PRODUCT PROFILE

WINCAT SERIES 100, 150, and 200 SYSTEMS

Including "CAT," "MiniCAT," "LapCAT", and Upgrades.

New levels of performance, power and capability have been designed into GHI's PC based systems for transient waveform capture and analysis. CAT (Computer Aided Testing) Systems with workstation power can quickly and economically meet customer needs for shock and vibration data measurement and analysis ***right out of the box. No user programming is needed***.

WinCAT is based on the unique transient recorder design to provide the user unparalleled ability to capture high frequency, single occurrence signals ("transients"), at high resolution. While this short duration signal capability is key for applications such as pyro shock response spectrum and time domain shock machine waveform analysis, in other applications needing long recording times the transient recorder also works well. This makes spectrum analysis of multi-channel data possible. These basic modes are augmented by repetitive recording and save to disk modes used for ensemble averaged spectra, as well as averaged and "statistical" SRS's.

The unique capabilities of the transient recorder make it stand alone when it comes to capturing and analyzing high frequency events such as shock waveforms or non-stationary data such as seismic "BellCor" testing. At the same time, the extended recording time of the WinCAT system supports applications that overlap the role of usually less flexible Data Acquisition (DAQ) Systems.

The WinCAT now utilizes a newly designed PCI card for the fast emerging PCI computer bus standard. As in the past, this product was designed by the innovators of the CAT hardware and software systems - GHI SYSTEMS delivered the first of a line of high performance "TRIAD" CAT systems in 1979, more than a year before the IBM PC was unveiled, and more than 9 years before late coming competitors recognized the power of the CAT concept. Hundreds of GHI's three generations of systems are currently in use by the world's leading companies and institutions. As a recognized leader in CAT transient and dynamic mechanical testing hardware and software, GHI continues to set standards for excellence through the introduction of the WinCAT with PCI hardware.

With the introduction of our forth generation product, WinCAT, a Windows* based product, GHI Systems once again brings the user the state-of-the-art. The new WinCAT competes with other products at both the hardware and software levels. Software features include true high speed channel to channel multiplexing (MUX), control of sampling speeds, gain ranges, pretrigger ratios, digital filtering, integrations, and a full range of formats for output media. All features are built into application specific software that focus the hardware components to the specific task. Comparisons between WinCAT and other products proves that the values offered produce productivity gains. It is quickly recognized that WinCAT is the most accurate and advanced. With it's integrated hardware and application specific software, it offers the features you need for tomorrow's upward growth.

From day one, GHI sensed the need for fully integrated Turn-Key products that require *no user programming skills whatsoever*. Over the intervening years, GHI has received customer feedback on changing needs, desirable special features and performance requirements, all of which have been integrated into the CAT concept to make it very user friendly.

up date

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"EASY CAT" should be the name of the product.

. GHI adopted this solutions oriented policy in 1979 and continues to deliver fully integrated products. This policy has helped our customers get their jobs done easily, *accurately, on time, and on budget*. GHI also offers integrated hardware and software products for customer installation in existing PC equipment.

The following describes the unique features of the GHI Series 100-200 Systems.

GHI Designs and Produces all Hardware and Software. All hardware and software for the WinCAT are designed and manufactured by GHI Systems to operate efficiently together. The WinCAT is the culmination of *21 years* of successful customer installation experience of previous products. We do not sell third party A/D cards or modified software. *GHI is therefore better able to provide solutions that meet the broadest range of customer requirements.*.

GHI Personnel are Specialists in Data Acquisition. Because of this, our unique PCI card and integrated software incorporate design features not found in the typical DAQ product. These features, all controlled through software by the user, optimizing the accuracy of your system. GHI Also provides a certificate of calibration accuracy that is traceable to NIST. *This gives the user the highest confidence in data integrity.*

User selectable front end gain and digitizing rate settings. Systems that do not have fully programmable A/D functions fail to reach accuracies needed. Generally, they do not have computer controlled setting ability for digitizing rate and input signal gain ranges. Because of this limitation, some vendors 'stretch' the digitized data vertically in order to fill the plot screen. This does not take full advantage of the quantizing range of the A/D converter and hence reduces resolution and accuracy. *GHI hardware produces higher accuracy results.*

WinCAT is Based on a True High Sample Rate "Transient Recorder.". It is universally understood in the testing community that the best hardware approach for capturing single occurrence signals is through the use of a transient recorder. This is because the transient recorder provides several function that enhance the accuracy of the data and the ease of use. The following lists some of these functions:

High digitizing speed. Digitizes at 10 times the highest frequency of the captured signal which guarantees *no greater than 5% peak amplitude error.*

Pre-trigger recording. Captures the 0 level of the excitation before the trigger event for later waveform scaling and for baseline amplitude correction. Also used to capture information before and after the trigger event.

