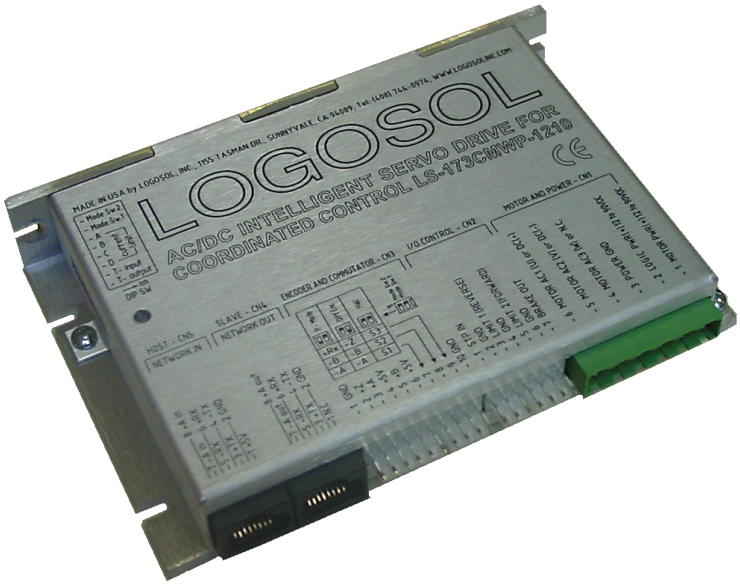
Logosol AC/DC Intelligent Servo Drive for Coordinated Control LS-173CMWP

Doc # 712173011 / Rev. A, 05/07/2010

Features

- **Motors supported:**
  - **Panasonic A and S series**
  - **Brushless 60/120° commutated**
  - **Brush-commutated (DC) motors**
- **Up to 20A peak, 12A continuous output current**
- **12 to 90VDC power supply**
- **Separate motor and logic power supply terminals**
- **Path point buffer for coordinated motion control**
- **30/60/120/240 Hz point rate**
- **32-bit position, velocity, acceleration, 16-bit PID filter gain values**
- **Comprehensive motor output short-circuit protection:**
  - **Output to output**
  - **Output to ground**
  - **Output to power**
- **Adjustable motor current limit**
- **Over/under voltage shutdown**
- **Overheating protection**
- **Hardware Stop Input**
- **Forward and reverse over travel inputs**
- **Communication speed 19.2 - 115.2 KBps**
- **Servo rate 2 kHz**
- **PWM frequency 20 kHz**
- **Command rate up to 1000/sec**
- **Small footprint (5” x 3.3” x 0.85”)**



