures, ESD and EMI Protections
Internal Capacitance	µF	7200
Base Plate Temperature (operating)	°C	-10 to 70 (over 50 with derating)
Base Plate Temperature (storage)	°C	-20 to 100
Maximum Humidity (non-condensing)	%	5 to 85
Shock		Shocks in Any Direction of 10 G Peak Acceleration and 10 ms Half Sine Without Damage IEC60068-2-27
Dimensions (excluding heat sink)	mm (in)	165 x 150 x 55 (6.5 x 5.9 x 2.2)



## MOTION CONTROL FOR SEMICONDUCTOR MANUFACTURING EQUIPMENT

The semiconductor industry has some of the most demanding applications in motion control. They require manufacturing and process control equipment designed and built with cutting-edge automation technology providing extreme accuracy and precision combined with high throughput.

By working with experts in the field of motion control, machine and tool makers take advantage of their expertise, and are able to devote engineering resources to the aspects of machine design that provide the highest levels of competitive advantage in their business.



### MEET THE CHALLENGES OF TODAY

- ✓ Accuracy, resolution, throughput
- ✓ Reduce cost of ownership
- ✓ Reduce time to market
- ✓ Keep focus on core engineering and differentials

### CUSTOM SERVO DRIVES HOW IT WORKS

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230  
V<sub>AC</sub>

50  
A<sub>RMS</sub>

15  
kW

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