True Trigger Digital From Signal. Accurately captures the signal when it exceeds the user defined threshold- in engineering units. It does this by comparison of the digitized data values against the digital trigger value set by the user. *Invaluable* for shock testing or when streaming field data from road tests.

Fast Multi-channel Multiplexing. Efficient design switches between input channels, one sample at a time, through common gain, offset, and A/D electronics. Other card systems can only digitize the full time record from one channel at a time before accepting data from any other. Channel to channel MUX time for the WinCAT is the reciprocal of the sample rate and number of channels selected - *as short as 1 microsecond!*

Recirculating Sample Memory. User selects digitizing speed or record length time. Writing to memory starts with user clicking on the Record Button ICON. When the signal exceeds the trigger threshold, pretrigger countdown continues the A/D function until the number of samples specified by the user have been captured. This is written directly to the PC RAM. The contents of RAM is then *displayed as a time history waveform and is scaled in engineering units.*

The net effect of the above can be visualized in a example of a shock machine test. Once the trigger amplitude and pretrigger settings are "TRUE" the recording is initialized, data is digitized and written to the transient recirculating RAM. Then the time duration of data, as selected by the user, is displayed on the screen. The shock pulse will be positioned mid-screen vertically and horizontally at a grid location equal to the pretrigger value. This display is seen in the figure below. No searching of long data files as produced by typical 'data acquisition' systems is needed with a transient recording.

At this point, the user may use any of the editing functions to expand, digitally filter, or scale the data in terms of peak amplitude, velocity change integral, time duration, etc.. When editing and analysis of the time domain are completed, a report can be printed (including generating electronic formats such at RTF or PDF), the user may elect to process the waveform with one of several optional analysis packages offered.

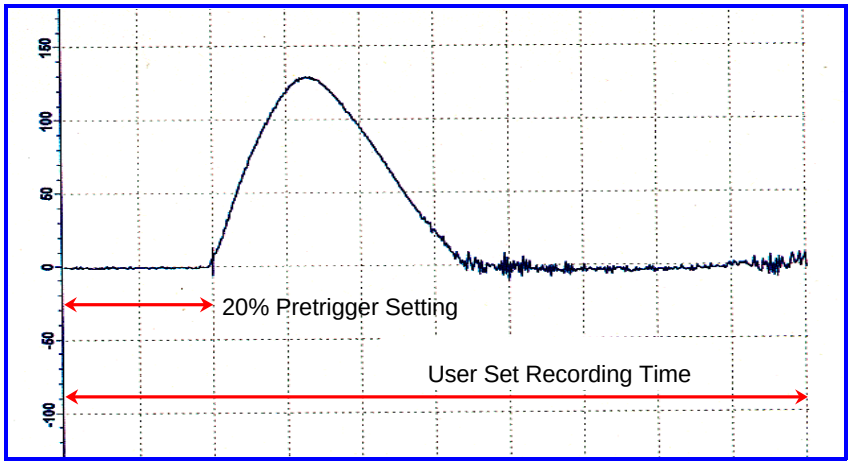

Figure 1. Typical transient recorder plot. The pretrigger setting of 20% places the pulse at the 20% of time grid line. Fast digitizing and gain functions have resolved the plot in true fidelity. This is a 3.2ms, 130g shock machine pulse. The pulse appears on the screen at the user selected points. There is no need to scan through long memories in order to find and analyze a single short duration event. Also, if multiple channels had be recorded, they could be co plotted on the screen at the same time reference.

The GHI WinCAT utilizes a large number of Windows functions to make your job easier. The following table lists just a few of the Windows functions with which the WinCAT *is compatible*.

