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Volume

2

Version 4.1

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Vision XP User's Guide

LDS TEST AND MEASUREMENT LLC

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LDS Nicolet

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Unpack the instrument and save the carton and packing material in case the instrument must be shipped to another site or returned to the factory for service.

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LDS Nicolet

Customer Service
8551 Research Way, M/S 140
Middleton, Wisconsin 53562
Tel: +1 608 821 6600
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YEAR 2000 COMPLIANCE

The Vision XP operating system and software has been tested and verified for correct operation concerning dates including the year 2000 and extending through the year 2030.

Nicolet
Dactron
Ponemah
Gould

LDS
TEST AND MEASUREMENT

EC Declaration of Conformity

We
Name: LDS Test and Measurement LLC
Address: 8551 Research Way, M/S 140
Middleton, Wisconsin USA 53562

CE

declare that this product
Product Name: Vision XP Data Acquisition System
Product Part Number: 986A0164 8 Channel
986A0165 16 Channel
Manufacturing Location: 8551 Research Way
Middleton, Wisconsin USA 53562

is in conformity with the following Standards

Safety:	EN 61010-1	
Emissions:	EN 55011	
	Product meets group 1, class A emission limits	
Immunity:	EN 61326-1	
	Electrostatic Discharge,	Criteria B
	Radiated RF,	Criteria A
	Electrical Fast Transients,	Criteria B
	Surge,	Criteria B
	Conducted RF,	Criteria A
	Magnetic Field,	Criteria A
	Voltage Dips,	Criteria B

following the provision of the EMC Directive (89/336/EEC)
and Low Voltage Directive (73/23/EEC).

Middleton, WI USA

Location | Date | Signature/Vice President of Operations

An SPX Company

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Chapter 1: Safety Messages

The first WARNING note below is required by the FCC and relates only to the interference potential of this equipment. This message is a direct quotation.


WARNING

The equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, can cause interference to radio communications. As temporarily permitted by regulation, it has not been tested for compliance with the limits for Class A computing devices pursuant to Subpart B or Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures can be required to correct the interference.

This instrument has been designed in accordance with EN61010-1:1993, /A2:1995, and UL 3101-1, safety Requirements for Electronic Measuring Apparatus. The present instruction manual contains some information and warnings which have to be followed by the user to ensure safe operation and to retain the instrument in safe condition.

Vision XP Specifications:

Tested to EN 61010-1 and UL 3101-1 safety Requirements for Electronic Measuring Apparatus.

Safety Category:



WARNING

The Vision XP is designed for operation with Category I (CAT I) measurement categories. CAT I is for measurements performed on circuits not directly connected to the mains. It is not designed for nor intended for use in Categories II, III, or IV.

Maximum Input Voltage: 500 Vac, dc-peak, IEC Cat 1
Overvoltage Protection: 1250 V range 20 V + higher; 300 V range 10 V + lower
Electronic Static Discharge: 2 kV

ELECTRICAL RATINGS

Power and Frequency Requirements

The instrument uses less than 250 W/350 VA and operates from line voltages of 100-120 or 230-240 Vrms at 50 or 60 Hz to Installation Category II, local level supplies distributed within a building

The power connection is via a standard IEC, CEE 22 connector. Access to the AC supply fuse can only be made if the AC supply connector is removed.

Fuse Rating: 3 A 250VAC 5X20MM Time Lag (Slo-Blo)

To disconnect this instrument from the AC supply, unplug the IEC connector on the rear panel. The instrument should be position to allow access to the AC connector. The standby switch on this instrument is not a disconnecting device. When the instrument is in standby mode, some power will still be consumed.

ENVIRONMENTAL SPECIFICATIONS

Temperature: The instrument should preferably be operated in a clean, dry environment with an ambient temperature of between 10 C and +40 C. The instrument will operate with full, specified accuracy between +10C and +40C. It can be occasionally be subjected to temperatures between 0 C and 50C without degradation of its safety.

Note: *Direct sunlight, radiators and other heat sources should be taken into account when assessing the ambient temperature.*

The instrument relies on forced air cooling via a fan and ventilation slots. Adequate ventilation can usually be achieved by leaving a 75 mm (3" gap) around the instrument. Care should be taken to avoid restricting the airflow around the fan holes at the side of the instrument.

Humidity: Designed for normal operation up to 90% relative humidity.

Altitude: This instrument is designed for normal use at a maximum rated altitude of 6096 m (20,000 ft).

To clean the instrument, disconnect all power sources and then wipe the surfaces lightly with a clean, soft cloth dampened with water.

SAFETY STATEMENT

The design of this instrument has been checked to EN 61010 for class I (grounded) use.

This manual contains information and warnings that must be observed to keep the instrument in a safe condition. The instrument should not be switched on if it is damaged and it should not be used under wet conditions. If the equipment is used in a manner not specified by LDS Nicolet the protection provided by the equipment may be impaired.

For correct and safe use of this instrument it is essential that both operating and service personnel follow generally accepted safety procedures in addition to the safety precautions specified in this manual. The instrument should not be placed in a position where it is difficult to reach the power switch or disconnect the power cable.

Whenever it is likely that safety protection has been impaired, the instrument must be made inoperative, and be secured against any unintended operation. Qualified maintenance or repair personnel should be informed. Safety protection is likely to be impaired if, for example, the instrument shows visible damage or fails to operate normally.



WARNING

This instrument must be operated with a protective ground (earth) connected via the protective ground conductor of the supply cable, or, if the instrument is fitted with one, via the safety ground terminal. Any interruption of the protective ground, inside or outside the instrument, is likely to make the instrument dangerous. Intentional interruption is prohibited.

Do not remove the covers. The covers protect the user from live parts and they should be removed only by suitably qualified personnel for maintenance and repair purposes.

To disconnect this instrument from the AC supply, unplug the IEC connector on the rear panel. The standby switch on this instrument is provided for functional purposes only. It is not intended as, or suitable as, a disconnecting device.

The instrument has been designed for indoor use. It can occasionally be subjected to temperatures between 0°C and +50°C without degradation of its safety.

The main plug shall only be inserted in a socket provided with a protective earth contact. The protective action must not be negated by the use of an extension cord without a protective conductor.


WARNING

ELECTRICAL SHOCK HAZARD!

Any interruption of the protective conductor inside or outside the instrument or disconnection of the protective earth terminal is likely to make the instrument dangerous. Intentional interruption is prohibited.

When the instrument is connected to its supply, terminals can be live, and the opening of covers of removal of parts (except those to which access can be gained by hand) is likely to expose live parts.

The instrument shall be disconnected from all voltage sources before it is opened for any adjustment, replacement, maintenance or repair.

Capacitors inside the instrument can still be charged even if the instrument has been disconnected from all voltage sources. Any adjustment, maintenance and repair of the opened instrument under voltage shall be avoided as far as possible and, if inevitable, shall be carried out only by a skilled person who is aware of the hazard involved.


WARNING

The instrument is available with an option to run from a 12 Vdc battery source, with an acceptable input range of 12-18 Vdc. To avoid electric shock, the power cord's grounding conductor MUST be connected to protective earth ground. When operating from a DC power source and measuring hazardous voltages, unit MUST be connected to protective earth ground through chassis ground stud.

Whenever it is likely that the protection has been impaired, the instrument shall be made inoperative and be secured against any unintended operation.

The protection is likely to be impaired if, for example, the instrument shows visible damage or has been subjected to severe transport stresses.


WARNING

ELECTRICAL SHOCK HAZARD! Do not remove covers. Refer servicing to qualified individuals.

Proper use of this device depends on careful reading of all instructions and labels.


WARNING

This instrument and related accessories are not designed for biomedical experimentation on humans and should not be directly connected to human subjects.


WARNING

This instrument must not be operated in explosive atmospheres.


WARNING

Always make sure the input signal does not exceed the maximum allowable input voltage, with respect to ground, listed in the specifications for this instrument.

Blank page.

Chapter 2: About This Manual

Symbols Used in This Manual

The following symbols are used throughout this manual to indicate warnings and cautions.



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



WARNING

Indicates a fire hazard which, if not avoided, could result in death or serious injury.



WARNING

Indicates an electrical shock hazard which, if not avoided, could result in death or serious injury.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury, or alerts against unsafe practices, or alerts against actions which could damage the product.

Manual Conventions

Several conventions are used throughout this manual for your convenience:

- Menu ***names*** and ***commands*** appear in bold, italic lettering.
- **Controls** and **control names** appear in bold lettering.

Chapter 3: Introduction



Introducing the Vision XP

Your Vision XP system consists of:

- Vision XP Mainframe
- Vision XP Software

There are two basic configurations of Vision XP systems available:

- 8 analog channels, internal 72 GB acquisition drive, 110/220 Vac power supply
- 16 analog channels, internal 72 GB acquisition drive, 110/220 Vac power supply

The data acquisition boards have the following analog specifications:

- 8 or 16 analog channels, 50 mV to 1000 V span (500 Vrms channel-to-chassis isolation) Some older boards have a top value of 500 V

Options for your Vision XP system include:

- PC keyboard, mouse, pad, and plug-in microphone
- Soft-sided carrying case with shoulder strap or hard-sided shipping case
- Plug-in signal conditioning adapters for thermocouple (J, K, T, E) , shunt (4-20 mA), RTD (PT-100), ICP accelerometer, strain gage (full, ½ or ¼ bridge transducer), and 480 Vms adapter
- PC-based software packages for display, analysis, and remote control of one or multiple Vision XP systems over an Ethernet network, including DataViewer, VisionNet, VisionNet Plus, Vision API, ProView and FlexPro
- Thermal array printer for high-speed realtime plotting
- Serial, parallel and USB ports to external PC based devices.

Understanding Vision XP's Acquisition System

The LDS Nicolet Vision XP is a rugged, portable data recorder with superior data acquisition specifications designed for mechanical and electrical measurements. The Vision utilizes the most recent advancements in PC technology to offer unparalleled acquisition, storage and display capabilities. It combines the realtime display and plotting features of an oscillographic recorder with the deep recording memory of a DAT/AIT and the Ethernet data transmission capabilities of a PC. Data from up to 16 channels at sampling rates of up to 100 kS/s is stored directly to a dedicated acquisition disk limited only by available disk space. Depending on the hard drive size, this capacity translates to over 60 minutes of storage per channel at the maximum sample rate, or almost 3 months for 8 channels at 100 samples/second. With its large 10.4" color screen and intuitive push button interface, the Vision's clean, simple layout is familiar to anyone who is comfortable using a cassette deck or ATM account. Data can be printed to either single sheet or continuous-feed printers, analyzed using the onboard calculator functions, or transferred via Ethernet to a networked PC for advanced analysis.

The Vision's design is optimized for recording long duration, high-speed data directly to a dedicated hard disk for maximum storage capacity and data integrity. Other PC-based acquisition systems that rely on the main system hard disk for data storage are susceptible to Windows system interrupts, driver conflicts, and uncertain throughput issues. In contrast, the Vision's unique "dual disk" architecture stores data on a dedicated acquisition drive separate from the main system hard disk, eliminating the potential throughput problems and Windows overhead issues associated with PC operating systems. This LDS Nicolet proprietary storage architecture enables gap-free recording of critical data to the fixed hard drive for maximum data integrity for your critical experiments.

The Vision is available in either an 8- or 16-channel configuration. Each channel uses its own independent 16-bit 100 kS/s digitizer with a 20 kHz analog bandwidth. Channels are electrically isolated from other channels and from the chassis by 500 Vpk. A wide input range of 50 mV to 1000 V allows the Vision recorder to connect directly to almost any signal type via standard shielded banana-type connectors. A digital signal processor (DSP) chip per channel provides digital filtering, as well as realtime calculations of important parameters such as RMS, duty cycle or standard deviations of your signals. Input adapters are available for most standard transducers, such as strain gages, accelerometers, thermocouples, and 4-20 mA shunt probes. Thermocouple cold junction compensation and linearization is handled on a channel-by-channel basis, and all channels can be calibrated for slope and offset and recorded in user-defined engineering units.

In addition to the analog channels, Vision has 8 digital inputs that monitor status lines, plus a TTL counter channel to directly measure frequency or RPM. A separate voice channel with integrated microphone input can be used for voice annotation of test parameters or key events. Voice data can be replayed through internal speakers during replay or easily accessed using built-in voice **Search** capability.

Although the Vision is capable of storing up to 50 MS per channel, data can be reviewed quickly by use of a **Jog/Shuttle** knob similar to most high end VCR's. Once the event of interest is located, Vision offers the ability to zoom indefinitely for more in-depth analysis of that portion

of the waveform using either the cursor measurement capability or built-in calculator functions. Searching for data can be further simplified by use of the dedicated single button search functions which enable data to be searched based on trigger events, front panel marks or can be programmed to search for specific recording times or data points.

The Vision enables user-defined events to be copied from the original data set either by placing cursors around the event of interest or by saving only the area currently displayed on screen. The subsequent data set can than be much more easily managed and data storage capacity is freed up for future use. You can export data in many popular formats, including LDS Nicolet NRF, Matlab, DADiSP, Excel, and a variety of others. Data can be transferred from the Vision through an Ethernet connection or by using the serial, parallel and USB (version 1.1) ports.

The Vision offers a number of ways to view your data and most importantly enables you to view data in your own user units such as PSI or joules and not only in voltage. Data can be displayed in a variety of ways including scrolling displays, stacked and overlaid time traces and in an XY format.

The on-board DSP processors enable real-time calculation of common waveform parameters such as waveform minimums and maximums, peak to peak, RMS and mean. Calculator functions enable more extensive functions such as Area, Frequency and waveform statistics to be calculated on any measurement region of interest. Independent front panel cursor controls establish the measurement region or enable relative or delta measurements in user units.

Vision offers a variety of ways to print test results. The front panel's **Hard Copy** button enables one-button printing to a variety of hardcopy devices. Any standard Windows compatible printer can be configured to plot current on-screen data, including tables with calculated parameters. If your printer supports continuous paper feed, Vision can be configured to print longer records similar to many strip chart recorders. For applications requiring continuous thermal array output, LDS Nicolet offers the AR-200 printer with output speeds of up to 50 mm/second for long duration archiving. Printed traces can be overlaid or displayed in a stacked display and grids can be individually sized based on your settings for the Vision's display panel. Using the Search function, Zoom buttons and Cursor controls allows you to configure the screen with the data of interest, exactly the way you want it for WYSIWYG printouts, including tables with your calculated parameter values.

With the ability to record GBytes of data, the ability to recall data quickly for review, analysis or printing becomes critical. The Vision uses a clever technique for fast review that recognizes that PC display monitors only have limited resolution for data display, such as 1024 x 768 points. The Vision's data structure stores lower-resolution data for realtime display parallel with the high-speed raw data. This feature allows the smooth scrolling display on the Vision's built-in TFT display or over an Ethernet connection to an external PC in realtime. It also allows Vision (and DataViewer) software to open GB-sized data files in just a few seconds for review and analysis, instead of burdening the system's RAM with huge amounts of data. Then, as you zoom in for closer analysis of interesting events, Vision only needs to open small areas from the GB file to give access to the raw data points. Of course all parameters and printouts are based on the raw data and are not limited a low-resolution "screen dumps."

For applications that require more than 16 analog channels it is possible to link multiple Visions together for synchronized recording. Up to four Visions can be joined in "master/slave"

configuration, providing 64 analog channels, 32 digital TTL inputs, and four counter/timer channels for larger scale acquisitions. Up to three "slave" units are linked to a "master" system via the RJ-45 connectors on the Vision's acquisition board. The master system provides a 10 MHz clock signal across the system for synchronous recordings within 200 nanoseconds between all channels in a system. The master unit also provides start and stop commands, as well as accepting and providing trigger signals from any channel in the system. The optional VisionNet Plus software package provides PC-based setup, display and control for the master/slave system, as well as a recording manager utility to merge data from the separate systems into one common file on a PC backup drive.

Vision supports a variety of methods to transfer data to external PCs or data storage devices for permanent data backup. Vision's built-in 100base-T Ethernet connection enables data to be sent anywhere in the world - to high capacity servers on your network or to colleagues in other countries using the Internet. The Vision system also includes a Universal Serial Bus (USB) port (version 1.1) used to transfer data to a variety of data storage devices and other PC based accessories. Smaller data files or the Vision's setup parameters can be transferred via the integrated 1.44 MByte floppy disk drive. Data transfer via a modem is possible with Vision, albeit only at a modem's slow transfer rates.

LDS Nicolet provides a selection of software products tailored to address individual needs and requirements.

- **DataViewer** provides the same basic review and display capabilities as the Vision recorder except it operates on an external PC. DataViewer can link via Ethernet to the Vision's data files on the dedicated data disk, even while recording new data on the Vision. Multiple users can access the same data file simultaneously with DataViewer, which can also post data directly into LDS Nicolet's ProView or imPRESSion advanced analysis packages. DataViewer also supports basic automation functions, including export capabilities to a number of third party software packages such as LabView, Matlab, DADisp, Dia-dago, Famos and many others.

- **ProView** provides a comprehensive array of analysis functions such as cross-channel maths, trigonometric functions, and statistical analysis. Users can create their own functions using ProView's formula database editor. Fully customized reports can be created using the integral report generator, and automated functions can be defined for analysis and reporting of a user's standard experiments. ProView works seamlessly with DataViewer to provide complete display, analysis and report generation effectively taking you "from sensor to report."

- **ImPRESSion** software incorporates Microsoft's Object Linking and Embedding (OLE2) architecture, allowing spectra or calculation results to be linked directly into Word or Excel documents. A wide variety of time and frequency domain functions provide a powerful toolkit of analysis capabilities.

- **VisionNet** software provides remote control of a Vision system over an Ethernet link from a PC. Thus, a Vision can be located in a plant or other remote test location, and still provide full access to the scrolling display and all Vision parameters from a remote office. From your desktop PC you can adjust amplifier settings, set new trigger levels, start or stop a recording, or even record a voice comment that is saved together with the Vision's raw data on the dedicated SCSI acquisition disk.

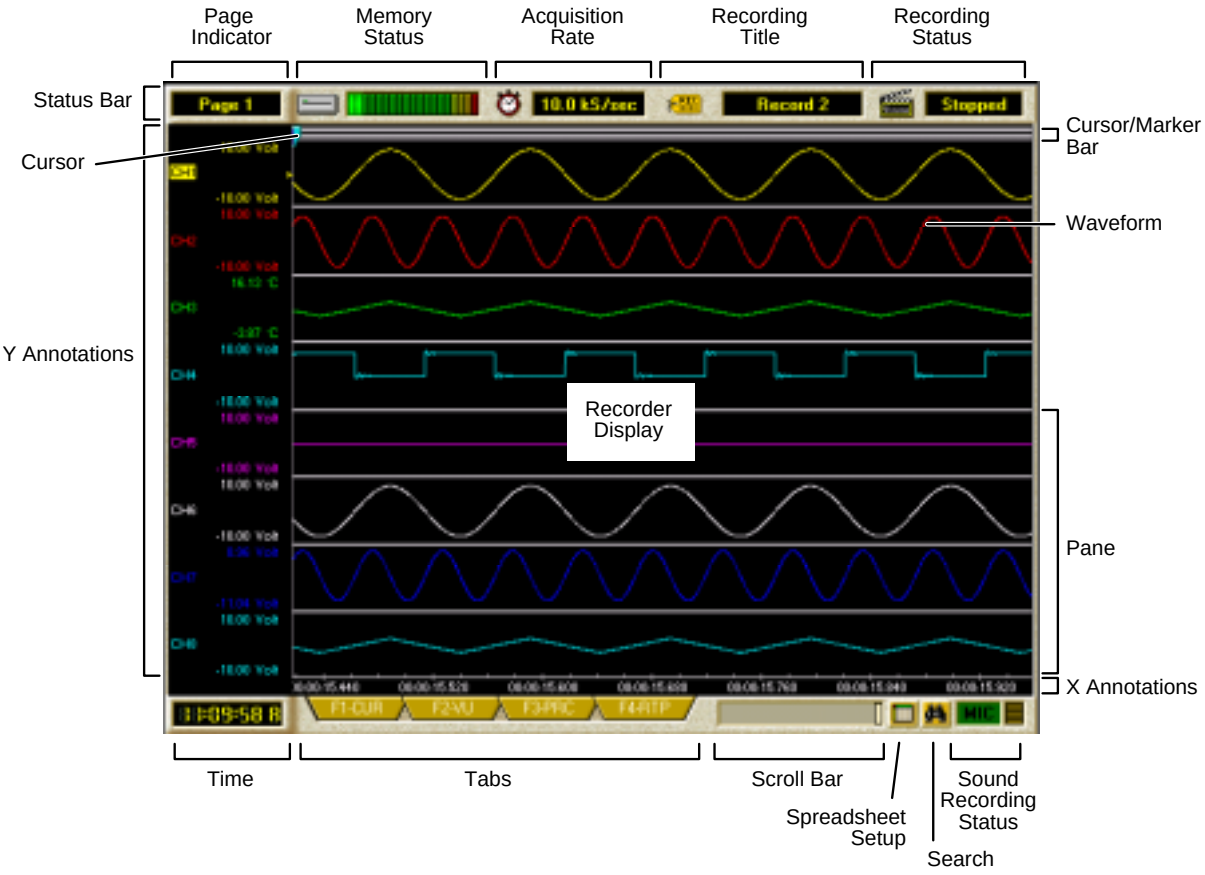
- **VisionNet Plus** expands the capabilities of VisionNet to support up to four Visions combined into a synchronized "master/slave" network. VisionNet Plus provides up to four windows for each Vision's scrolling display, and adds a helpful spreadsheet setup screen to edit multiple channels with a single mouse click. A recording manager utility keeps track of the data files across the four Vision units and allows data to be merged from the separate Visions into a single data file on the PC.

- **Vision API** (Applications Programmers Interface) provides links to the Vision's user interface commands, allowing you to write customized programs using C, Visual Basic, or Java languages. The Vision software uses Microsoft's Distributed Component Object Model, or D(COM) protocols, giving access to the Vision's commands without forcing the programmer to know the Vision's source code.

Vision XP Features	Specifications
Number of channels	8 or 16
Continuous Recording Rate (per ch) for 8 channel configuration	100 kS/s
Continuous Recording Rate (per ch) for 16 channel configuration	100 kS/s
Digitizer Resolution	16 bits
Analog Accuracy	Less than 0.05% error (for 1000 V acquisition board)
Bandwidth	20 kHz
Power Requirements	110/220 Vac autoswitching or 12 Vdc Power draw of 150 W
Range	50 mV to 1000 V (for 1000 V acquisition board)
Isolation	500 Vrms
Connectors	4 mm banana jacks
Coupling	AC, DC, GND, DC-RMS, AC-RMS, T/C
Offset	1x range
Overvoltage Protection	1250 V for range 20 V and higher; 300 V for range 10 V and lower
Input Impedance	1 MΩ, 40 pF nominal
Transient Memory (per ch)	N/A
Maximum Pre-trigger	Full capacity of the hard drive (minimum 72 GB)
Maximum Storage	Full capacity of the hard drive (minimum 72 GB)
Anti-alias Filter	6-pole Bessel; digital; tracks sample rate
Realtime display of derived parameters	Yes
Stripchart Display	Yes
Fast Oscilloscope Display w/ cursors	Yes
Counter/timer inputs	One
Circular buffer mode (First-In-First-Out) available	Yes* *Single trigger only

Organization of the Vision XP Environment

The main features of the Vision display are shown below. The Vision environment is a dedicated software application written using the Windows® operating system. However, you cannot run other Windows applications on your Vision system.



The **Status Bar** contains a **Page Indicator**, **Memory Status**, **Acquisition Rate**, **Recording Title**, and **Recording Status**.

The **Recorder Display** shows traces of acquired data as it is recorded, as well as data recalled from previous recordings. Cursors can be placed on the display to analyze traces and for post-run calculations. Up to sixteen **Waveforms** can be displayed in each **Pane** and the traces can be either stacked or overlayed.

The **Cursor/Marker Bar** displays the markers placed in a recording. It also contains the cursor "handles" that allow you to move the cursors. The markers are as follows:



Front Panel Marker -Indicated mark initiated from front panel mark button, or from a system trigger while in Continuous acquisition mode



Sound Marker – Indicates microphone annotation of data



Trigger Marker – Indicates trigger event

The **Time** displays the current time in hours:minutes:seconds.

The bottom **Tabs** open display pages for cursor display, view meters, post-run calculations, and real-time parameters. Click on a tab using the mouse to open the corresponding display.

The **Scroll Bar** enables scrolling review of the current recording.

The **Channel Setup** Bar opens a spreadsheet used to set channel parameters.

The **Search** binoculars open the menu to set search parameters to locate points of interest within the current recording.

The **Sound Recording Status** is active while recording with a microphone and provides an input level indicator.

Pressing the **Menu** button on the front panel activates the main system **Menu** in the display. Menu items are selected using front panel function buttons.



Vision XP Mouse and Keyboard Shortcuts

The Vision's user interface is designed to operate using the front panel control buttons and menu selections. Most of the Vision's functions are also available using the left or right button of a standard mouse. A mouse allows you to click-and-zoom around interesting data, change sampling parameters, and modify the display and parameter calculations. A brief listing of the most commonly used mouse (and keyboard) shortcuts are listed in the following tables, and are described in full detail in a later chapter.

Mouse/Keyboard Features-

Use a right-mouse click on the following display element for the corresponding action:

Display Element	Action
Page number (upper left corner)	Select Page 1 through 8
Hard drive icon (upper left)	Deletes current recording
Green/yellow/red icon (upper left)	Lists available disk space for recording
Stopwatch icon (upper middle)	Selects Standalone/Master/Slave status
Sample Rate (upper middle)	Selects sample rate (1 to 100K, External)
Clapboard (upper right)	Initiates Auto-Setup
Recording Status (upper right)	Initiates Record/Pause/Stop, Help/Exit
Display trace borders	Click and drag with the left mouse button to re-size the page layout of the displayed traces
Y-axis annotation bar	Selects active channel Auto-zooms, original scale, user scale, zoom+, zoom-, changes annotation
Trace display area	Sets red/blue cursor at current mouse location Re-sets default pane sizes (after adjusting by click and drag) Toggles between X-Y and Y-t display modes
Red/Blue cursor display	Select SEARCH parameters
X-axis display bar	Play forward, play back or stop Zoom+, zoom-, and restore to default timescale Change annotation (absolute, relative, abs./tick, rel.tick)
Parameter meters (PRC, RTP)	Select channel, parameter type, time scale
Playback scroll bar (lower right)	Left mouse click-and-drag over recording Right mouse click to begin/end
Binoculars icon (lower right)	Left mouse click to open SEARCH menu
Microphone icon (lower right)	During Continuous recording, select Add Mark or Add Voice Mark. During Transient recording, select Add Trigger
Touch mouse pointer to right side of display	Turns on Menus
Touch mouse pointer to left side of display	Depending on Menu Mode selection in menu, toggles menu off or moves one menu back

Additionally there are many keyboard shortcuts available for features such as start/stop recording, zooming, entering offset or trigger levels, etc. All front panel bezel button commands are available using corresponding F-keys on your keyboard. The arrow keys and PgUp/PgDn keys are also useful navigation elements.

The function keys are particularly useful, mapping directly to the Vision's menu panels.

Function Key	Action If Menus Are ON	Action If Menus Are OFF
F1	F1 Menu Selection	CUR (Cursor tab On/Off)
F2	F2 Menu Selection	VU (Viewmeters On/Off)
F3	F3 Menu Selection	PRC (Post-Run Calculations On/Off)
F4	F4 Menu Selection	RTP (Real-time Parameters On/Off)
F5	F5 Menu Selection	Launches custom program if one is defined.
F6	F6 Menu Selection	Channel & Triggers Setup menu toggle
F7	F7 Menu Selection	X-Y Display Toggle
F8	F8 Menu Selection	Y-annotation Toggle
F9		Menus On/Off (or 1 Menu Back) toggle
F10, F11, F12		Stop, Record, Pause

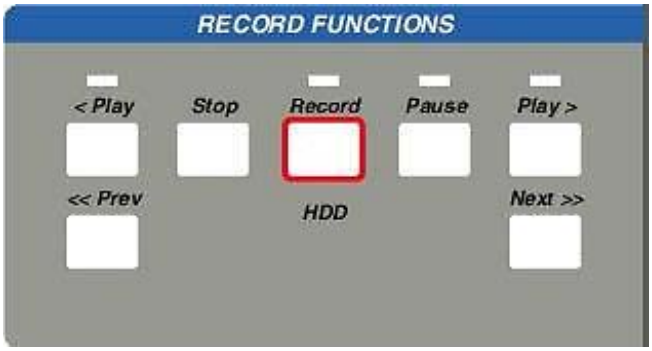
Configuring the System



Before you begin acquiring data, you must first configure the system. Your Vision system is configured using the **Menu**, the **Set-Up** buttons on the front panel, and the **Trigger** buttons on the front panel. Using these buttons you can configure acquisition parameters, channels, triggers, display options, memory options, units, system preferences, and access the utility functions.

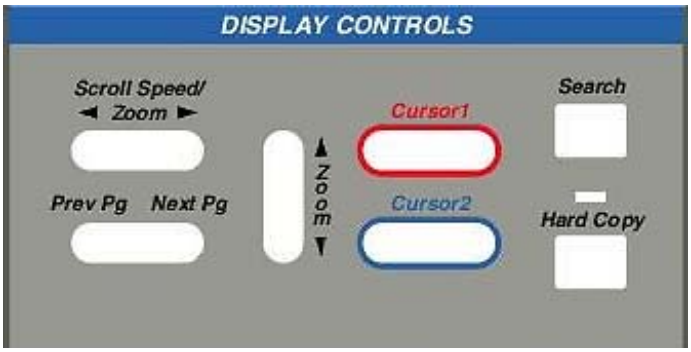
Acquiring Data

Using your Vision is easy since many of its functions are designed to look like familiar controls on a tape recorder.



Viewing Data

The **Display Controls** allow you to control the way you view data on the Vision. You can zoom, change pages, set cursors, search, or print a copy of the display. The **Jog / Shuttle** knob is used for both scrolling through displayed waveforms or, when the **Menu** is displayed, making **Menu** selections. You can turn on the **View While Recording** feature to use the display controls to review data that has scrolled of the screen while capturing data.



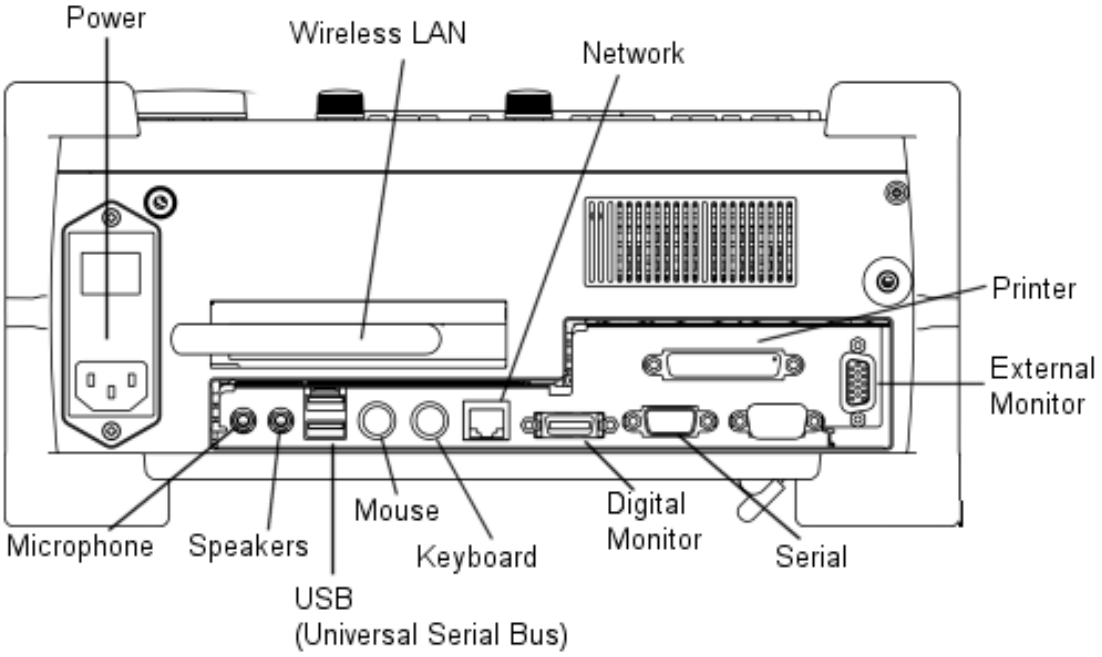


Chapter 4: Using the Front Panel Controls

Setting Up the System

Your Vision requires only the main power cable to operate. While the Vision's user interface software is designed using push-button menus and front panel buttons, your Vision may be shipped with optional mouse and keyboard.

Your Vision uses mini banana connectors for data input. A variety of adapters are available for use with other input types. The side panel connectors are shown below.



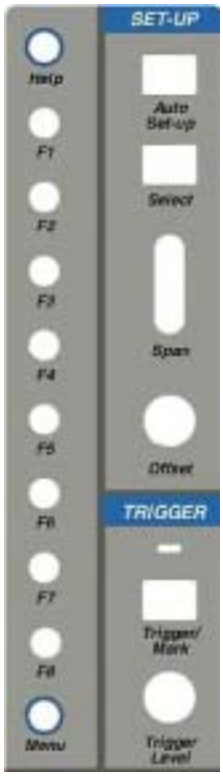
Starting the System

To start your Vision, make sure that the main power cord is plugged in to the Vision and into an electrical outlet (or 12 Vdc battery for the DC version of the Vision), and press the **Main Power Switch. The Vision** begins its startup procedure and performs a series of self tests before opening the **Recorder Display**.

Using Front Panel Button Controls

The front panel controls on the Vision are clearly labeled. Refer to the illustrations below to locate the controls.

Each of the front panel button commands is also accessible when using an optional mouse and keyboard. When using VisionNet or VisionNet Plus software options to control the Vision(s) from an external PC, the mouse and keyboard options must be used instead of the front panel buttons. Each command described in this chapter will show its mouse or keyboard command in italics.



Help: Press to obtain context sensitive help.

Mouse: Right mouse click on the Recording Status icon in the upper right corner for options.

