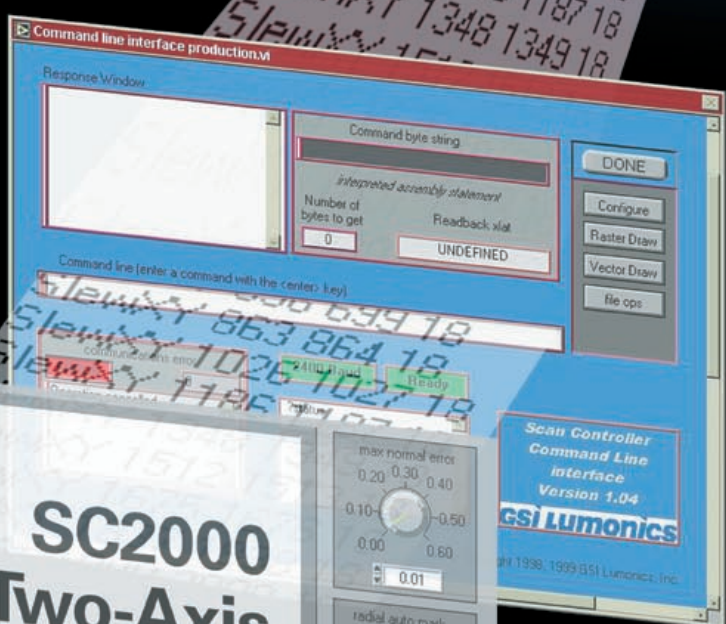SlewXY 116 -115 18
SlewXY 49 50 18
SlewXY 215 216 18
SlewXY 376 377 18
SlewXY 535 536 18
SlewXY 698 699 18
SlewXY 863 864 18
SlewXY 1026 1027 18
SlewXY 1186 1187 18
SlewXY 1348 1349 18

Command line interface production.vi

Response Window

Command byte string

DONE

interpreted assembly statement

Number of
bytes to get   Readback xlat

0   UNDEFINED

Configure

Raster Draw

Vector Draw

file ops

Command line (enter a command with the center key)

SlewXY 863 864 18
SlewXY 1026 1027 18
SlewXY 1186

Ready

Scan Controller
Command Line
interface
Version 1.04

GSI Lumonics

1998, 1999 GSI Lumonicz, Inc.

max normal error

0.20 0.30 0.40

0.10   0.50

0.00   0.60

0.01

radial auto mark

0.400 0.600

0.200   0.800

0.010   1.000

0.0710

no repeat   restart

segment visibility

Show

done

SC2000
Two-Axis
Scan
Controller

-0.2   0.0   0.2   0.4   0.6   0.8   1.0

1.01   1.05

SC2000
Two-Axis
Scan
Controller

GSI Lumonics

The SC2000 Scan Controller gives you the means to both develop and deploy fully-optimized motion control for optical scanners, using a single hardware platform and a choice of programming environments. You'll develop your products more efficiently, and get to market faster and more cost effectively than ever before.

MOTION CON

Optimized for Optical Scanning

The SC2000 provides specific features for optical scanner motion control, to optimize cost, size and performance.

Embedded DSP control architecture, with serial PC link

* PC used for SC2000 program development/downloading, and scanner sub-system monitoring (optional)
* PC optionally used for direct control of scanners (@1.6K vectors/second) over serial link
* DSP generates scanner position commands from downloaded program at fast 43 KHz rate
* distributed architecture eliminates dependence on PC for real-time control, and avoids compatibility problems with different PC motherboards and operating systems

On-board 128K RAM and 384K flash memory

* holds one large, or up to 256 smaller scanner control programs

Two (2) filtered 16-bit D/A converters

* feeds up to 2 MiniSAX analog scanner servos without causing any scanner jitter

Twelve (12) high-speed synchronization I/O ports

* links scanner control to other system elements (e.g. lasers, sensors, etc.)
* synchronizes to scanner command-update events with sub-microsecond repeatability

Small, single-board, affordable hardware package

* fits easily into a small scanning subsystem
* priced for OEM machine manufacturer