Copy Screens to **Windows Clipboard** and *Paste to wordprocessor reports.*

Compatible with all installed printers, black/white/laser, on *your Windows based system.*

Export ASCII files for *upload* to other Windows tools. *To floppy, hard disk or printable file.*

Several methods of generating electronic test reports for E-Mail:.*PDF*, RTF, JPEG, BMP and GIFF.*

Extended Windows file name *management.*

Report design manager; *Change Titles, Fonts, Edit Fields, Place Tags on Waveforms for reports, change colors.*

Print Preview *On Screen, with Zooms. WYSIWYG.*

Tool Bar for waveform editing and optional *analysis programs. Yellow flags tell what the Tool will do, no Guessing.*

Pull-down menus for all functions for finer function selection.

* PDF using customer supplied Adobe Acrobat Distiller installed on host computer.

SYSTEM OVERVIEW WinCAT PRODUCTS

The WinCAT provides computer aided testing capability in a full PCI Bus PC and Pentium, or similar environment. The powerful WinCAT software is designed for high resolution Super VGA displays providing the graphics power of a Workstation.

Combined with a fast, high capacity hard disk, expansion RAM, network card and any Windows compatible printer -color or monochrome, a WinCAT based PC is ready to support a full range of lab computer applications.

WinCAT's capability can be utilized now with Windows '95 and '98, and in the near future on NT 4.0 and Millennium.

Compatible LANs, communications modems, as well as other Windows© Compatible software products may be added to implement connectivity or add overall laboratory or company capability.

In order to insure optimum performance for the PCI based WinCAT, PC must be at least 160MHz.

WinCAT FEATURES

Keyboard vs mouse. The WinCAT uses a mouse for the same reason most major Windows compatible programs do. However, a mouse can not replace a keyboard completely as many programs need user input for characters and numbers and the mouse is very inefficient at this. In addition, where mouse real estate is limited, WinCAT supports the ALT[KEY] mode of operation on important and repetitive functions, as well as direct keyboard input for setup, test report comments, etc. The ALT[KEY] functions are defined on the Pull Down Menus.

Print Spooler & Test Report Job Queue To overcome printer slowness when outputting test reports, WinCAT takes advantage of the Windows print spooler and job queue function. During rapid fire testing, several reports, to be printed on the local printer, may be in the Windows print queue at one time, depending on PC Memory.

The Print Spooler accepts one or more full test reports (even in color), and places them in the Printer Queue. This takes place in the background, taking only a second or two after which the computer is fully available for the next task. Numerous reports can be routed to the printer while testing/analysis continues.

New PCI Card Recording Modes.

Partitioned memory mode. In addition to full recording memory lengths, WinCAT 100, 150 and 200 Systems can partition the full length memory into short 2KB record lengths. 64 each 2KB recordings take the same disk space as one 128KB file. The 110-04 'MiniCAT' System provides 16 each 2 KB partitions.

Increased maximum record lengths. The PCI card software replaces digital hardware with on-board RAM using instead PC RAM, making it possible to extend transient record lengths beyond 128KB. Software flags adjust the various display and analysis functions to accommodate the vastly greater amount of data. WinCAT provides scrolling such that portions of recordings can be reviewed in high resolution similar to a chart recorder.

Demonstrations have successfully proven the viability of both 1MB and 10MB record lengths. These can now be implemented by special order. The extended memory lengths provide 4 and 40 times longer recording times than the standard 128KB software ***without sacrificing bandwidth***. For example, it is now possible to record 10MB of data at a sampling rate of 1 MHz, the recording time would be 10 sec instead of he standard 132 msec. Similarly a previous sample recording time of 6.5 seconds could now be extended to 500 seconds with a bandwidth of 2KHz for transients and 8KHz for spectrums (20KHz sampling rate.).

Automatic Analysis Modes.

Automatic setup and analysis. The automatic setup and data analysis mode is a powerful tool for those who do large numbers of repetitive tests. When the AUTO MODE is called, the user is prompted for input to four questions about the expected shock test signal: 1] maximum possible shock amplitude, 2] expected shock duration, 3] general waveform shape (haversine, trapezoid, etc.), and 4] if automatic frequency selection post recording filtering is desired. WinCAT then selects the optimum time and amplitude scale and digitizer settings to capture the signal at maximum accuracy.