Function Keys: Press to make selections when the menu is visible in the recorder display. When the menu is not visible, the buttons have the following functions:

F1 - Toggles the Cursor tab on and off

F2 - Toggles the View Meter tab on and off

F3 - Toggles the PRC tab on and off

F4 - Toggles the RTP tab on and off

F6 - Toggles the Channel and Trigger Setup menu on and off.

F7 - Toggles the display between Y-T and X-Y

F8 - Toggles display of the Y Annotation using the four available styles

Note: *The keyboard keys F1 to F8 perform the same functions as the F1 to F8 keys on the front panel.*

Menu: Depending on the selection you make in the ***Menu Mode*** section of the ***Preferences*** menu, the **Menu** button will either step back one menu level or toggle the entire menu on and off.

Keyboard: F9, or Escape for 1 Menu Back/Toggle off
Mouse: Touch the right or left edge of the Vision

Auto Set-up: Press to automatically adjust input span and DC offset for each active channel.

Keyboard: Ctrl-A
Mouse: Right mouse click on the Clapboard icon in the upper right corner

Select: Press to make the next channel in the display the active channel. The active channel number appears in a highlighted box.

Keyboard: Up/Down Arrows
Mouse: Point and click



Span: Push the top of this button to increase the span (e.g. from 10 V to 20 V); push the bottom of this button to decrease the span. The span can range from 50 mV to 1000 V in increments that appear on screen when you press the **Span** button. You can only change the span when the system is in Record or Pause mode.

Keyboard: Alt-up (down) arrow
Mouse: No shortcut, use Channels menu

Offset: Turn this knob to the right to move the trace up; turn it to the left to move the trace down. The baseline is automatically corrected. In Record or Pause mode, you are adjusting the input amplifier (maximum setting of 100% full scale value). In Play or Stop mode, you are adjusting only the display offset.

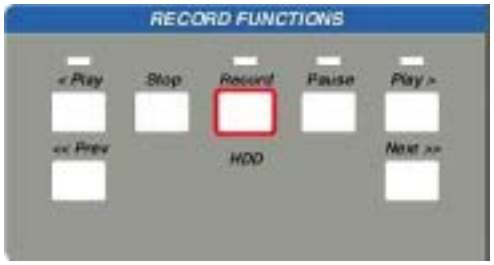
Keyboard: Ctrl-up (or down) arrow
Mouse: No shortcut, use Channels menu

Trigger/Mark: Press to enter a manual trigger or to mark an interesting event while in continuous recording mode. If you press and hold the button down, it activates the microphone to save a voice recording (Voice mark). The voice mark feature is disabled when acquiring data in Transient Mode.

Keyboard: Alt-T
Mouse: Right-mouse-click on the MIC icon in the lower right corner

Trigger Level: Turn to the right to move the trigger level up and turn to the left to move the trigger level down. When you turn the knob, a trigger level text box appears briefly on the display.

Keyboard: No shortcut, use Trigger menu
Mouse: No shortcut, use Trigger menu



<< Prev: The **<< Prev**, or **Previous Recording** button, moves the display to the beginning of the current recording when pressed once. It moves the display to the beginning of the previous recording if pressed again.

Keyboard: Shift PgUp
Mouse: Right-mouse-click on the X-axis for options

<Play: The **< Play**, or **Playback** button, plays back the current recording towards the beginning of the recording. The speed of play back can be increased by pressing the button several times. It continues until either the **Stop** button is pressed or until it reaches the beginning of the recording.

Keyboard: Ctrl-Left Arrow keys
Mouse: Right-mouse-click on the X-axis for options

Stop: The **Stop** button stops the current recording immediately. It also stops play back or play forward of previously collected data.

Keyboard: F10
Mouse: Right mouse click on the Recording Status icon in the upper right corner for options.

Record: The **Record** button starts a new recording to be saved to the acquisition drive. In Continuous data acquisition mode, data is saved to disk immediately. In Transient mode data is not acquired until the trigger and qualifier conditions are met.

Keyboard: F11
Mouse: Right mouse click on the Recording Status icon in the upper right corner for options.

Pause: Press to view, but not record the data. This allows convenient setup and monitoring without consuming disk space. Pause mode is most often used to adjust the data collection and channel setup parameters without saving data to disk. If you have already started data collection with the **Record** button, pressing the **Pause** button disables triggers and stops saving data to disk.

However, if the **Pause** button is pressed again to deactivate, data collection continues as before. The data collected before and after the **Pause** button is still part of the same recording file.

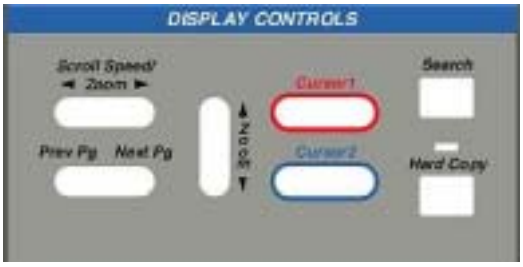
Keyboard: F12
Mouse: Right mouse click on the Recording Status icon in the upper right corner for options.

Play >: The **Play >**, or **Play Forward** button, plays the current recording towards the end of the recording. The speed of playback is increased by pressing the button several times. It continues until either the **Stop** button is pressed or when it reaches the end of the recording.

Keyboard: Ctrl-Right Arrow
Mouse: Right-mouse-click on the X-axis for options.

Next >>: The Next >>, or **Next Recording** button, moves the display to the end of the current recording when pressed once. It moves the display to the beginning of the next recording if pressed again.

Keyboard: Shift-PgDn
Mouse: Right-mouse-click on the X-axis for options.



Scroll Speed/Horizontal Zoom: While data is scrolling, press the right side of the button to increase scroll speed by 2x; press the left side of the button to decrease scroll speed by 2x. The display rate can range from 500 um/s up to 50 mm/s. If the Vision's display is not scrolling, this button acts as a horizontal zoom button. It does not affect data acquisition rate, which is set in the ***Acquisition*** menu. The time scale per division varies with the time resolution of the acquired data, and is shown at the bottom of the display. Pressing this button in the middle resets the display to its default values.

Keyboard: +/-
Mouse: Right-mouse-click on the X-axis for options.

Prev Pg/Next Pg: Up to eight display pages can be configured using the ***Display*** menu commands. Channels can be stacked, overlaid, stacked in groups, or as XY displays. Using the **Previous** or **Next Page** button steps display through all defined pages, with the page number shown in the upper left corner of the screen. Pages that are turned off are skipped. The number of traces per screen and the display type are defined in the ***Display*** menu under the ***Configure Page*** selection.

Keyboard: PgUp/PgDn
Mouse: Right-mouse-click on Page Indicator icon in upper left corner

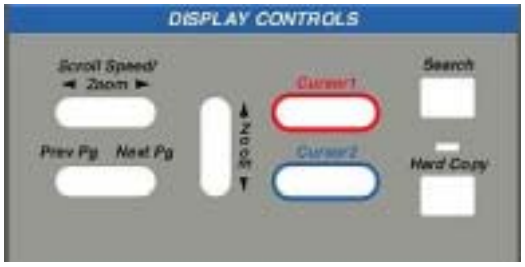
Cursor1 (Red) and Cursor2 (Blue): Two cursors, red and blue, are provided for post-run analysis of the Vision's acquired data. The X position and Y values for each trace can be observed with the cursor display, which is activated by pushing the **F1** button when the menu buttons are turned off. Each cursor is moved independently in Free mode, whereas the spacing between the red and blue cursors is fixed at a user-defined span in Tracking mode. Cursors can be used to define the period over which a derived parameter such as frequency is calculated. One or both cursors can be sent to the defined trigger mark or specified time in the recording when using the ***Search*** menu.

Keyboard: Red cursor uses left/right arrow keys, Blue cursor uses Shift-left/right arrow keys.
Mouse: Right-mouse-click on Recorder Display screen for options

Vertical Zoom: Vertical zoom is used to increase/decrease the displayed view of the currently selected channel by 2x. It does not affect the input span of the channel, which is set in the ***Channels*** menu. The active trace is highlighted in the Y-annotation portion of the screen, and can be switched using the **Select** button. If the cursor is on the screen, vertical zoom automatically centers the zoomed trace about the intersection of the cursor and trace. The keystroke Alt-Numeric + (-) can also be used to increase (decrease) the zoom of the displayed view. When you Zoom a trace, a scale appears on the Y-axis that shows the current scale in the amplifier range. Pressing this button in the middle resets the display to its default values.

Pressing the **Zoom** button causes a text box to appear in the display showing the zoom level. Pressing the middle of the **Zoom** button resets the display to the amplifier settings. Ctrl-Home on the keyboard can also be used to reset the display to the amplifier settings.

Keyboard: Alt-+/-
Mouse: Right-mouse-click on Y-axis, or click-and-drag to resize panes



Search: Opens the ***Search*** menu, enabling selection of the type of search. If you press the **Search** button and the **Cursor** button at the same time (either cursor, either direction), the system does a search for that color cursor in the indicated direction.

Keyboard: Alt-S
Mouse: Right-mouse-click on binoculars icon in lower right corner

Hard Copy: Prints a copy of the current display if printer is connected and properly set up.

Keyboard: Ctrl-P
Mouse: Right-mouse-click on Recorder Display screen for options



Jog/Shuttle: Allows you to manually scroll through the data by moving the knob to the left or right. It is also used to select the values for various menu options.

Keyboard: Up/Down arrow keys
Mouse: Right-mouse-click on X-axis for options

Using the Menu

The Menu allows you to access Vision commands from the front panel of your Vision. To show the menu, press the **Menu** button on the front panel or **F9** on your keyboard.



The menu appears at the right side of the Vision window. You can access all the commands for that menu by pushing the button on the front panel next to that menu name. (Press the **F1** button on the front panel to select the ***Acquisition*** command in the first menu, for example.) Depending on the selection you make in the ***Menu Mode*** section of the ***Preferences*** menu, pressing the **Menu** button again will either step back one menu level or toggle the entire menu on and off.

Keyboard: F9, or Escape to toggle one menu back/off.
Mouse: Touch the right/left edge of display

Chapter 5: Using the Main Menu



The ***Main*** menu allows access to all the Vision commands. Selecting any of the ***Main*** menu commands brings up a menu of commands for that selection. The **Menu** button on the front panel or F9 on your keyboard turns the menu on and off and is used to navigate through the different menu options. Dragging the mouse off the right side of your screen will also bring up the ***Main*** menu; dragging the mouse off the left side of the screen will toggle back one menu level.



Acquisition

The ***Acquisition*** command brings up a menu that is used for setting the data acquisition parameters for the test sequence. Select the acquisition mode (continuous recording or transient capture), action upon triggers, sample rate for all channels, the amount of data to record (both pre- and post-trigger), and enter a recording title and comments. Actual data acquisition is initiated using the **Record** button on the front panel.



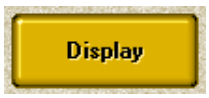
Channels

The ***Channels*** command brings up a menu that is used for setting sampling parameters for the individual channels, including settings for span, offset, coupling, filtering, and definition of engineering units. The menu also includes a calibration procedure for each channel. Span and offset settings can be entered using either the menu software or front panel buttons.



Trigger

The ***Trigger*** command brings up a menu that is used for entering trigger settings for the individual channels, whereas the Vision's action upon a trigger is determined in the ***Acquisition*** command menu. Each channel's trigger status is defined as On, Off, or Qualifier, with selectable trigger levels and conditions. A trigger Overview page can be displayed and printed. A channel's hysteresis, or sensitivity to noise spikes on a trigger signal, can be adjusted for selected trigger settings using either the menu software or the front panel **Offset** knob.



Display

The ***Display*** command brings up a menu that is used to access a wide variety of display options available for the Vision. Up to eight separate display pages can be defined with options such as display mode (stack/overlay/XY) and display X or Y axis settings. Each channel can be independently selected for display range and offset parameters. Separate pages for cursor values, view meters, post-run calculations and real time parameters are also available. Either the menu or front panel buttons can be used for many display choices such as page number, selected channel, or zoom settings.



Disk

The ***Disk*** command brings up a menu that is used to save/recall setup parameters, copy recordings, disk formatting, and other disk utilities.



Measure

The ***Measure*** command brings up a menu that enables calculation and display of parameter values such as RMS, frequency, or duty cycle while recording data. In addition, calculations can be performed post-run with the use of interactive cursors. Selection of the parameter calculations and displays for each channel is determined in the ***Measure*** menu. The F3 (PRC) and F4 (RTP) function buttons are used to toggle the calculations displays on and off.



Preferences

The ***Preferences*** command brings up a menu to select preferred settings for the operation of the Vision. Display defaults and menu interactions can be defined, as well as settings for the sound channel. Hardcopy printouts and Report settings can also be defined as well as operation for standalone or master/slave mode. If a customized macro program has been defined it may be called from this menu.



Utilities

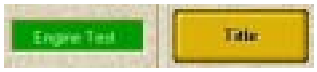
The ***Utilities*** command brings up a menu that is used to set up channel settings, printers, networks, and time/date settings. A spreadsheet to set up channel and triggering parameters is found in the Overviews menu. New versions of the operating software may be updated, and a KeyLock sequence defined to lock the front panel's function buttons. The ***Shutdown*** command used to close down the Vision unit is also found here. Information about the Vision software versions is found in the About menu.

Chapter 6: Using the Acquisition Menu



The selections in the ***Acquisition*** menu are used to define the data collection parameters for a given experiment. The Vision has two basic acquisition modes, *Continuous* and *Transient*, to specify if all data is collected continuously (like a tape recorder), or if data is only stored upon a trigger (like an oscilloscope). If one or more channels are defined as triggers (using the Trigger menu), the Vision's action on a triggered event are defined here. All channels are recorded at the same sample rate.

The Vision features a full disk pre-trigger circular buffer In this mode; data is stored temporarily to the acquisition drive, which acts as a first-in-first-out (FIFO) buffer up to the available disk capacity. After the buffer is full, the earliest data is discarded and replaced by the newly acquired data. The data in the buffer is saved upon a triggered event, according to your specifications. This feature enables experiments which can require hours, days, or even weeks of monitoring until the triggered event occurs.



Title

This selection activates the title box directly to the left of the menu and a cursor appears. The cursor position is moved left or right by using the cursor button controls on the front panel (**Cursor1** or **Cursor2**). Select a letter or number using the **Jog/Shuttle** knob to scroll through the alphabet. The vertical **Zoom** button can also be used to select numbers or letters. Pressing the **Select** button on the front panel toggles between capital and small letters and activates extended characters such as umlauts. Repeat the process to complete the full name of your recording title. If you have a keyboard, you can also type in the title.

The following front panel controls allow you to enter and edit alphanumeric titles:

- Cursor left (either color) – moves to previous character
- Cursor right (either color) – moves to the next character
- Zoom left – deletes highlighted character
- Zoom right – inserts a space
- Previous page – moves cursor to the first letter of the title
- Next page – moves cursor to the last letter of the title

Note that the first character of the title must be a letter. The rest of the title can include numbers. If you press Record multiple times, the recording name appears with an updated extension number.



Mode

This selection activates the title box directly to the left of the menu and a cursor appears. Using the **Jog/Shuttle** knob or the mouse, you can select between *Continuous* and *Transient* mode. The two modes have slightly different menu options to reflect their different modes of operation. The selections for *Continuous* mode are described immediately below here, followed by the selections for *Transient* mode.



Continuous Mode

In *Continuous* mode all sampled data can be stored to the disk until the disk capacity is reached. Data is generally collected until the recording is stopped manually, or can be recorded until a triggered event. (In contrast, selecting *Transient* mode records data only upon a triggered event, with no data stored between triggers.)

Note: *In Continuous Mode triggers are marked with the Bookmark icon.*



Acquire

This selection activates the acquire box directly to the left of the menu. Rotating the **Jog/Shuttle** knob (or **Vertical Zoom** button) moves the **Acquire** condition options up and down. You can also use the mouse to choose an option. Selecting the highlighted rate sets the **Acquire** condition.



Until Disk Full

Select this option if you want to continuously acquire data until the hard disk drive is full. Data is saved to disk immediately after pressing the **Record** button on the front panel. The length of the recording is dependent on the sample rate and the memory available on the acquisition drive. Recording can be stopped manually before the disk is full by pressing the **Stop** button on the front panel.

Note that there is no change to the acquired data when a trigger occurs while a recording is in progress. However, the data is tagged with a bookmark for post-run search. The bookmark marker icon appears in the Cursor/Marker bar during review.

Right-mouse-click on the Memory Status LED icon at the top left corner of the display to show the disk space available until the disk is full and the recording stops. The Max. Recording Time value will update if the sample rate or number of channels recorded are changed.



Until Stopped

Select this option to continuously monitor data until the recording is stopped manually by pressing the **Stop** button on the front panel. Menu options ask how much data to save when the **Stop** button is pushed using the **Store** button. This differs from the *Until Disk Full* selection as only the amount of data defined in the **Store** parameter is saved to disk. In the example shown here the Vision would save the last 1 hour of data before the recording was stopped.



Until Trigger

Select this option to continuously monitor data until a trigger from an analog channel is recorded. The **Trigger/Mark** button on the front panel will mark the data, but it cannot be used as a trigger that will stop a Continuous Acquisition. The acquisition terminates once the trigger and the post trigger data is collected. The ***Pre-Trigger*** command sets the amount of data recorded previous to the trigger, and the ***Post-Trigger*** command sets the data amount after the triggered event.

Pre-Trigger

This command appears when the ***Acquire*** selection is set to *Until Trigger*. It determines the time span of the data before the trigger event to save to disk in hours:minutes:seconds. The pre-trigger value is dependant on the sample rate and available storage capacity of the acquisition drive.

Post-Trigger

This button is offered when the ***Acquire*** selection is set to *Until Trigger*. It determines the time span of the data saved to disk after the trigger event disk in hours:minutes:seconds. The post-trigger value is dependant on the sample rate and available storage capacity of the acquisition drive.

Note: *The Vision features a full disk pre-trigger circular buffer. In* Until Trigger *mode, data sampled at the beginning of the test will be discarded for newly acquired data after the acquisition drive's capacity is exceeded. This enables experiments which can require hours, days, or even weeks of monitoring until the triggered event occurs. The maximum pre-trigger data setting is thus the available space on the acquisition drive.*



Specified Time

Select this option to continuously acquire data for a given time period. Press the **Record** button on the front panel to begin immediately saving data to disk. Acquisition stops after the time specified under ***Duration***.



Transient Mode

When using the Vision's Transient acquisition mode, data is only permanently stored to disk upon a trigger signal. During acquisition the Vision's display screen is split into two. The current trace levels are displayed on the right side of the screen, whether or not the data is being stored to disk. Upon a trigger signal, data shows up on the left side of the screen, where it is immediately available for functions such as cursor functions, zooming, printing, etc, while the system awaits the next trigger. New triggered events will update the left screen with the new data centered around the trigger signal. The gap in time between triggered events will be shown as either a pair of wavy lines on the display, or simply as a gap in the displayed traces between the triggered segments.



If there is a large amount of data (if you are collecting at a high sample rate, for example), the display may update slowly. The split screen feature makes it easy to immediately review data before the Vision has finished recording the entire data set.

During acquisition the **Scroll Speed/Horizontal Zoom** button controls the display of the triggered data on the left side of the screen. The scroll speed of the right side of the screen can be set by placing the system in Pause mode and adjusting the Scroll Speed prior to the recorded test. If you are using a mouse, you can adjust the size of the split screen panels using a left mouse click and drag to "drag" the center line of the display to one side or the other.

Selecting *Transient* mode allows you to set the following options.

Number (#) of Triggers

This selection activates the box directly to the left of the menu. Use the **Jog/Shuttle** knob or the up/down arrows on the keyboard to determine the number of triggers to acquire. Up to 10,000 triggers are allowed, depending on the available storage capacity of the acquisition drive. Pressing the **Scroll Speed/Horizontal Zoom** button when selecting the **number of triggers** will accelerate the speed of the Jog/Shuttle knob movement by ten times.

Pre-Trigger

This selection activates the box directly to the left of the menu. Use the **Jog/Shuttle** knob or the keyboard to determine how long before the trigger that pre-trigger data is recorded. The maximum number of pre-trigger points is 250,000. You can use the arrow keys on the keyboard to move to the next decimal place as well as increase or decrease each digit. The space after the third decimal point in the selection field is used to set the time scale (pico-, nano-, micro-, milli-, seconds, kilo-, mega-, giga-, tera-seconds), depending on the sample rate and available storage capacity of the acquisition drive. You may also use the arrow keys on the keyboard to select the time prefix in the final space.

Using the **Cursor** left/right button moves the active focus one place to the left/right.

Using the **Scroll Speed/Horizontal Zoom** button left/right moves the decimal point left or right. Only three numbers before the decimal point are allowed.

Moving the active focus to the blank space behind the numerical values allows you to set the time scale's order of magnitude (such as micro-, milli-, kilo-, or mega-) using the **Jog/Shuttle** knob or vertical **Zoom** button.

Using the **Prev/Next Pg** left/right button moves the active focus to the beginning/end.

Post-Trigger

This selection activates the box directly to the left of the menu. Use the **Jog/Shuttle** knob or the keyboard to determine how long to acquire data after the trigger event. You can use the arrow keys on the keyboard to move to the next decimal place as well as increase or decrease each digit. The space after the third decimal point in the selection field is used to set the time scale (pico-, nano-, micro-, milli-, seconds, kilo-, mega-, giga-, tera-seconds), depending on the available storage capacity of the acquisition drive. You may also use the arrow keys on the keyboard to select the time prefix in the final space.

Using the **Cursor** left/right button moves the active focus one place to the left/right.

Using the **Scroll Speed/Horizontal Zoom** button left/right moves the decimal point left or right. Only 3 numbers before the decimal point are allowed.

Moving the active focus to the blank space behind the numerical values allows you to set the time scale's order of magnitude (such as micro-, milli-, kilo-, or mega-) using the **Jog/Shuttle** knob or vertical **Zoom** button.

Using the **Prev/Next Pg** left/right button moves the active focus to the beginning/end.



Sample Rate

This selection activates the ***Sample Rate*** box directly to the left of the menu. Rotating the **Jog/Shuttle** knob or the mouse moves the sample rate options up and down. Selecting the highlighted rate sets the sample rate for the acquisition. The sample rate ranges from 1 S/s to 100 kS/s in 1-2-5 steps. All channels are sampled at the same rate.

Selecting the *External* option in the sample rate box activates the ***Ext. Clock Settings*** menu.



External Clock Settings

This menu is used to determine the ***Horizontal Units***, and ***Interval*** and ***Sample*** of the external clock. The maximum sample rate available for an external trigger signal is 50 kHz.

Horizontal Units

Defines the units of measurement used by the external clock (for example, degrees or radians).

Interval and Sample

Describes how many external clock counts make up the chosen number of Sample units. For example, as shown in the menu, 4 sampled counts per degree rotation of a shaft encoder. In this case, the Horizontal Unit is degrees of rotation and in 1 Interval (1 degree of rotation) there are 4 Samples (4 clock counts). This leads to 250 milli-degrees per Sample, as shown in the gray box.

You can use either the **Jog/Shuttle** knob, the arrow keys on the keyboard or keypad on the keyboard to adjust the entries in the ***Interval*** and ***Sample*** menu options.



Comment

This selection activates the comment box directly to the left of the menu and a cursor appears. The cursor position is moved left or right by using the cursor button controls on the front panel (**Cursor1** or **Cursor2**). Select a letter or number using the **Jog/Shuttle** knob to scroll through the alphabet. The vertical **Zoom** button can also be used to select numbers or letters. Pressing the **Select** button on the front panel toggles between capital and small letters and activates extended characters such as umlauts. Repeat the process to finish entering your comments. Alternately, you may use the keyboard to type a comment.

The following front panel controls allow you to enter and edit alphanumeric comments:

- Cursor left (either color) – moves to previous character
- Cursor right (either color) – moves to the next character
- Zoom left – deletes highlighted character
- Zoom right – inserts a space
- Previous page – moves active cursor to the first letter of the comment
- Next page – moves active cursor to the last letter of the comment

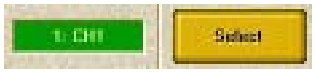
Note that the first character of the comment can only be a letter. The rest of the comment can include numbers.

Chapter 7: Using the Channels Menu



The Vision can be configured with either 8 or 16 isolated acquisition channels. Each channel utilizes isolated differential amplifiers with a bandwidth of 20 kHz per channel. The ***Channels*** menu is used to give each channel a unique name, determine the type of input coupling, select the span and offset and also assign engineering units. It is also possible to turn channels on/off, perform a two-point calibration, and set the 8-pole Bessel filter to different frequencies. The Vision provides 8 digital input channels and one counter timer. The counter timer can be used for frequency and RPM inputs.

A Channels and Trigger Setup spreadsheet is available to set channel parameters of multiple channels at one time. This menu may be called by pressing the F6 button when the Menus are turned off; by clicking on the Channels Setup icon in the lower right corner of the display (if a mouse is used); or through the Set-up button found in the Overviews menu in the Utilities menu bar. Description of the Channels Setup spreadsheet is found in *Chapter 13- Using the Utilities Menu*.



Select

Selecting this command activates the box immediately to the left. Use the **Jog/Shuttle** knob or the mouse to choose the channel, event marker, or counter to be configured. Channels are numbered left to right on the board.



Configuring Channels

Name

This selection activates the name box directly to the left of the menu and a cursor appears. The cursor position is moved left or right using the cursor button controls on the front panel (**Cursor1** or **Cursor2**). Select a letter or number using the **Jog/Shuttle** knob to scroll through the alphabet. The vertical **Zoom** button can also be used to select numbers or letters. Pressing the **Select** button on the front panel toggles between capital and small letters and activates extended characters such as umlauts. Repeat the process to complete the channel name. You can also type in the name if you have a keyboard connected to your Vision.

The following front panel controls allow you to enter and edit alphanumeric names:

- Cursor left (either color) – moves to previous character
- Cursor right (either color) – moves to the next character
- Zoom left – deletes highlighted character
- Zoom right – inserts a space
- Previous page – moves active cursor to the first letter of the name
- Next page – moves active cursor to the last letter of the name

Note that the first character of the name can only be a letter. The rest of the name can include numbers.



Coupling

Selecting this menu activates the box immediately to the left. Moving the **Jog / Shuttle** knob or the mouse shows the available selections. Settings become active when another menu button is pressed or the menu is turned off. There are up to ten different coupling options and only the appropriate selection should be made. The appropriate input dongles are required in order to use some of the coupling options.

Note: *Channels selected with AC-RMS or DC-RMS coupling are saved as RMS data, not the raw data of the input signal.*

AC

This is used to remove any DC or low-frequency (< 10 Hz) component (offset) from the input signal.

DC

The input signal is directly coupled to the instrument so that all frequency components of the input signal are displayed. The bandwidth is from DC to 20 kHz.

GND

This selection routes the input to earth ground in order to check for amplifier DC offsets and baseline noise.



AC-RMS

Calculates the RMS value of the AC-only portion of the signal, using a time constant that is selected using the **RMS Parameters** button described below. The DC offset is not included in the measurement.

DC-RMS

Calculates the RMS value of the signal, using both the AC and DC components of the signal. The RMS time constant is selected using the **RMS Parameters** button described below.

RMS Parameters

Allows you to set the analog bandwidth and update rate of RMS values for either AC-RMS or DC-RMS coupling settings.

5 KHz at .1 s
5 KHz at .1 s
5 KHz at .2 s
2.5 KHz at .2 s
5 KHz at .5 s
2.5 KHz at .5 s
5 KHz at 1 s
2.5 KHz at 1 s

4-20 mA

The 4-20 mA coupling option is used with the optional 4-20 mA dongle adapter. Selecting this option automatically sets the span to the appropriate input level. The 4-20 mA adapter uses a precision 100 ohm resistor, so the span is set to 0-2 V with this selection.

Thermocouple Channels

If after selecting any of the analog channels you select **TCouple E, TCouple J, TCouple K, TCouple T or PT100** in the coupling menu, follow the steps in this section to set the span, offset, EU (engineering units), filter and the correct storage option.

Selecting a type of thermocouple in this menu applies the appropriate linearization table for the selected thermocouple. The Vision unit does not automatically sense the presence of the thermocouple dongle on the input channel; it is your responsibility to correctly configure the coupling option for each channel. The thermocouple dongle contains the circuitry for cold junction compensation. Before taking data, give the thermocouple dongle five minutes to stabilize after it is plugged in.

	Range (°Celsius)	Range (°Fahrenheit)
Thermocouple E:	-270 to 1000	-454 to 1832
Thermocouple J:	-210 to 1200	-346 to 2192
Thermocouple K:	-270 to 1372	-454 to 2502
Thermocouple T:	-270 to 400	-454 to 752
PT100:	-200 to 800	-328 to 1472



Temperature Span

Selecting this activates the box immediately to the left, and turning the **Jog/Shuttle** knob or moving the mouse highlights the desired temperature span for the display range. The temperature span ranges from 10 °C to 2000 °C in 1-2-5 increments. This selection set the maximum/minimum values that are recorded by the channel. Selecting a smaller temperature span will increase the precision of the measured values, whereas a larger span will give coarser values.

Around

Selecting this activates the box immediately to the left and a cursor appears. This menu option is used to select the center temperature of the temperature range. For example, setting ***Around*** to 37° and ***Temperature Span*** to 20° sets the range from 27° to 47° for that channel. Any temperature greater than 47° will register as 47°; any temperature less than 27° will be read as the lower limit of 27°.



Span

Selecting this activates the box immediately to the left, and turning the **Jog/Shuttle** knob highlights the desired span. You may also make your selection by moving the mouse. The voltage input span ranges from 50 mV to 1000 V in 1-2-5 increments. (Some Vision data acquisition boards also offer a span of 1000 V.) Use the **Select** button to assign the desired input span.

Note: *The **Span** button on the right front panel operates only when the Vision system is recording data.*

Note: *The Vision's amplifiers are differential and centered around 0 volts, so selecting a Span of 20 V will set the amplifier to +/- 10 V.*



Offset

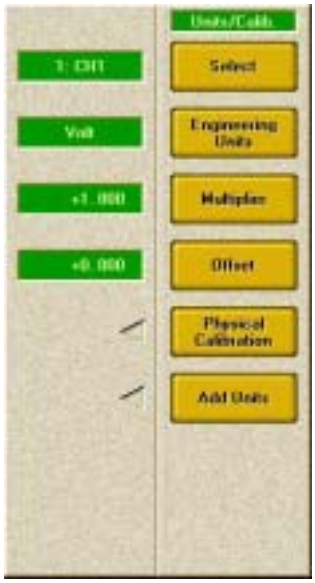
This command specifies the position of 0 Vdc in the ADC converter, and thus determines the measurable range. Selecting this command activates the box immediately to the left and a cursor appears. Using the **Jog/Shuttle** knob or the up/down arrows on the keyboard, select the number and repeat the process for the rest of the numeric positions. If you are using a keyboard, type in the desired Offset value. When the cursor is moved to the right side of the numerical values, you can adjust orders-of-magnitude using the **Jog/Shuttle** knob - to turn 2.000 V into 2.000 mV, for example.

When the Span value is set to 1000 V the Offset function is disabled, limiting the maximum input span to +/- 500 V. It is not possible to adjust the offset to measure from 0 V to +/- 1000 V.

Note: *The **Offset** button on the right front panel changes the electronic offset of the amplifier only when the Vision system is in* **Record** *or* **Pause** *acquisition modes. Otherwise, turning the **Offset** knob changes only the display offset of the highlighted channel, and does not affect the recorded data.*



Units Calibration



Selecting this button brings up a submenu. ***Units/Calib*** appears in the top box indicating the name of the submenu. This function allows you to define a linear slope equation for each channel to record data in engineering units. The calibration values can be entered as High/Low calibration values, or by defining the slope (M) and offset (B) from the linear equation Y = Mx + B. The following selections can be made from this menu.

Select

This button selects the channel to be calibrated. Care must be taken while using this option so as not to get confused with the active displayed channel, which is highlighted in the Y axis region of the waveform display.

Engineering Units

Choose your own engineering units such as “psi”, “radians”, etc. Several pre-defined units are available as defaults, or any number of new units can be defined. See the ***Add Units*** button for further details.

Multiplier

This feature is used to translate the engineering units to the measured voltage levels from the transducer. It sets the slope M of the line in the linear equation Y = Mx + B. For example, if a pressure transducer produces a 1 V output for 10 psi pressure, enter a scale factor of 10 in this box. Use the **Jog/Shuttle** knob or the keyboard to choose the value and the cursor button or the left/right arrow keys on the keyboard to go to the next number entry slot.

Offset

This feature is the second part in completing the unit calibration to correspond to the transducer (the Multiplier is the first, *see above*). It sets the offset B of the line in the linear equation Y = Mx + B. Enter the offset value in this box only if the zero volts does not represent a zero value in engineering units (for example, when using a 4-20 mA current loop). The offset value is set in engineering units.

Example: The Slope and Offset values as defined in the linear slope equation:

$$y = Mx + b$$

where the variables are defined as:

y is the desired value in engineering units;

M is the slope (= Technical Multiplier) in engineering units per volt;

X is the measured value in volts;

b is the offset value, in engineering units.

For example, if the transducer has a response factor of 10 Gs per volt, with a constant 1G offset, the slope equation describing that channels response is:

Y = Mx + b

Reported value = (10 G/V)(Measured value in volts) + 1G.

For a reading of 2.5 V at the transducer the reported value will equal 26 G's.



Physical Calibration

Choosing this menu option opens a new menu that is labeled **Phys. Calib.** at the top of the box. This menu allows you to determine the correct calibration between voltage and engineering units for your particular transducer.



Two-Point Physical Calibration Using the Measure Option

The *Measure* option in the ***Calibration Mode*** menu allows you to calibrate your transducer using physical inputs. The following procedure describes how to apply two physical input levels (representing a high and a low value) to your transducer and have the Vision automatically calculate the Technical Units scaling.