### Firmware support of scanner-specific command line instruction set

* high-level, flexible command line language
* easy vector and raster motion programming with full X-and Y-axis synchronization
* specialty functions including pixel clock output, position verification, conditional execution
* new functions added continuously; PC link used for firmware updates
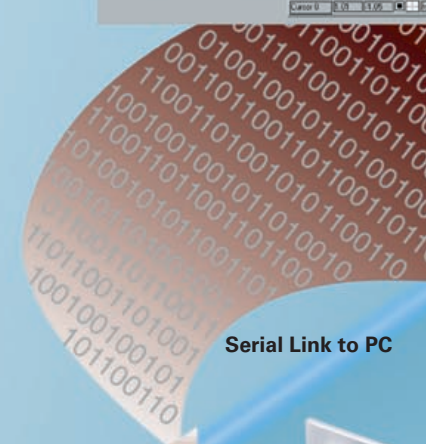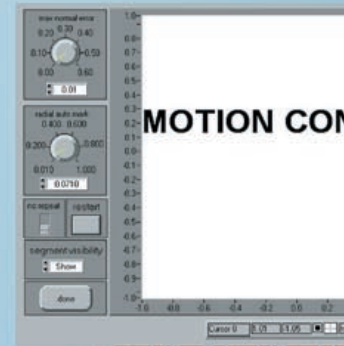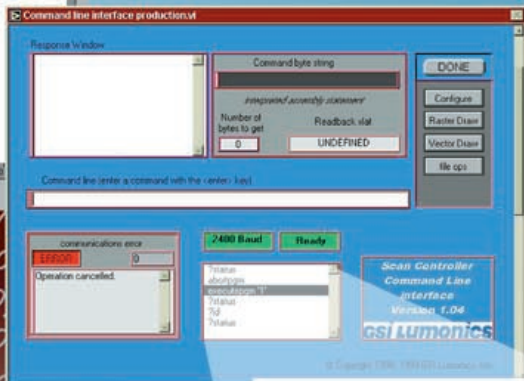
Serial Link to PC

SC2000 Two-Axis Scan Controller
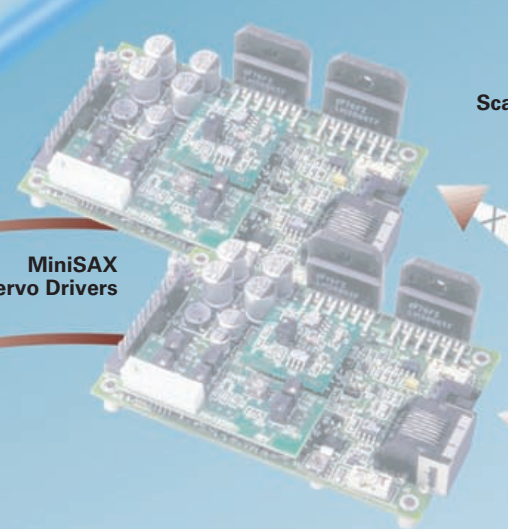
MiniSAX Servo Drivers

VM2000 Optical Scanners

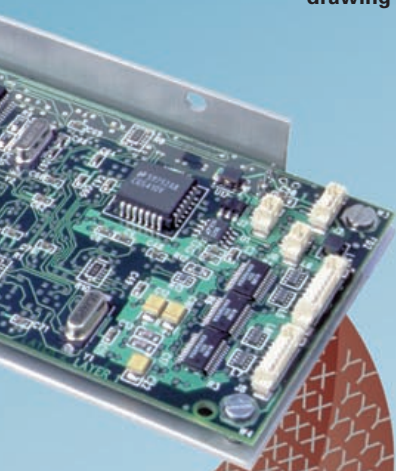# SCANNER MOTION CONTROL

```
unsetsync 1
slewxy 1000 0 15
setsync 1
slewxy 10000 -10000 37
slewxy 9362 -10000 27
```

Portion of program for drawing letter "L"

An Intelligent Development Tool to Start

The SC2000 comes with a choice of PC host programming software to easily develop the scanner control programs, for immediate downloading or integrating with other system software. Each programming environment is based on the SC2000's command line language whose English language commands and binary equivalents are fully documented.