Description

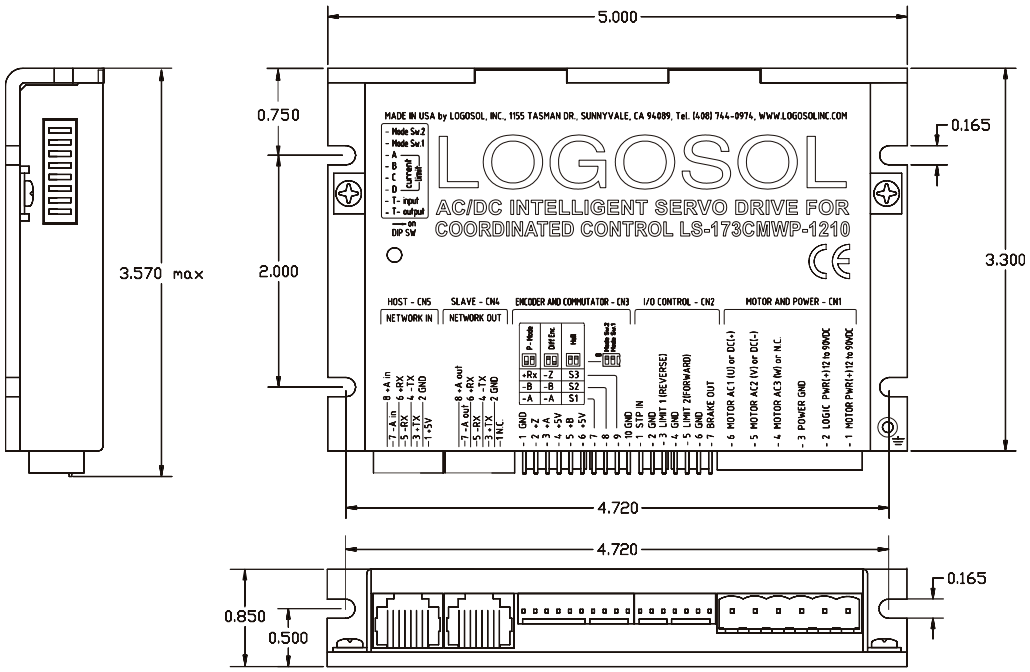
LS-173CMWP is a version of the LS-173CM, with separate motor and logic power supply terminals, and replacement for LS-174WP. Motor power supply can be switched OFF without affecting the encoder reading and device communication. LS-173CMWP is a single-axis motion controller with integrated servo amplifier designed for applications using Panasonic A and S series motors, standard brushless motors and brush-commutated motors up to 1 HP. Trapezoidal brushless motor commutation is performed. Up to 31 intelligent servo drives can be controlled over a multi-drop full duplex RS-485 network in a distributed motion control environment. Standard RJ-45 connectors and commercially available cables are used for daisy chaining of the modules.

LS-173CMWP is equipped with various safety features such as short circuit protection for the motor and amplifier, over travel switch inputs, hardware stop input, over/under voltage shutdown and encoder presence control. The maximum motor output current can be limited by setting of dip-switches or by software.

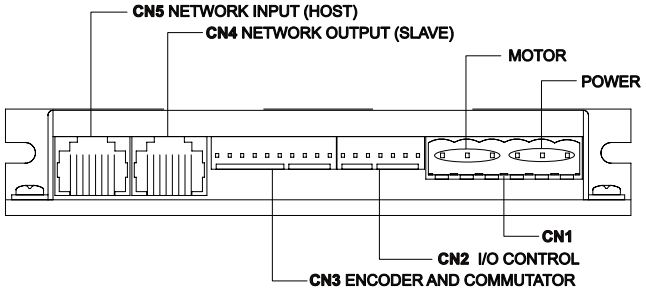
TECHNICAL SPECIFICATIONS rated at 25°C ambient, POWER (+)=60VDC, Load=250μH motor