1. Select *Measure* in the ***Calibration Mode*** box.
2. In the ***Engineering Units*** box, enter the physical units measured by your transducer.
3. In the ***Upper Value*** box, enter the desired physical value of the high input signal, as defined in the Engineering Units menu.
4. Apply the high value of pressure, force, etc. to your transducer. The value appears in the ***Measure Now*** box.
5. When the input has stabilized, click the ***Measure Now*** button to capture the input voltage corresponding to the high input. The value is now fixed in this box.
6. In the ***Lower Value*** box, enter the desired physical value of the low input signal.
7. Apply the low value of pressure, force, etc. to your transducer. The value appears in the ***Measure Now*** box.
8. When the input has stabilized, click the ***Measure Now*** button to capture the input voltage corresponding to the lower value. The value is now fixed in this box.
9. A value between approximately 20% and 95% of full deflection is recommended for the most accurate calibration. If necessary, return to the ***Channels*** menu and adjust the amplifier span.
10. Click on ***Accept*** to save the calibration and ***Cancel*** to exit the menu without making any changes.
11. After the measurements have been accepted, the calculated values are inserted in the ***Multiplier*** and ***Offset*** boxes in the ***Channels*** menu.



Manual Two-Point Calibration from Data Sheet

The *Manual Entry* option in the ***Calibration Mode*** menu allows you to calibrate your transducer using data from the transducer data sheet. The following procedure describes how to enter calibration data points directly from the transducer data sheet and have the Vision compute the Technical Units scaling automatically.

1. Select a high and a low calibration point from the data sheet, with the corresponding voltage values. In the ***Channels*** menu select an amplifier span that includes both voltage values.
2. In the ***Engineering Units*** box, enter the physical units measured by your transducer.
3. In the ***Upper Value*** box, enter the physical value of the upper data point.
4. In the ***Upper Voltage*** box, enter the voltage that corresponds to the high data point.
5. In the ***Lower Value*** box, enter the physical value of the lower data point.
6. In the ***Lower Voltage*** box, enter the voltage that corresponds to the low data point.
7. Click on ***Accept*** to save the calibration and ***Cancel*** to exit the menu without making any changes.
8. After the inputs have been accepted, the calculated values are inserted in the ***Multiplier*** and ***Offset*** boxes in the ***Channels*** menu.



Add Units

This menu enables user definition of new Engineering Units to add to the EU selection lists. Selecting this menu opens a new menu. **Add Units** is displayed in the box at the top of the menu. Use the ***New Unit*** button to activate the box to the left and use the **Jog/Shuttle** knob to select the letters you want to use. Use the cursor button to move to the left or right to add letters to spell the new unit. If you have a keyboard, you may also type in the name for the new unit. Use the ***Accept*** button to add the unit to ***Engineering Units*** option in the ***Units/Calib.*** menu. Use ***Cancel*** to go back to the ***Units/Calib.*** Menu. When users add their own Engineering Units a ***Delete Units*** button appears below the ***Add Units*** button in the ***Units/Calib.*** menu set.



Filter

The Vision employs an analog 8-pole Bessel filter with a 20 kHz bandwidth, followed by a digital anti-alias filter that tracks the sample rate and automatically sets the cut-off frequency at one fourth the sample rate. The **Filter** button automatically presents filter cut-off rates at one-fourth of the selected sample rate and lower. Use the **Jog/Shuttle** knob, the mouse, or the up/down arrows on the keyboard to select the cut-off frequency for the filter. If your application does not require a filter, you may also choose *Off* from this menu to remove the digital anti-alias filter from the circuit.



Storage

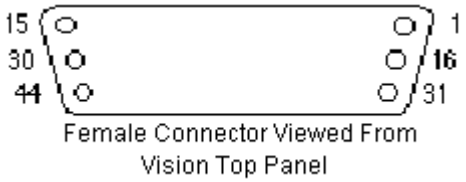
This feature allows selection for each channel to be turned on or off. If *No* is selected in this menu, data is **not** saved and the trace color is set to gray.



Configuring Event Markers

The Vision provides eight TTL input event markers, plus a counter circuit using TTL inputs. The eight inputs are connected to channels one through eight of the 44 channel pin adapter. Channels 17-30 can all be used to connect to system ground.

***Note**: The Event Marker channels are not electrically isolated. They are measured relative to the Vision's chassis ground.*



Marker 1-8/Remote

The Marker 1-8 connector is a 44-pin D sub connector used to connect digital inputs to the Vision acquisition system. An AMP HD22 series 44-pin D (Male) connector is compatible. The minimum pulse width is one sample period at the current acquisition rate. Spare connectors are available from LDS Nicolet as part number 117-901100.

***Note:** To meet CE requirements, the cable used to attach this connector must include the ferrite that is shipped with the connector. The ferrite must go around all the cables coming out of the connector.*

Please reference to the *Appendix* for a detailed pin out of the 44-pin connector.

Name

This selection activates the name box directly to the left of the menu and a cursor appears. The cursor position is moved left or right by using the cursor button controls on the front panel (**Cursor1** or **Cursor2**). Select a letter or number using the **Jog/Shuttle** knob to scroll through the alphabet. The vertical **Zoom** button can also be used to select numbers or letters. Pressing the **Select** button on the front panel toggles between capital and small letters and activates extended characters such as umlauts. Repeat the process to complete your recording name. If you have a keyboard connected to your system, you can also type in the name.

The following front panel controls allow you to enter and edit alphanumeric names:

- Cursor left (either color) – moves to previous character
- Cursor right (either color) – moves to the next character
- Zoom left – deletes highlighted character
- Zoom right – inserts a space
- Previous page – moves active cursor to the first letter of the name
- Next page – moves active cursor to the last letter of the name

Note that the first character of the name can only be a letter. The rest of the name can include numbers.

Invert

This menu is used to invert the TTL input signal. The signal is inverted if the user selects the YES option. It can be selected independently for each status bit.



Storage

This feature allows selection for the event channels to be turned on or off. If *No* is selected in this menu for any of the event channels, none of the event channels are stored.



Configuring the Counter

The Vision acquisition board is equipped with a Counter input circuit that measures the digital Marker inputs for frequency, RPM, or a Custom setting such as liters per minute. It accepts a TTL level signal input to pin #12 on the 44 pin connector on the analog card. In the ***Channels*** menu selecting *Counter* in the ***Select*** submenu brings up the appropriate options to utilize the counter. Please reference to the Appendix for a detailed pin out of the 44-pin connector.

Name

This selection activates the name box directly to the left of the menu and a cursor appears. The cursor position is moved left or right by using the cursor button controls on the front panel (**Cursor1** or **Cursor2**). Select a letter or number using the **Jog / Shuttle** knob to scroll through the alphabet. The vertical **Zoom** button can also be used to select numbers or letters. Pressing the **Select** button on the front panel toggles between capital and small letters and activates extended characters such as umlauts. Repeat the process to complete your recording name. If you have a keyboard connected to your system, you can also type in the counter name.

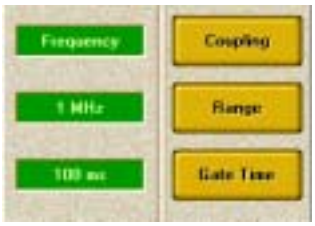
The following front panel controls allow you to enter and edit alphanumeric names:

- Cursor left (either color) – moves to previous character
- Cursor right (either color) – moves to the next character
- Zoom left – deletes highlighted character
- Zoom right – inserts a space
- Previous page – moves active cursor to the first letter of the name
- Next page – moves active cursor to the last letter of the name

Note that the first character of the name can only be a letter. The rest of the name can include numbers.

Coupling

Selecting this menu activates the box immediately to the left. Using the **Jog/Shuttle** knob or the mouse, you can select between *Frequency, PM or Custom.*



Frequency

Low-to-high transitions are counted during a specified time and converted to frequency in Hertz. Operation is similar to a conventional frequency counter, with measuring time selectable from 1 ms to 10 s. **Range** and **Gate Time** controls are provided in order to display and record the desired range. A new reading is presented at the end of each measuring period. A short measuring time allows faster updates, while a longer measuring time allows finer resolution of small changes. The maximum input frequency for the counter is 5 MHz. Use **Range** and **Gate Time** menu options to configure your frequency inputs.



RPM

Pulses on the TTL input counter, typically from a shaft encoder, are counted during a specified time and converted to Revolutions Per Minute (RPM). The number of pulses per rotation MUST be entered in the **Pulses Rotation** box so the Vision can accurately identify each revolution. Operation is similar to a conventional frequency counter, with measuring time selectable from 1 ms to 10 s.



Custom

In addition to the standard Frequency and RPM options, you can define custom engineering units (liters/minute for example). When Custom is selected as the Coupling choice, a new menu button labeled **Units Calibration** appears.

Units Calibration



Engineering Units - Use your own engineering units such as "liters per minute." These units are displayed after being defined under the **Add Units** menu below.

Multiplier – This feature is used to translate the engineering units to the number of pulses collected by the counter's TTL input. For example, if 10 pulses correspond to 1.0 liter of fluid passing through a pump, the multiplier would be set to 0.1 to get liters per minute.

Time Unit – The available options for this button are Seconds, Minutes, or Hours. This allows you to define the time over which the pulses are counted before being updated with a new value.



Add Units/Delete Units - This menu enables user definition of new Engineering Units to add to the EU selection lists. Selecting this menu opens a new menu. **Add Units** is displayed in the box at the top of the menu. Use the ***New Unit*** button to activate the box to the left and use the **Jog/Shuttle** knob to select the letters you want to use. Use the cursor button to move to the left or right to add letters to spell the new unit. If you have a keyboard, you may also type in the name for the new unit. Use the ***Accept*** button to add the unit to ***Engineering Units*** option in the ***Units/Calib.*** menu. Use ***Cancel*** to go back to the ***Units/Calib.*** Menu. When users add their own Engineering Units a ***Delete Units*** button appears below the ***Add Units*** button in the ***Units/Calib.*** menu set.

Range/Gate Time/Pulses Rotation

These controls are provided in order to display and record the desired range. A new reading is presented at the end of each measuring period. A short measuring time allows faster updates, while a longer measuring time allows finer resolution of small changes. Both resolution and response time are improved by using a high-resolution encoder, for example 1440 pulses per revolution rather than 32. The maximum input frequency for the timer hardware is 5 million pulses per second, or over 80,000 RPM with a 3600-pulse encoder. Use the **Range**, **Gate Time** and **Pulses Rotation** menu options to configure your RPM inputs.



Storage

This feature allows selection for each channel to be turned on or off. If *No* is selected in this menu, data is **not** stored.

Chapter 8: Using the Trigger Menu



Each channel (analog, digital, or counter) can be set as a trigger channel, so that data collection is triggered when the input level "goes high", or meets the trigger setting of that channel. The Vision starts to collect data upon a high signal from any of the selected trigger channels. In Boolean terms, all trigger channels use OR logic.

In contrast to a trigger channel, a channel can instead be set as a Qualifier channel, which MUST be triggered high to enable data collection. If the Qualifier channel is not high, data is not collected, even if the designated trigger channel(s) go high. A practical application of a Qualifier channel is to set up all the desired trigger channels prior to the actual test, then use a Qualifier channel as a switch to enable data collection when everything is ready to go. In Boolean terms, Qualifier channels use AND logic.

Example 1: Channels 1-8 all set with Trigger = *On*, ("Trigger" channels)

- **Scenario:** If Channel 1 goes high, it triggers data collection. Or if any 1 of the other channels goes high, it triggers data collection.

Example 2: Channel 1 is a Qualifier, Channels 2-8 are Triggers.

- **Scenario 1:** Channel 1 is low. Channel 2 goes high. No data is collected, as the Qualifier channel is not on.
- **Scenario 2:** Channel 1 goes high, Channels 2-8 are still low. No data is collected, as the Qualifier is high to enable data collection, but the Trigger channels are not high.
- **Scenario 3:** Channel 1 goes high. Data acquisition starts when Channel 2 goes high.

Example 3: Channels 1 and 2 are set as Qualifiers, Channels 3-8 are Triggers.

- **Scenario 1:** Channels 1 and 2 are low; Channel 3 goes high. No data is collected, as the Qualifier channels are not on.
- **Scenario 2:** Channel 1 is high, Channel 2 is low, and Channel 3 goes high. No data is collected, as both Qualifier channels MUST be high to enable data collection.
- **Scenario 3:** Channels 1 and 2 are both high; Channels 3-8 are still low. No data is collected, as the Qualifier channels are high to enable data collection, but no Trigger channel has gone high.
- **Scenario 4:** Channels 1 and 2 are both high. Data acquisition starts when any of Channels 3-8 go high.

Data collection can also be triggered manually, using the **Trigger/Mark** button on the Vision's front panel.

In the Vision's Transient acquisition mode a trigger is required before data is recorded to the hard disk. There are four different ways to send a trigger signal to the Vision, including:

- An acquisition channel which has a defined trigger level receives the appropriate signal
- You press the **Trig/Mark** button on the Vision's front panel
- You right-mouse-click on the MIC icon in the lower right corner of the Vision's display and select the option to Add Trigger
- A TTL signal is applied to the External Trigger pin in the Vision's 44-pin D connector on the acquisition board

The right side of the Vision's split screen shows the current channel levels on the display, which is shown even when the Vision is not acquiring data. If no trigger signal is received, these traces are displayed but not stored to disk. Upon a trigger signal the pre-defined pre- and post-trigger data is stored to disk as it is posted to the left side of the display screen. The trigger point is displayed as a small red T marking on the top of the display. You can analyze recorded trigger segments (zoom, cursors, print) while the Vision is still monitoring current data levels for another trigger signal. If you start a recording but receive no triggered events the recording will not be saved.

In most Continuous acquisition modes, data is recorded to disk irrespective of trigger status. The channels defined as triggers will not change the data acquisition behavior, but rather stamp the recording with a Bookmark, as shown by a yellow exclamation point on the display screen. The bookmarks are useful to stamp important events during a recording, and can be found as an option within the Search menu for post-run analysis.

An exception to the trigger behavior in Continuous acquisition mode occurs when you use the Continuous Until Trigger setting, which sets the acquisition disk as a circular buffer to preserve data prior to a triggered event. If the available disk space is filled prior to the trigger, the acquisition drive acts as a first-in-first-out (FIFO) buffer, with the oldest data points discarded in favor of new data. The buffer temporarily stores the most recent data, up to hard drive buffer capacity, until a trigger occurs.

In Continuous mode, you can bookmark important data using the **Trig/Mark** button on the front panel. If the **Trig/Mark** button is pressed and held down it activates a user-supplied microphone, with

a resulting Voice mark instead of the yellow Bookmark. The microphone remains active and can be used to record comments until you let go of the **Trig/Mark** button. The resulting *.WAV file will play back through the internal speakers (or user-supplied external speakers) whenever the Voice mark icon appears on the Vision's display during replay. The voice channel is not available in Transient mode, where the **Trig/Mark** button always acts as a trigger. Voice marks may also be initiated using the right mouse click action of a mouse on the green MIC icon in the lower right corner of the display.

Different trigger conditions are available, depending on the type of channel (*Analog, Event, Counter*) being configured, and the trigger status for that channel (*On, Off, Qualifier*). Selection of parameters for the different channel types is described below.



Configuring Analog Triggers

Select

Selecting this menu activates the box immediately to the left. Rotate the **Jog/Shuttle** knob or use the mouse to select the input for the trigger. For an analog trigger source select from CH1 to CH8 (or CH16 for 16-channel systems).

Trigger

Selecting this menu activates the box immediately to the left. This menu offers three options. *Off* turns the trigger off for the selected channel, *On* sets the selected channel as a Trigger to start (or stop) data collection and *Qualifier* defines the channel as a switch that must be on to enable data collection upon a trigger event.

Off

If a channel has a trigger setting defined as Off, its values have no effect on the data acquisition action. If this option is selected no other menu are available.

On

Selecting this option brings up the trigger setup menus. When you choose this option, three new menu buttons appear: ***Condition, Level*** and ***Hysteresis.***

Condition

Use the ***Condition*** menu to determine whether to trigger on a rising edge, falling edge, dual slope (either rising or falling edge) or the slope of the waveform.

Rising Edge Trigger: The Vision employs the Hysteresis method to trigger. This means the waveform needs to cross two levels in the positive direction in order to trigger. Hysteresis trigger is used to insure that the Vision system does not collect multiple triggers due to a noise riding on the signal. You specify the trigger level in the Level box and the noise level in the Hysteresis box.

Falling Edge Trigger: The Vision employs the Hysteresis method to trigger. This means the waveform needs to cross two levels in the negative direction in order to trigger. Hysteresis trigger is used to insure that the Vision system does not collect multiple triggers due to a noise riding on the signal. You specify the trigger level in the Level box and the noise level in the Hysteresis box.

Dual Edge Trigger: This setting allows you to define both high and low levels as trigger levels for an input channel. For example, a static pressure sensor typically at 14 psi can be set to trigger if the measured pressure goes above 18 psi or below 10 psi. Vision does not support hysteresis triggers in this trigger mode.

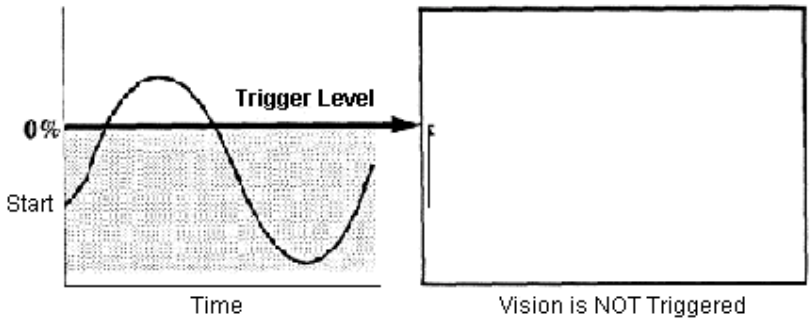
Slope Trigger: This trigger feature allows you to trigger on the slope of the waveform. Enter the change in amplitude (Delta-Y) over the desired time span (Delta-t) over which the slope is to be measured. The time and voltage spans entered must not be longer than 256 data points, or the system will decrease the values to 256 data points. This entry can result in a correct slope value but an incorrect trigger. For example, if you are running at a sample rate of 100 kS/s and you enter in Delta-Y=1 V and Delta-t=1 sec, you have exceeded 256 data points. The Vision will record the values Delta-t=2.56 ms (256 data points) and Delta-Y=2.56 mV. This entry results in the same slope value (1 V/s) but a very different trigger condition. Slope trigger allows you to trigger on a sharp spike in the data, or on a relatively rapid change in response from the transducer.

Note*: The Slope Trigger uses the absolute value of the Delta-Y value, so the system will trigger on either a falling or rising signal.*

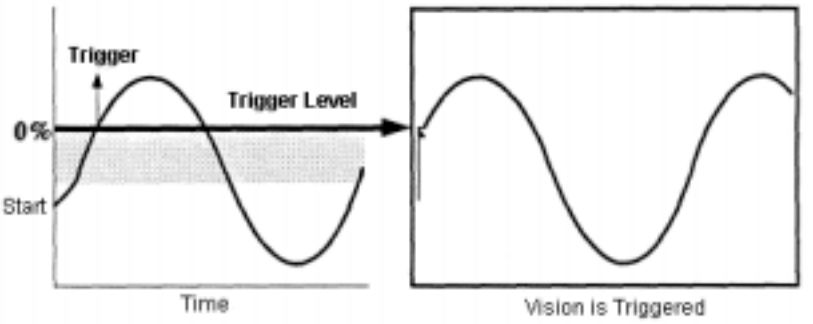


Hysteresis/Level

Hysteresis is used to determine the sensitivity of the Vision's trigger to noise riding on the measured signal. It is only available when ***Trigger*** is set to On. The measured data must start outside the hysteresis range before crossing the set trigger ***level*** in order to trigger data collection, as shown in the accompanying diagrams. For example, if Channel One's Trigger is set to On, Condition = Rising, Level = 6.00 V, and Hysteresis = 200 mV, then the trigger condition will be met when the signal from Channel One passes through 5.80 V, then passes 6.00 V to trigger. A signal beginning at 5.95 V rising above the 6.00 V trigger level will not act as a trigger. Pressing the **Scroll Speed / Horizontal Zoom** button when selecting the trigger level or trigger hysteresis accelerates the speed of the **Jog / Shuttle** knob movement by ten times.



This signal failed to trigger the Vision because it did not begin its initial positive voltage transition outside of the Sensitivity window.



The Sensitivity window was reduced. The signal qualified as a valid trigger event because it started its positive voltage transition outside the Sensitivity window before it crossed the Trigger Level.



Qualifier

Selecting qualifier in the ***Trigger*** menu brings up two other menu selections; the ***Qualifier*** menu and the ***Level*** menu. By selecting the specified channel as a qualifier, you require that channel's trigger status to be high to enable data collection. Selecting the ***Qualifier*** menu brings up the ***Above, Below, Between*** and ***Outside*** options. For the Above and Below settings you determine a single level crossing for the Qualifier channel. For Between and Outside settings you enter two levels, high and low, to which the Qualifier signal is compared. The Vision does not utilize hysteresis triggers in Qualifier mode.



Configuring Counter Triggers

The selections for the counter triggers are identical to those for the analog input channels (see *Configuring Analog Triggers* in this chapter).



Configuring Event Triggers

Select

Selecting this menu activates the box immediately to the left. Rotating the **Jog/Shuttle** knob enables you to select the input for the trigger. You may also use the mouse to make your selection. For the event trigger select from *Ev1* to *Ev8*.

Trigger

Selecting this menu activates the box immediately to the left. This menu offers three options. *Off* turns the trigger off for the selected channel, *On* turns the trigger on and *Qualifier* allows you to set conditions for triggering on the selected channel.

Off

If you select this option no other menu is available for you to set. Proceed to the next event channel using the ***Select*** menu.

On

Selecting this option brings up the ***Condition*** menu. Use the ***Condition*** menu to determine whether you want to trigger on a rising edge, falling edge, or dual (either a rising and falling edge).

Rising Edge Trigger: The system records a trigger on the rising edge of the event trace (low to high transition).

Falling Edge Trigger: The system records a trigger on the falling edge of the event trace (high to low transition).

Dual Trigger: The system records a trigger event on a change in state of the event bit (low to high or high to low transition).



Qualifier

An event channel can be defined as a qualifier, with the selections *Event is High* or *Event is Low*. This channel status must be met to enable data acquisition. The *Dual* Trigger setting is not supported in ***Qualifier*** mode.



Overview

Selecting the ***Overview*** command opens a panel displaying the mode, primary condition and secondary condition for each channel. An icon alerts you to the defined trigger status for each condition.

The Channels and Triggers Setup Menu can be accessed by pressing **Select-F6** on the front panel or **Ctrl-F6** on the keyboard.



 Rising

 Falling

 Dual

 Hysteresis

 Slope

 Slope

 Above (Qualifier)

 Below (Qualifier)

 Between (Qualifier)

 Outside (Qualifier)



Overview Events

Selecting the ***Overview Events*** command opens a panel displaying the channel and mode for each event channel. An icon alerts you to the defined trigger status for the mode.

The Channels and Triggers Setup Menu can be accessed by pressing **Select-F6** on the front panel or **Ctrl-F6** on the keyboard.



 Rising Edge

 Falling Edge

 Dual

 Event is High (Qualifier)

 Event is Low (Qualifier)

Blank page.

Chapter 9: Using the Display Menu



This menu allows you to customize the main display. The default set up has eight panes in one page. A pane is the division containing a single waveform trace. The Vision allows you a great deal of display flexibility. You can stack traces, re-organize them in different pages, change display ranges, display offset, include/exclude channels/panes etc.

In addition to the menu buttons, many of the front panel buttons affect the display of data (the **Zoom** button, for example). The menu selection buttons (**F1-F8**) have alternative functions when the menu is turned off, as described at the end of this section.



Page Number

The Vision allows up to eight display pages with eight panes in each. Use this menu to determine the page to customize display settings. The displayed page can be changed using this menu selection or by using the **Prev Pg/Next Pg** button on the front panel. You can also use the PgUp/PgDn keys on the keyboard to choose the displayed page or, if you are using a mouse, by right-mouse-clicking on the Page Number icon in the upper left corner of the Vision display.



Page Title

The eight display pages can have unique names. This selection activates the title box directly to the left of the menu and a cursor appears. The cursor position is moved left or right by using the cursor button controls on the front panel (**Cursor1** or **Cursor2**). Select a letter or number using the **Jog/Shuttle** knob to scroll through the alphabet. The vertical **Zoom** button can also be used to select numbers or letters. Pressing the **Select** button on the front panel toggles between capital and small letters and activates extended characters such as umlauts. Repeat the process to complete the full name of your recording title. If you have a keyboard, you can type in the name for the Channel.

The following front panel controls allow you to enter and edit alphanumeric titles:

- Cursor left (either color) – moves to previous character
- Cursor right (either color) – moves to the next character
- Zoom left – deletes highlighted character
- Zoom right – inserts a space
- Previous page – moves active cursor to the first letter of the title
- Next page – moves active cursor to the last letter of the title

Note that the first character of the title can only be a letter. The rest of the title can include numbers.



Display Mode

The ***Display mode*** command allows you to select the layout of the page. Selecting this activates the box to the immediate left and a number a number of options appear.

Stacked

Selecting this option stacks the waveforms in panes numerically in sequential order, based on Channel number, with a separate pane for each input channel. This is the default set up of the display. A maximum of 16 traces is available per page. If the Vision is configured with 16 channels, Channels 1-8 appear on Page 1 and Channels 9-16 appear on Page 2 in the default display configuration.

Overlay

This option displays all the waveforms included on the page in one big pane. The y-axis displays all the ranges for the waveforms. Pressing the **Select** button on the front panel changes the active trace, which is denoted by a highlighted channel name on the y-axis label.

2-Panes

This option is similar to the *Overlay* option, but instead of all eight channels appearing in one full-page pane, the display is split into two panes. The first pane contains channels one to four and the second pane contains channels five to eight. If less than eight channels are selected, the channels are split evenly between the two panels. Channels are added to the panes sequentially, so the first several channels appear in the top pane, with the later channels grouped into the lower pane.

3-Panes

This option is similar to the *Overlay* option, but instead of all the eight channels appearing in one full-page pane, the display is split into three panes. Channels are added to the panes sequentially and are evenly divided between the panes. The first several channels appear in the top pane, with the later channels grouped into the lower panes.

4-Panes

This is similar to the *Overlay* option, but instead of all the eight channels appearing in one full-page pane, the display is split into four panes. Channels are added to the panes sequentially and are evenly divided between the panes. The first several channels appear in the top pane, with the later channels grouped into the lower panes.

X/Y

This selection allows the input levels from different channels to be plotted versus each other, as opposed to being plotted versus time. The ***Time-Axis*** button is replaced by the ***X-Axis*** button, which is used to set the input channel used for the abscissa. The **F7** menu button is a shortcut to toggle the current display between XY and scrolling displays.

Note that the XY display is active in playback mode or in *Transient* collection mode. An XY display is not updated in *Continuous* acquisition mode.

Off

This section simply turns the page off and no panes are displayed on the screen.



Time Axis/Channel X-Axis

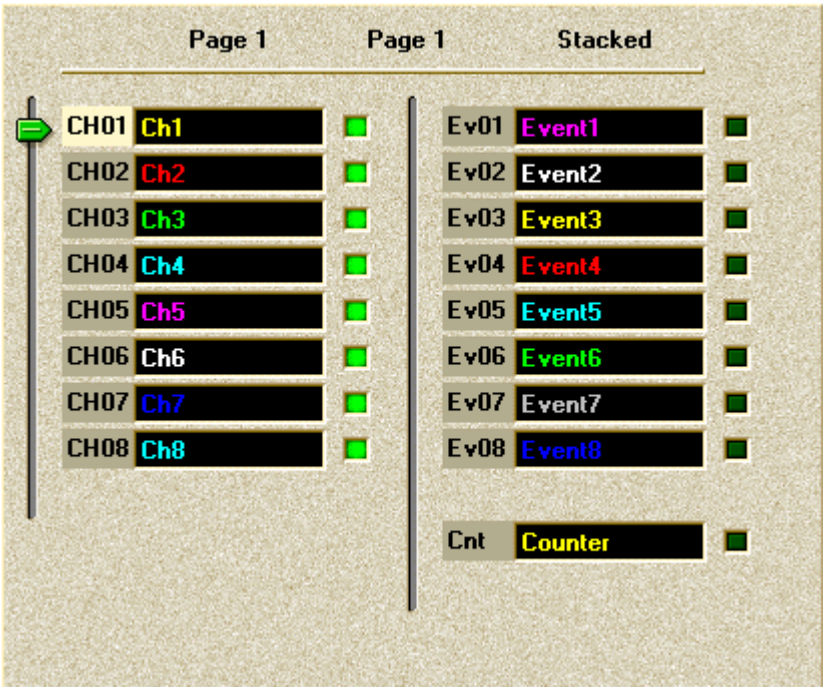
Use this menu to select the time per division of the x-axis of the waveform. Choose from 10 μs/div to 60 min/div. You can use the **Jog/Shuttle** knob or the mouse to make your selection. Pressing the **Scroll Speed/Zoom** button expands or contracts the current display by a factor of two until reaching the display limits. During acquisition or playback, the waveform display reaches a maximum scroll speed of 50 mm/second.

This button changes to ***Channel X-Axis*** in the X-Y mode. The ***Channel X-Axis*** button allows you to select the channel for the x-axis in an X-Y plot, replacing time. Choose from the channels available in the Vision system.



Configure Page

This menu selection brings up a list of the channels to be displayed in the current display page, as shown below. The **Jog/Shuttle** knob, the vertical **Zoom** button, or the mouse may be used to highlight a channel. Pressing the **Select** button turns the channel on or off, as displayed by the square green lamp to the right of the channel. You may also use the mouse the click on the square to the right of each Channel to turn that Channel on or off.





Trace Select

This menu allows you to select the channel for which you want to change display options. Selecting this button activates the box to the left, and, using the **Jog/Shuttle** knob in the front panel or the mouse, you can make your selection. Pressing the **Select** button on the front panel can also be used to change the active trace, which is denoted by a highlighted channel name and a small colored triangular mark on the y-axis label.



Display Range

The Vision allows you to determine the display span for each waveform. The display span is typically shown on the left side of each pane.

Note: *Pressing the **F7** menu toggles through different Y-axis display modes. When the* **Display Range** *button is highlighted, turning the **Jog/Shuttle** knob or pressing the **Vertical Zoom** button or the up/down arrows on the keyboard changes the display range of the selected channel within the panel.*

Note that the displayed range can be different from the input amplifier settings. This feature allows you to display a small portion of the signal while maintaining the full input span. The zoom factor appears momentarily on the screen when the front panel **Zoom** button is pressed. To return to a 100% zoom factor, press the center of the **Zoom** button. While the input span determines the amplification range and consequently affects the signal integrity, the display span only determines the vertical display of the waveform. It should be understood as a form of vertical zoom.

Note: *By default, the selected Display Range will not be retained after using the Zoom in/Zoom out functions, but will instead revert to the Engineering Unit values. To retain the selected Display Range as the new default you can save the new display values using the Save Settings dialog in the Disk menu.*



Display Mid-Scale

This command allows you to adjust the position of the selected trace within its panel. When the **Display Mid-Scale** button is highlighted, turning the **Jog/Shuttle** knob or pressing the vertical **Zoom** button or the up/down arrow keys on the keyboard changes the mid-scale display of the selected channel. Pressing the **Scroll Speed/Horizontal Zoom** button when adjusting the Display Midscale accelerates the speed of the **Jog/Shuttle** knob movement by ten times.

You should be aware that the mid-scale display is different from the input offset set with the **Offset** knob on the front panel. The input offset determines the amplification range and consequently affects the signal integrity, whereas the display mid-scale only affects the vertical display of the waveform.

Chapter 10: Using the Disk Menu



The ***Disk*** menu allows you to save your current setup, load a previous setup, copy/view previous recording and select the drive that you want to use to save/recall data.



Settings Drive

This command allows you to select the drive where the settings file for the Vision's data acquisition and display parameters is stored. The available options are: *Local Disk* (your Vision system's C: drive), *Diskette* (your Vision's floppy disk), or *Acquisition Disk* (removable acquisition drive, not available at this time). This drive will be used for the "Load Setup" and Save Set-up" buttons.

Note: *This menu selection is NOT used to define where Vision data is copied using the* **Copy Recording** *button. It is used exclusively for the Vision's parameter settings files, not data files.*



Load Setup

Selecting this menu brings up a new set of options. ***Load Setup*** appears in the top box indicating the name of the menu set. ***Load Defaults***, ***Current Recording*** and ***Cancel*** buttons appear.

Select

This command allows you to choose a setup to load from a list of previously saved setups. Up to 20 unique setup files can be defined and saved. The setup is not actually loaded until you click on the ***Load*** button.

Load

This command loads the setup you chose in the ***Select*** command.

Load Defaults

This command loads the default setup. The Default settings file cannot be overwritten.

Current Recording

This command allows you to load the data acquisition and display parameters from the current recording.

Cancel

This cancels this option and takes you back to the previous menu.

Delete Setting File

This command allows you to delete a setup that was previously created. Once a setup is deleted it cannot be reloaded.





Save Setup

Selecting this menu brings up a new set of options. ***Save Setup*** appears in the top box indicating the name of the menu set. ***Select, Name, Save,*** and ***Cancel*** buttons appear.

Select

Select the data acquisition parameters from a list of previously saved setups. You can save up to 20 setups. Note that setups are not saved automatically when you record data. You must save the setup using the ***Save*** command in this menu.

Name

This selection activates the name box directly to the left of the menu and a cursor appears. The cursor position is moved left or right by using the cursor button controls on the front panel (**Cursor1** or **Cursor2**). Select a letter or number using the **Jog/Shuttle** knob to scroll through the alphabet. The vertical **Zoom** button can also be used to select numbers or letters. Pressing the **Select** button on the front panel toggles between capital and small letters and activates extended characters such as umlauts. Repeat the process to complete your recording name. If your system has a keyboard, you can also type in the name.

The following front panel controls allow you to enter and edit alphanumeric names:

- Cursor left (either color) – moves to previous character
- Cursor right (either color) – moves to the next character
- Zoom left – deletes highlighted character
- Zoom right – inserts a space
- Previous page – moves cursor to the first letter of the name
- Next page – moves cursor to the last letter of the name

Note that the first character of the name can only be a letter. The rest of the name can include numbers.

Save/Cancel

Selecting ***Save*** saves your setup file in the specified drive location, selecting ***Cancel*** does not.



Max Recording Time

The time listed to the left of this menu item is the maximum length of the recording based on the current sample rate. This time can also be determined by right clicking on the green / yellow / red icon in the memory status section at the top of the screen. This time will change if you change the sample rate or the number of channels recording data.