Captured signals are either automatically filtered at the correct frequency, as determined by a computer routine with respect to shape and duration, or at a user specified frequency. The signal is then plotted and automatically annotated. WinCAT plots shock signals as positive going pulses, marks the 10% amplitude time duration points, then computes and displays peak acceleration and velocity change. This is done for up to 4 channels plotted at the same time. The user may then unfilter or refilter the waveform, and select a "fairing" cursor to find the average effective acceleration for any pulse shape. Partial velocity changes and pulse durations relative to cursors can also be measured. All that remains is to edit and print out the report.

All AUTO MODE results may be overridden by manual functions including unfiltering and refiltering, expansion, and cursor positioning if desired.

Average Effective Acceleration (faired values).

WinCAT ***computes*** the exact effective average acceleration for any shape shock, giving a more exact estimate of the shock's effect on fragility thus meeting and exceeding the "fairing" requirements specified in ASTM standards. Other systems only read peak values or force the user to estimate the average amplitude, by eyeball, which is highly subjective. For those who demand hand fairing, this function is also provided by horizontal cursor movement. These functions do not require filtering. They produce the correct values even in the presence of extreme product response or shock machine noise.

Test Report Generator.

A WYSIWYG report template (What You See Is What You Get) mode is standard. The user can customize the headings on the report format as needed by editing five (5) title fields to enter information such as item under test, test engineer, type of test, etc The report is date and time stamped automatically. Report Setup also provides the ability to modify the report titles fonts, using any installed fonts in your Windows system. All titles may also be edited. Report Editing Menu pull-downs let you edit the report fields and Print Preview lets you see the report as it will be printed out on the current printer installed on your computer.

Individual element colors may be changed on the Color Setup pull down menu. Include headings, backgrounds, waveforms, or data items that are uniquely important to your operation. Prior to printout, WinCAT will show you the report for last minute fill-in of important details or to make changes. Any customized report design may be saved when attached to a waveform file.

Different Report Formats may be designed and then saved as different files or in different directories. This allows different users, projects or customers to have their own custom report format designs. Along with the Windows Copy-To-Clipboard function, which can implement a custom report format within a word processor (described below), the user has great flexibility in producing quality test reports.

Copy and Paste. In addition to the WinCAT provided boiler plate test report format, the user may also COPY the analysis screen to the Windows Clipboard and then PASTE the screen into a more extensive report that may be generated with a word processing program. Alternately, once copied and pasted to the Windows "Paint" screen, the file can be saved in JPEG, BMP, and GIFF formats.

Tag the Data. The WinCAT user can edit and attach tags to any waveform. The tag remains attached during saving the file to disk, printout, etc. These tags may be moved by dragging with the mouse and will remain in position even if the waveform file is saved and recalled.

Measure when Plot is Zoomed. Both Vertical and Horizontal Zooming for editing purposes are standard. Several tools are available when zoomed. Full cursor mode amplitude and time measurements, filtering, and editing may be used in the zoomed display. Printout capability in all "zoom" modes is supported. Expansions of up to 16X vertically and 256X horizontally are available, depending on the number of channels.

Zooming Tools. A Right Mouse button Click will pull down a menu that allows selection of variable horizontal expansion by using the mouse pointer to 'paint' the section of the waveform to be expanded. After painting, the painted portion of the waveform (all waveforms when multiple channels are plotted) is expanded to fill the entire screen horizontally. In addition, there are + and - 'Magnifying Glass' ICONS for horizontal expansions, and Up and Down Arrow ICONS for vertical expansions.

Scrolling Records. The WinCAT provides both horizontal and vertical scrolling in order to view expanded portions of a recording file at more resolution. In the horizontal scrolling mode, this allows viewing and processing of any 512 byte block of data of the total recorded for the particular channel. This function is very powerful for finding fast transients that exist in noise, or other signal details. Once scrolled, the portion of memory displayed may be processed by any of the optional WinCAT software tools.

The flexibility for editing waveforms as well as presentation is unique to the WinCAT.