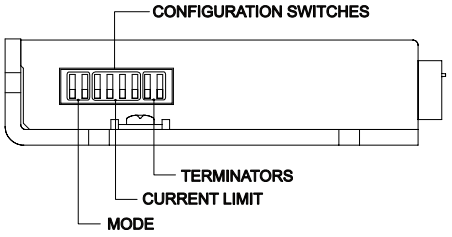
POWER SUPPLY VOLTAGE MOTOR PWR LOGIC PWR	 12 to 90 V DC, 100V Absolute Maximum 12 to 90 V DC, 100V Absolute Maximum
POWER CONSUMPTION (LOGOC PWR)	2.5W at 24V
MAX MOTOR OUTPUT CURRENT LS-173CMWP-1210 Peak / Continuous LS-173CMWP-2010 Peak / Continuous	 12A/8A 20A/12A
MAX MOTOR OUTPUT VOLTAGE	V_{out}= 0.96(POWER (+)) – 0.17(I_{out})
MIN LOAD INDUCTANCE	200μH
PWM SWITCHING FREQUENCY	19,512 KHz
SERVO RATE	0.512 msec
SERIAL BAUD RATE	19.2 – 115.2 Kbps
OPEN COLLECTOR BRAKE OUTPUT Max voltage applied to output Max current	 48V 0.3A
INPUTS Encoder & Commutation Digital Inputs	 TTL with 1K pull-up to 5V LO min=-1V, HI max=48V
ENCODER	Quadrature with index or Panasonic encoder mode
COMMUTATION	Hall sensors 60/120° or Panasonic
INDICATORS Orange Green	 Power 'ok' *(ORANGE and GREEN leds are ON when the Power OK' and the device is not initialized)* Servo 'on'
PROTECTION Short circuit Overheating shut off	 Motor output to motor output Motor output to POWER GND Motor output to POWER (+) Activated at 80°C
FIRE-SAFETY Internal fuse LS-173CMWP-1210 LS-173CMWP-2010	 Quick blow 10A 15A
POWER DISSIPATION (max)	30W
THERMAL REQUIREMENTS Storage temperature range Operating temperature range	 –30 to +85°C 0 to 45°C
MECHANICAL Size Weight	 L=5.00", H=3.30", D=0.85" 0.55lb. (250gr.)
MATING CONNECTORS Power & Motor Inputs & Outputs Encoder & Commutator Communication	 Magnum EM2565-06-VL or Phoenix MSTB2.5/6-ST-5.08 Molex 22-01-3077 housing with 08-50-0114 pins (7 pcs.) Molex 22-01-3107 housing with 08-50-0114 pins (10 pcs.) 8 pin RJ-45

DIMENSIONAL DRAWING



SERVO DRIVE LAYOUT

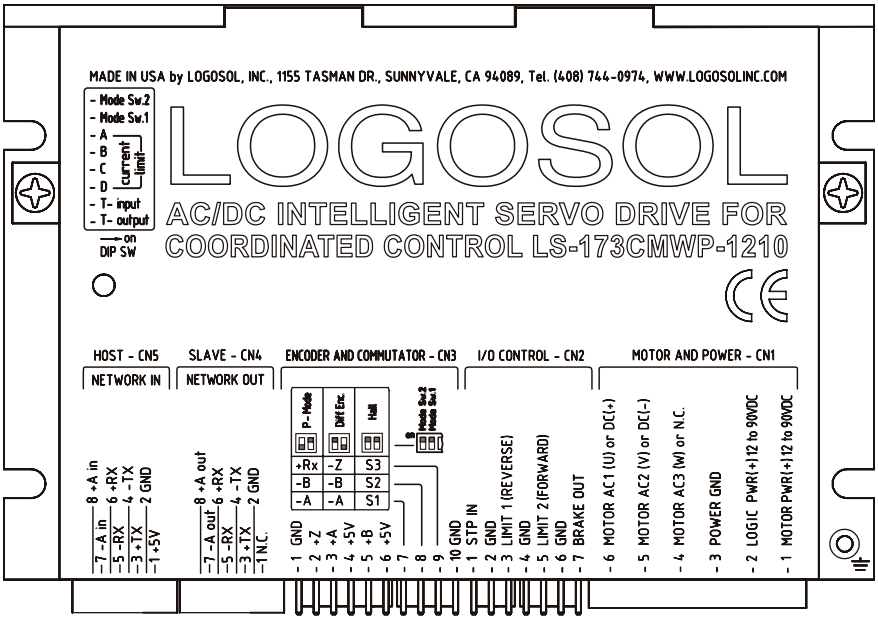




ORDERING GUIDE

PART NUMBER	MODEL	DESCRIPTION
912173053	LS-173CMWP-1210	Intelligent Servo Drive for Coordinated Control 12A/8A /100V
912173054	LS-173CMWP-2010	Intelligent Servo Drive for Coordinated Control 20A/12A /100V
230601004	LS-173-CN	Mating connector kit
230601017	PAN-AS-CN	Mating connector kit for Panasonic A and S series motors
230601027	PAN-ASB-CN	Mating connector kit for Panasonic A and S series motors with brake