Copy Recording

This command allows you to copy one or more user selectable recordings from the acquisition disk to an external drive or network.

Source

This command allows you to select the source you want to copy from a selection list. Valid selections are:

- [current] recording: the recording that is currently loaded
- Any other recording on the acquisition disk
- [all]: allows you to copy all files in one go

Range

When a current recording is selected you can select one of the following ranges:

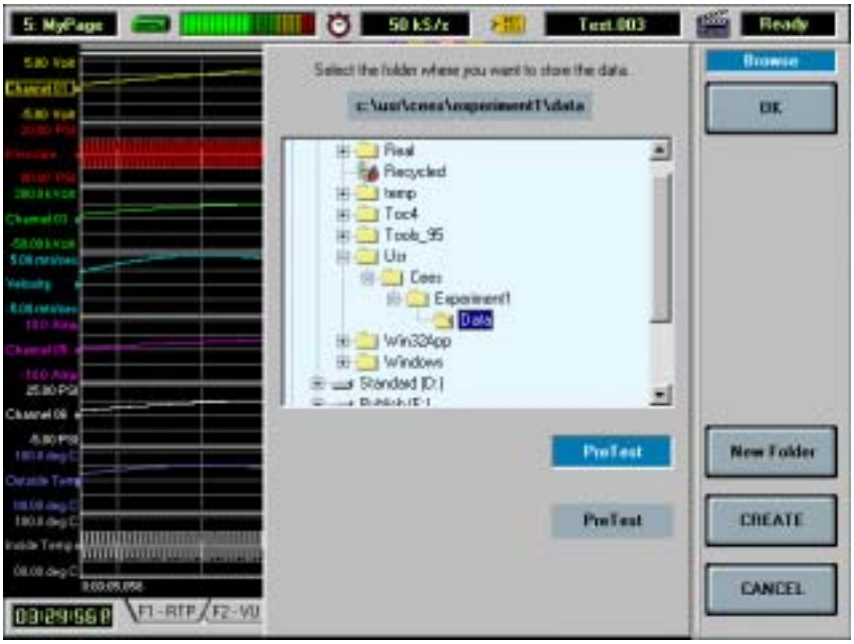
- Complete recording
- As displayed
- Between cursors (current record only)

When any other recording is selected the range is automatically set to *Complete* and the ***Range*** button is grayed.

Destination

This command allows you to select the path where you want to store your data, provided it is saved in NRF format. This can be any valid Windows path, inside or outside the Vision. If an export format other than NRF is chosen, the destination is specified in the ***Export Setup*** menu.

Selecting the ***Destination*** button opens a new menu where you can make these selections.



OK

Clicking on this button choose the destination listed to the left of this box as the folder where you would like to store your data.

New Folder

Enter a name for the new folder.

Create

Creates the new folder after you have given it a name in the ***Create New Folder*** field.

Cancel

Exits the menu without creating a new folder.

Name

This feature is available for the NRF export format only. This feature is especially useful when you want to copy multiple (triggered) segments from one recording with different names. The default value is the Recording title.

This selection activates the name box directly to the left of the menu and a cursor appears. The cursor position is moved left or right by using the cursor button controls on the front panel (**Cursor1** or **Cursor2**). Select a letter or number using the **Jog / Shuttle** knob to scroll through the alphabet. The vertical **Zoom** button can also be used to select numbers or letters. Pressing the **Select** button on the front panel toggles between capital and small letters and activates extended characters such as umlauts. Repeat the process to complete your recording name. If you have a keyboard, you can type in the recording name.

The following front panel controls allow you to enter and edit alphanumeric names:

- Cursor left (either color) – moves to previous character
- Cursor right (either color) – moves to the next character
- Zoom left – deletes highlighted character
- Zoom right – inserts a space
- Previous page – moves cursor to the first letter of the name
- Next page – moves active cursor to the last letter of the name

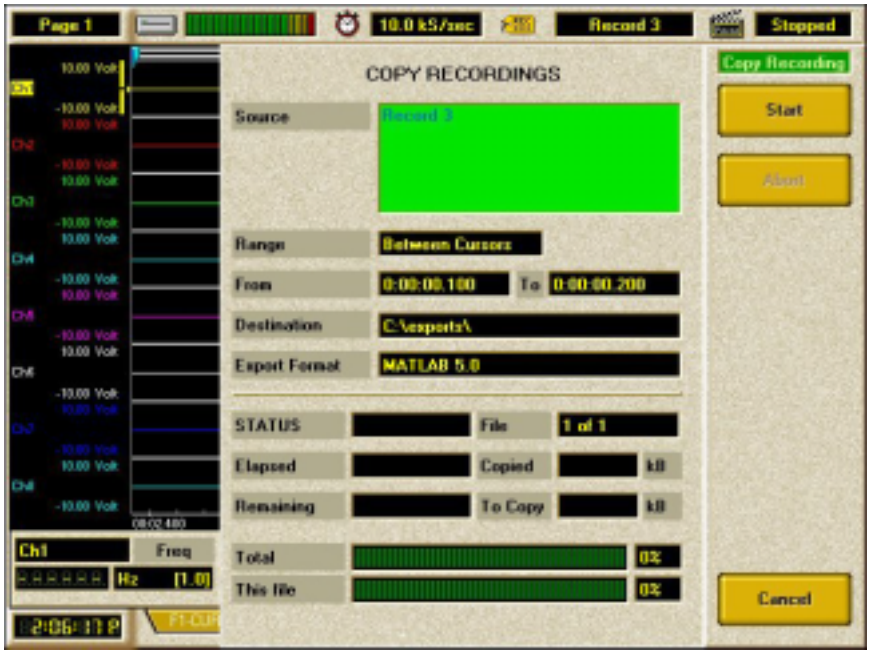
Note that the first character of the name can only be a letter. The rest of the name can include numbers.

If an export format other than NRF is chosen, the file name is specified in the ***Export Setup*** menu.


Page 1
10.0 kS/sec
UPS1A 050 4
Stopped
Copy Recording
[Current]
Between Cursors
C:\
UPS1A 050 4
Source
Range
Destination
Name
Copy
Select Batch
Export Format
Export Setup
Ch1
Freq
Hz
[1.0]
Ch1
P-P
Volt
[1.0]
Ch1
F4-RTP

Copy

Selecting **Copy** allows you to copy a single record to a given destination. If a recording other than the current recording is selected, you can only copy the entire data file. The following panel appears for copying a single file:



Start

Starts the actual copy process.

Abort

Aborts the copy process.

Cancel

Returns to the copy menu without starting the copy process.

The window to the left of the menu gives information about the copy process, e.g.

- Source, range, destination
- Batch list
- Active time, estimated time left, status
- Export format
- Progress bar(s)

Select Batch

This command opens a spreadsheet showing a list of all available recordings that can be added to the batch. Using the front panel, recordings are selected by scrolling with the **Jog/Shuttle** knob or the **Zoom** button and pressing the **Select** button to highlight the required recording.

Using a keyboard and mouse, the batch copy spreadsheet can be modified much like an Excel spreadsheet. Columns can be resized by clicking on the column divider and dragging to the desired width. Columns can also be reordered by clicking on the column title and dragging to the desired location. Recordings are selected individually by pressing the Control key and clicking the left mouse button or in groups by holding down the Shift key while clicking the left mouse button. After all required recordings are highlighted, select **Batch Copy** to review the copy parameters.

Export Format

This command allows you to select the form you would like to export your data in.

You can set preferences for each file type by selecting **Export Setup.**

Export Setup

This command allows you to set the preferences for the file type selected in ***Export Format***. A keyboard and mouse are required for creating the initial setup for each export format. Once created, that setup becomes the default for the corresponding export format.

Export Setup contains settings unique to each file type, such as:

- File Name
- File Destination
- Saving Conventions
- Naming Conventions





View Recording

This command opens a menu that allows you to load a recording for viewing. The properties of the file you are loading are described, making it easier to determine which file you want to open.

Select

Select a recording to load from the list on the left. When you choose a file name from the list, the properties of that file are listed below the file name in the following order: comments which you have entered to describe the file, file size, the time the recording was made, the date the recording was made and the duration of the recording. The recording is not opened as the current recording until the Load button is pressed.

Expand Comment

This selection opens a text box used to enter Comments to be stored with the recording. Comments may be of any length. The Expand Comment function lets the user see the entire comment instead of being limited to the 12 characters in the menu selection field.

Load

Loads the selected recording as the Current file.

Cancel

Exits the menu without loading a recording.



Delete Recording

This command opens a menu that allows you to delete a recording.

Select Recording

Select a recording to delete from the list on the left.

Delete

Delete the selected recording.

Delete All

Deletes all the recordings on your hard drive.



Disk Utilities

This command opens a menu that allows you to format or eject a removable disk.

Quick Format Acq. Disk

This command re-formats the Vision's acquisition disk to eliminate all previous data files.

Note: Once formatted, all previous data files are permanently deleted and cannot be recovered. There is no un-format command.

Chapter 11: Using the Measure Menu



This menu is used to perform measurements on the acquired data. Selecting this menu brings up two options, ***Post-Run Calculations*** (PRC) and ***Real-Time Parameters*** (RTP). Selecting ***Post-Run Calculations*** allows you to perform calculations after the data has been acquired. PRC is interactive, allowing you to move the cursor locations that determine the span over which the calculation is performed. In contrast, the ***Real-Time Parameters*** are calculated and displayed during acquisition, and are performed over a pre-defined time span. The PRC or RTP parameters values are displayed along a bar at the bottom of the page when you click on the **F3** or **F4** tabs using the mouse. Click on the tab again to hide the display. A list of the parameters available for each option is given in the following sections.

If you are using a mouse you can edit the PRC and RTP fields directly from the main display screen. Position the mouse pointer on the meter you wish to edit on the bottom of the screen, and use a right mouse click to get the available options. You can edit the channel number, type of parameter, and calculation range for each meter.



Post Run Calculations (PRC)

Selecting this option brings up a new menu set. ***PRC*** appears in the menu name box at the top of the menu. Use this menu to select and determine parameter type and measurement conditions.



Channel Select

Selecting this menu activates the box immediately to the left. Use the **Jog/Shuttle** knob or the mouse to select the channel in which you want to perform your calculation. The channel options include all the channels available in the Vision unit.

Calculation/X-Range

The ***Calculation*** menu lists the available parameter calculations that can be performed on the selected channel. If you have selected an analog channel or counter then all the available calculations are listed in this menu. However, only a few calculations are available for the event channels. After selecting the parameter use the ***X-Range*** menu to select the range over which the parameter should be calculated. The selected calculation can be performed either on the whole recording, the displayed segment of the recording or

between the two cursors. You can move the cursors left/right to set up the x-range over which you want to perform your calculation. The cursors can be used in *Tracking* mode to maintain a fixed gap, even as the cursors are moved to different parts of the recording.

The results of the PRC are included in a table format if you print a report using the Hard Copy button.

Available Calculations in PRC

Area
Base
Duty Cycle
Energy
Fall Time
Frequency
Maximum
Mean
Minimum
Overshoot
Peak to Peak
Period
Pulse Count
Pulse Width
Rise Time
RMS
Slope
Standard Deviation
Top
Undershoot

Add to View

Adds the selected parameters to the PRC tab. Toggle the tab on and off by pressing the **F3** button on the front panel when the Menu is off. A maximum of eight parameters per screen can be displayed.



Clear Last

Deletes the last parameter from the PRC tab.



Real Time Parameters (RTP)

Selecting this option brings up a new menu set. ***RTP*** appears in the menu name box at the top of the menu. Use this menu to select and determine parameter type and measurement conditions.



Channel Select

Selecting this menu activates the box immediately to the left. Use the **Jog/Shuttle** knob or the mouse to select the channel in which you want to perform your calculation. The channel options include only the analog channels and the counter. Real time parameter calculations cannot be performed on event channels.

Realtime Parameter/Range Time

The ***Realtime Parameter*** menu lists the available parameter calculations that can be performed on the selected channel. If you have selected an analog channel or counter then all the available calculations are listed in this menu.

After selecting the parameter use the **Range Time** menu to select the time (range) over which the parameter should be calculated. The selected parameters are calculated over the user-specified time and displayed in the RTP display. The parameters are continuously calculated over the range and updated as the recording is made. These values are not stored and are available for display only while the recording is in process.

Available Calculations in RTP

Base
Duty Cycle
Fall Time
Frequency
Maximum
Mean
Minimum
Peak to Peak
Period
Pulse Width
Rise Time
RMS
Slope
Standard Deviation
Top

Add to View

Adds the selected parameters to the RTP tab. Toggle the tab on and off by pressing the **F4** button on the front panel when the Menu is off. A maximum of eight parameters per screen can be displayed.



Clear Last

Deletes the last recorded parameter from the RTP tab.



Cursor Mode

This controls operation of the red (Cursor1) and blue (Cursor2) cursors.

Free

In *Free* mode, the cursors can move independently.

Tracking

In *Tracking* mode, the cursors can be locked so that they scroll together at a fixed distance. If you move the red cursor, the blue cursor will follow at a fixed interval. The blue cursor can be moved independently of the red cursor to adjust the interval.

Chapter 12: Using the Preferences Menu



The ***Preferences*** menu contains various options for you to set up the Vision's display, sound functions, report settings for overview/summary print-outs, hardcopy printouts of the graphical traces, recorder options for different types of printers, and menu display options. Display options include grid on/off options, X and Y axis annotation, data points on/off, and channel colors. Sound options are available for on/off, microphone levels, and speaker levels. Report settings are used to print overviews of channel configurations and trigger status, and include paper orientation, margins, and spacing. Hard copy options configure a printer for printing out the waveform traces, and include single sheet or multiple pages, page number to print, autoprint on/off, grids on/off, and selection of paper orientation and calibrated margins. The recorder options allow the Vision to be configured in stand-alone mode, in master/slave configurations, or to set the system to overwrite the current recording instead of creating a new record. The menu display options allow you to select the language and color of the buttons, as well as toggling the ***Quick Help*** feature on and off. Finally, the path to launch a custom application is defined in the Launch Executable menu.



Display



Selecting this option opens a new set of menus. ***Display*** appears in the menu name box at the top of the menu. Use these menu options to set the parameters of your display.



Grid

This allows you to turn the display grids on or off for each trace. When you select **Grid**, the box to the left is activated. Use the **Jog/Shuttle** knob or the mouse to move the options and make your selection. The selections are: *Off, On, 2, 4, 6, 8,* and *10 Divisions/Trace*. The *2-4-6-8-10* options select the number of grids that divide each of the displayed traces. For example, 2 Div gives one grid line at the 50% level of each trace, whereas 10 Div divides each trace into 10 x 10% sections.



X-Annotation

This menu is used to view your preferred x-axis scales. Select the menu to activate the box to the left. Use the **Jog/Shuttle** knob or the mouse to move the options and make your selection.

Off

This turns off the time display bar at the bottom of the display.

Absolute Standard

The absolute standard x-axis display shows the time of recording in the left and right corners of the display.

Relative Standard

The relative standard x-axis display sets the time of the start of the recording to zero seconds and labels the time at the left and right corners of the display.

Absolute/Tick

In the per tick mode, time stamps are displayed for every grid crossing of the x-axis so that the time resolution between data points is more clearly marked than in the standard setting. If **abs./tick** is chosen, the time of recording is displayed.

Relative/Tick

In the per tick mode, time stamps are displayed for every grid crossing of the x-axis so that the time resolution between data points is more clearly marked than in the standard setting. If ***Rel./Tick*** is chosen, the time at the start of the recording is set to zero seconds.



Y-Annotation

This menu is used to view your preferred y-axis scales. Select the menu to activate the box to the left, and use the **Jog/Shuttle** knob or the mouse to move the options and make your selection. You can also toggle between these selections by pressing the **F8** button when the menu is turned off.

Off

This turns off the side bar located on the left side of the display. Vertical units and channel names are no longer displayed, enabling a wider waveform viewing area.

Range

Selecting this option displays the vertical display range and assigned engineering units for each pane.

Curs. 1 and 2

This option allows you to view the cursor value underneath the channel name. Both the cursor values are displayed and the value next to the colored square corresponds to the colored cursor. As the cursor moves, the values are updated.

Cursor Last

This command displays the cursor value underneath the channel name for the trace's value at the active intersection (i.e., the cursor which was moved last). The values are updated as the cursor is moved.



External X-Annotation

This menu applies when you are using an external source to determine the clock timebase. Select this menu button to activate the box to the left. Use the **Jog/Shuttle** knob or the mouse to select the desired option.

Standard

The *standard* x-axis display shows the time of recording in the left and right corners of the display.

Cycle: Degrees

The *cycle: degrees* option allows you to mark the x-axis in terms of degrees of rotation.



Show Data Points

If this menu option is on, each individual data point will be shown on the screen in addition to a line connecting them. If this option is turned off, only the line connecting the data points is shown, not the points themselves.



Default Time Scale

The value shown to the left of this menu option is the default time per division for the x-axis of the display. If you press the middle of the horizontal zoom button on the front panel, the display will return to this time per division. Select this menu button to activate the box to the left, then use the **Jog/Shuttle** knob or the mouse to select the desired option. The menu options range from 10µs/division to 60 minutes/division.



Channel Colors

This menu allows you to select the color options for the channel displays.

Channel

This menu allows you to select a channel. Select **Channel** to activate the box to the left, then use the **Jog/Shuttle** knob or the mouse to select the desired channel.

Color

The box to the left of this option displays the color for this channel when it is recording data. To change the color, select **Color** to activate the box to the left, then use the **Jog/Shuttle** knob or the mouse to select the desired option.

Storage Off Color

The box to the left of this option displays the color for this channel when it is not recording data. To change the color, select **Storage Off Color** to activate the box to the left, then use the **Jog/Shuttle** knob or the mouse to select the desired option.

Default Colors

Selecting this menu button will reset all of the channels to their default colors.



More

Selecting this menu button allows access to the ***Sweep Mode*** button and the ***Record While Rec.*** button.



Sweep Mode

When this mode is turned on, the Vision's display stops scrolling the traces across the screen. Instead, the traces are frozen on the screen until updated by a vertical line, which sweeps across to refresh the display.



Review While Rec.

When the ***Review while Recording*** mode is turned on you can continue recording new data to disk, while reviewing data that has already scrolled off screen. In this mode, the Vision's display screen is split into two parts. The left side of the screen displays previously recorded data, while the right side displays the current trace levels. Data on the left side of the screen is immediately available for functions such as parameter calculations, cursor functions, zooming, printing, and searching.

If there is a large amount of data (if you are collecting at a high sample rate, for example), the display may update slowly. The split screen feature makes it easy to immediately review data before the Vision has finished recording the entire data set.

During acquisition, the **Scroll Speed/Horizontal Zoom** button controls the display of the data on the left side of the screen. The scroll speed of the right side of the screen can be set by placing the system in Standby mode and adjusting the Scroll Speed prior to the recorded test. Also, if you are using a mouse, you can adjust the size of the split screen panels by left mouse clicking on the centerline of the display and dragging it to one side or the other.

To learn about reviewing data while recording in Transient Mode review the Transient Mode section under the ***Acquisition*** menu.





Sound

Selecting this option brings up a new menu set. **Sound** appears in the menu name box at the top of the menu. Use this menu to select parameters for the Vision functions that involve sound.

Sound

When the sound is turned on, the Vision beeps when menu buttons are pressed, recordings are started or stopped, or sample parameters are adjusted. This helps you to verify that your selected button push was registered correctly. You can select to turn these sounds off with this menu button.

Voice Mark Start

If you want to add a voice mark to your recording, you hold down the **Trigger/Mark** button on the front panel for the amount of time specified to the left of this box. You may choose times ranging from 0.5 to 3 sec, or you may turn the option off completely. If you press the **Trigger/Mark** button for less than this amount of time, you will add a Bookmark or a Trigger to your data when acquiring data in Continuous Mode. The Voice Mark feature is disabled in the Transient Acquisition Mode.

Microphone Volume

This menu button allows you to adjust the volume of the microphone connected to your Vision. To adjust the volume, select the button to activate the box to the left, then use the **Jog/Shuttle** knob to increase or decrease the volume as desired.

Speaker Volume

This menu button allows you to adjust the volume of the speakers in your Vision. To adjust the volume, select the button to activate the box to the left, then use the **Jog/Shuttle** knob to increase or decrease the volume as desired.

Test Speaker

When you select this menu option, the Vision will make a sound, allowing you to test the volume level of the speakers.

Auto Replay Voice Mark

When the ***Auto Replay Voice Mark*** selection is set to ON, voice marks recorded with the data file are played each time the megaphone icon appears on the vision's display screen. When this option is OFF, no voice marks are replayed.



Report Settings



The **Report Settings** menu is used to set printer parameters when printing out the Vision's overview reports, which include Channels, Triggers, and Event Triggers. These reports may be viewed under the ***Utilities/Overview*** menu selection. This dialog is not used to set the printer options for waveform traces, only tabular overview reports.

Orientation

Options for orientation include *Landscape or Portrait*, which rotates the page in the direction of the tabular overview report.



Margins

This menu option opens a new menu which allows you to set margins (Top, Bottom, Left, and Right) for the report printout. It also allows you to set the margins in either inches or centimeters.



Hard Copy



Selecting this menu brings up options for setting up your printer for hardcopy output of the waveform traces shown on the Vision's display screen. The Vision can be configured with a continuous feed thermal printer, or other multi-page printers, as well as single sheet printers. All data from *Continuous* acquisition mode, and triggered segments from *Transient* mode, may be plotted during acquisition or post-run.

Mode

This option lets you select either *Single Sheet* or *Multiple Sheets* for your printout. Selection of Single Sheet only allows printer settings that will fit on a single page printout. Selection of *Multiple Sheets* brings up new menu buttons to select how much of an entire recording will be printed onto multiple sheets (or onto a continuous feed thermal printer) and paper speed.



The Vision's **HardCopy** button on the front panel may also be used for controlling the real-time printer output during acquisition. Pressing the **HardCopy** button multiple times will toggle printing status between ***On*** and ***Off.***

Note: The Vision puts data for the printout into a print buffer in one-page increments. If printing is halted without finishing the entire selected segment, the Vision will not stop printing until it finishes printing the last entire page in the buffer.

Print Segment (Multiple Sheets Only)

This menu button is available only if *Multiple Sheets* is selected in the **HardCopy Mode** menu. It controls how much of a recording is printed out in a post-run session. Selections include *Between Cursors*, *Displayed*, and *Complete Recording*. When *Between Cursors* or *Displayed* is selected, the printout will use appropriate beginning and ending points which encompass the selection while providing even graph points.

Paper Speed (Multiple Sheets Only)

This menu button is available only if *Multiple Sheets* is selected in the ***HardCopy Mode*** menu. It determines the time axis spacing of the printed waveform traces. Settings range from 10 mm/Minute to 5 m/second. The Vision puts data for the printout into a print buffer in one-page increments. If printing is halted without finishing the entire selected segment, the Vision will not stop printing until it finishes printing the last entire page in the buffer.

Grid Style

This options lets you select whether to include grid lines on your printout, and is independent of the grid control on the LCD display. The selections include *Off*, *Dots*, or *Line* and can improve the legibility of your printout, depending on the data point resolution of your data, trace colors, and overlaid/stacked display mode.

Auto Start/Auto Print

This feature allows you to automatically print out the defined display segment upon receiving a trigger signal. The trigger point is included on the printout, as well as the name of the channel that is triggered. Selections include *Off* or *On Trigger*.

In Single Sheet paper mode, the print out will automatically be sized to include the entire Triggered segment. In Multiple Sheet paper mode the user may select Paper Speed and define the trace segment to be printed (*Complete Recording*, *Between Cursors*, or *Displayed* segment).

Display Page

This menu selects which of the eight display pages will be used for printing. This selection is independent of the **Prev/Next Pg** display selection during acquisition. This allows you to display one page on the Vision's display during acquisition, while printing other channels of interest for a permanent report.

Orientation

Options for orientation include *Landscape* or *Portrait*, which rotates the direction of the printed waveform traces.



Margins

This menu option opens a new menu which allows you to set margins (Top, Bottom, Left, and Right) for the waveform trace printout. It also allows you to set the margins in either inches or centimeters.





Recorder

The ***Recorder*** menu allows you to modify the functionality of the Vision system, including its master/slave/stand-alone status, and its Overwrite mode.

Multiple Vision units may be linked together in master/slave mode, enabling synchronous sampling and phase alignment of all channels at once. One master system provides the clock signal for up to three slaves, combining for a possible 64 channels across the four systems. The master is connected to the slaves via an Ethernet cable with RJ-45 connectors. The cable must be a shielded Cat 5E cable in order for the Vision to meet CE requirements. This cable carries both the clock signal and the trigger signals between units, so that a trigger on any of the four units will trigger data acquisition on all the systems. (Note: The Ethernet cable must be less than three meters long to guarantee the reliability of the clock and trigger communications between the master and slave units). The RJ-45 connectors are found on the Vision's data acquisition board and are labeled M1, M2, and M3/S1. Each slave should have the Ethernet cable plugged into the M3/S1 port, and the master sends the clock signals to the slaves over the M1/M2/M3 ports.

While the master system provides the clock pulses to the slave units, each system may be configured with its own acquisition sample rate and acquisition mode (***Continuous*** or ***Transient***). Thus, a system may have the master system sampling in ***Continuous*** mode at 1.00 kS/s, whereas a slave unit is sampling in ***Transient*** mode at 100 kS/s. The slave units cannot initiate data acquisition but must rely on the master system to provide the **Record** starting pulse.

Data is saved on each Vision unit independently. Master/slave configurations may be set up using the standard software on each Vision unit, or configured over a PC network using LDS Nicolet's optional VisionNet Plus software. VisionNet Plus is a Windows-based acquisition software package (Windows 95, 98, NT, or 2000) that allows you to set up sampling parameters on all master and slave systems, select realtime displays for the PC, and merge the independent data files into a single distributed recording file (*.DRF) which contains all the traces from the different systems.

Role

This menu option is used if you are using several Vision units together in Master/Slave mode. If your Vision unit is operating independently, you should choose the **Standalone** option from this menu. If you have connected several Vision units together, you should choose the appropriate **Master** or **Slave** option from the list using the **Jog/Shuttle** knob or the mouse.

When you select an option, the icon at the top of the screen changes to indicate your selection:

 Standalone

 Master

 Slave

Overwrite Mode

If this option is *Off*, the Vision will create a new file every time the *Record* button is pressed. When this option is *On*, the Vision will overwrite the current recording with a new recording when you press the **Record** button on the front panel. The *On* option is useful when you are setting up your system and do not wish to save any of the recordings.

External Pause

Setting the ***External Pause*** to ON enables control of the Vision's PAUSE recording status by applying an external TTL signal to pin 13 (SELECT) of the Vision's parallel port. The Vision goes into PAUSE mode when the TTL signal goes HIGH. The ***External Pause*** feature is disabled if this button is set to OFF. It can take up to 250 msec after the TTL signal is hardware applied for ***Pause*** to be enabled/disabled.



Menu

This menu provides selections for navigating menus, color schemes, obtaining help, and the language for the display.



Menu Mode

This selection allows you to determine how to toggle the menus. Selecting *One back* always takes you one menu back in the menu hierarchy when the **Menu** button is pressed. Selecting *Toggle* means the entire menu toggles on/off when the **Menu** button is pressed. You may find the *Toggle* selection quicker to navigate between menus, particularly for selections that are 2-3 menu layers deep in the hierarchy. Select the menu to activate the box to the left and use the **Jog/Shuttle** knob or the mouse to move the options and make your selection.

Scheme

The Scheme sets the colors of the menu buttons and text in the user interface. It does not affect performance, but you can change it to improve the readability of the display elements.

Quick Help

When the ***Quick Help*** selection is on, context-sensitive Help balloons are displayed with a brief explanation of the use of any selected button. ***QuickHelp*** is designed to help a beginner learn to use the Vision's software interface. It is different in usage from the **Help** button located at the top of the menu buttons, which requires you to search for your help topic.

Language

Allows you to choose the language for the text of the display. The options include English, German, Dutch, Italian, and French. Select the menu to activate the box to the left, then use the **Jog/Shuttle** knob or the mouse to make your selection.



Launch Executable

This feature allows you to enter a file pathway to run a custom application (such as automated sequence) designed with the Vision Applications Programmers Interface (API) software. Once the pathway is defined, the application is launched by pressing the F5 button (or typing the **F5** key on an optional keyboard) when the Vision's menu panel is turned off.

Example: Set the Launch Executable pathway to C:\PROGRAM FILES\COMPANY XYZ\MYTEST.EXE.

When the **F5** button is pushed when the Vision's Menus are turned off, the application MYTEST.EXE will run. For more information about customized programs contact your LDS Nicolet representative for information about the Vision API option.

Chapter 13: Using the Utilities Menu



The Utilities menu contains commands that allow you to perform a variety of tasks for the system. You can set the time and date, set up a printer, connect to a network, lock the system's front panel, edit and print the current settings, shut down the system, and get information about your Vision system.



Date/Time



This button opens a menu that allows you to set the time and date for the system.

Time

This button allows you to change the time for your Vision system. When you first select ***Time***, the hours are highlighted. Use the **Jog/Shuttle** knob, the vertical **Zoom** button or the up/down arrows on the keyboard to change the time. Move to the minutes and seconds using either **Cursor** button on the front panel.

Date

This button allows you to change the date for your Vision system. When you first select ***Date***, the month is highlighted. Use the **Jog/Shuttle** knob, the vertical **Zoom** button or the up/down arrows on the keyboard to change the date. Move to the days and year using either **Cursor** button on the front panel.

Properties

This button opens the standard Windows Date/Time dialog box that will let you set the time, date and set your time zone and Daylight Savings options.

Accept

When you have entered the correct time and date, click ***Accept*** to enter the new values into your Vision system.

Cancel

If you want to exit without changing the date and time for your system, click ***Cancel.***



Printer

The Printer menu provides a series of menu options to install, select, and calibrate the line spacing of any Windows-compatible printer. An **Abort Printing** button is also provided to discontinue printing.

Select

This option allows you to choose which printer you would like to use. Any printer you have installed on the Vision (see ***Maintenance*** below) will be available as a choice on the list.

Abort Printing

The **Abort Printing** button is provided to eliminate all pending print jobs if desired. This allows you to stop printing if the incorrect settings were used for the printout, or if they decide that a hardcopy printout is not required.



Calibration

The printer ***Calibration*** menu allows you to reset the Vision's hardcopy output to meet the variances between different printers. By calibrating the X and Y axis measured values versus their reference values, small differences between printers may be eliminated with great precision. For example, if a new printer creates a printout with spacing of 4.8 mm between grid lines instead of 5.0 mm, the calibration procedure may be used to set the new printer to the proper output values.

Maintenance

This command opens the Windows dialog box that allows you to add any Windows compatible printer to your system. See your Windows manual for further instructions.

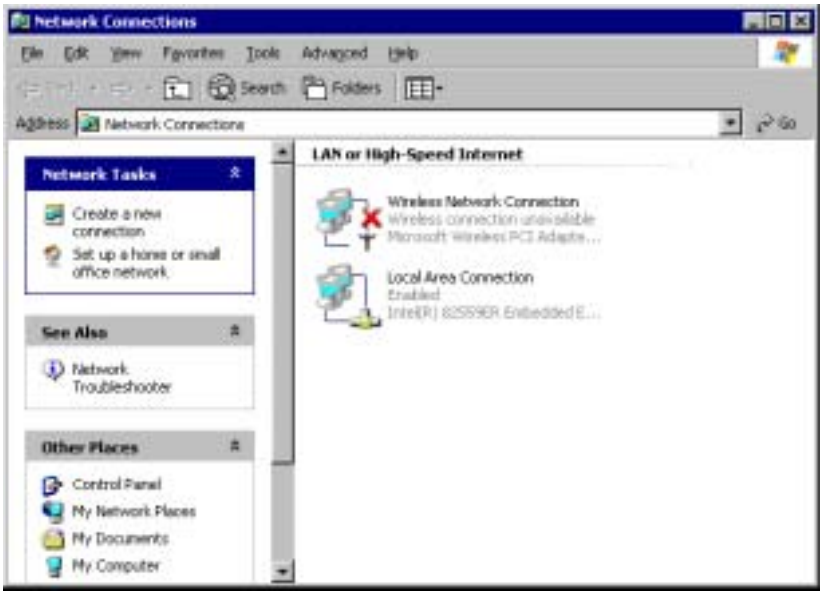
Note: *You need a mouse and keyboard to setup a printer with your system. If you select this button without a mouse and keyboard connected, you will get an error message.*



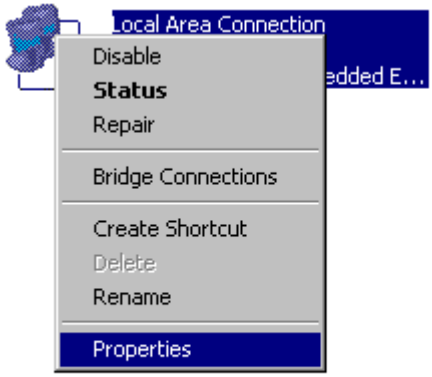
Network

This menu command opens the standard Windows Network dialog box that allows you to set the network connections for your Vision. You do not need to change anything in this box unless you want to put your Vision on a network. A mouse and keyboard are required for access to this menu option. If you select this menu button without a mouse and keyboard connected, you will get an error message.

