

HOLO-SPECTRA INC.

20 Years of Laser and Holographic Services

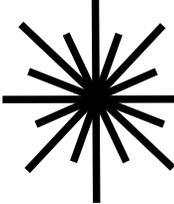
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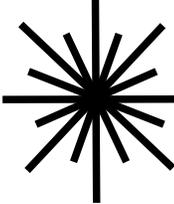
SpectraScan II AccentTM
Next Generation 32-Bit
Laser Scanning/Marking Software
& Control System



SpectraScan II

by Holo-Spectra

The *SpectraScan II AccentTM* is a versatile laser scanning control system designed for 2-axis pre-objective and 3-axis (that is X, Y, and focus) post-objective scanning configurations. It works with General Scanning and Cambridge scanners and amplifiers under the control of our advanced *AccentTM* Windows software. This environment includes the *QuadMod32 Laser Computer* on a board. The software and board run in a standard PC Windows computer under the 32-bit Operating Systems Win95 or NT. The system supports continuously variable laser power intensity modulation, Q-Switch control, shutters, and a tracer visible laser diode for path visualization. The *QuadMod32 Laser Computer* has several 16-bit and 8-bit D/A outputs for these functions as well as 16 bits of TTL logic that can be programmed for external control synchronization with parts handling equipment. With the use of different modules, image input can be accomplished with drawing tools, mouse drawing, digitizing tablets, video cameras, scanners, and computer file converters. Font support, step-and-repeat, runtime bin marking variations, operator parts database interface, and multiple marking objects are some of the features supported. This is very advanced software integrating the ease of use of Win95 interface features, Access databases, and OLE capabilities. This means that manufacturers can deeply integrate marking work functions with their systemwide enterprise computing or on-floor automated production systems.



SpectraScan II

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***SpectraScan II Accent™* consists of the following elements:**

SpectraScan II Accent™ Control Software and Support Modules

It may include the following dependent on application.

LaserDesigner Image Creation and Editing Module

AccentProLase Microsoft Access Database Parts Interface

Visio OLE Drawing Module

LD Converter for Corel, AutoCad, etc. Auto File Conversion

AccentRastaMan Raster Scan Utilities

QuadMod 32 Microprocessor Scan Computer Board with 68030 on board, minimum of 4MB RAM, ROM with LaserCommand API, 16-bit primary D/A outputs for scanner amplifiers, multiple 16 and 8-bit D/A outputs for laser power, duty-cycle, Q-switch modulation, etc, and TTL signals for blanking and shutter, and 16 bits of IO for process control.

***SpectraScan II Accent™* is intended for use in the following Laser Marking Applications:**

OEM Marking Systems or Laser Scanner Control

Control Modules for Marking Equipment Manufacturers

Retrofit Upgrades for all Previous Scanner-Based Systems using

General Scanning or Cambridge scanners and industry standard laser electronics

SPECTRASCAN II ACCENT™

TECHNICAL SPECIFICATIONS

SYSTEM FEATURES

Output channels: X (horizontal), Y (vertical) at 16 bits of resolution (optional Z (depth) at 12 bits for specialized applications). Six 8-bit auxiliary color coded channels. One 8-bit Beam Intensity channel. TTL-level blanking and visible signals; TTL-level shutter control. Sixteen TTL-level outputs and inputs for controlling or detecting external devices.

Resolution:

Frame creation: 13.96-bit resolution for drawing and editing (16,000 x 16,000 grid)

Internal processing: 32- or 64-bit resolution to eliminate round-off error.

Digital-to-analog outputs: Outputs X and Y signals at full 16-bit resolution (65,536 x 65,536).

Marking Image Mode: Hybrid Vector/Point Storage Format

Points per frame: Variable on frame-by-frame basis; 3000 maximum.

Max. frames on-line: This depends on the amount of *QuadMod32* memory and the total points in all frames. A standard 4MB *QM32* board can hold about 750 500-point frames; a 16MB card holds about 4000 frames. (These figures are for traditional point-oriented frames. You can hold three times as many vector-oriented frames, on average.)

Max. frames floppy: Approx. 350 500-point frames per 1.44 MB 3.5" floppy disk. Note that loading frames off floppy disk or hard drive does not interfere with display.

Max. frames hard drive: Limited only by hard drive space. Each megabyte can store about 250 500-point frames.

Max. tracks: 8 tracks standard in Access control screen. Custom systems that need to vector to hundreds of differing images in realtime can be accommodated.

Displayable pts: 8192 total per projector (all

frames in all tracks should not exceed 8192).

Point output rate: 32 points per second to 50,000 pps. System easily handles ILDA test pattern tuning speeds of 12,000, 24,000 and 36,000 points per second.

Frame output rate: 2.6 to 100 frames/second (500-point frames) typical.