CONNECTORS AND PINOUT



DIP SW – DIP SWITCH

SW	SIGNAL	DESCRIPTION	FACTORY SETTING
1	T-output	Transmit line terminator	off
2	T-input	Receive line terminator	off
3	D	Current limit switch	off
4	C	Current limit switch	on
5	B	Current limit switch	on
6	A	Current limit switch	on
7	Mode Sw1	Mode select switch	on
8	Mode Sw2	Mode select switch	on

CN1 – POWER AND MOTOR CONNECTOR

PIN	SIGNAL	DESCRIPTION
1	MOTOR PWR(+) 12 to 90VDC	12 to 90V motor power supply, positive terminal
2	LOGIC PWR(+) 12 to 90VDC	12 to 90V logic power supply, positive terminal
3	POWER GND*	Power supply ground
4	MOTOR AC3 (W) or NC	Output to motor Phase 3 terminal for brushless motors Phase W for Panasonic A and S series motors Not connected for brush motors
5	MOTOR AC2 (V) or DC (-)	Output to motor Phase 2 terminal for brushless motors Phase V for Panasonic A and S series motors Negative terminal for brush motors
6	MOTOR AC1 (U) or DC (+)	Output to motor Phase 1 terminal for brushless motors Phase U for Panasonic A and S series motors Positive terminal for brush motors

* *POWER GND and GND are electrically connected. Drive Case is isolated from drive circuitry and can be grounded externally.*

CN2 – I/O CONTROL

PIN	SIGNAL	DESCRIPTION
1	STP IN	Stop input (disables the drive)
2	GND*	Signal ground
3	LIMIT 1 (REVERSE)	Over travel input
4	GND*	Signal ground
5	LIMIT 2 (FORWARD)	Over travel input
6	GND*	Signal ground
7	BRAKE OUT	Brake output. Open collector output 48V/0.3A

CN3 – ENCODER AND COMMUTATOR

PIN	SIGNAL	DESCRIPTION
1	GND*	Encoder ground
2	+Z	Encoder index
3	+A	Encoder phase A
4	+5V**	Encoder power supply
5	+B	Encoder phase B
6	+5V**	Commutator power supply
7	S1 -A -A	Hall input #1 for Hall mode Encoder phase –A for DC brush motor (differential encoder) Encoder phase –A for Panasonic A and S series motors
8	S2 -B -B	Hall input #2 for Hall mode Encoder phase –B for DC brush motor (differential encoder) Encoder phase –B for Panasonic A and S series motors
9	S3 -Z +RX	Hall input #3 Encoder phase –Z for DC brush motor (differential encoder) Hall data for Panasonic A and S series motors
10	GND*	Commutator ground

CN4 – NETWORK OUT (SLAVE)