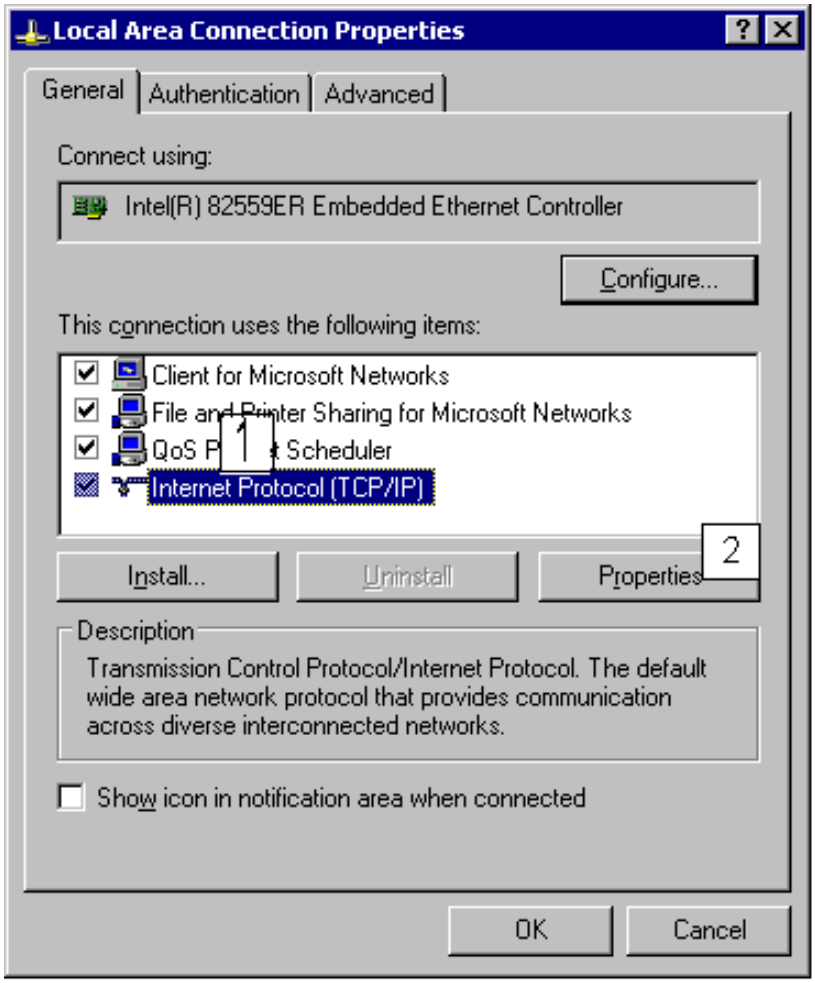
When you choose this menu option, you will see the following:



To set up a Local Area Connection, right click on Local Area Connection and choose Properties as shown below.



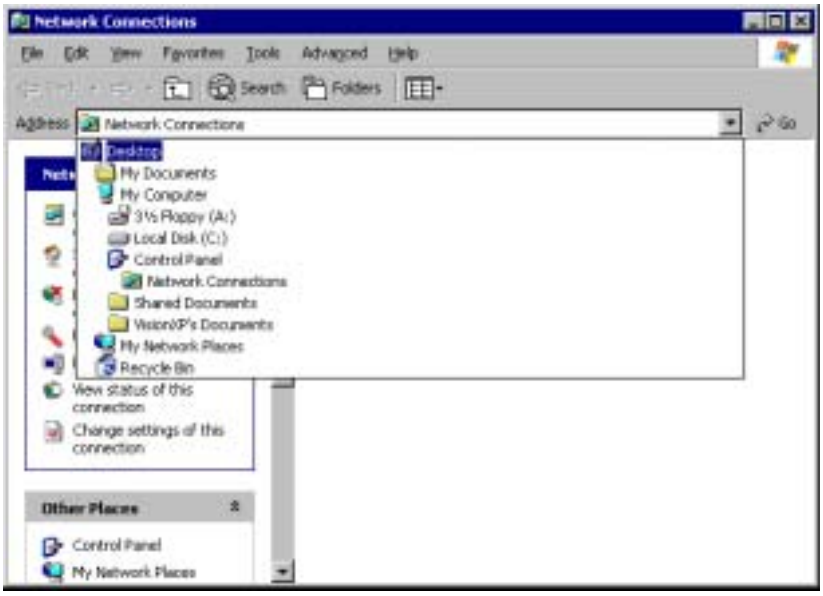
The Properties dialog box opens.



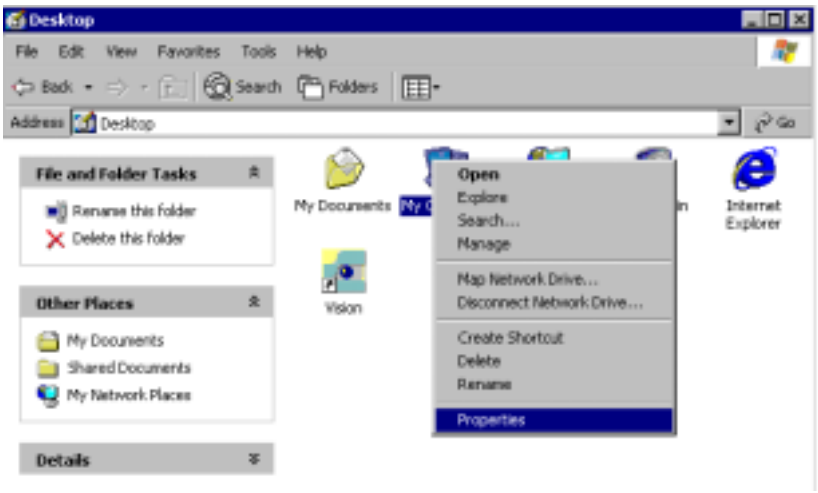
First choose TCP/IP (1) and then click on the Properties (2) option. In the box that opens, you need to list a valid IP address and then click OK.

Select OK to close this dialog.

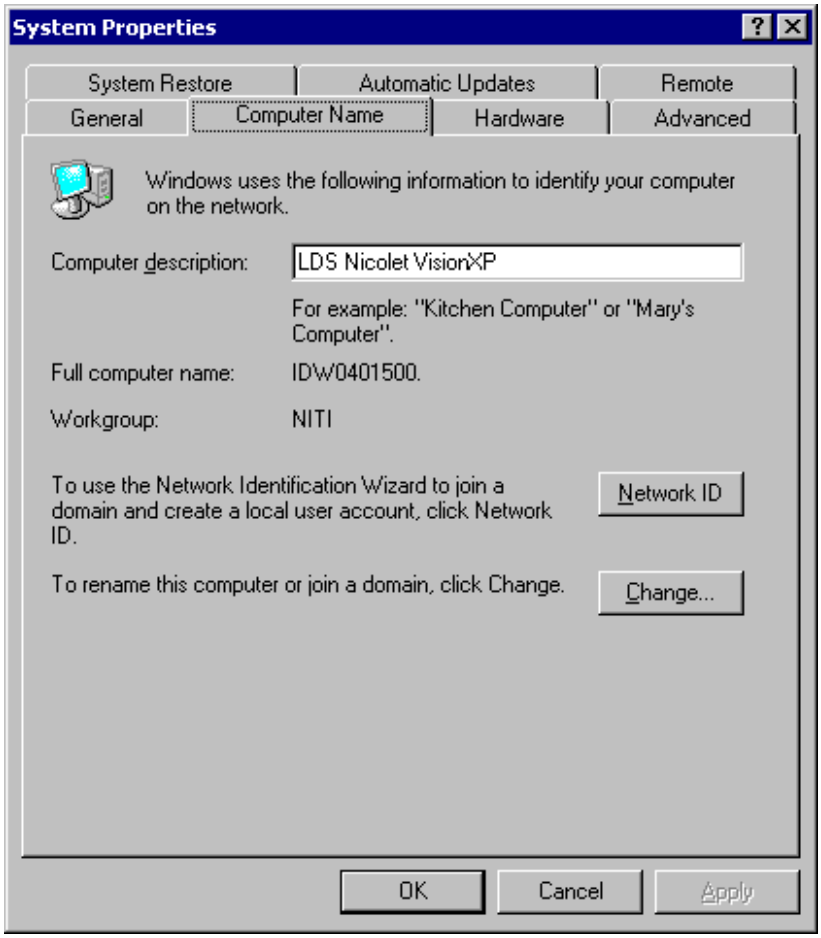
Next go to the Address selection at the top of the dialog and click on the drop down arrow. Go to the Desktop.



In the Desktop dialog box, right click on My Computer and choose Properties.



In the dialog that opens, select the Computer Name tab as shown on the next page.



Click on the Change button if you want to change the computer name or the Workgroup or Domain name. In order for two PCs to be on the same network, they must be in the same workgroup.

Once all of these changes have been made, your Vision will be connected to the network you have specified. The Vision uses an automatic login when it is turned on. This automatic login needs to stay in place in order for the Vision to be accessed by DataViewer, VisionNet, and VisionNet Plus.



Overviews

This command opens a menu that allows you to open an overview of the channels, triggers or event triggers. The overview displays are editable (using the Set-up feature), and allows settings for multiple channels to be set at one time.

If you are using a mouse you can launch the editable Setup spreadsheet by clicking on the icon in the lower right corner of the Vision's display. You can also access the Setup panel by pressing **F6** on the keyboard and front panel.

Channels

Choosing this menu option opens the panel shown below which describes the coupling, minimum and maximum readings, units, filter settings and whether or not the data in that channel is being saved.

CHANNEL OVERVIEW

	Channel	Coupling	Min	Max	Units	Filter	Store
Ch01	CH1	TCouple-K	0.000	100.0	°C	10.0 Hz	
Ch02	CH2	DC	-10.00	10.00	Volt	2.50 kHz	
Ch03	CH3	DC	-10.00	10.00	Volt	2.50 kHz	
Ch04	CH4	DC	-10.00	10.00	Volt	2.50 kHz	
Ch05	CH5	DC	-10.00	10.00	Volt	2.50 kHz	
Ch06	CH6	DC	-10.00	10.00	Volt	2.50 kHz	
Ch07	CH7	DC	-10.00	10.00	Volt	2.50 kHz	
Ch08	CH8	DC	-10.00	10.00	Volt	2.50 kHz	
Cnt	Counter	RPM	0.000	10.00	kRPM	1.00 sec	

Triggers

See *Chapter 8: Using the Triggers Menu* to learn about the triggers overview display.

Event Triggers

See *Chapter 8: Using the Triggers Menu* to learn about the event triggers overview display.

Print Settings

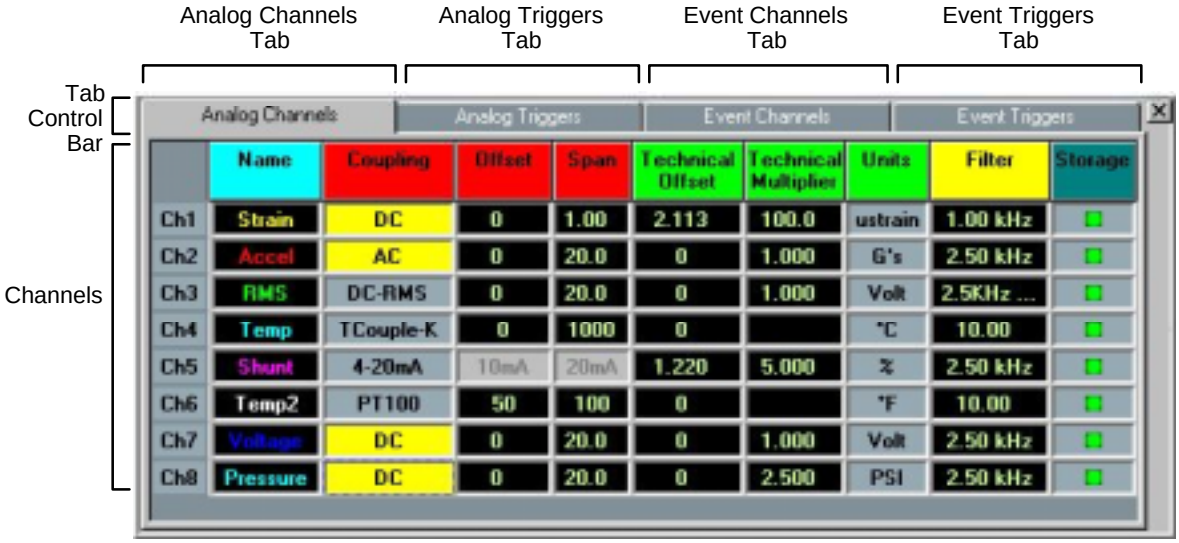
Choosing this menu option prints a report to the selected printer that contains all of the information found in each of the three overview panels.

Set-up

Pressing the Set-up button launches the editable spreadsheet for all analog and digital channels, as well as trigger settings for each channel. The options are identical to those described in previous chapters, but this spreadsheet allows you to select any or all channels to edit parameters at one time.

Using an external mouse is the fastest and easiest way to navigate the channels, but all functions are available via front panel buttons and keyboard controls, as described below.

Note: *The spreadsheet setup screen may also be launched via a mouse click on the*  *button in the lower right corner of the display screen, or by pressing the* ***F6*** *button when the menus are turned off.*



This spreadsheet allows you to change channel and triggering parameters for multiple channels instead of working through each channel one at a time. All available settings are identical to those described in *Chapter 7- Using the Channels Menu*, and *Chapter 8- Using the Trigger Menu*.

The **Tab Control** bar is used to select the channel options that are displayed and available for editing, including:

Analog Channels tab for setting sampling parameters for the Vision's 8 or 16 analog channels;

Analog Triggers tab for setting trigger status (On, Off, Qualify) and trigger conditions for the analog channels;

Event Channels tab for setting the 8 digital TTL parameters, and;

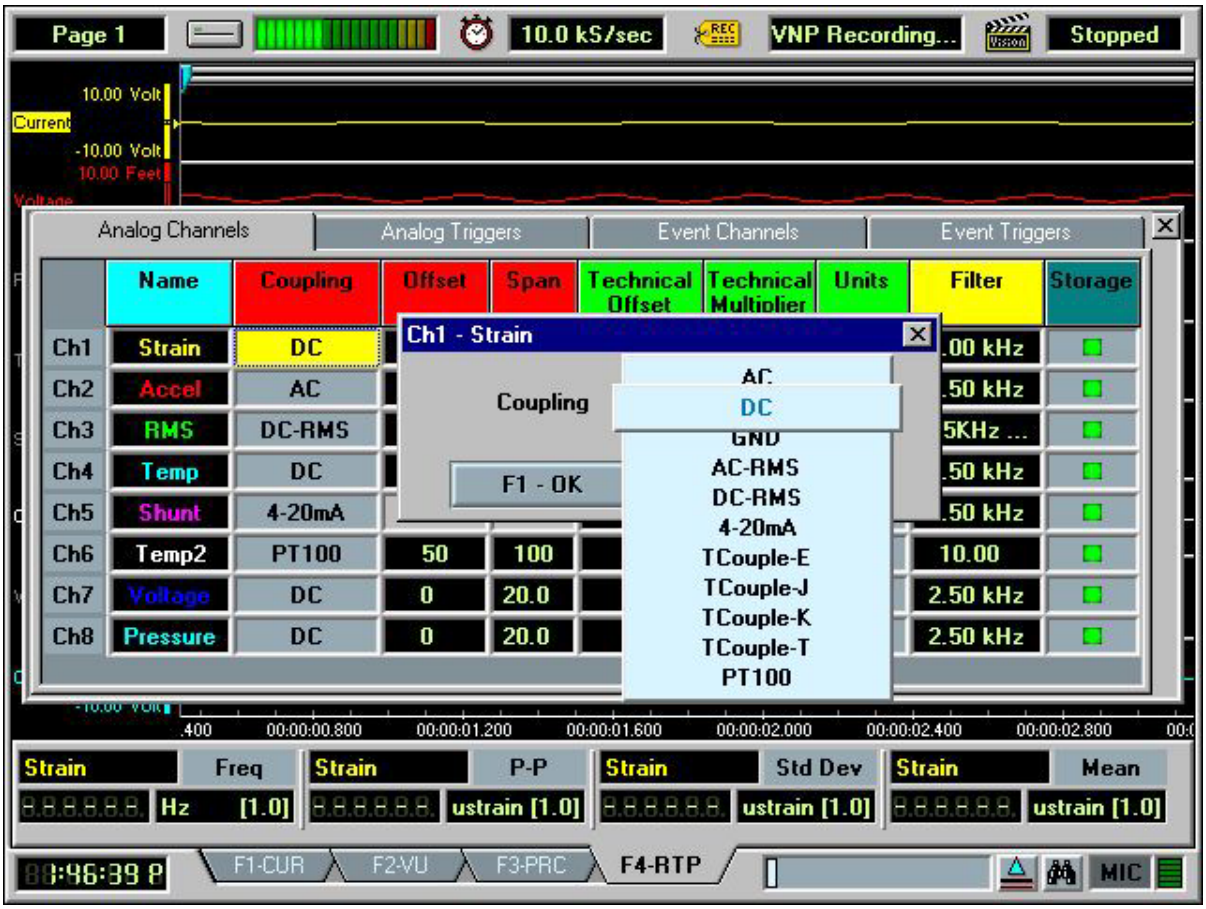
Event Triggers tab for setting trigger status and conditions for the digital Event channels.

Navigating the Channels and Trigger Setup Spreadsheet

While the spreadsheet is used most easily with a mouse, you can also navigate using the front panel buttons or keyboard. This section will describe the navigation features of the spreadsheet using a mouse, followed by the corresponding front panel/keyboard commands. Users familiar with MicroSoft's Excel spreadsheet will recognize the Ctrl-click, Shift-click, and right mouse click functions used by that program.

Changing the Value of a Single Cell

Place the pointer over the desired cell and click once. The highlighted cell turns yellow to show it is active. Right mouse click to bring up the options for that cell. The following screen shows the selections available for the **Coupling** setting for the Ch1- Strain channel.

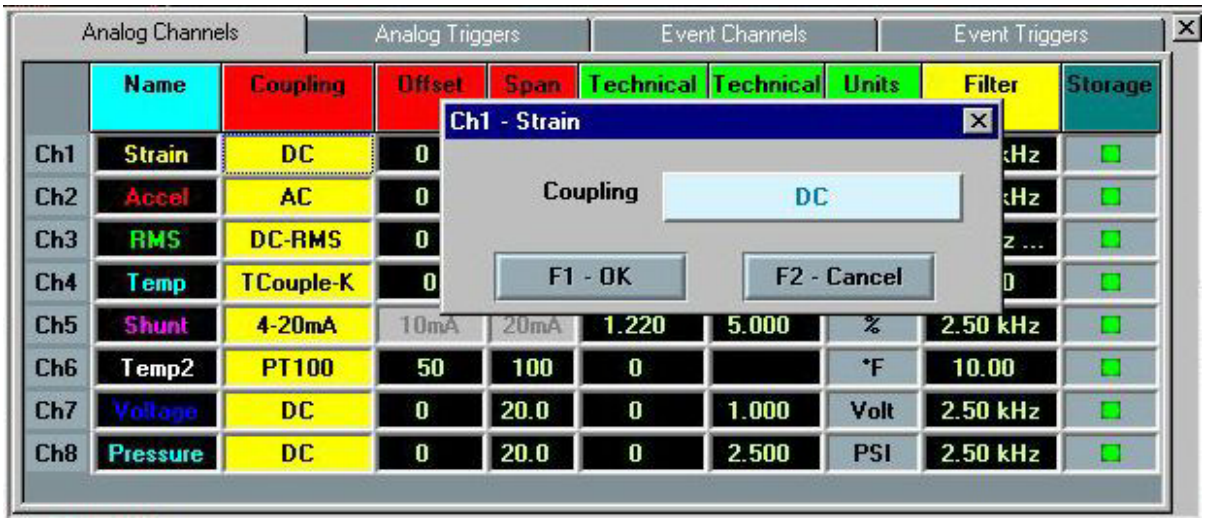


From the Front Panel buttons: Move the active cell highlight right/left using either of the **Cursor** buttons, or up/down using the **Vertical Zoom** button. When the desired cell is highlighted, press the **Select** button to bring up the options for that cell. You can use the **Vertical Zoom** button or the **Jog/Shuttle** knob to select the option, then press **F1-OK** or **F2-Cancel** to return to the spreadsheet.

From a Keyboard: Move the active cell highlight using the left/right/up/down **Arrow** keys. Press the **Enter** key to bring up that cell's options, and use the **F1-F2** function keys to accept the new setting or cancel the dialog.

Changing the Value of All Cells in a Column

Place the cursor over the title bar of the column and click. This will highlight all cells in that column for editing. Now do a right mouse click to bring up the options for the selected column. The following screen shows the column **Coupling** selected for all channels in the spreadsheet. Save the results by clicking **F1** or cancel the dialog by clicking on **F2**

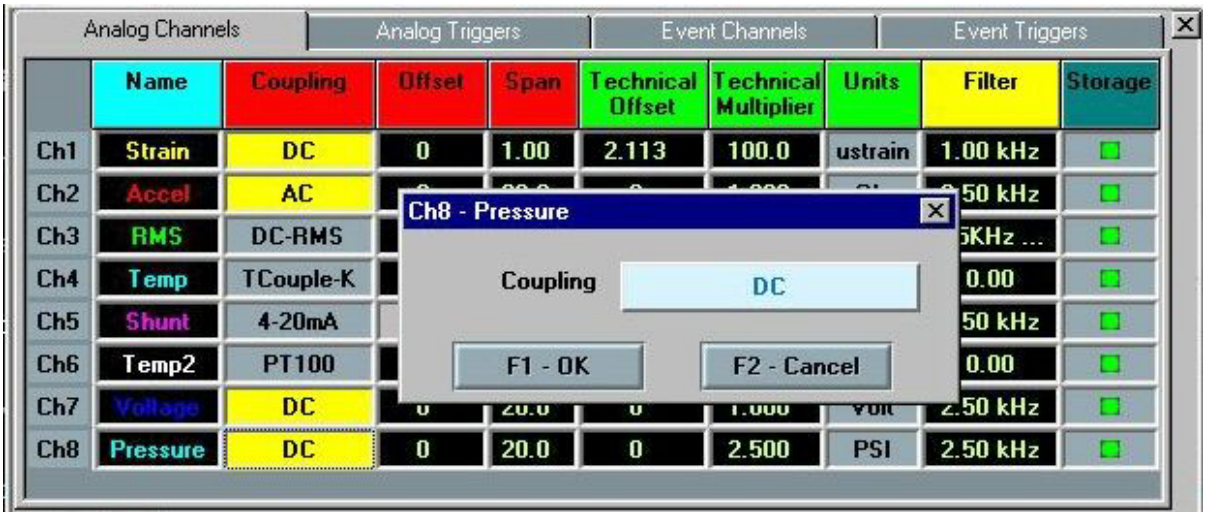


From the Front Panel buttons: Move the active cell into the desired column. Press the **F7** button to select all cells within that column; press **F8** to de-select all cells. Press **Select** to bring up the options for the selected column.

From a Keyboard: Use the arrow buttons to move the active cell into the desired column. Press the **F7** key to select all cells within that column; press **F8** to de-select all cells. Press the **Enter** key to bring up the options for the selected column.

Changing the Value of Selected Cells in a Column

Click on a cell that you wish to include in the multi-cell selection. For additional cells, press and hold the Ctrl button on the keyboard and click on the desired cell. All cells of interest must be within a single column so that the same parameter is being edited.



From the Front Panel buttons: Move the highlight to the desired cell using the **Cursor** buttons for left/right moves, or the **Vertical Zoom** button for up/down moves. Press the Search button to make the current cell active. Use the **Vertical Zoom** button to move up/down to other cells, which are also selected by pressing the **Search** button. You can also press the center of the **Vertical Zoom** button (i.e., both Zoom Up and Zoom Down) to select the cell. When all desired cells in the column are highlighted, press the Select button to bring up the options for that parameter. Moving the highlight left or right to a different column and pressing the **Search** button (or middle of the **Vertical Zoom** button) will re-start a new set of active cells and remove the highlight from those cells in the previous column.

From a Keyboard: To activate the highlighted cell press the **Space** bar. Move the active cell up/down using the **Arrow** keys and select other cells with the **Space** bar. Press the **Enter** key to bring up the options for that parameter. Selecting a channel in a new column with the **Space** bar will re-start a new set of active cells and remove the highlight from those cells in the previous column.

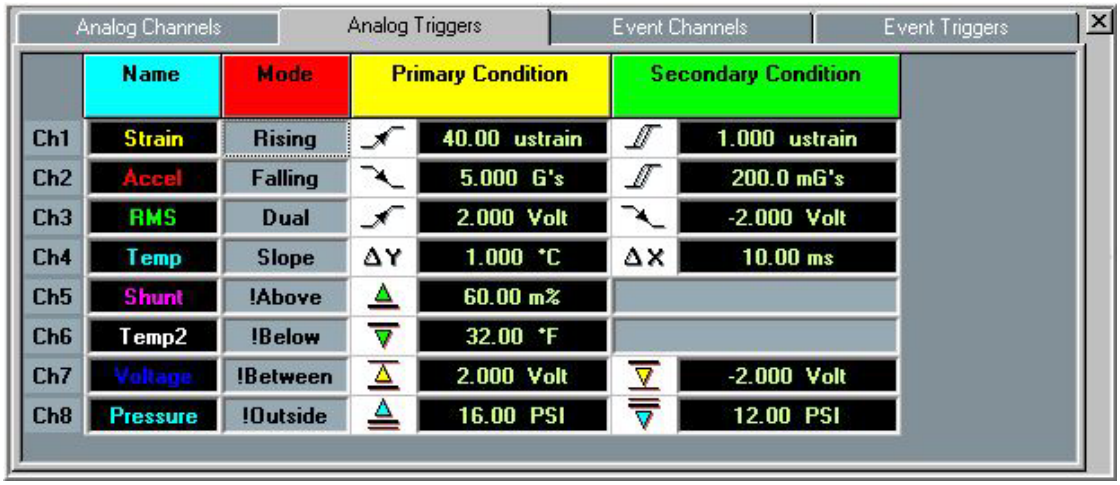
Moving to a New Tab

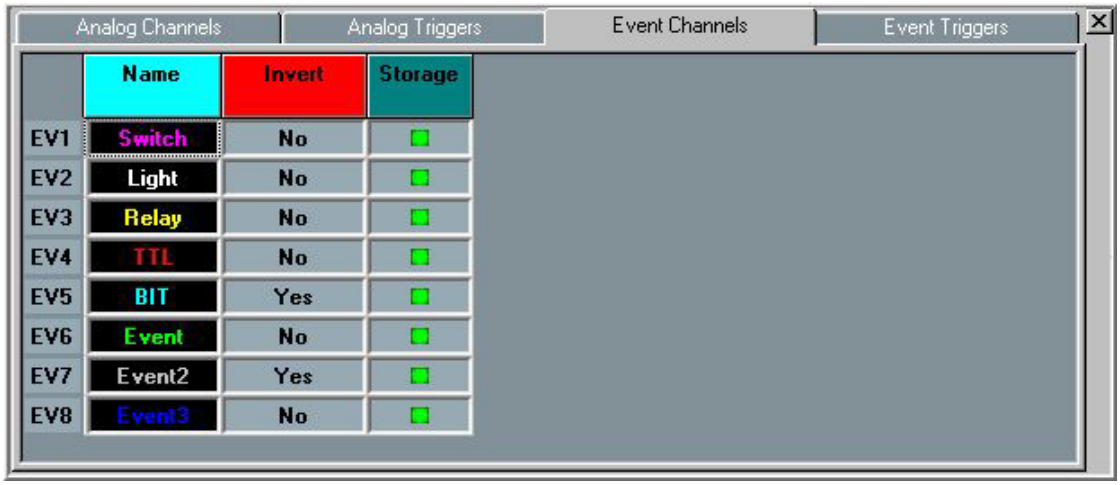
There are four tabs with editable fields, including**: Analog Channels, Analog Triggers, Event Channels,** and **Event Triggers**. The principles of editing the cells within each tab are identical. If using a mouse, simply click on the tab for the desired field.

From the Front Panel buttons: Press the **Next>>** button to toggle between the Tab heading and the spreadsheet cells below. After highlighting the Tab heading use the **Cursor** button to move left/right to the desired spreadsheet, then click **Next>>** again.

From a Keyboard: Press the **Tab** key to toggle between the Tab heading and the spreadsheet cells below. After highlighting the Tab heading use the left/right **Arrow** keys to move to the desired spreadsheet, then press the **Tab** key again.

The spreadsheets associated with the tabs for Analog Triggers, Event Channels, and Event Triggers, are shown below. For more detailed description of the settings available for each parameter see *Chapter 7-Using the Channels Menu*, or *Chapter 8- Using the Triggers Menu*.

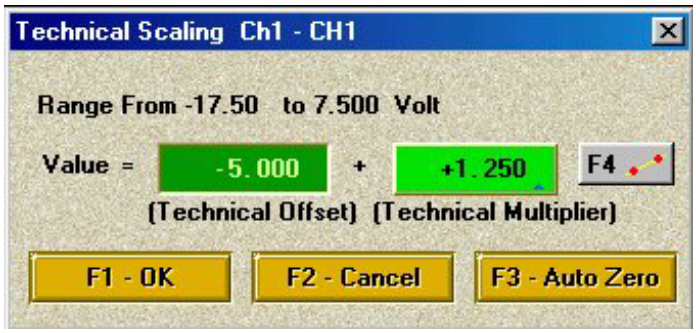


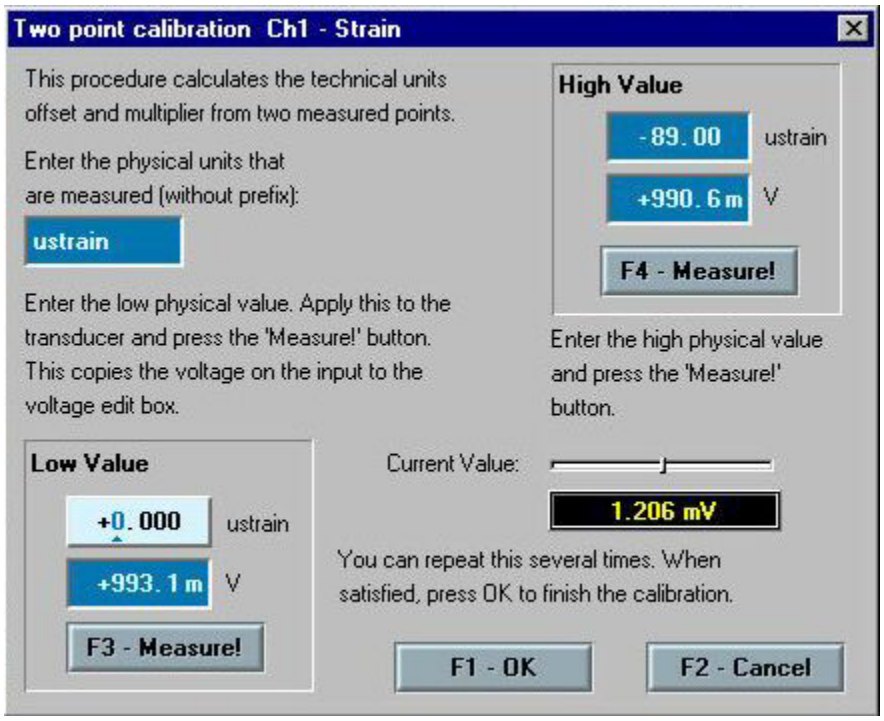




Notes on Analog Channels Spreadsheet Settings

Note: *The **Technical Offset** and **Technical Multiplier** dialogs are combined into a single dialog, along with a calibration wizard dialog accessed via the **F3** button. From the front panel use the **Next>>** button to tab between the **Offset** and **Multiplier** values, or press the **F3** button to launch the wizard dialog. The **Next>>** button is also used to tab between the different fields in the wizard dialog shown below.*





The ***AutoZero*** button (***F3***) re-sets the Technical Offset value to eliminate small offset values in the analog channels due to electronic drift in the transducers. This function does not electrically compensate for the transducer's electrical offset, but rather sets the currently measured value to zero.



Upgrade Vision XP

This button allows you to update the Vision software for a new software release. The new Vision software may be loaded via floppy disks, or may be loaded over an Ethernet connection if the Vision is mounted onto a network.



Key Lock





This function disables all front panel controls so settings cannot be changed without entering the ***Key Lock*** password. This includes display controls, menu buttons, setup controls, and trigger controls. By selecting the ***Key Lock*** button you can select which, if any, record functions (Start, Stop, Pause, and Trigger) you want to remain operational while the ***Key Lock*** function is enabled.

Start, Stop, Pause, and Trigger are set individually within ***Key Lock***. When ***Key Lock*** is enabled, the buttons set to Lock Off remain functional. Select the ***Key Lock*** button when Start, Stop, Pause and Trigger are set properly.

Selecting ***Key Lock*** prompts you to enter a four digit key code using the function keys on the front panel. The system then prompts you to re-enter the code. Once you have entered the code twice, the specified functions are locked and cannot be changed until you enter the same four digit code. IT IS IMPORTANT THAT YOU REMEMBER THE CODE YOU ENTER! You can click ***Cancel*** to return to the menu if you decide not to lock the display.



ShutDown

This command closes the Vision software application and shuts down the operating system. You should always select ***ShutDown***, then turn off the Vision's power switch. It is possible to corrupt the start-up files of the Vision's PC if the power switch is turned off before the Vision software is shut down.



About

This button opens a window that displays information about your Vision system.

Chapter 14: Using the Search Menu





The ***Search*** menu is activated by pressing and releasing the **Search** button on the front panel. You set all search parameters (search type, channel, level, etc) within the ***Search*** menu. Pressing the **Search** button together with one of the cursor buttons takes that cursor to the previous/next search mark, using the currently defined search type and level.



This menu can also be opened by clicking on the Search icon at the bottom right corner of the Vision display.

The search feature helps you find important data in long recordings quickly and easily. Search can be used to find triggers, voice marks, minimum and maximum values on defined channels, events at a specific time, or pre-defined steps through the data. Once a search type is defined, you can press the **Search** button together with a **Cursor** button to move that cursor directly to the next data mark.

If using a mouse, the Search function is enabled by a right mouse click when the mouse's pointer is resting on either the Red or Blue Cursor on the display.

Search Type

By selecting the ***Search Type*** menu, you activate the box to the left. Using the **Jog/Shuttle** knob or the mouse, you can choose the type of search you would like to perform.



Level

A ***Level*** search lets you look for a specific EU voltage.

Channel

Allows you to select which channel is searched.

Level

Allows you to enter the value in engineering units for which you want to search.

Direction

Allows you to search *Left* (earlier in the recording) or *Right* (later in the recording from the current cursor location.



Extreme

Allows you to find the minimum or maximum level for the specified channel.

Local Max = Searches for the next maximum in the recording

Local Min = Searches for the next minimum in the recording

Loc. Max/Min = Searches for the next maximum or minimum in the recording

Display Max = Searches for the absolute maximum in the displayed data

Display Min = Searches for the absolute minimum in the displayed data

Rec. Max = Searches for the absolute maximum over the entire recording

Rec. Min = Searches for the absolute minimum over the entire recording



Marker/Trig.