EXTERNAL HARDWARE

Computer required: An IBM-PC compatible running Microsoft Windows95 or higher with ISA (AT-style) or EISA bus slots. Like all Windows programs, screen graphics draw faster on better computers. For this reason, we recommend a relatively fast Windows system such as a 486 or 586 with a video accelerator card or local bus video. If a lot of editing is involved in your work then a 17" color monitor is recommended.

Board required: One *QuadMod32* board, which is included with each Accent system. See *QuadMod32* section below for detailed description.

Genlock option: To hand-trace a live or taped video image, use a high-quality VGA scan converter/genlock such as Digital Vision's *TelevEyesPro* (approx. \$600, call 617/329-5400).

Note: Because these images are genlocked (overlaid) and not digitized, they cannot be autotraced.

Scanners supported: Any standard laser marking system with galvanometer scanners (General Scanning, Cambridge Technology, or equivalent) and analog or digital scanner amplifiers.

External controls: Wide variety of inputs and outputs. The *QuadMod32* provides eight TTL-level inputs and eight outputs through a DB-25 connector.

FRAME CREATION CAPABILITES FROM VARIOUS MODULES

Input devices: Mouse or digitizing tablet. At this time, tablets must have a Windows mouse emulation driver; the tablet is not yet read directly. Trace over camera or VCR video using optional genlock hardware (see above). Trace over bitmaps by hand or using AutoTrace (see below).

AutoTrace (RTV): Raster-to-vector conversion is built-in. Any Windows bitmap (.BMP format) file can be used as a background for Drawing Window. This bitmap can be hand-traced or AutoTraced. AutoTrace adjustable parameters include line density, corner density, and corner detection sensitivity. No special hand scanner or separate program is needed for raster-to-vector conversion. Scanned artwork may need to be cleaned up and simplified in a paint program if AutoTrace is to be used.

LD Converter: Module hosts OLE based drawing programs and automates the conversion of computer vector formats into marking objects. For example, Corel Draw and AutoCad files can be used.

Drawing tools: Single point, continuous draw, line, rectangle, polygon, circle, ellipse, paint roller, brush, gridding, clear screen, redraw screen. All with user-controllable automatic blanking, anchor points, and point spacing.

Editing tools: Edit entire frame or selected regions. Rotate, resize, flip, flop, move, smooth, center, freeze, snap to grid. Lock axes. Renumber frame to have different number of points. Six levels of undo. Eliminate blanking jumps automatically. Save frames with 23-character descriptions.

Frame tools: Various tools including: copy all points, copy selected points, copy block of frames, append frames.

Color tools: RGB color system with up to 256 different colors in any one frame. The colors are chosen from a total of 16.7 million colors available on the monitor. Color settings can be loaded and saved. Laser marking system can interpret color information in different ways primarily as a change of scan speed for finessing marked output.

Intensity Brush: Draw using variable line thickness. This is interpreted by Accent as laser power variations for finessing marked output.

Vector-orientation: Can convert point-oriented frames to vector-oriented. Then only the endpoints of lines are stored. At output time, the frame is marked optimally with your chosen parameters. This usually results in better-looking and more versatile marks, which also take less memory and hard drive space to store.

Drawing window: Resizable, movable Drawing Window. Eight levels of magnification. Three different viewing modes (points, lines, points + lines). Onion-skin mode for comparing or tracing existing frames.

Text and typefaces: Twenty different outline fonts, five different stick/script fonts. Adjustable letterspacing, linespacing, character height and width. Automatically anchors corners and sharp angles (example: bottom of "V"). Custom fonts can be made using optional program.

Special Data Types: Special types that are optionally available are incremental number, date/time, and bin variant. These can be set to change interactively for marking output dependent on conditions. For example, different part measurements may signal different TTL words for a change in the marking pattern.

QuadMod32 COMPUTER BOARD

Description: The *QuadMod32* is a four-layer computer with a 40 MHz Motorola 68030 microprocessor, and 4 or 16 MB of memory.

QuadMod memory: 4 MB of memory is standard; this provides approximately 750 500-point frames which are instantly available. The 4MB can be replaced with higher density SIMM memory to give 16MB; this provides approximately 4000 500-point frames.

Output voltages: X, Y, Z (optional); -5 to +5 VDC. Other analogue signals, 0 to 5 VDC. Blanking, visible and shutter TTL-level outputs. Sixteen TTL-level I/O lines, programmable as inputs or outputs. Usually configured as 8 inputs and 8 outputs.

Connector: 50-pin IDC male connector on the *QM32* board. There is a ribbon cable adapter which terminates in two more common connectors: a DB-25 female (parallel-port type) for scanner signals, and a DB-25 male for TTL I/O lines.