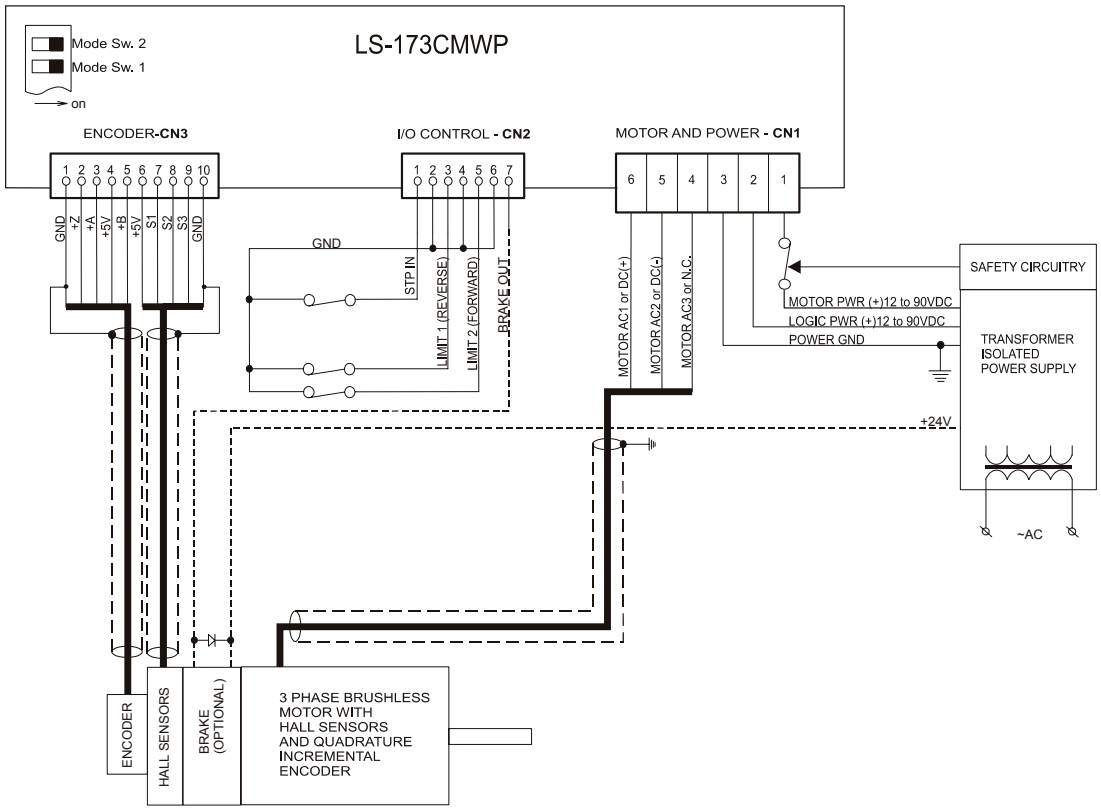
PIN	SIGNAL	DESCRIPTION
1	N.C.	Not connected
2	GND*	Interface ground
3	+TX	(+) Transmit data
4	-TX	(-) Transmit data
5	-RX	(-) Receive data
6	+RX	(+) Receive data
7	-A out	(-) Address output
8	+A out	(+) Address output

CN5 – NETWORK IN (HOST)

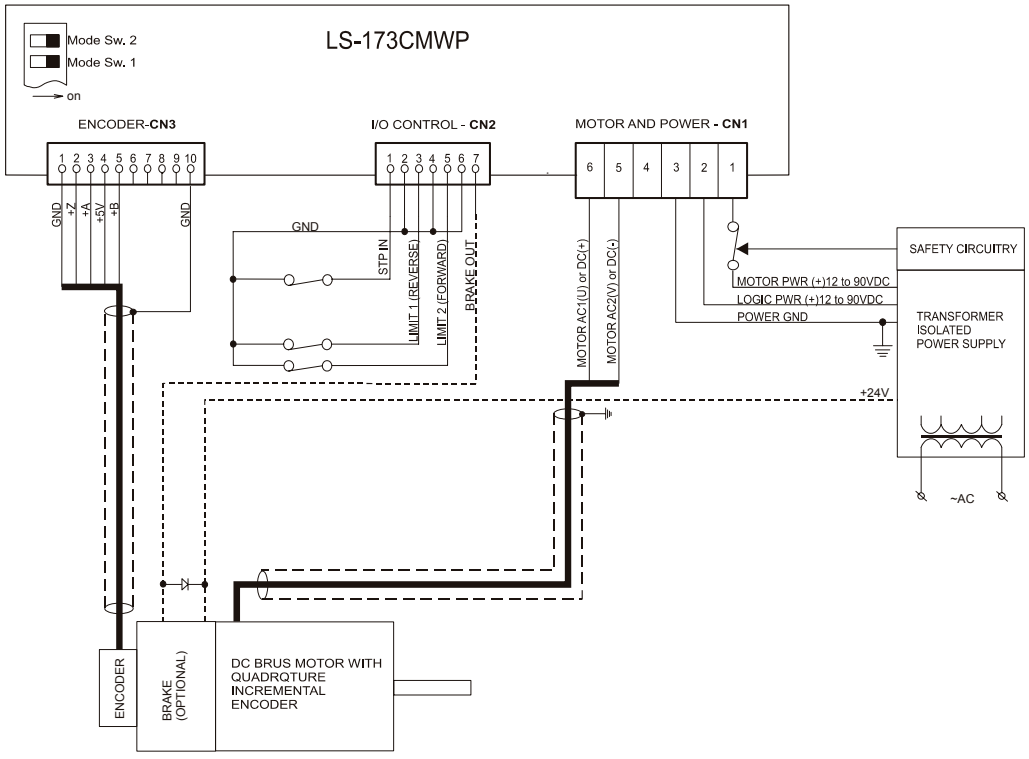
PIN	SIGNAL	DESCRIPTION
1	+5V**	RS-232 adapter power supply
2	GND*	Interface ground
3	+TX	(+) Transmit data
4	-TX	(-) Transmit data
5	-RX	(-) Receive data
6	+RX	(+) Receive data
7	-A in	(-) Address input
8	+A in	(+) Address input