Defines the search to locate the next/previous triggered event. The trigger can be the result of a measured parameter value or manually entered by pressing the **Trigger/Mark** button on the front panel.



Front Panel Marker Icon



Trigger Marker Icon



Voice Mark

Searches for voice recordings that were activated by pressing and holding **Trig/Mark** button. The recorded data plays back when the icon enters the display screen.



Sound Marker Icon



X-Value

Searches for a specific spot in the recording defined by the x-axis value.

X-Value

Enter the x-axis value that defines the location for the search.



Step

Moves a defined time step to an earlier/later point in the recording.

Step Size

Enter a step size to use for the search.



Cursor

You can send either the red cursor, blue cursor, or both cursors to the next search location. If you press the **Search** and **Cursor** button (either cursor) on the front panel at the same time, only the selected cursor will move to the search point.



Search

Initiates the search using the defined values.



Cancel

Closes ***Search*** menu without performing a search.

Chapter 15: Mouse and VisionNet Functions

Mouse Functions

If you have a mouse or keyboard attached to your Vision there are many menu and display features that can be accessed with a right-mouse-click or a keyboard command. This chapter focuses on the mouse options, with a detailed listing of the keyboard commands described at the end of the chapter.

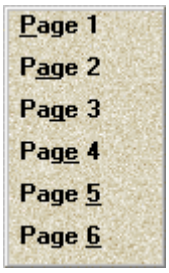
Menus

You can turn the Main Menu on by sliding the mouse off the right edge of the screen. Sliding the mouse off the left side of the screen results in the same action as pressing the front panel Menu button when a menu is open. That is, the menu will either go back one level or close completely depending on your choice in the ***Menu Mode*** section of the ***Preferences*** menu.

Status Bar



The Status Bar runs across the top of the Vision display screen. In addition to giving you information about the current recording being displayed, this bar in combination with the mouse gives you many convenient shortcuts to change the data you see in the Recorder Display.



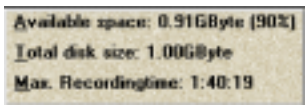
Page Select

If you right mouse click on the box that displays the current page number [1], a list of all the available pages appears. You can easily switch between the available pages by making your selection from the list.



Disk Icon

If you right mouse click on this icon [2], you have a choice of ejecting the current removable disk or deleting the current record.



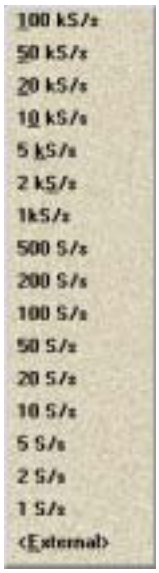
Disk Gauge

If you right mouse click on this icon [3], a panel will open which displays the available space on the disk (in both GB and % full), the total disk size and the max recording size in hour:minute:seconds based on the current sample rate and the number of channels recording data.



Stopwatch

By right mouse clicking on the stopwatch icon [4], you can choose whether to put your Vision in *StandAlone*, *Master* or *Slave* Mode. See *Chapter 12: Using the Preferences Menu* for more information.



Sample Rate

The box to the right of the stopwatch [5] displays the current Sample Rate. Right clicking on this box displays a list of the available sample rates; drag the mouse down the list to make your selection.



Load Recording

Right clicking on this icon [6] displays a list of available recordings. When you choose a recording from the list, it will be loaded as the new current recording.



Recording Title

Right clicking on the recording title [7] displays important information about the current recording, including file size, time and date of the recording, and file duration.



Auto Setup

When you right mouse click on the clapboard icon [8], the *Auto Setup* choice appears. When you Auto Setup your Vision, each active display channels reverts to its default input span and DC offset. Note that any zoom levels from the previous display will hold over to the new display with the new input span. For example, if Channel 1 was zoomed in at a 20% zoom ratio, the display will still show the 20% zoom ratio, but it will be based on the default input span.



Recording Status

The last box in the Status Bar [9] shows the current Recording Status. A right mouse click on this box will give you the option of *Stop*, *Start*, *Standby*, *About* and *Exit*. The first three commands control the recording status for the current display. The About command opens a box that gives you details about your Vision system. The Exit command allows you to Exit the Vision application.



Y-Axis

Right mouse clicking on the Y-axis opens the menu shown.

Auto Zoom

This command vertically zooms in on the active trace until it fills the current pane.

Original Scale

This command changes the active trace back to the original display settings, thus reversing any zoom commands that had been performed.

User Scale

This command resets the active to the values set under the Display menu (in Display Range and Display Mid Scale).

Zoom + / Zoom –

These commands zoom in or out on the selected trace. There is no limit on the number of times you can zoom in or out.

Annotation

Selecting this option opens another menu which lets you choose between the three modes of Y-Annotation: *Range*, *Cursor 1 and 2*, or *Cursor Last*. See *Chapter 12: Using the Preferences Menu* for a description of each kind of Y-Annotation.



Display

Right mouse click anywhere in the Recorder Display to access the menu shown here.

Set Red (Blue) Cursor

This command moves the red (blue) cursor to the current mouse position.

Center Around Red (Blue) Cursor

This command scrolls the Vision's display of the current recording until it is centered on the red (blue) cursor location.

Default Pane Sizes

This command changes each of the panes in the current page back to its default width. Note that you can re-size individual panes in the display by positioning the mouse over the line you want to move and clicking and dragging it to where you want it. The mouse pointer will turn into a hand once you click on the line.

Hard Copy

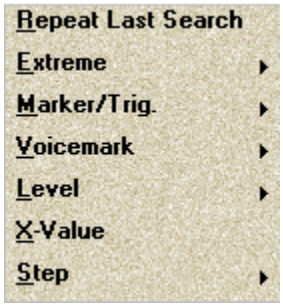
This command initiates the Vision's hardcopy printer output, using the current settings defined in the **Preferences/Printer** menu options.

X-Y Mode/Y-t Mode

This command is an easy way to switch the display between X-Y and Y-t Mode. See *Chapter 9: Using the Display Menu* for more details on these two types of displays.

Zoom Back/Unzoom

If you have zoomed in on one pane in the display, *zoom back* will take you back one level (if you zoomed multiple times). *Unzoom* takes you all the way back to the original display, closing the zoomed window completely.



Cursors

Right mouse clicking on the cursors in the display brings up the menu shown on the left. This menu allows you to search with the cursor your mouse is on.

Repeat Last Search

This option allows you to repeat the last search, i.e. do the search that is described in the Search menu. See *Chapter 14: Using the Search Menu* for more information on the options in that menu.



Extreme

This option opens the secondary menu shown here. With the first three options on the menu, you specify whether you want to search to the right or to the left for the given extreme. The *Display Max* (*Display Min*) option goes to the absolute maximum (minimum) of the signal as shown on the display. The *Red. Max* (*Rec. Min*) option finds the absolute maximum (minimum) of the entire recording.



Marker/Trig. Or Voice Mark

These two options will search for the Marker, Trigger or Voice Mark in the current recording. You specify whether you want the search to go to the right or to the left.

Level

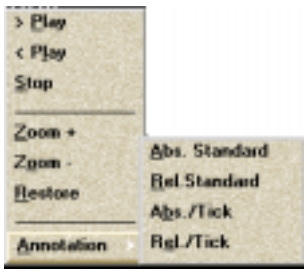
This option searches the recording for the level shown in the drop down menu. You specify whether you want to search to the right or to the left in the recording.

X-Value

This option searches the recording for the X-Value that is listed in the ***Search*** menu in the *X-Value* menu option. The secondary menu that appears when you make this selection allows you to specify whether you want to search to the right or to the left in the recording.

Step

This option moves the cursor a specified time stamp. The ***Step Size*** is specified in the ***Search*** menu. The secondary menu that appears when you make this selection allows you to specify whether you want to search to the right or to the left in the recording.



X-Axis

Right mouse clicking on the X-axis opens the menu shown to the right.

> Play/ < Play

This command starts playing back the current recording in the forward (>) or backwards (<) direction.

Stop

Stops the playback of the current recording.

Zoom +/Zoom –

These commands zoom in or out on the selected trace. The steps taken here follow the available time/division options available in the Preferences menu. Therefore, the zooming will stop once you have reached 60 min/div (zoom out) or 10µs/div (zoom in).

Restore

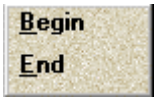
Moves the display back to the default time display value as defined in the ***Preferences*** Menu.

Annotation

This option opens a secondary menu listing the X-Annotation options that are available: *Abs. Standard, Rel. Standard, Abs./Tick* or *Rel./Tick*. See *Chapter 12: Using the Preferences Menu* for a complete description of each option.

PRC and RTP

The tabs that open these two displays are found at the bottom of the Vision display. *Chapter 11: Using the Measure Menu* has a complete description of these two calculating tools. Once you have calculations being displayed in these tabs, it is simple to use the mouse to edit the measurement. In the PRC box, you can right mouse click on the Channel, the Measurement and the Time Period (or Cursor Area) and choose from the available options. In the RTP box, you can select the Channel you would like monitored, the Parameter you want to measure, the Units you want displayed and the Time Period over which you would like the Measurement calculated.



Scroll Bar

Right mouse clicking on the scroll bar gives you two choices. *Begin* moves the display back to the beginning of the current recording. *End* moves the display to the end of the current recording. You may also left mouse click and hold on the white box within the scroll bar and then drag the mouse to move the display to any position within the recording.



Microphone

The Microphone options will only be seen when the Vision is recording data. If you are in Continuous recording mode, you will have the option to *Add Mark* or *Add Voice Mark* as an interesting piece of data is recorded. If you are in Transient recording mode, a right mouse click will give you the option to *Add Trigger* (Voice mark is disabled in Transient Mode). See *Chapter 12: Using the Preferences Menu* for a complete description of each option.



Search

Clicking on the binoculars icon in the bottom right corner of the screen opens the ***Search*** menu. See *Chapter 14: Using the Search Menu* for a complete description of the menu commands.

VisionNet Functions

If you purchased VisionNet software, install and run the program. The VisionNet software looks and feels identical to the software on your Vision. The only difference is that you do not have front panel buttons available to you to make menu selections. All of the front panel buttons on the Vision have been mapped to keys on your keyboard to allow you to move around the VisionNet software in the same way you are used to navigating using the Vision. The keyboard shortcuts are listed below. Note that when a menu is open, the F1 through F8 keys on the keyboard perform the same functions as the F1 through F8 keys on the front panel of the Vision. For a more complete description of the menu commands, please see the appropriate Chapter in this manual.

Keyboard	**Front Panel**	**Command**
F1	F1	Opens Cursor Pane
Ctrl-F1	Search-F1	Positions Display around Cursor 1
F2	F2	Opens Vu-meter Pane
Ctrl-F2	Search-F2	Position Display around Cursor 2
F3	F3	Opens Post Run Calculations (PRC) Pane
F4	F4	Open Real Time Parameters (RTP) Pane
F6	F6	Toggles between Channel, Trigger and Events Overviews
Ctrl-F6	Search-F6	Trigger Overview
F7	F7	Toggle XY Display
F8	F8	Toggle Y-Annotation
F9	Menu	Toggle Menu
F10	Stop	Stop Recording or Scrolling
F11	Record	Start Recording
F12	Pause/Standby	Go into Pause or Standby Mode
PgUp	Prev. Page	Go to the previous Display Page
Shift PgUp	Prev. Recording	Go to the previous Recording
PgDn	Next Page	Go to the next Display Page
Shift PgDn	Next Recording	Go to the next Recording
Home	Prev. Page	Go to the beginning of the current recording

Keyboard	Front Panel	Command
End	Next Page	Go to the end of the current recording
Ctrl Home	Middle of Vertical Zoom	Restore Display Range to default settings
Numeric +	Speed Up	Increase scrolling speed
Numeric -	Speed Down	Decrease scrolling speed
←	Cursor 1 Left Button	Move Cursor 1 to the left
Shift ←	Cursor 2 Left Button	Move Cursor 2 to the left
Ctrl ←	Play Back Button	Play current recording backwards
Alt ←	Search-Cursor 1 Left	Repeat last search, cursor 1 to the left
Alt-Shift ←	Search-Cursor 2 Left	Repeat last search, cursor 2 to the left
→	Cursor 1 Right Button	Move Cursor 1 to the right
Shift →	Cursor 2 Right Button	Move Cursor 2 to the right
Ctrl →	Play Forward Button	Play current recording forwards
Alt →	Search-Cursor 1 Right	Repeat last search, cursor 1 to the right
Alt-Shift →	Search-Cursor 2 Right	Repeat last search, cursor 2 to the right
Alt +	Zoom Up Button	Increase Zoom on the display
Ctrl +	Offset Knob or Search-Zoom Up	Increase display offset
Alt -	Zoom Down Button	Decrease Zoom on the display
Ctrl -	Offset Knob or Search-Zoom Down	Decrease display offset
Ctrl A	Auto Setup Button	Auto Setup
Ctrl B	Search-Trig/Mark	Search for next Bookmark, Marker or Trigger
Alt S	Search Button	Toggle Search Menu
Alt T	Trig/Mark Button	Transient Mode— add trigger Continuous Mode— add (voice) marker
Ctrl T	(no front panel option)	Always generates a trigger

Keyboard	Front Panel	Command
↑	Select Button	Select previous trace
Alt ↑	Span Up Button	Increase span (only active while recording)
Ctrl ↑	Offset Knob	Increase channel offset (while recording)
↓	Select Button	Select next trace
Alt ↓	Span Down Button	Decrease span (only active while recording)
Ctrl ↓	Offset Knob	Decrease channel offset (while recording)
Ctrl *	Search-Autoscale	Autoscale display vertically
Ctrl /	Search Autoscale	Restore original vertical trace scaling

Blank page.

Chapter 16: VisionNet Plus

Introduction

LDS Nicolet's VisionNet software offers PC-based remote control, display, and data review of a Vision data recorder over an Ethernet network connection. VisionNet Plus (VNP) extends this functionality to support synchronized data collection from up to four Vision systems, controlled by a networked PC, acting like a single 64-channel system. Users can monitor data traces from any of the four Visions during a recording using VNP's display, which is identical to the interface to a stand-alone Vision unit. VNP adds a simple toolbar to the familiar Vision interface for features such as the *Channel Setup Spreadsheet, Recording Manager,* and *DataViewer* for review and analysis.

VNP lets you adjust settings such as a channel's span or offset, system sampling rates, trigger conditions, and displayed traces for each of the Visions in a networked system. You can adjust parameters using the standard Vision user interface commands for each unit, or take advantage of the *Channel Setup Spreadsheet* to edit multiple channels at once in an Excel-like spreadsheet environment. VNP's *Recording Manager* function maintains a record of recording properties and can export data from each Vision into the DataViewer software for review, analysis, or posting directly into LDS Nicolet's ProView and FlexPro software for advanced analysis. Data can also be exported in a wide variety of file formats for analysis using software packages like LabView, MatLab, Diadem, MeScope, or Ease.

To synchronize data collection between multiple Visions, each Vision requires an Ethernet link to the controller PC running VisionNet Plus software, plus a separate link to transmit the clock and trigger signals between systems. The Master also detects trigger signals from any channel(s) on the 4 Visions and initiates synchronous data collection across all units. The Vision uses a standard Ethernet-type RJ-45 connector cable to connect each Slave unit to the Master, using the M1/M2/M3S1 connectors on each acquisition board. The connection to each Slave system is made through the connector labeled M3S1, with the other end connected to any of the Master system's M1-M2-M3 connectors.

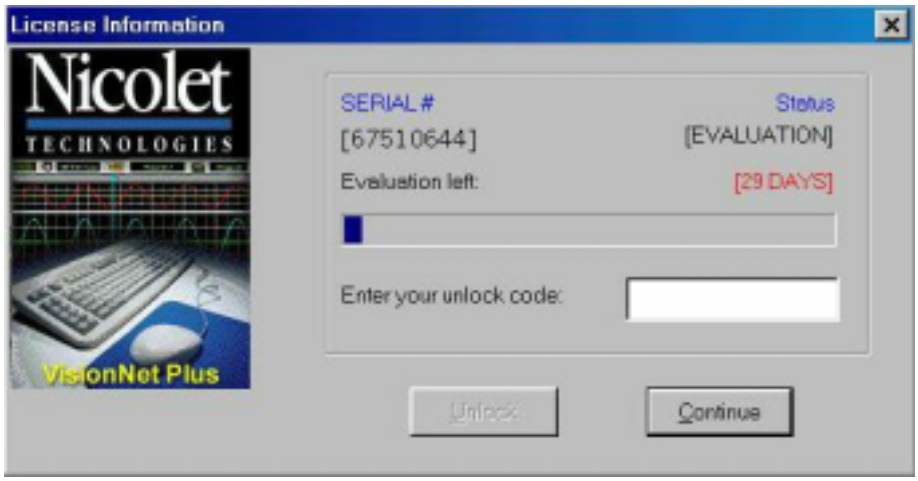
In addition to the Master/Slave connectors, each Vision must be configured with a unique TCP/IP address and connected to an Ethernet network. The Vision follows MicroSoft's Network Neighborhood conventions to set up IP addresses, domain names, and user administration options. All Visions in the VNP system must belong to a common IP subgroup, although the controlling PC may be located outside the Ethernet hub. This allows control of the Vision's from a remote location outside the user's internal network (if the user has a Virtual Private Network (VPN) installed). Ethernet instructions are described in more detail in Appendix A.

While recording, data is stored directly to an internal acquisition drive on each Vision, while a lower resolution data stream is transmitted to the PC for display. VNP's *Recording Manager* function allows users to transfer and merge data files from the different Vision units into a single data file on the PC. Data from each channel in the entire VNP system is synchronized using the 10 MHz oscillator of the Master unit's backplane clock, insuring time alignment with sub-microsecond precision.

This chapter explains the buttons and commands unique to VisionNet Plus software. Explanation of standard Vision features and functions are found in the earlier chapters of this manual.

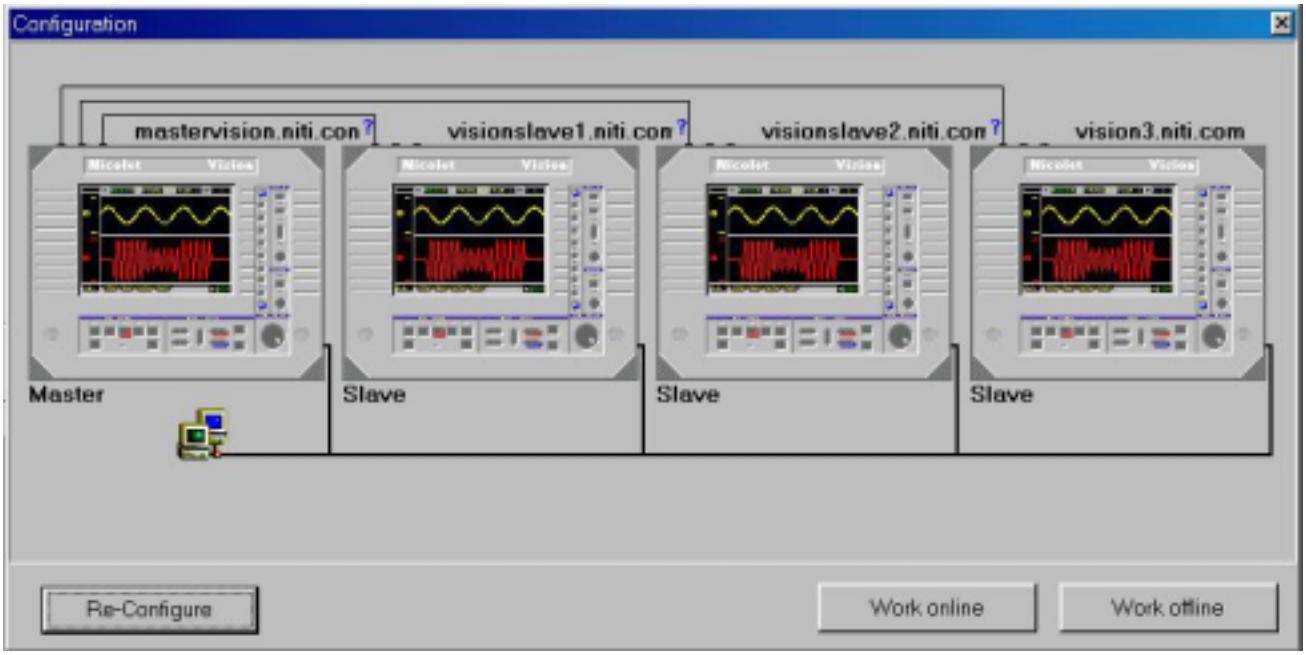
VisionNet Plus Launch Screen

This screen is displayed when the VisionNet Plus application is launched for the first time. It indicates that VNP installs for a 30-day evaluation period, during which time the software must be registered (see the CD jewel case insert for registration directions). The registration procedure installs the software onto a specified PC, which is identified by the PC serial number. The VNP license may be transferred between different PCs using the Transfer License method found under the Help menu.



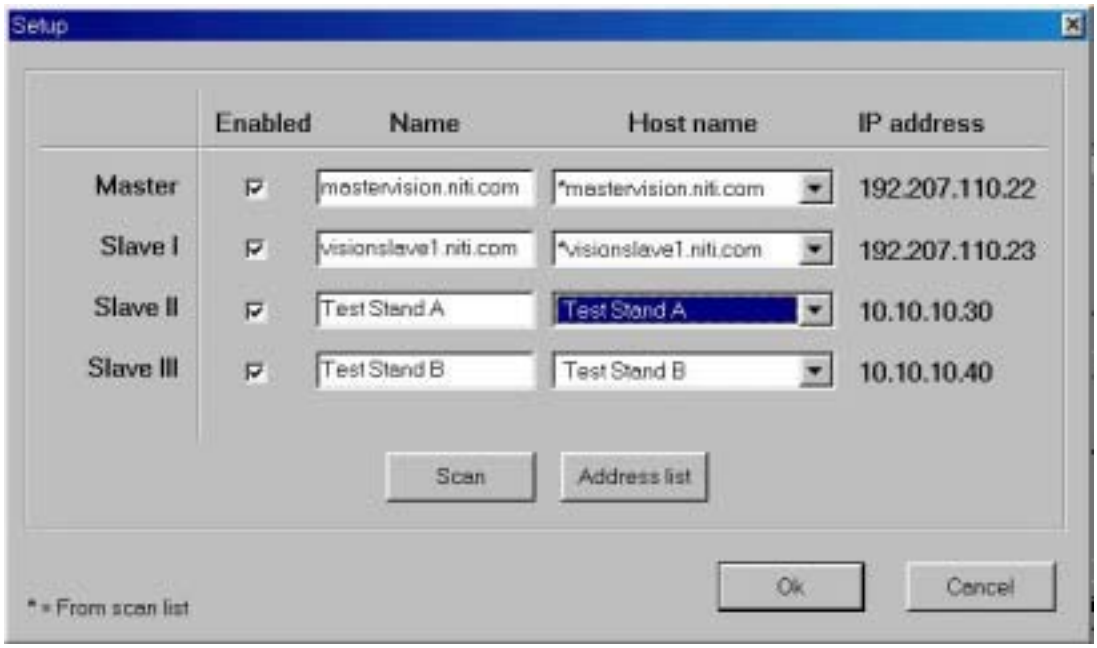
Configuration

The Configuration dialog displays the network name and Master/Slave status of each Vision used in the most recent recording. Fewer Visions will be displayed in this screen if the latest experiment did not use four Visions (which is the maximum number supported by Master/Slave operation). The blue question marks shown by each Slave connection means that VNP has not yet tested the link between systems, so the system status is unknown. If a Vision is disconnected or otherwise unavailable the question mark is replaced by a red X.



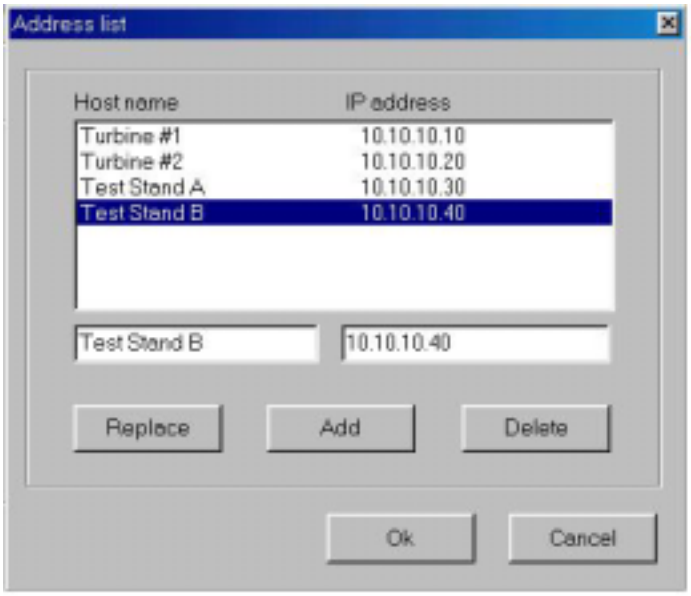
Re-Configure

The following dialog appears when the **Reconfigure** button in the Configuration dialog is selected. These menu choices are used to define the Ethernet names and IP addresses of each Vision used for synchronized data collection. A maximum of four Visions (one Master and three Slave units) can be used for a test, with each unit's usage (Master, Slave I, Slave II, Slave III) activated by clicking on the *Enable* checkbox.



There are two ways to define the name and IP address of each Vision available for use in VNP experiments. You can enter the name and a defined IP address, using the Address List dialog. A new Vision name and IP address can be added to the list with the **Add** command, or can replace the highlighted Vision's place in the list with the **Replace** command. The **Delete** command removes the highlighted Vision from the list. When you're done editing the Vision list, you can accept the changes using the **OK** button, or press the **Cancel** button to ignore any changes made to the list before returning to the Configuration Setup dialog.

This approach is useful for Vision systems with a specified IP address. This function must be used to connect to Visions outside the Ethernet Local Area Network (LAN). It is possible to control Visions over larger Wide Area Networks (WAN) using the defined IP address listings.

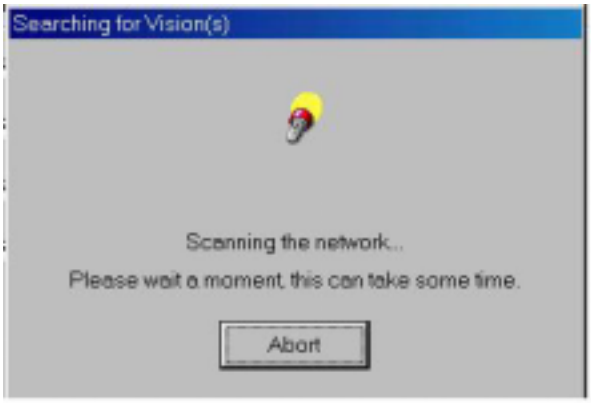


The other way to determine the name and IP address of Visions within the LAN is through use of the **Scan** button, which sends out a broadcast message to all PC's within the LAN searching for all Vision systems. The broadcast message is about 128bytes long and includes:

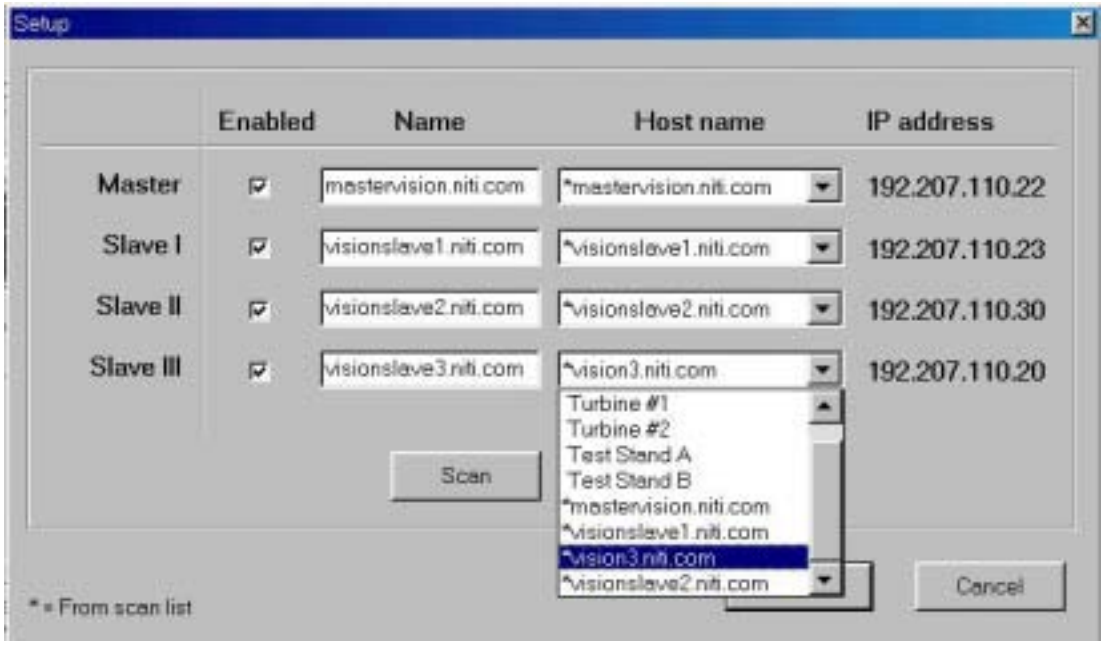
- The TCP/IP address of the computer that runs the search process
- A question to each Vision to send the Network TCP/IP address and Computer name back to the searching computer.

Each Vision recognizes this message and replies with the requested information. The reply message is about 256 bytes long. The Network TCP/IP address and Computer name are retrieved from network settings on the Vision system.

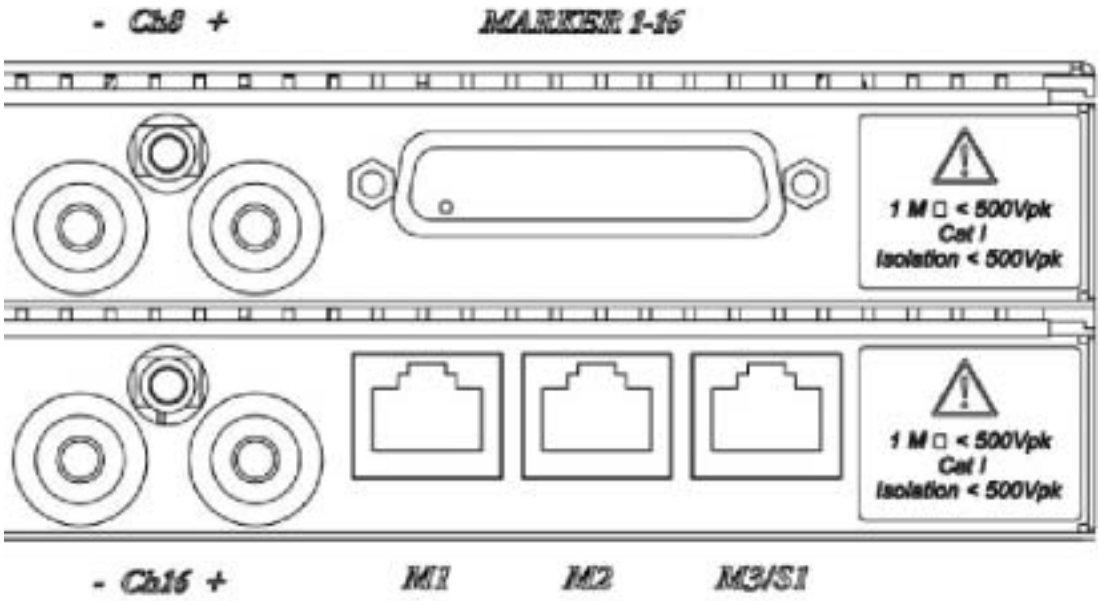
***Note**: More details about VNP's network settings and communications protocols are found in Appendix A.*



Once the Vision names and IP addresses are defined, you must define the Master and Slave unit(s). All available Vision systems are found in the drop-down list on the right side of the screen. Visions that were found using the Scan function are marked with an asterisk (*).



Each Vision has a set of 3 Ethernet-type RJ-45 connectors on the data acquisition board. They are labeled M1, M2, and M3/S1. Each Slave unit is connected via the S1 connector to one of the 3 connectors on the Master unit. These lines carry the high-frequency clock signal from the Master to each Slave system to synchronize sampling to within 50 nsec between channels. The RJ-45 cables also carry triggers between Vision systems so that all units will start recording simultaneously from a triggered event on any system.



Work Online

This button launches VNP into its runtime mode, enabling data to be collected. Working online requires that each Vision is available over the Ethernet network. All data acquisition parameters (sample rate, coupling, filter settings, and offset) are stored independently on each Vision system, not on the centralized PC. Thus, all changes to acquisition settings and collecting data must be accomplished in the Online working mode.

Work Offline

This button allows you to access the Recording Manager menu, which provides header information about collected data files, although there is no access to the raw data itself. Available information includes recording title, date/time collected, file size, and recorded comments. The titles list is searchable for file names or key words in the comments field, but it does not provide search capabilities for waveform data.

VisionNet Plus Toolbar



Navigation through the VisionNet Plus software is organized through the VNP toolbar shown above. The buttons open dialogs as described below. Detailed descriptions of each dialog follow.



Load Setup - Loads pre-defined settings files to each Vision in the M/S configuration.



Save Setup - Saves current settings for each Vision into a printable settings file.



Preferences - Allows you to select between several preferences for displays, language, and ASCII export settings.



Recording Manager - Includes recording names, file size, comments, and is used to post data to DataViewer for post-run analysis and file mergers.



Configuration - Returns to the initial Configuration screen, allowing you to re-configure your M/S setup.



Recording Controls – Start, Stop, or Pause recording of data.



Vision Display Selection - Toggles displays on/off for each Vision in the M/S configuration. Permits adjustments to sampling parameters (sample rate, channel settings, trigger levels, etc) for each Vision system.



Channel Configuration - Launches a dialog that includes a spreadsheet used to define sampling parameters for every channel in a VNP configuration.



Local Lockout - Locks the front panel buttons of each Vision for exclusive control of sampling parameters by the controlling PC. Can be toggled on/off.



Exit - Disconnects Ethernet links between Vision(s) and PC and exits the VNP program.



Information - Displays VNP version number. Also used to transfer VNP license password between PCs.



