USL   Ultrasonic Sciences Ltd

SI10 motor controller and PM30 interface

10 axis motion control for DC servo and stepper motors

Interface to encoders, limit switches and other external sensors

PCI control of PM30 Pulser Receiver

The SI10 board is a PCI expansion board designed for control of motors in scanning systems, both for DC servo motors and stepper motors. When used in combination with DC motor servo amplifiers or stepper motor power supplies it provides full software control of motion systems. A joystick interface is included for manual operation of axes.

In addition, it incorporates a controller for the USL PM30 Pulser Receiver, previously unavailable in a PCI format, and PLC / logic interfacing. This combination enables the SI10 to control all relevant functions of ultrasonic scanning systems, from simple 2 axis units up to complex multi-axis systems. When used with a suitable analogue-digital converter board, the PM30 and SI10 will create a full highly specified ultrasonic scanning system .

The new SI10 is designed to replace the SI6 stepper motor indexer board in stepper motor driven scanning systems with up to 10 axes. It also provides DC servo control for scanning systems using DC motors, also for up to 10 axes. For closed loop control it incorporates 10 encoder counters—essential for DC servo control but also desirable in certain stepper motor driven scanners.

Most scanners incorporate limit switches to define "end of travel" limits and the SI10 can read signals from up to 10 of these sensors.

The SI10 offers manual control of scanners through a four joystick interface. This includes switch sensors so that, in systems with more than 4 axes, all the axes can be operated by using the joysticks in conjunction with the selector switches.

In systems using the PM30 Pulser Receiver, the SI10 replaces the UP15 controller board and thus permits control of the PM30 through a PCI interface instead of the previous ISA type.

The SI10 can be used with the USL stepper motor power supplies (SMD04) and the DC servo power supplies (SAD03 and SAD06 types—see picture below), both in 19" rack mount format.

These units all incorporate proprietary filter units to eliminate the possibility of interference to the low level amplified ultrasonic signals.

The SI10 is also compatible with stepper and DC servo drives supplied by external providers, but special precautions may be needed in these cases to avoid noise.

Specification

Format	¾ length PCI board

Stepper motor control

Clock pulse generators	10 off
Pulse length	10 µsecs
Trigger source	PRF generator or software driven source
Output type	Open drain, normally On
Software trigger register	10 bits
Motor direction signals	10 off
Type	Open collector output

DC servo control

Drive enable signals	10 off
Output type	Open drain
Max off state voltage	20V
Maximum On state current	100mA
Power up state	On or Off, link selectable
Control Drivers	10 off
Type	Differential analogue o/p, 10 bit DAC's
Range	0 - 10 V

Encoder counters

Number	10 off
Type	Differential or single ended
Minimum input voltage	+2.2V (logic high)
Maximum Input voltage	+0.8V (logic low)
Resolution	32 bit
Counter latch	10 off
Activation	Rising edge on encoder Z pulse. Other activation signals available.

Limit switch Inputs

Number	20 off
Input	4K7 pull up resistor

PLC I/O

Number	8 in, 8 out
PLC outputs	100 mA open collector drivers
PLC inputs	PC readable opt-isolated inputs

Joystick

No of Controllers	4 off
Resolution	8 bit ADC
Switch sensing	3 inputs with pull up resistors.

PM30 interface

Type	I^2C interface
PRF generator	Included
Power supply	Filtered +12, +5 and –12V