* *POWER GND and GND are electrically connected. Drive Case is isolated from drive circuitry and can be grounded externally.*
***200mA Max current for all three outputs combined.*

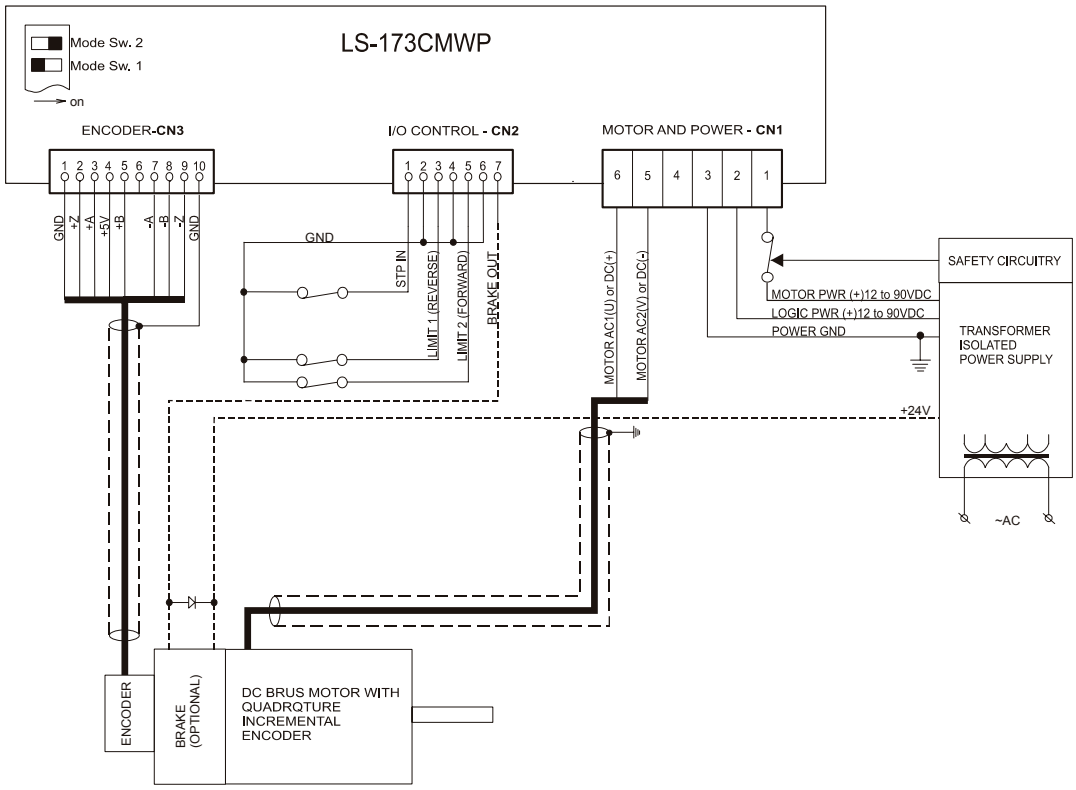
SAMPLE APPLICATION using Brushless motor