Help - Launches Help menus for VNP.



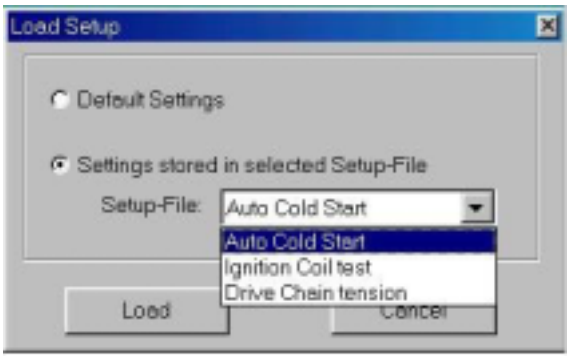
The title field is used to enter Recording title and Comments field for new recordings.



VNP Status LED- The green LED shows if VNP is currently on-line or off-line.



Recording Status LED- The yellow LED shows Start/Stop/Pause Recording status.



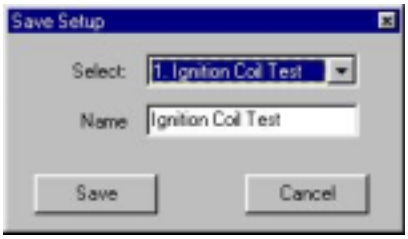
Load Setup



The Load Setup window is used to install the pre-defined recording parameter files to be used for the next new recording. Parameters are stored for each Vision within the M/S configuration, including:

- Sampling Rate
- Channel Span, Coupling, Filter settings, Offset, Physical Unit Calibration, and On/Off status
- Display settings for each Vision
- Trigger settings
- RTP/PRC measurements settings
- Other user preferences

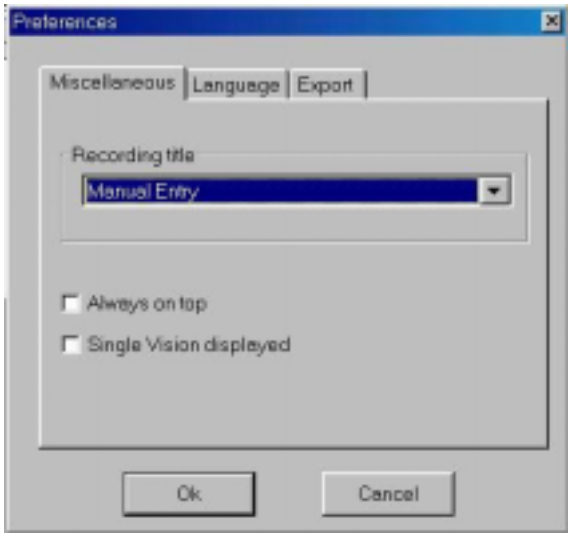
The Default settings file is pre-defined by LDS Nicolet and cannot be overwritten.



Save Setup

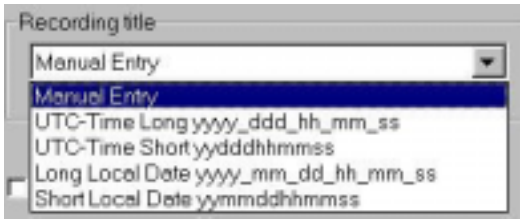


The Save Setup dialog is used to save the current recording parameters from each Vision in the M/S configuration as a setup file. Up to 20 user-defined configurations can be saved by selecting the file number and entering a file name. You can select an EMPTY file number to save a new configuration file, or overwrite a previously defined file.



Preferences


The Preferences menu sets user preferences for Recording Titles, Language, ASCII export settings for parameter files, and other miscellaneous display settings.



The **Recording Title** field sets the name for the next recording. If *Manual Entry* is selected, you can enter your own file name. A number after the recording title is created and automatically incremented for subsequent recordings with the same base title name. Other options for recording titles use the time and date when the recording was started, using either Universal Time (UTC) or Local Time options.



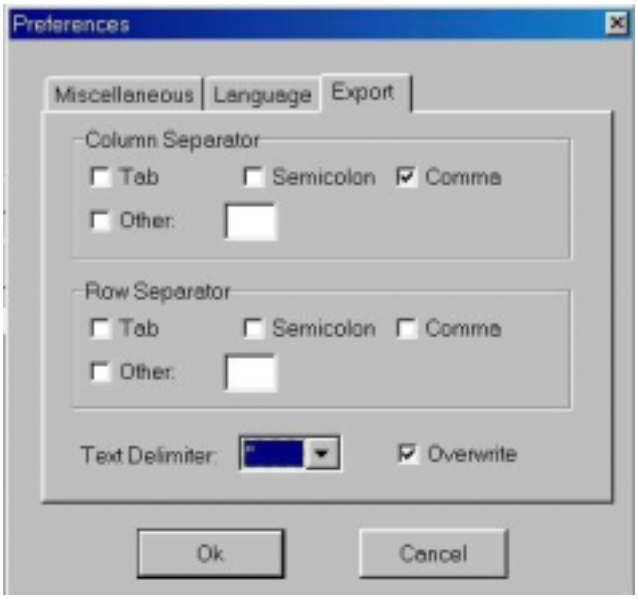
The **Always on Top** checkbox is used to keep the VisionNet Plus toolbar visible on the PC desktop at all times. If it is not selected, the toolbar display is covered up when you select other software programs.



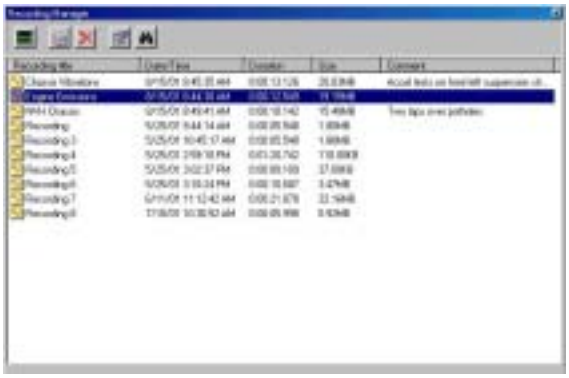
The **Single Vision Displayed** checkbox automatically minimizes the displayed Vision screen when another Vision unit's screen is selected through the Vision Display Selection buttons. If this checkbox is not selected, a Vision screen remains maximized on the desktop when another Vision's display is selected making it possible to display up to four Visions on a PC simultaneously.



The **Language Preferences** tab allows you to select the language for the menu commands within the VisionNet Plus software. Selections include English, French, German, Spanish, Dutch, and Italian.



The **Export Preferences** tab is used to select the ASCII file export settings used when VisionNet Plus saves configuration data files. This affects only the text files used for configuration parameters, not for files containing data from the Visions.



Recording Manager

 Opens the Recording Manager, which displays the recording names, date of acquisition, length of recording, file size, and comments saved with each Master/Slave distributed recording. The Recording Manager includes a toolbar, which allows you to open a recording with DataViewer software, copy a recording to any networked folder, delete a recording, display the recording properties, and search the list of recordings for specified titles and comments.

During a recording, data is stored on the individual SCSI acquisition drives of each Vision in the Master/Slave configuration. For example, the Master unit may contain data from channels 1-16, whereas the first Slave unit has data from channels 17-32. The Recording Manager allows you to display channels from different systems in one screen, such as Channel 1 overlaid with Channel 32. It also allows you to combine data from the individual Vision systems into a merged *.NRF data file on the controlling PC (or any networked drive).



DataViewer - Launches DataViewer software and posts data of the highlighted recording from the Vision systems into DataViewer. More information about DataViewer's features and capabilities can be found in the DataViewer Software Manual.



Copy Recording – Opens a dialog which prompts you to enter a destination folder used to copy data from each Vision unit in the Master/Slave configuration into a combined Distributed Recording File, *.DRF.





Configuration



Opens the Configuration dialog used when the VisionNet Plus software is first launched. It shows the current Master/Slave configuration with the names of each Vision unit and allows you to change configurations, such as adding or subtracting a Vision unit from the setup.



Recording Controls

Starts, Stops, or Pauses a recording. The buttons resemble the controls on a cassette tape recorder and are used in exactly the same manner.



Pause - Prompts the Master unit to send the Pause signal to all systems in the M/S configuration. In Pause mode the display screens of each Vision will update but no data is saved to disk. Pause mode is useful to set channels to the proper range and offset values, and to verify proper operations before beginning a test. The yellow recording status LED on the VNP toolbar will update to read PAUSE.

If the **Pause** button is pressed while the recording status is Stopped, the Vision displays will start scrolling to show current channel values. However, no data file is created. You can adjust channel settings and display preferences while in Pause mode, but no data is permanently saved to disk. The **Record** button must be pressed to start collecting data to disk.

If the **Pause** button is pressed while a recording is underway, data storage is halted until the **Record** button is pressed again. In this case the data recorded before and after the Pause command will be contained within one recording file, with a time gap from when the Visions were in Pause mode. Pause may be selected multiple times within a single recording.



Record - Prompts the Master unit to send the Record signal to all systems in the M/S configuration. All systems start recording at precisely the same moment, as controlled by the Master system's control signals and backplane clock. The yellow recording status LED on the VNP toolbar will update to read RECORD.



Stop - Prompts the Master unit to send the Stop signal to all systems in the M/S configuration. The yellow recording status LED on the VNP toolbar will update to read STOPPED.



Vision Display Selection

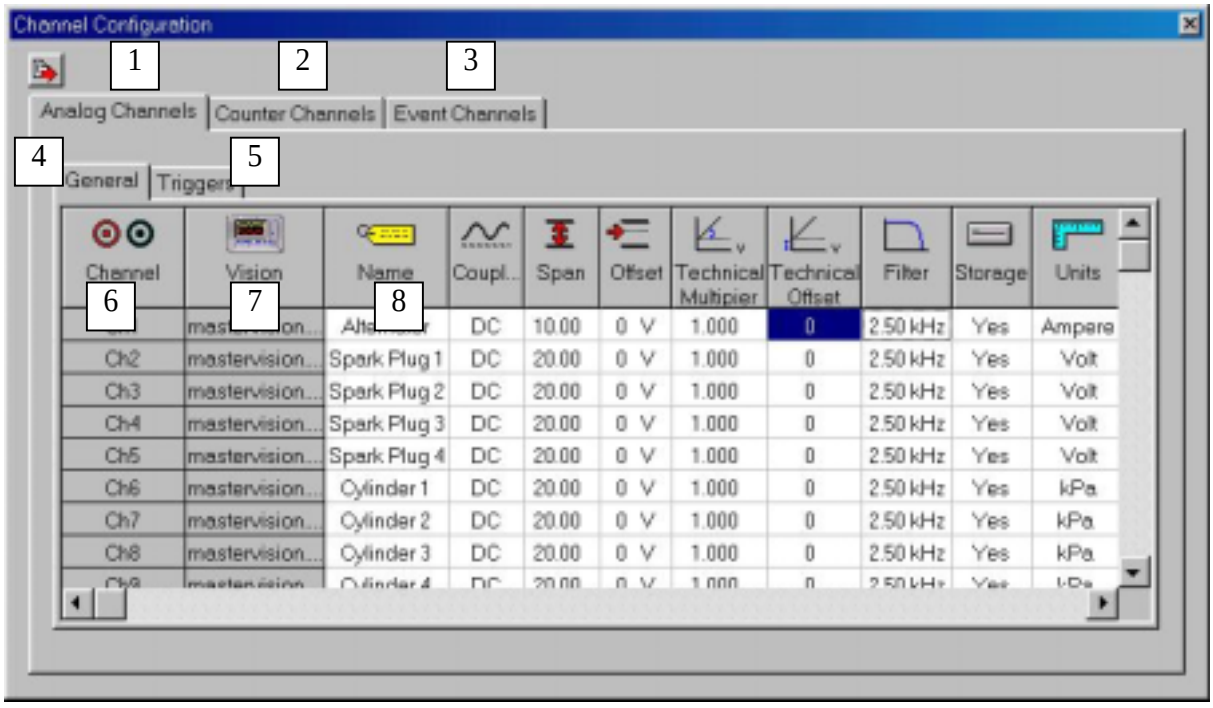
Toggles each Vision's display between full sized and minimized. Each Vision's display is fixed at 640 x 480 pixels. Configurations with less than four Vision units will show fewer icons, as one is available for each Vision unit. The Vision displays can all be shown on the screen at one time. You can also set a preference to automatically minimize a Vision's display screen when a new Vision is selected through the **Preferences** toolbar.

These controls provide full access to all Vision commands and parameter settings for both Master and Slave units. You can change channel settings one at a time using the standard Vision menu displays, or use the *Channel Configuration* dialog described in the following section to change multiple channels' settings at once.

Channel Configuration



The **Channel Configuration** dialog allows you to view and edit the channel and trigger settings using an Excel-like spreadsheet. You can modify channel settings for one channel, for all channels, or for selected channels by using familiar MicroSoft mouse actions such as double-click, Ctrl-mouse click, Shift-mouse click, and right mouse click commands to select active fields in the spreadsheet.



The **Channel Configuration** dialog is used to modify the settings for multiple channels at one time. The channel selection options are organized into separate tabs according to the type of channel, including:

Analog Channels [1] - Up to 16 per Vision, or 64 for an entire VNP configuration.

Counter Channels [2] - One per Vision, or up to 4 for an entire VNP configuration.

Event Channels [3] – 8 TTL channels per Vision, or 32 for an entire VNP configuration.

For each type of *channel (Analog, Counter, Event*) the spreadsheet organizes the settings into two tabs. For example, under the **General [4]** tab you can set values for coupling, span, and filters for the Analog channels; frequency range and pulses per rotation for the Counter channels; and Invert yes/no options for the digital Event channels. The **Triggers [5]** tab provides fields to set trigger conditions for each channel. The spreadsheet does not provide settings for global Recording parameters such as sample rate, Acquisition mode, or Recording name. It is used exclusively for setting values for individual channels.

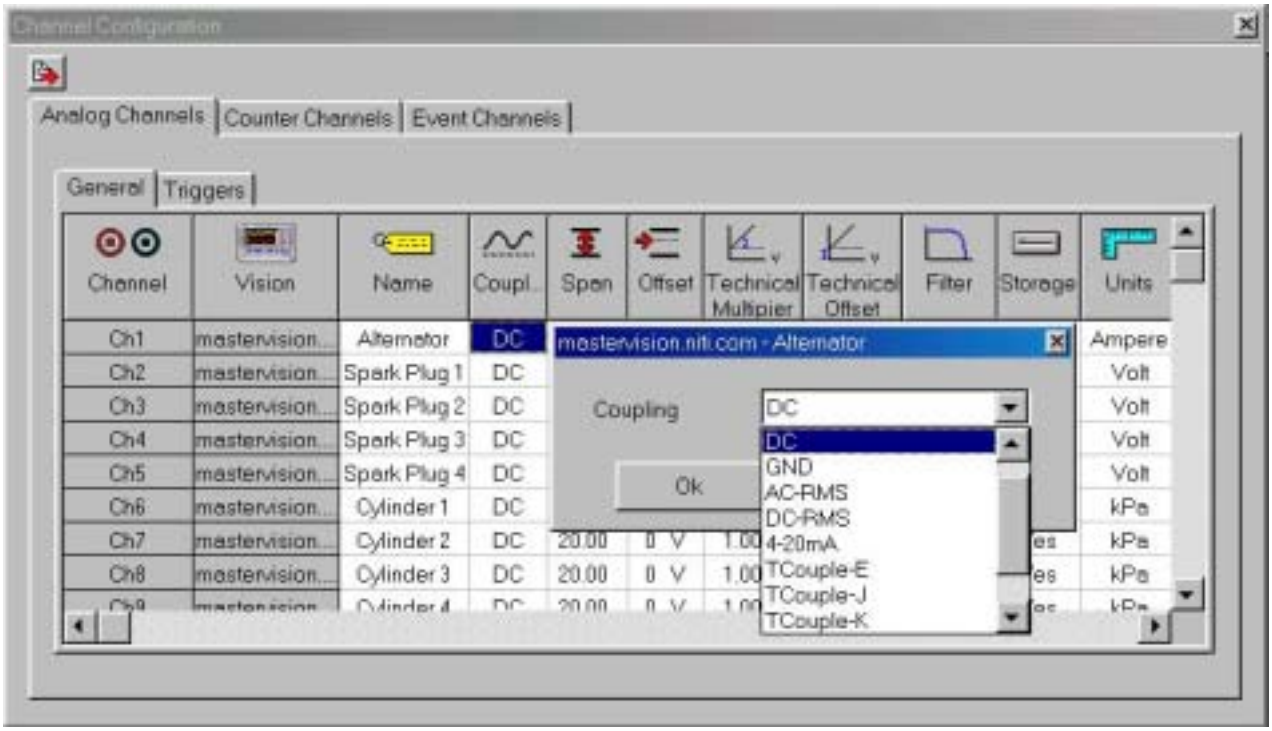
Every tab includes the first three columns:

Channel [6] – Displays the channel number and is non-editable.

Vision [7] – Displays the Vision name and is non-editable.

Name [8] – Displays the channel name (limited to 12 characters).

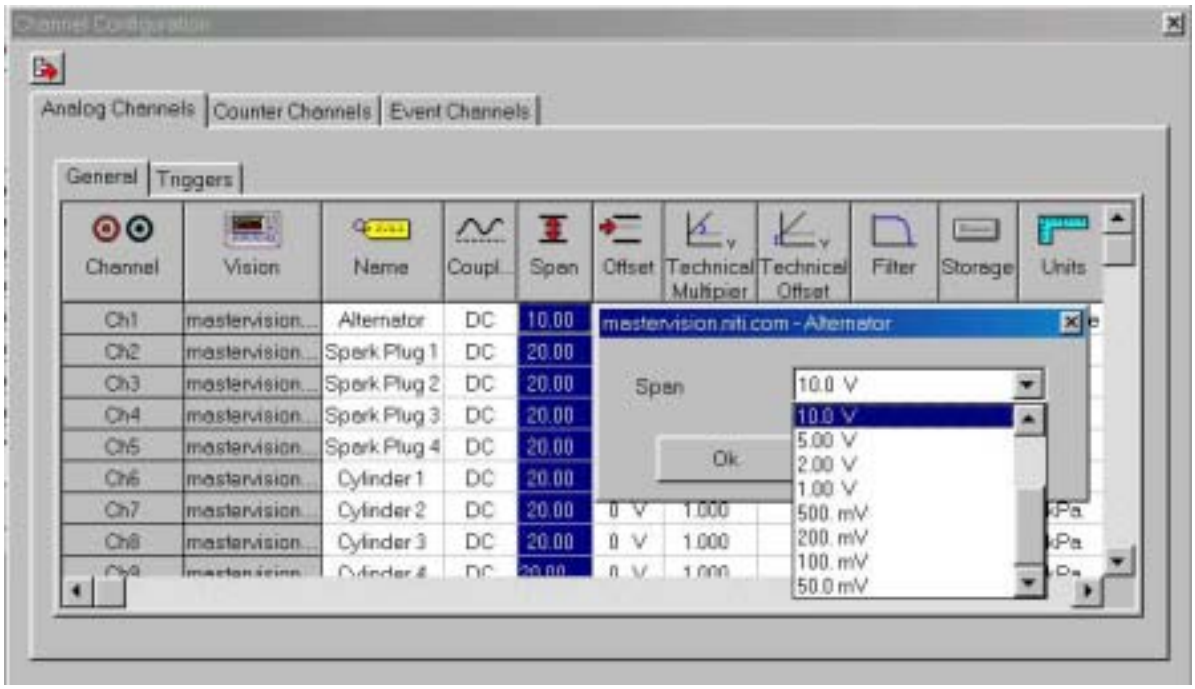
Changing Settings



Double clicking or clicking the right mouse button on fields in the Channel Configuration dialog allows you to make changes to the settings. If you double click on the *Coupling* field of Channel 1 in this example, the drop down menu shown appears. Select an option and click the *Ok* button to accept the new option, or click *Cancel* to return to the spreadsheet with no changes.

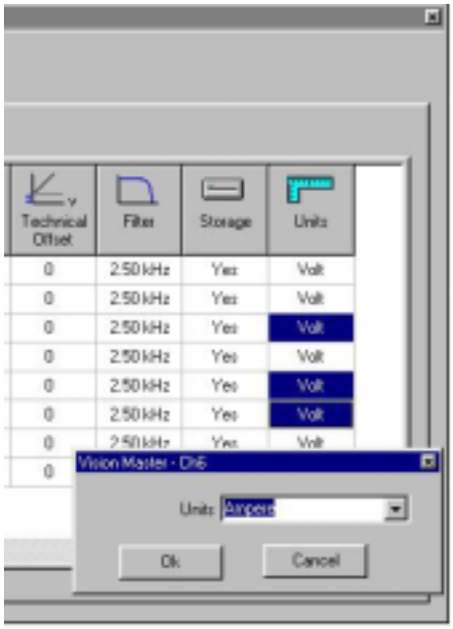
The same menu appears if you right mouse click while hovering over the field. The settings are context sensitive to the highlighted field to present the appropriate options.

You can also highlight an entire column by clicking on a column's title box. The highlighted fields that are affected by your parameter selection will turn blue. In the following example, the user has double clicked on the ***Span*** title box, which brings up the list of possible span settings. If this user clicks the **Ok** button, all channels will change their input span to 10 V.



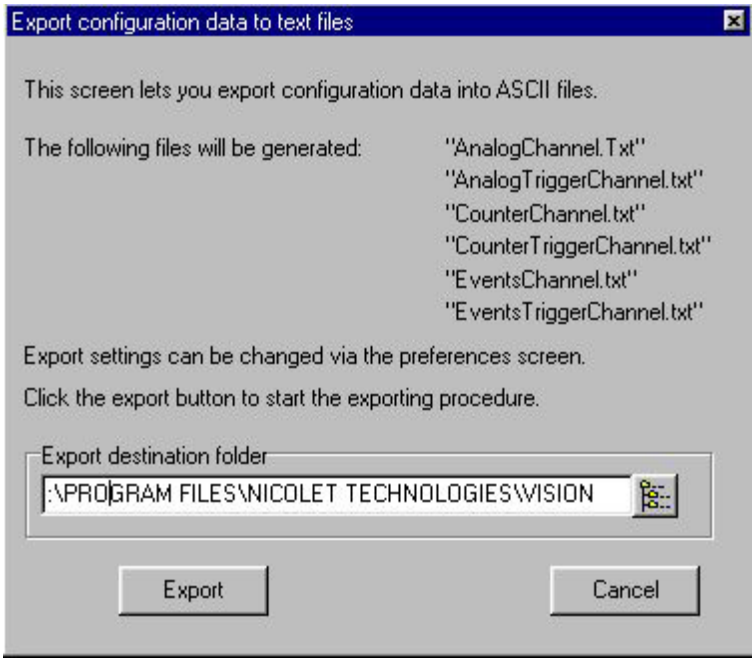
It is possible to select multiple channels within a column by holding down the **Ctrl** key and clicking on the desired fields. Once the channels are selected, double-click with the **Ctrl** key still pressed to bring up the menu to change the settings. Only those channels that are selected will be affected. It is also possible to right mouse click when the appropriate fields are selected to bring up the parameter menu.

You can also hold down the **Shift** key while clicking on a channel's parameter fields to highlight multiple channels. In this case, all channels that fall between the first and last selected channels will be highlighted.

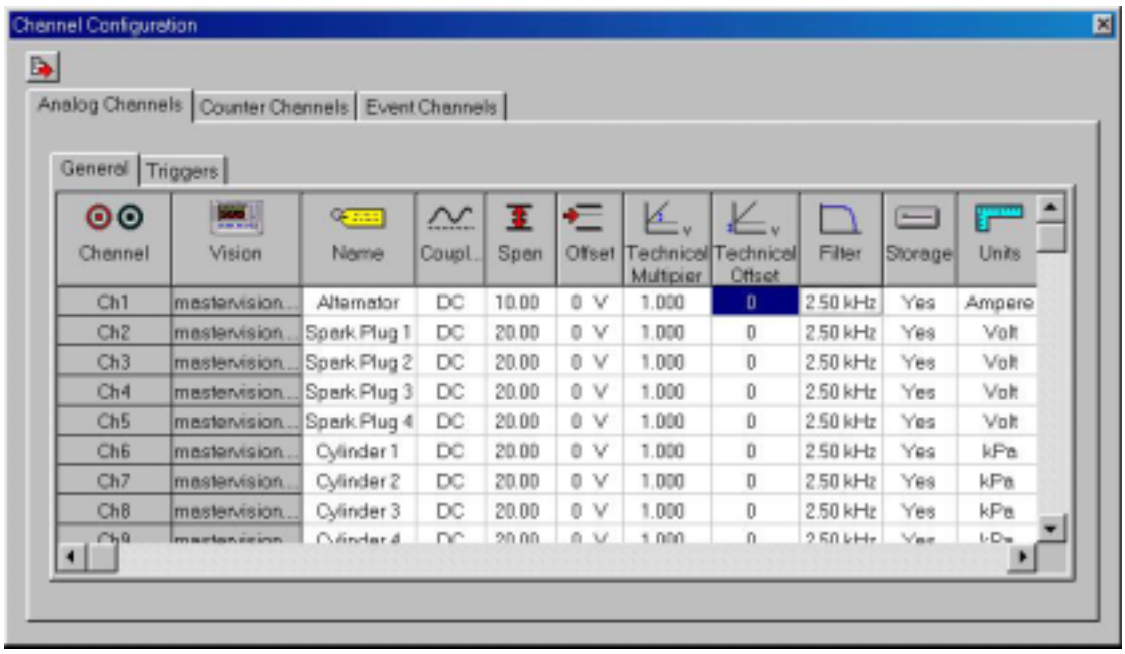


Channel Configuration Spreadsheet Report File

 The button in the upper left corner of the Channel Configuration dialog is used to export ASCII report files detailing the VisionNet Plus parameter settings. You can define the networked drive and folder in which to export the report files, which have pre-defined names. Select Export to create the report files, or Cancel to return to the main Channel Configuration spreadsheet window.



Analog Channels Configuration - General



The General channel parameters for the Analog channels in the VNP configuration include:

Span – Displays the span.

Offset – Displays the offset.

Technical Multiplier - Defined as slope M in the Physical Calibration equation, y = Mx + b. The Technical Offset dialog includes an Auto Zero feature to compensate for small drifts in transducer levels. The calibration procedure is explained in more detail in the following section.

Technical Offset – Defined as offset b in the Physical Calibration equation, y = Mx + b. The calibration procedure is explained in more detail in the following section.

Filter – Selectable up to ¼ sample rate, or Off.

Storage – Select Yes/No if data from this channel is to be saved in the next recording.

Units – User-defined physical calibration units such as PSI, microstrain, or G's.

More detailed definitions of the Channel Configuration options are found in *Chapter 7- Using the Channels Menu.*

Physical Calibration

The *Technical Multiplier* and *Technical Offset* values are functions of the Vision's 2-point physical calibration procedure. These functions are identical to the settings defined in the *Units Calibration* menu of the Vision's *Channels* menu dialog (Chapter 7).

When either of these fields is selected for editing the user sees the following dialog, which allows manual entry of the Slope and Offset values as defined in the linear slope equation:

$$y = Mx + b$$

where the variables are defined as:

y is the desired value in engineering units;

M is the slope (= Technical Multiplier) in engineering units per volt;

X is the measured value in volts;

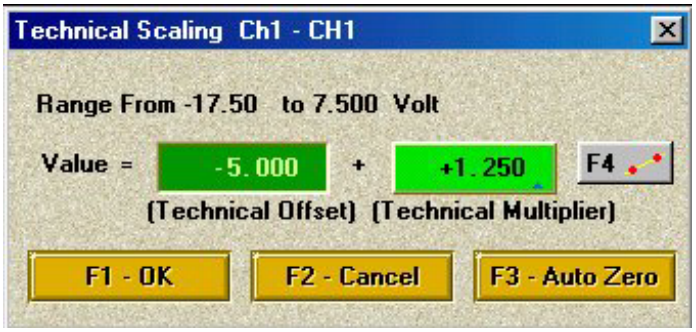
b is the offset value, in engineering units.

For example, if the transducer has a response factor of 10 Gs per volt, with a constant 1G offset, the slope equation describing that channels response is:

Y = Mx + b

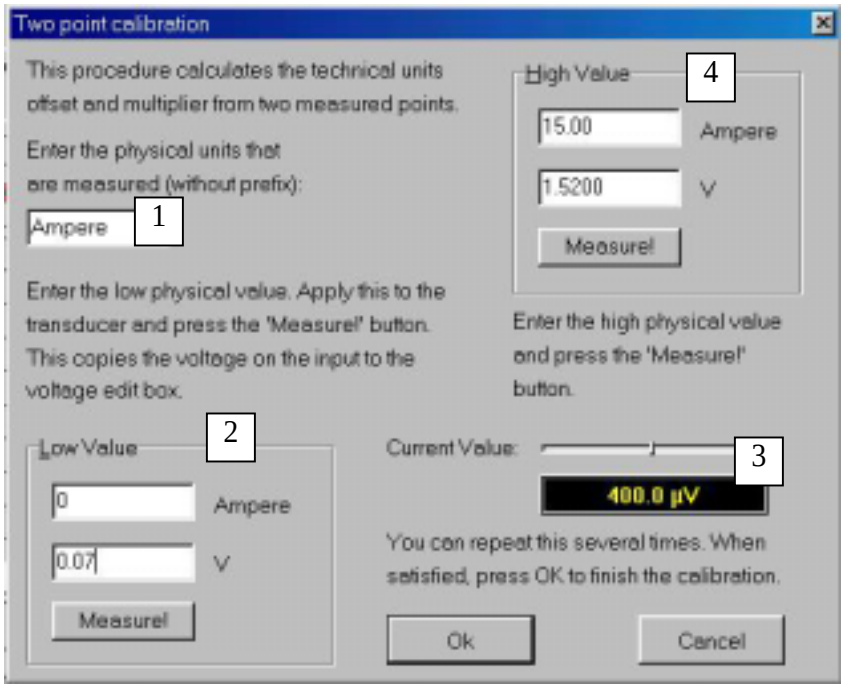
Reported value = (10 G/V)(Measured value in volts) + 1 G.

For a reading of 2.5 V at the transducer the reported value will equal 26 G's.



The ***AutoZero*** button (***F3***) re-sets the Technical Offset value to eliminate small offset values in the analog channels due to electronic drift in the transducers. This function does not electrically compensate for the transducer's electrical offset, but rather sets the currently measured value to zero.

The previous section described how to enter Slope and Offset values manually. If you want to measure new high and low values for physical calibration, click on the **Measure** button in the *Technical Scaling* dialog.



The Two Point Calibration procedure prompts you to enter the following information:

Physical units (PSI, for example).

Low value in physical units (0 PSI, for example)

High value in physical units (100 PSI, for example)

You are then prompted to apply the needed low and high calibration forces to the transducer, then click the Measure! button to set that value.

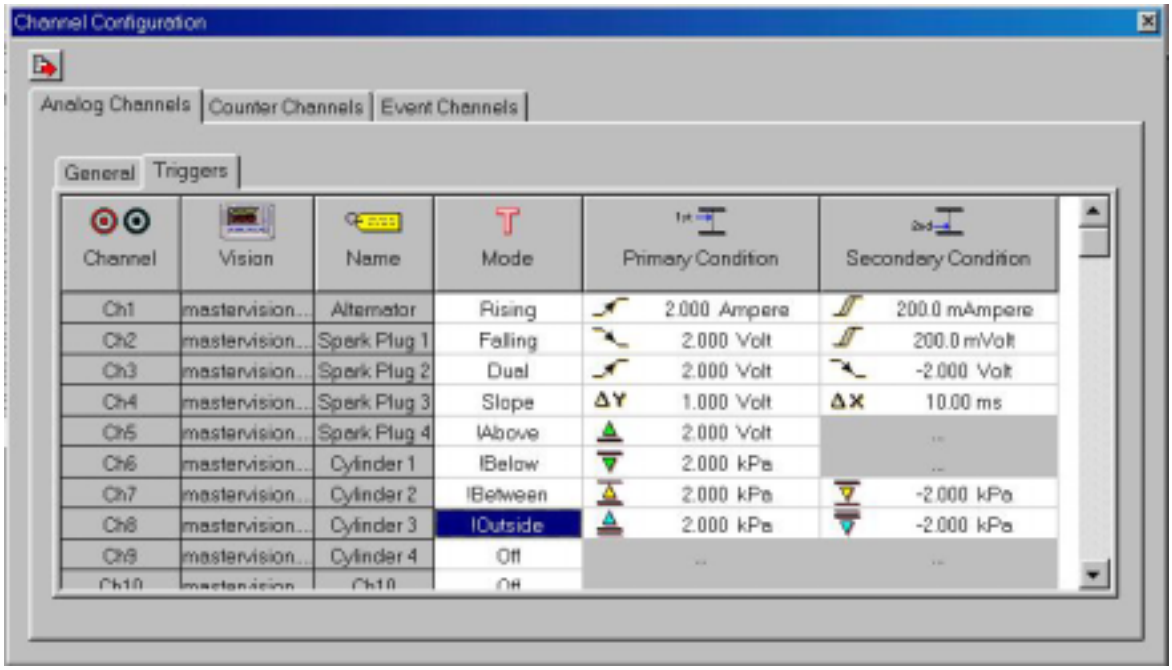
1. In the ***Physical Units*** box [1], enter the physical units measured by your transducer.
2. In the ***Low Value*** box [2] in the lower left corner of the screen, enter the desired physical value of the low input signal
3. Apply the low value of pressure, force, etc. to your transducer. The *Current Value* field appears in the lower right corner of the screen [3].
4. When the input has stabilized, click the ***Measure!*** button in the *Low Value* box [2] to capture the input voltage. The value is captured and displayed.

5. In the ***High Value*** box [4] in the upper right corner, enter the required physical value of the high input signal.
6. Apply the high value of pressure, force, etc. to your transducer. The *Current Value* field displays the result [2].
7. When the input has stabilized, click the ***Measure!*** button in the High Value box [4] to capture the input voltage. The value is captured and displayed.
8. A value between approximately 20% and 95% of full deflection is recommended for the most accurate calibration. If necessary, return to the ***Channels*** field in the main spreadsheet to adjust the amplifier span.
9. Click on ***Ok*** to save the calibration and ***Cancel*** to exit the menu without making any changes.