Move Overlaid Waveforms on Screen with - Full Screen Editing The WinCAT employs proven GHI screen editing functions. These allow vertical and/or horizontal movement of a signal on the CRT (and hence, on the test report) for instance to separate a key channel from other signals plotted on a common screen baseline. Separation of the signals from multichannel recordings such as from triaxial accelerometers is key to reducing confusion and errors in analysis. Interpretation of three or four signals plotted atop each other is difficult. See the WinCAT triaxial mode test report attached to this bulletin. Reduce confusion and errors with the WinCAT.

Default Setup Files The WinCAT has default setup tables on hard disk that control all recording choices. Whenever the system is turned OFF, WinCAT saves the current Setup File to disk as the default file. When the program is again started up, this default setup file is uploaded and WinCAT is ready to go once more. WinCAT remembers the last setup you were using and defaults to it when restarted.

Customization The user may change setup variables to meet specific requirements as needed. When the user escapes the Setup Menu after making the change, a new default setup file is saved. Even in the event of shut down or power failure, restarting WinCAT will upload the last entered setup file.

Built-In Disk Archiving Functions Included in WinCAT software are disk file management functions that allow archiving to floppy disk, deleting, normal save and recall. If your computer is equipped with a ZIP Disks, or recordable CDROM in addition to the standard floppy drive, your options for archiving are greatly expanded. Since the files are Windows compatible, if your computer is on a network, they can be uploaded to servers or other users.

Disk file directories are displayed by file type. File names in WinCAT directories us the extended file naming ability of Windows 95-98, and may be up to 27 characters in length. Any combination of upper or lower case alphanumerics, dashes, spaces, except DOS “prohibited” characters may be used. This provides a clearer identification of the file, unlike the older Windows and DOS conventions of 8 characters plus extension.

STANDARD FEATURES & SPECIFICATIONS

WinCAT is offered in three versions:
Series 100- 4, 8 or 16 channel WinCAT.
Series 110- 4 Ch Starter WinCAT
Series 150- 4, 8, or 16 channel LapCAT

Note: The Series 150-041 is a special LapCAT system that features 4 channels of post processing spectrum and fatigue analysis only.

All employ twelve bit digitization and an aggregate sampling rate of one MHz.

The basic WinCAT transient recording RAM buffer is 128KS (samples) for the Series 100, 150, and 200 systems. The Series 110-04 Starter WinCAT utilizes a 32KS buffer. For all products, each sample is two 8 bit RAM Bytes providing 12 bits of A/D resolution (4096 quanta steps. Available RAM is divided by the number of channels being used. For example, 8KS of RAM per channel is allocation for 16 channel systems, with correspondingly larger amounts for fewer channels. This value increase such that for one

channel, the full 128KS is available. Software partitioning of the 128KS memory divides it into 64 recording bins, each with 2KS of RAM for faster operation and economy of disk storage. The Series 110-04 MiniWinCAT's memory allocations are similar but are based on a shorter RAM.

Extensions of proven Gill SYSTEMS software supports full on-screen waveform editing including waveform move and scroll capability. Waveforms recorded on common DC baselines may be moved vertically or horizontally to make viewing easier and to better present the data when using monochrome laser, inkjet or dot matrix printers for report output.

The user will also appreciate the proven time domain digital post filtering and unfiltering, reference cursor zeroing (for incremental time and amplitude corrections and measurements and acceleration versus time area integrations) features that were improved from previous GHI products.

The included Level 1 Windows software package includes several powerful time domain features. These include triaxial vector solutions, cushion displacement, fairing cursors, user selected digital filter cutoff frequencies. These form the nucleus of all standard Level 1 modules provided with all systems.

Optionally , the user may want to specify post processing analysis functions such as Shock Response Spectrum (SRS) and FFT**, which provides full and partial spectrum PSD's with gRMS integrals, transfer functions (transmissibility) and linear/log FFT low/high pass filtering and inverse FFT for signal reconstruction.

MILSPEC with automatically constructed tolerance bars for the majority of world-wide shock test specifications with click and drag waveform move for checking waveshape, peak, duration, and velocity change. Any of these programs may be integrated into a single compiled *.EXE program when purchased. If ordered later after system delivery, GHI will furnish a new loader disk that contains the latest software releases for the programs the user has plus the new optional package.