SPECTRASCAN II ACCENT™ FOR WINDOWS SYSTEM CONTROL FEATURES

SYSTEM FEATURES

Output configurations: Output can be channeled through a serial port for General Scanning DE Command format, parallel port for digital output to General Scanning DSC format bus, or 16-bit analogue output for scan amps such as Cambridge Technology's or General Scanning. Additional analogue outputs are available for laser intensity modulation, Q-Switch control, laser duty cycle, or other hardware control functions. Multiple TTL IO ports are available for event-based variations in scanning, shutter control, trace laser control, and other interactive programming.

Project Format: Projects can be created, saved, and opened with the information of all scan parameters, individual component images, converted scan commands, DE correction tables (when using a GS DSC system), and project descriptions. Defined projects can be assigned to database stored parts in their unique configurations. An Operator Window allows marking sessions based only on these stored parts with automated parts counting and scan time estimates. This Operator Window can be password protected from all the editing windows. Working sessions are also stored in Access databases.

Marking Input: Using images, text, and other input formats taken from the LaserDesigner creation program, OLE draw programs, or converted computer files, up to 8 tracks of graphic input can be prepared for output in one marking project. Using a coded color, one of these tracks can represent the unique shape of the scan field or part to be marked. This can be scanned by the Trace Laser for verification of optical alignment. These tracks can be manipulated independently in the following ways: made active or inactive in the current marking scan, resized, moved, rotated, flipped, flopped, or renumbered for higher or lower point density.

View port: A view window shows all output for all tracks. For ease of editing, specific tracks can be made invisible. View telescoping up to 128X and panning is easily used. For positioning accuracy,

grids can be turned on. Screen measurements can be in coordinate units, inches, or centimeters. Software will calibrate the viewing window in the actual marking field dimensions based on the marking system's physical parameters. Dimension tool will indicate exact distances between field edges, separate marks, or intra-mark. Position output indicators show current cursor location and range of viewport on-screen.

Editing Tools:

Center: Automatically centers active tracks in the marking field.

Renumber: Renumbers a track for less or more composite points. Effects scanning speed and output accuracy.

Move: Positions active tracks in the scan field. Can be done by mouse, slider, or exact distance.

Rotate: Angulates active tracks in the scan field. Can be done by mouse, slider, or actual degrees.

Resize: Shrinks or enlargens active track images in the scan field. Can be done by mouse, slider, or actual percent change desired.

Flip: Inverts image about any defined Y-parallel axis.

Flop: Inverts image about any defined X-parallel axis.

Dimension: Mouse driven ruler showing distance between clicked points in the scan field.

Select: Tool for selective choice of small area of total image for application of other tools.

Undo: Permits reversion to previous state.

Marking Speed Control: Input window sets the base scan speed. Using discrete location tools, percentage variations in scan delays or local speed changes can be introduced providing finesse in marking quality.

Laser Intensity Control: Using Select tool, percentage variations in laser output power can be introduced in any area of a mark providing finesse in marking quality. Input window sets base laser power.

Step-and-Repeat Mark Formations: Simple user interface takes a single marking combination and assists in the creation of a repeated array of the marks. Spacings are easily entered and single groupings can be deleted or shifted in relative position.

Bin Mark Variations: 3 IO lines can carry the realtime information for 8 pre-assigned variations in a single marking track while other marking information remains constant.

Parts Handling Interface: Using an exceptionally easy interface, descriptive phrases are assigned to specific IO TTL lines. Then, using AND and OR logical connectors, you define conditions for mark initiation. Signals are available during marking and at completion of a mark cycle.

Laser Operating Parameters: Supports CO₂ or YAG systems with Q-Switches, duty-cycles, etc. Laser blanking delay is available.

Error Compensation: GridGen calculations are made for General Scanning DE format. Based on physical scan configurations, corrections can be made to X and Y coordinates and a variable focus correction calculated. For pre-objective systems, custom correction algorithms can be implemented.

Trace Laser: Control signals are available for a visible diode trace laser which can be used during marking, pre-mark, or for alignment.

Scan Trigger: Marking can be triggered by a screen button, external events, or clocked output. Interlocks or external device states can be part of this loop. Continuous marking with parts counts and input to session databases is supported.

Screen Display: Status messages, project name, output format, and total active point information is available on screen. Other windows show project descriptions, DE command listings, physical layout, and actual elapsed marking time and number of parts marked for complete job estimating.

USER HELP

Installation manual: Booklet describing installation and initial setup.

Help files: On-line help, instantly accessible while working in the programs. Standard Windows-type help files. Click on hypertext or pictures to jump to desired information. In-depth and fully cross-indexed.

Monitor Screens: Windows are available for monitoring LD QM32 commands, serial port and parallel port activity.