Command Line Interface
* stand-alone application
* immediate mode, for downloading and executing scan vectors directly from PC
* building mode, for composing complete programs to download and execute
* graphical mode, for drawing a scan pattern that is converted into string of program statements

Visual Basic™
* Active X component for assembly of the SC2000 command line language
* simple integration of SC2000 into system-wide program

LabView™
* LabView driver VIs provided for each of the SC2000's high-level commands
* can be used with multitude of other instruments supported by LabView

PC-Linked or Stand-Alone Operation

After program development is complete, the SC2000 can either remain linked to the PC for further host interaction, or run a program on a completely stand-alone basis. In either case, the high-speed sync I/O channels can be used to control the downloaded scanner programs and coordinate them with other system events.

PC-Linked
* enables fast (@1.6K vectors/second) downloading of programs or direct command execution
* enables downloading of new program while another is running (ping-ponging), eliminating download delay
* provides ability to run unlimited new programs.
* enables monitoring of scanner subsystem by PC

Stand-Alone
* runs the pre-loaded programs at maximum speed
* eliminates cost and packaging of an under-utilized PC after program development is complete

Features

- Commands 2 MiniSAX analog scanner servos with low-noise 16-bit D/A output.
- Runs with or without serial PC link using embedded DSP control and on-board memory.
- Includes high-level control language software with Command Line Interface, Visual Basic™ and LabView™ development tools.
- Integrates into whole system using 12 high-speed sync I/O's.

SC2000 Two-Axis Scan Controller Specifications

Dual MiniSAX Servo-compatible Interfaces	• 2 position-command D/A outputs, ±3V, 16-bit, 2 LSB typ. non-linearity • 16-bit position-feedback A/D • Servo enable and status interlock
External Sync I/O System Interface	• 8 TTL-compatible inputs • 4 open-drain digital outputs • 4 auxiliary analog inputs (12-bit)
On-Board DSP Control	• 43 KHz scanner-command update rate • 128K RAM, 384K flash memory • sub-microsecond repeatability of sync I/O to command update events • Flexible firmware instruction set, optimized for scanner-based system control
PC Programming Interface	• RS232 (2400 to 115K Baud, 1.6K scanner vectors/second) • Other links possible – contact factory
PC-Resident Development Software	• Windows-based Command Line Interface • Visual Basic™ drivers • LabView™ drivers
Power Requirement	• ±12V to ±25V

Cables Available	• Power cable
	• Serial link cable to PC
	• Sync I/O cable
	• Output cable to MiniSAX scanner servo
	  -with servo-enable control
	  -without servo-enable control

Software	• Single CDROM
	  -Command Line Interface
	  -LabView™ Driver
	  -Visual Basic™ Driver
	  -Product Manual

SC2000 Outline
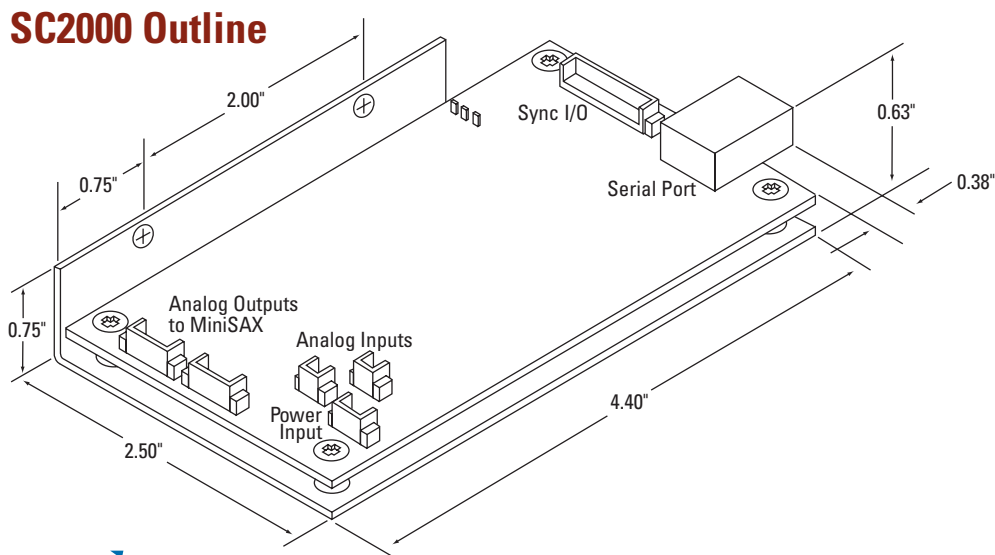
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