Some very specialized software programs are available such as protective helmet♡ or sports playing surface tests♡.

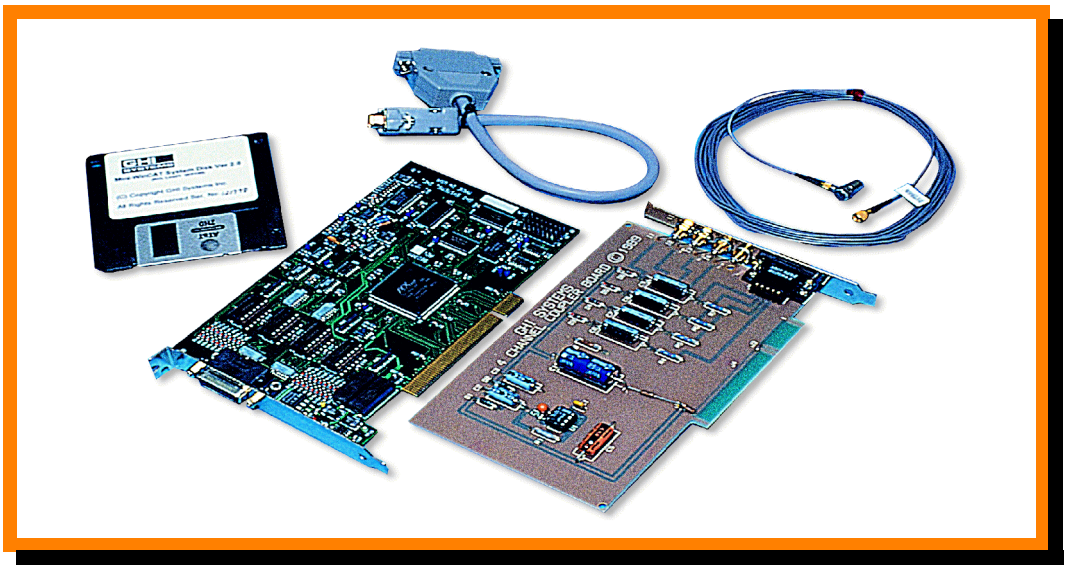

Figure 2. Typical WinCAT card and software set. Includes PCI bus analog amplifier and Digitizing Card, half ISA slot 4 Ch voltage mode sensor signal conditioner, software loader floppy, interconnect cable between digitizer and conditioner cards and accelerometer (furnished only with P/N 110-04 for protective package engineering tests). Note shown, 4 channel BNC DC sensor input box and it's associated connection cable.

Typical Hardware Specifications For Integrated Turn-Key Computer Systems (Contact GHI for current specifications)

CPU: Pentium or equal, at least 160MHz and 16 MB RAM, expandable. Windows '95 or '98. Full 101 Key AT type Keyboard and Serial Mouse, 4GB Hard Disk or larger, 20X or faster CD-ROM. 17" 0.28 pitch, color monitor supporting SVGA modes, at least 1 PCI and 1 ISA half length.

PCI A/D Card Under WinCAT Software Control

Channels:	4, 8 or 16 parallel, MUX Scanned
Sampling Rate:	1 MHz Aggregate
Digitizing Resolution	12 bits (0.0244% of full scale)
A/D Linearity:	Greater than 1% ✤
Time accuracy:	Better than 0.01%, set by precision quartz crystal clock.
Amplitude throughput accuracy:	Calibrated to better than 1.5% of full scale, NIST Cert.
A/D converter:	Pipelined two pass flash
Recording durations, WinCAT100-150-200 Systems, in 1,2,5 progression Normal mode:	13, from 130 ms to 1300sec
Recording durations, WinCAT 110-04 Systems, in 1,2,5 progression Normal mode:	4, from 32ms to 320ms
Input V(i) full scale window levels, in 1,2,4,10 progression:	0.4, 1, 2, 4, 10, and 20 Volts full scale.
For a 10 mV/g sensor, this equates to:	40, 100, 200, 400, 1000, and 2000 g's full scale.
Baseline Vertical Zero Grid Positions, WinCAT 100-150-200 only	10% to 90% of full scale. 10% increments.
WinCAT 110-04	All channels set at 50% of full scale range.
Pretrigger delay:	1% to 99% of recording duration.
Transient Memory: WinCAT 100-150-200	128KS 16 bit Windows RAM
WinCAT 110-04	32KS 16 bit Windows RAM
Partitioned Mode	2KS, 1KS or 500S
Custom Modes	From 1MS up to limit of HD.
Partitioned Mode Recordings:	Up to 64 tests per file.