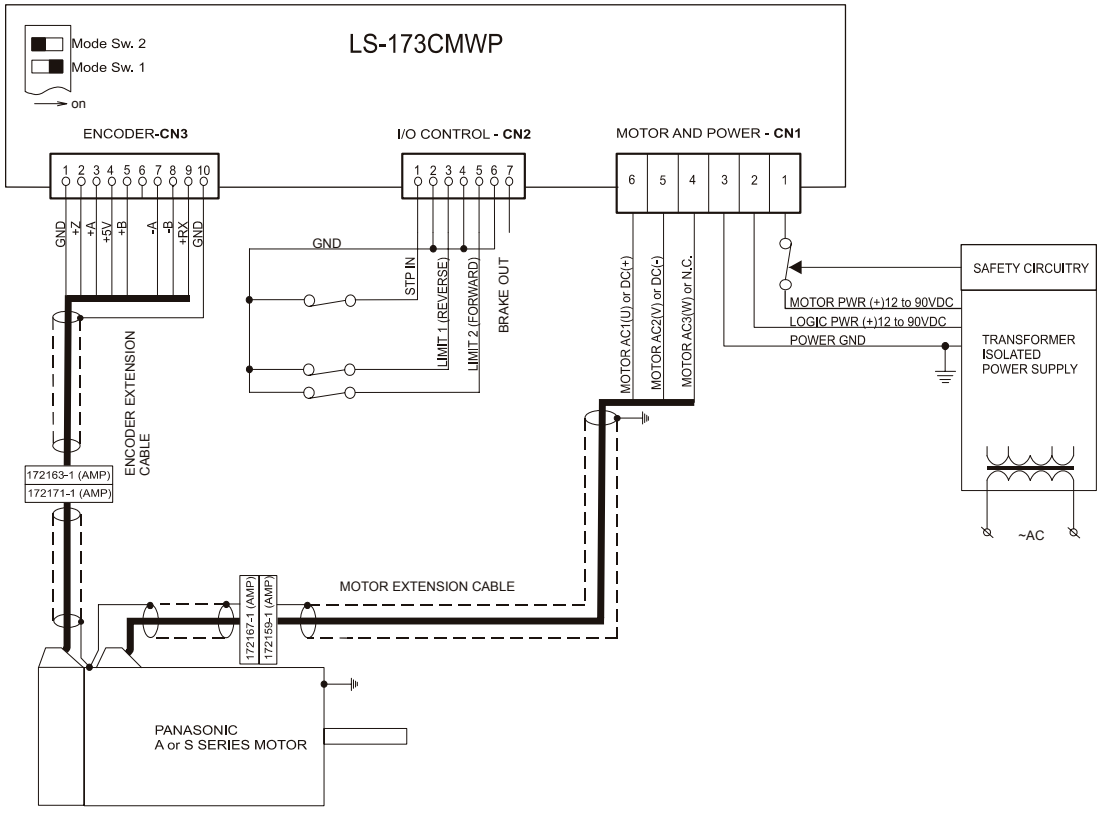
SAMPLE APPLICATION using DC (brush) motor with single eneded encoder



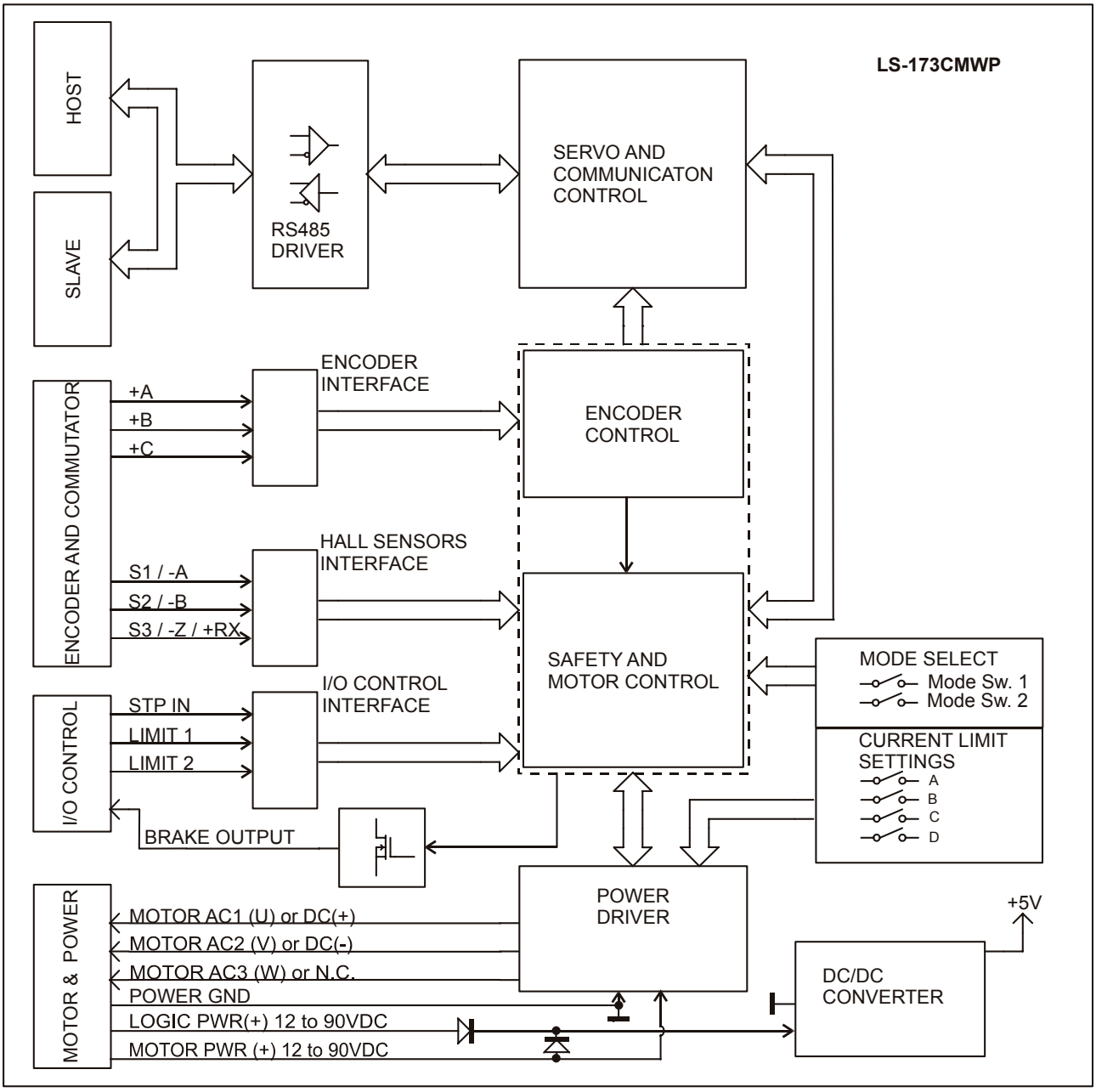
SAMPLE APPLICATION using DC (brush) motor with differential encoder



SAMPLE APPLICATION using Panasonic A or S series motor



LS-173CMWP functional diagram



For addition information regarding:

- Architecture;
- Safety features;
- Theory of operation;
- Commands description;
- Software examples;

Refer to: LS-173CM Intelligent Servo Drive for Coordinated Control.