✤ Total throughput accuracy from input through data array. This is the true system accuracy. A/D quantizing uncertainty is often advertized as "accuracy" by others. Quantizing error does not include analog errors in front-end electronics. Every 12 bit A/D system has the same quantizing error - 0.024% of full scale- but not the same throughput accuracy. For this reason, GHI performs a NIST traceable calibration of your system prior to delivery and provides a calibration certificate stating the true accuracy in terms of full scale settings. In addition, GHI will furnish calibration steps or provide calibration at our facilities on returned circuit card sets.

BASIC LEVEL 1 MEASUREMENTS SOFTWARE NODULE

Major Screens: 2.			
		1) Signal Analysis Screen	
		2) Comprehensive Setup Screen Group,	
User or Automatic Setup Selections for Control of :			
		1) Sample Rate/Recording Time Window Lengths:	13
		2) Full Scale Gain Ranges for each channel:	6
		3) DC Baseline Level Settings for each Channel:	9
		4) Channels to Plot:	1 to 4
		5) Hold Channels: From disk file or last recording:	1 to 4
		6) Filtered and unfiltered on same screen, pairs:	4*
Digital Recording Trigger settings from signal,			
	Polarity:	+, -, or window (either)	
	Amplitude resolution	4095 Levels, in EU.	
	Trigger Source:	Any or All Channels, Or ESC Key for User Control.	
Pretrigger Delay (Pretrigger Ratio):		1 to 99% of record in 1% steps.	
Screen editing:	Move	Vertical or Horizontal Any channel.	
	Expansion:	Horizontal	Up to 256 times
		Vertical	1 to 16 times

Memory Scroll:	Full memory, any Ch
Signal Inverting:	Any Channel, Independent.
Reference Cursor Controls:	Zero Amplitude @ Cursor Zero Time @ Cursor Zero Integral @ Cursor Zero Amplitude Absolute Hold Cursors
Reference Cursor Outputs, time:	Between Reference & Active Cursor Amplitude at Cursor Position Integral from Reference to Active Cursor Position
Plot Grid:	10 x 10 grid on screen with EU Vertical scaling for each channel, regardless of EU's in use. Automatically placed when printout is called. Signal baselines automatically set to grid when zero function are used.
Post Recording Filtering:	Digital. No phase error. Moving point, variable length averaging filter. User entered 3 db point sets the 6 db/octave cutoff, Complies with SAE JAN 211 and ASTM specs. This filter can not provide an anti-alias function.

Automatic Mode:

Computer displays filtered shock signal, marks duration between 10% amplitude points scales peak amplitude and velocity change. Correct filtering cutoff is computer determined from pulse shape and duration, or by user selection.

Final data readout of Peak or Average Effective acceleration amplitude, pulse length and velocity change between 1O% amplitude points. Used in Normal and Partitioned Memory Modes. Filtered frequency is listed on report. Works on 1 to 4 channel recordings.

Manual Cursor Mode:

Single cursor move gives amplitude and time on waveform at new cursor location, plus highest peak acceleration and velocity change between cursor and beginning of signal (t=0). Zeroing mode provides above answers between zeroed time reference cursor and active cursor position.

Store/Recall/Archive/Delete Waveforms on Hard disk:

Extended '95-'98 Windows format name convention (up to 30 characters) for save. Recall, archive, and delete using Windows directory management. Number allowed on hard disk = HD capacity/260KB.

WYSIWYG Test Report Generator:

You may use the furnished default test report template or design your own to include items of importance, using the fonts available with your computer. Boxes may titled and filled-in using the WYSIWYG Test Report Editing Screen.

CONTACT FACTORY OR LOCAL REPRESENTATIVE FOR CURRENT PRICING AND AVAILABILITY.

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