After the measurements have been accepted, the calculated values are inserted in the *Technical* ***Multiplier*** and *Technical* ***Offset*** boxes in the ***Channels*** spreadsheet. The new *Multiplier* and *Offset* values for that channel are also updated in the Vision's *Channels* menu settings.

Analog Channels Configuration - Triggers

Selecting the ***Triggers*** tab opens a spreadsheet with selections for the mode, primary condition and secondary condition for each channel. Triggers are explained in greater detail in Chapter 8.



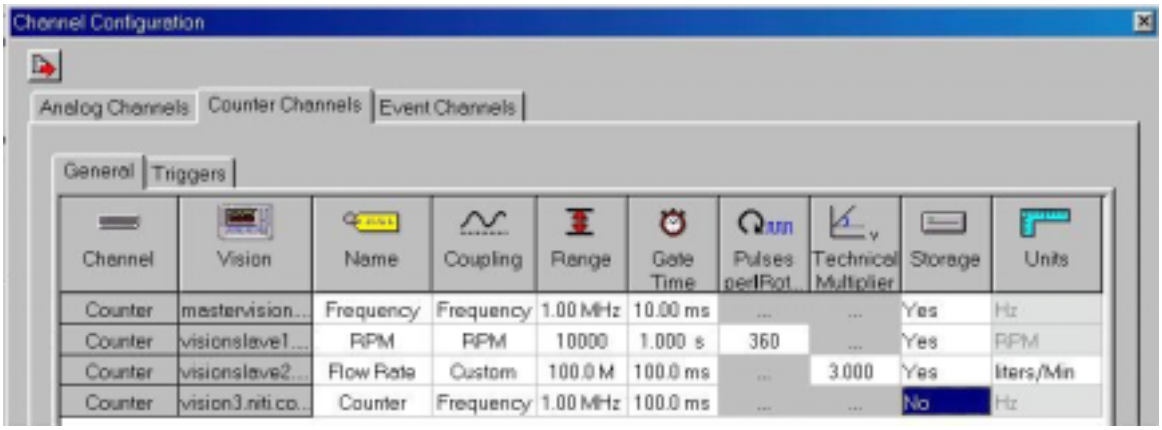
The trigger field for each channel may be set to Off, or to one of the following selections, shown here with the representative icons.

Primary Condition	**Secondary Condition**
Rising	Hysteresis
Falling	Hysteresis
Dual	Dual (upper and lower limit)
ΔY Slope	ΔX Slope

Selections for Qualifier trigger status are represented with an exclamation point before the description.

Primary Condition	**Secondary Condition**
!Above	No secondary condition
!Below	No secondary condition
!Between	!Between (upper and lower limits)
!Outside	!Outside (upper and lower limits)

Counter Channels Configuration – General



The **General** channel parameters for the **Counter** channels in the VNP configuration include:

Coupling – Includes frequency, RPM, or custom settings.

Range- Sets dynamic range and data point resolution of the input signal.

Gate Time – Sets update rate of counter signal.

Pulses per Rotation – Used to define number of counter pulses per 360 degree revolution of a shaft encoder.

Technical Multiplier - Sets slope values for Custom coupling settings.

Storage – Select Yes/No if data from this channel is to be saved in the next recording.

Units – Defined as Hz, RPM, or custom defined Clock units per sec/min/hour.

More detailed definitions of the Channel Configuration options are found in *Chapter 7- Channels Menu*.

Counter Channels Configuration - Triggers

Selecting the **Triggers** tab opens a spreadsheet with selections for the mode, primary condition and secondary condition for each channel. Triggers are explained in greater detail in Chapter 8.



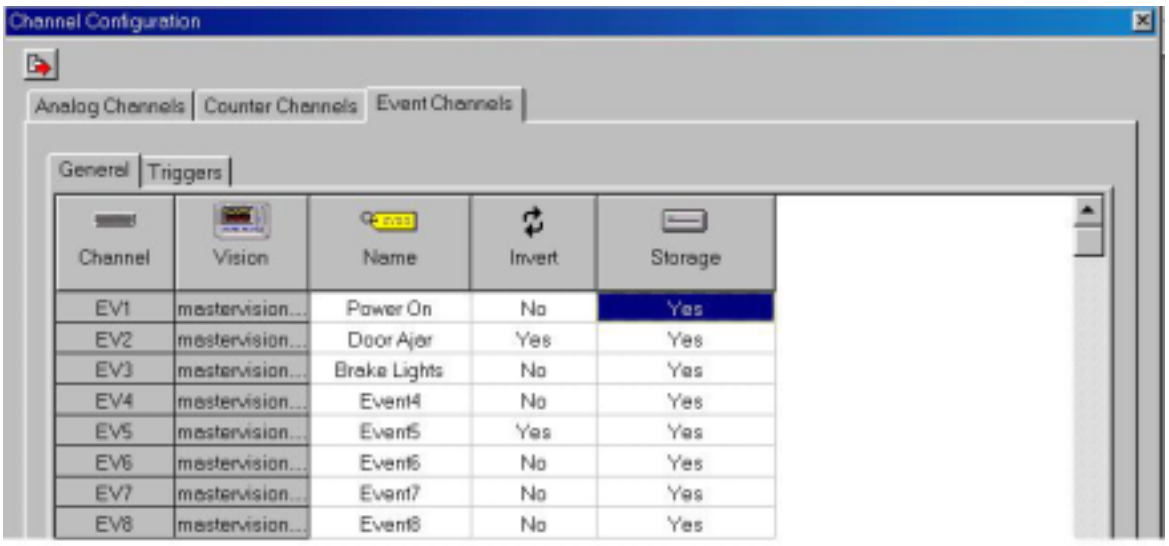
The trigger field for each channel may be set to Off, or to one of the following selections, shown here with the representative icons.

Primary Condition	**Secondary Condition**
Rising	Hysteresis
Falling	Hysteresis
Dual	Dual (upper and lower limit)
ΔY Slope	ΔX Slope

Selections for Qualifier trigger status are represented with an exclamation point before the description.

Primary Condition	**Secondary Condition**
!Above	No secondary condition
!Below	No secondary condition
!Between	!Between (upper and lower limits)
!Outside	!Outside (upper and lower limits)

Event Channels – General

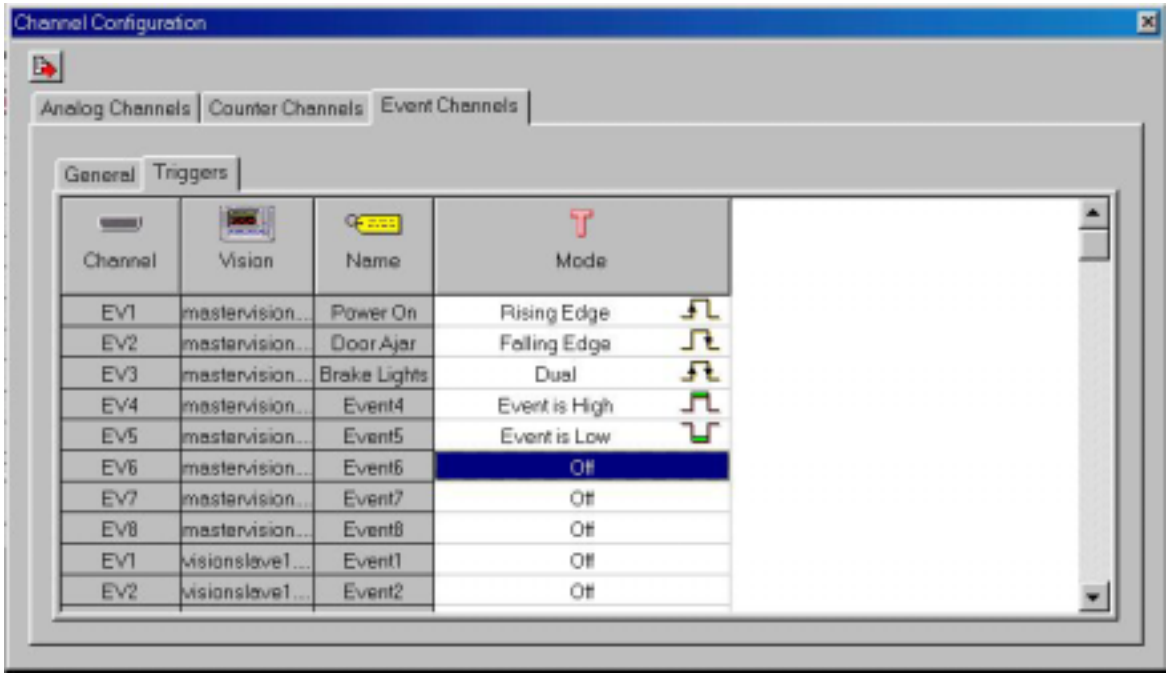


The General channel parameters for the Event channels in the VNP configuration include:

Invert – Select Yes/No if data from this channel is to be inverted.

Storage – Select Yes/No if data from this channel is to be saved in the next recording.

Event Channels - Trigger



The trigger field for each channel may be set to Off, or to one of the following selections, shown here with the representative icons.

Mode

Rising Edge

Falling Edge

Dual

Event is !High (Qualifier)

Event is !Low (Qualifier)

Local Lockout

When VisionNet Plus is launched it automatically locks out the front panel controls of each of the Vision systems in the Master/Slave configuration. When the front panel is locked, all commands to the Vision must be made via software from the VisionNet Plus menus. Clicking on the **Local Lockout** button toggles the locks off, giving you local control to modify the Vision settings through the front panel buttons.

Exit

 Always use the **Exit** button to shut down VisionNet Plus software and de-couple the DCOM communications links between the PC and each Vision system in the configuration. Shutting down VisionNet Plus through other means, such as Ctrl-Alt-Del, may leave communications "threads" active between systems, leading to network time-outs, network errors, or even locked up PC and Vision systems.

Information

 Clicking on this button displays the version number of VisionNet Plus software, including a list of the assorted driver files used. This information is helpful if you must contact LDS Nicolet support for any problems you may encounter when using VisionNet Plus.

Also included in the information displayed is the Transfer button used to transfer your copy-protected seat license for VisionNet Plus from your current PC to a different PC system. IMPORTANT! Please read the instructions carefully before transferring your license. You must load VisionNet Plus software onto the new PC prior to removing the license from the old PC, or you will lose the seat license entirely.

Chapter 17: Service Information

Vision XP Service Information

The Vision adopts the form factor of a standard flatbed chart recorder, the traditional instrument of choice for our customer base before the release of the Vision. The external design of the Vision utilizes a lightweight, shock resistant plastic molded case with a lightweight aluminum frame and wrap around feet on each corner of the chassis to absorb corner impacts. The Vision internal design is based on the NLX PC Motherboard platform. The display in the system is a 10.4 TFT display with a monitor output port on the system.

The instrument uses less than 250 W / 350 VA and operates from line voltages of 100-120 Vrms at 60 Hz, and 230-240 Vrms at 50 Hz to Installation category II, local level supplies distributed within a building.

The PC Motherboard is an industry standard NLX form factor PC Motherboard with minimum CPU specifications of:

a) Celeron processor, speed of 700 MHz

b) 256 MB of RAM

c) SCSI drive up to 72 GB

d) WinXP

e) Lithium 3 V battery**

**Not user serviceable. Replacement must be conducted only by authorized service personnel.

The display is a NEC NL8060B-17 800x600 SVGA. The Vision also has an external VGA connector with a standard 15 pin D connector for external monitor use. All versions of the Vision contain a 3.5” internal floppy which allows for the creation of bootable Windows emergency recovery disks and data/setting transfer of the Vision.

Data is stored on the Vision by using an internal acquisition SCSI Drive (36 GB minimum drive size).

The NLX PC Motherboard includes the following standard PC I/O ports (see diagram below for exact locations):

a) Ethernet, 10/100 Mb/s twisted pair connector

b) LPT, a standard ECP Parallel port

c) 2 9 Pin D Connector serial ports

d) 2 USB Serial Ports

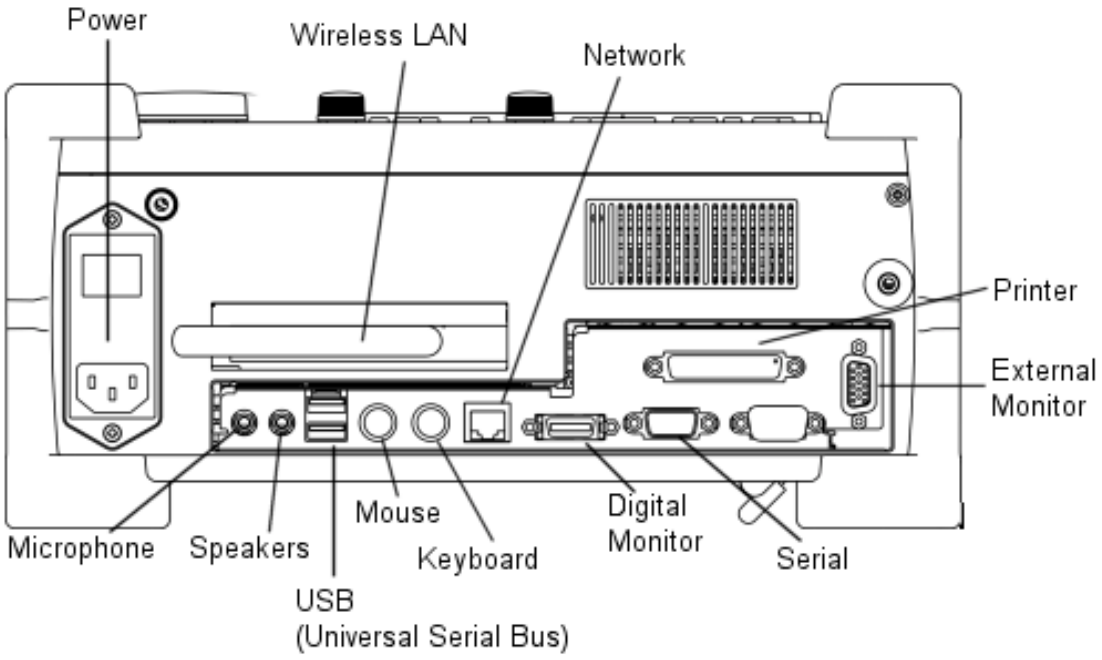
e) PS/2 Mouse Port

f) PC/AT Keyboard type with standard PS/2 Connector

g) External Monitor Port for flat panel or CRT video display

h) IrDA1.1 compliant serial port

i) "Sound Blaster" compatible microphone in and line/headphone out.



Marker 1-8/Remote

The Marker 1-8 connector is a 44-pin D sub connector used to connect digital inputs for the Vision. An AMP HD22 series 44-pin D (Male) connector is compatible. The minimum pulse width is one sample period at the current acquisition rate. Spare connectors are available from LDS Nicolet as part number 117-901100.

Note: *To meet CE requirements, the cable used to attach this connector must include the ferrite that is shipped with the connector. The ferrite must go around all the cables coming out of the connector.*



Female Connector Viewed From Vision Top Panel

Pin #	Signal	Pin #	Signal	Pin #	Signal
1	EVENT 1	16	Not used	31	Not Used
2	EVENT 2	17	GND	32	Not Used
3	EVENT 3	18	GND	33	EXT TRIG
4	EVENT 4	19	GND	34	EXT CLK
5	EVENT 5	20	GND	35	EXT STOP
6	EVENT 6	21	GND	36	EXT START
7	EVENT 7	22	GND	37	Not Used
8	EVENT 8	23	GND	38	Not used
9	Not used	24	GND	39	Not used
10	Not used	25	GND	40	TRIG OUT
11	Not used	26	GND	41	GND
12	COUNTER	27	GND	42	GND
13	Not used	28	GND	43	EXT PWR
14	Not used	29	GND	44	EXT PWR
15	Not used	30	GND		

Digital Marker Inputs

Number	8 per Vision system
Type	fixed threshold TTL
Slope	high, low level; positive, negative edge slope
Overvoltage protection	15 V
Input connector	44-pin "D" connectors
Minimum Pulse Width	One sample period at current Acquisition Rate

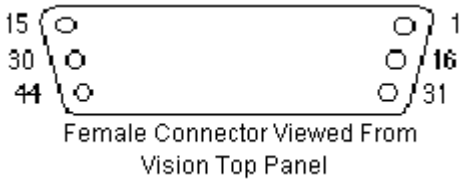
Counter/Timer Input

Number	1 per Vision system
Type	fixed threshold TTL
Functions	frequency, RPM
Maximum Count Frequency	5 MHz

Notes:

EXT PWR is 5 V rated at 700 mA maximum total from both pins. It is protected by an internal fuse which is re-settable.

EXT START and EXT STOP both have internal 10 KΩ pull-down resistors and must be driven to a TTL-compatible high level to actuate the start/stop function. A positive signal applied to the EXT START input has the identical action to pressing the ***Record*** button on the front panel, whereas the EXT STOP input corresponds to pressing the front panel's ***Stop*** button.



Note: *To meet CE requirements, the cable used to attach this connector must include the ferrite that is shipped with the connector. The ferrite must go around all the cables coming out of the connector.*

MARKER INPUT SPECIFICATIONS

Input Type: TTL logic level, threshold approximately +1 V

Minimum Pulse Width: one sample period at current acquisition rate

Safe Overload: 15 V

Input Impedance: 10 kΩ to ground

Open Circuit Voltage: <0.2 V, low state

Pullup resistor (if required): 5 kΩ to pin 43 or pin 44

Clock In

The EXT CLK TTL connector (pin 34) is used during External Clock mode. The Vision constantly samples input data at the full digitizer rate. On each rising edge of the incoming clock pulse, the most recent sample is stored into the data stream. Typically, the EXT CLK signal is associated with a rotary encoder generating pulses every N-degrees of rotation. This allows data samples to be associated with rotary position as opposed to absolute time. If a convenient source of uniform pulses is not available, the Synchroscope accessory is available to generate a clock from almost any input. Please ask your LDS Nicolet Representative for information.

The maximum external clock rate is 50 kHz, and the minimum pulse width for each clock is 10 microseconds.

Trig In

The Vision responds to triggers applied to the EXT TRIG TTL connector (pin 33).

The minimum pulse width is 4 microseconds.

Trig Out

The Vision generates TTL-compatible triggers on the TRIG OUT TTL connector (pin 40).

Vision XP Specifications

The tables below indicate the published analog specifications of the LDS Nicolet Vision XP.

There are two sets of specifications, depending on whether the Vision data acquisition board has a maximum 500 V span or 1000 V span. This can be determined on your system by checking the available options under the Channel/Span menu selection. These specifications are subject to change without notice.

Voltage Range 500 V Systems	DC Gain Error	Offset Error	SINL* Error	RMS Noise Limit	MSE#
50 mV-100 mV	± .15% of range	± .20% of range	.05% of range	.10% of range	.25% of range
>100 mV	± .15% of range	± .10% of range	.05% of range	.03% of range	.20% of range

Voltage Range 500 V Systems	Typical CMRR Results	CMRR Test limit
< 1 V	-90 dB	-84 dB
1 V – 10 V	-64 dB	-50 dB

Voltage Range 1KV Systems	DC Gain Error	Offset Error	SINL* Error	RMS Noise Limit	MSE#
50 mV- 100 mV (200 mV for noise)	± .05% of range	± .065% of range	.02% of range	.065% of range	.10% of range
>100 mV (>200mV for noise)	± .05% of range	± .03% of range	.02% of range	.025% of range	.10% of range

Voltage Range 1KV Systems	Typical CMRR Results	CMRR Test limit
< 1 V	-110 dB	-105 dB
1 V – 10 V	-80 dB	-72 dB

* Static Integral Non-Linearity # Maximum Static Error

The errors detailed above are determined from a standard statistical analysis. Each Vision is tested by inputting 10 known voltages (V_{in}) and comparing the known input value to the value measured by the instrument (V_{meas}). These 10 data pairs (V_{in}, V_{meas}) are combined and a best fit line is determined. The errors listed above are determined from the parameters of the best fit line as follows:

Gain Error = Slope of the best fit line

Offset Error = Y-intercept of the best fit line

SINL = absolute greatest difference between V_{meas} and the best fit value

MSE = absolute greatest difference between V_{in} and V_{meas}

See *Chapter 3: Introduction* (page 3-7) for the Vision XP System Specifications.

Dongle Specifications

Vision offers a full range of signal conditioning through dongles that plug into the Vision inputs.

Verification Procedure

This procedure describes a method of testing and verifying DC Gain accuracy for incoming inspection or routine test purposes. This example is ***based*** on the automated Vision Calibration/Verification procedure followed during the manufacture of the Vision and should not be used in place of a factory or authorized service center calibration/verification. The factory automated software also includes testing for offset, noise, bandwidth, linearity, maximum static error along with DC Gain error.

Note: *The performance verification listed below requires the use of very precise test equipment and careful cable connections. The low voltage ranges in the Vision, and the accuracy of the system, mean that proper grounding and cable connections are* ***critical*** *in order to properly test your Vision. A failure below does not necessarily indicate that the Vision is out of tolerance. If you are concerned about the status of your LDS Nicolet Vision XP, you should arrange for a factory or authorized service center calibration with test data.*

Note: *The connection required to make valid measurements are highly critical. A verification test cable is available from LDS Nicolet as part number 395-906401.*

Recommended Intervals

The LDS Nicolet Vision XP should be tested and if necessary, calibrated, at one year intervals or after any major repair that may affect calibration.

Equipment Required:

Precision DC voltage source of the following characteristics:

Accuracy: 0.005% or better

Output Range: +/- 20 mV to +/- 250 V

Example: Fluke 5700A

Warm Up

Verification tests should be performed at normal room temperature and humidity, approximately 21-23 degrees C and less than 80% relative humidity. The instrument should be allowed to warm up for one hour before verification tests.

DC GainVerification Procedure

Step 1: Set the amplifier cards to their default setting by pressing the Menu button and selecting the Disk <F5> menu.



Select “Load Set-up” <F3> from the list of options and the following menu appears:



Select “Load Defaults” <F3> from the menu. This will force the Vision into a default setting.

Repetitively press the “Menu” button until you are back to the main menu.

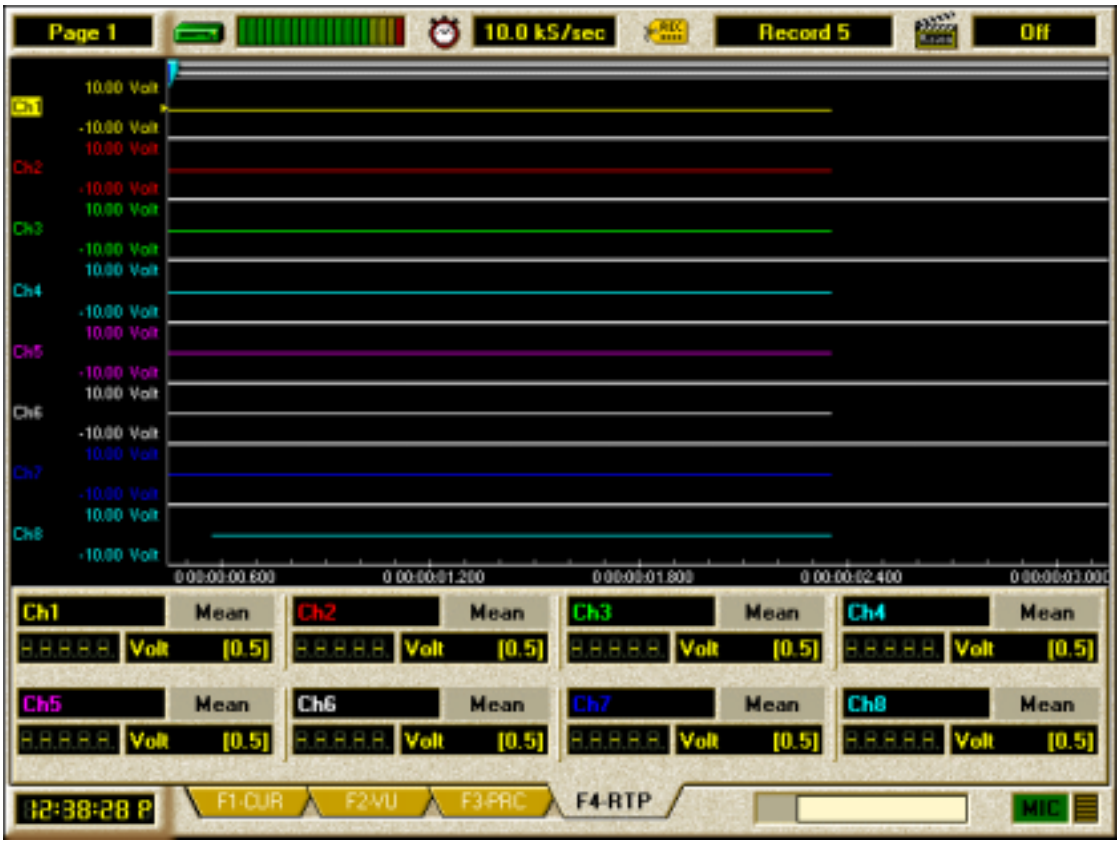
Press the “Measure” <F6> button

Select “Real Time Parameters” <F2> button so that you see the menu below.



Repetitively press the “Clear Last” <F5> until all four of the default Real Time Parameters are removed from the screen.

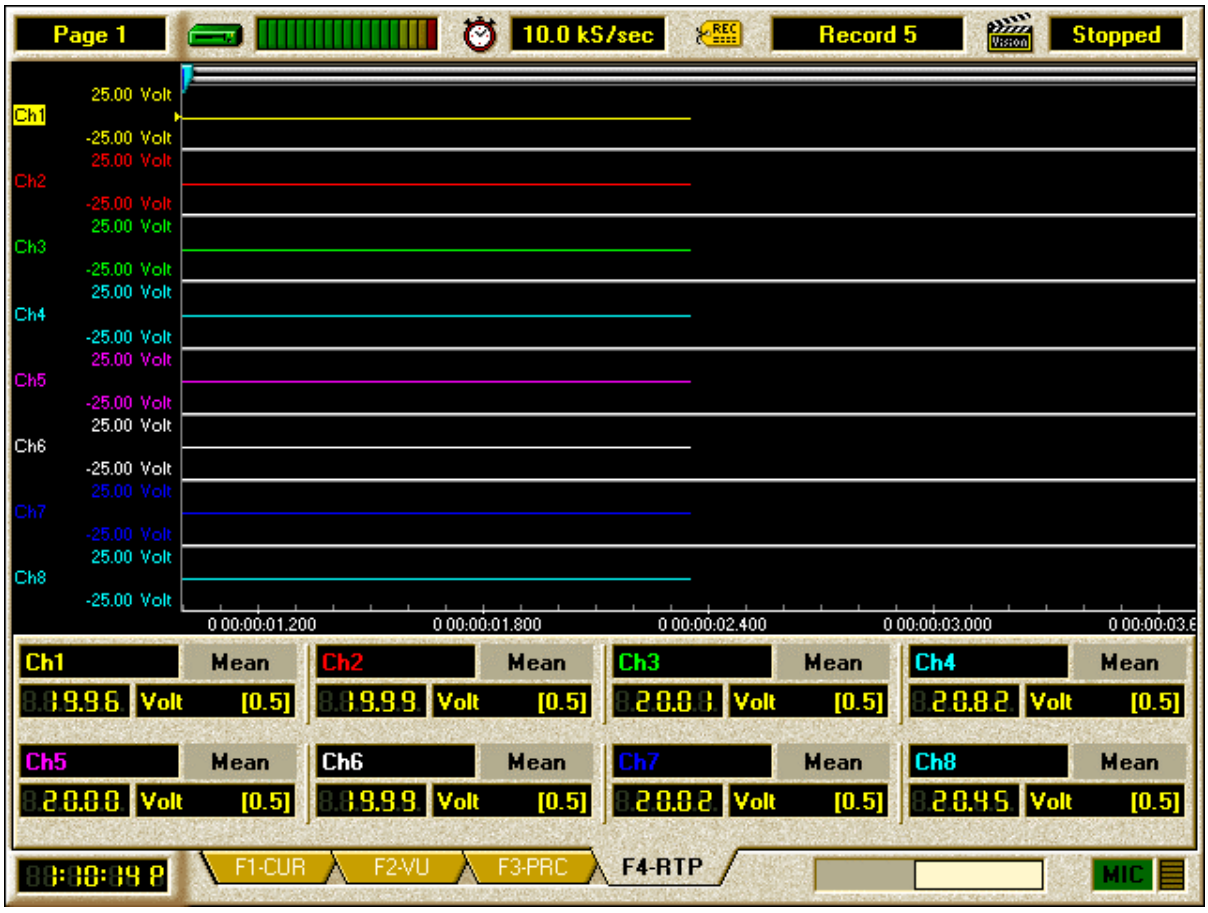
Press the Channel Select <F1> and select Ch:1. Press the Realtime Parameter <F2> and select the Mean Function and “Add to View” <F4> for each of the channels. If you have a 16-channel system, set up channels 1-8 on Page 1 of the display and channels 9-16 on Page 2.



You should now see a display as above, with eight (one for each channel) “Mean Values” displayed on the Vision screen.

All Vision settings are now completed. We recommend that you save the settings on the hard disk or a floppy disk for future use. Refer to the Settings instructions in Chapter 10, “Using the Disk Menu” for a more in depth discussion of saving your settings.

Apply a DC voltage of 75% to 95% of a positive full scale to all inputs. Test one channel at a time and do not “daisy chain” the channels together. For the 50 V Span in this example (± 25 V), apply +20.000 V.



Press the **Pause** button on the Vision front panel. Your display should look similar to the image above, with the Mean values being updated a few times a second.

Observe and record the Mean voltage reading for each channel. Some fluctuation in the last digit is normal: record the most frequent value that you see.

Apply a negative voltage of the same value to each channel. For the 50 V Span in this example (± 25 V), apply –20.000 V. Observe and record the Mean voltage readings for each channel. Some fluctuation in the last digit is normal: record the most frequent value that you see.

For each channel, add the positive and negative readings to find the absolute value of the voltage measured. In the 50 V span, the total is approximately 40 V. For example, channel 1 in the above displays measured +19.96 V and –20.02 V for an absolute value total of 39.98 V.

Subtract the expected standard value from the value of the reading. With 40 V applied, Channel 1 read a total of 39.98. The error is (39.98 – 40.00) = -.02 V.

Error = (Positive Reading + Negative Reading) – Actual Input Voltage

Compare the amount of error to the specification limit. Refer to the Vision XP Specification sheet for the current specifications (identify if the Vision under test is a 500 V Vision or a 1000 V Vision). For a 50 V span in a 500 V Vision, the maximum error within specification is therefore (50 V * 0.0015) or 0.075 V. Channel 1 is within specification.

Specification Limit = Span * (Gain Error Percentage/100)

For each Channel, compare the calculated Error to confirm it is less than the Specification. If all channels are within specification, the test for this Span is completed. If any channel exceeds specification, a recalibration may be required. Contact LDS Nicolet for instructions on obtaining calibration services.

OPTIONAL- If desired or if required by your standard procedures, additional voltage points and spans may be tested in similar fashion. For example, if the remaining Spans are to be tested, a table similar to the following would be constructed. Note any Span specification differences by reviewing the Vision XP specification sheet in this manual.

Appendix A: Network Settings

Introduction

The LDS Nicolet Vision XP records data to an internal SCSI acquisition drive during acquisition. The data may be copied, post-run, to the system's C: drive, or via Ethernet to an external network drive. This feature allows users to manually transfer data to any networked drive via operation of the Vision's front panel controls. However, the standard Vision software does not support data acquisition controlled by an external PC, nor does it provide real-time displays to the external PC.

This appendix discusses the proper network protocols and settings required for VisionNet to operate with the Vision. Please refer to the previous chapters of this manual for specifics on the Vision's capabilities.

System Requirements

Vision XP

Each Vision you will use for remote access or control requires the following:

- Any hardware configuration
- Vision software version 2.0 or higher
- DCOM95 software (supplied with Vision software upgrade)

If your Vision contains software earlier than version 2.0, download the latest version from the LDS Nicolet Web site (www.lds-group.com) or contact your LDS Nicolet representative to obtain upgrade diskettes. Vision software Version 2.0 and newer contains the DCOM server that allows remote control. No additional software is required on the Vision systems.

If multiple Vision systems are to be synchronized, you will need one Slave Cabling Kit for each Slave Vision. Also, each Vision must be running the same version of software for the units to be connected.

Controlling Computer

The PC used for remote control requires the following:

- Microsoft Windows 98, NT4/SP3, 2000, or XP operating system of any release
- 233 MHz Pentium II processor or higher
- Minimum 64MB RAM
- SVGA Graphics
- MicroSoft Internet Explorer, v5.0 or higher
- 10-base-T or 100-base-T Ethernet interface card from any vendor

Network

- Standard 10-base-T or 10/100-base-T twisted pair Ethernet
- Sufficient ports to connect the controlling computer and all participating Visions

The network traffic generated by real-time remote displays can be significant. If possible in your network environment, LDS Nicolet recommends that a local hub be used to contain this traffic, with a bridge to the rest of your enterprise or workgroup network.

Configuring Network Settings

LDS Nicolet offers several software packages allowing display, analysis, or remote control of one or more Visions over an Ethernet network. LDS Nicolet uses standard TCP/IP Windows networking protocols to configure the Vision(s) and PC, with commands sent between systems using Microsoft's DCOM protocols. DataViewer software only requires a successful TCP/IP link to display and analyze data stored on the Vision's SCSI acquisition drive. VisionNet and VisionNet Plus software add the ability to send commands to the Vision to modify sampling parameters, start or stop recordings, or transfer data files to the PC.

Before VisionNet or VisionNet Plus can be used to control a Vision over the network, several steps must be performed. The following sections describe each step in the process in detail. VisionNet/Plus use the Microsoft Distributed Component Object Model (**DCOM**). Since configuring VisionNet over the network is mainly about configuring the network and **DCOM**, the following sections will simply use the term **DCOM** to describe the procedure.

The following two steps must be performed to configure DCOM on your PC and on your Vision(s):

Step 1: Configuring Workgroups and TCP/IP

Step 2: Installing DCOM95

Step 1: Configuring Workgroups and TCP/IP

DCOM on Windows 98/Windows NT4/Windows 2000 uses the TCP/IP protocol. The TCP/IP protocol must be installed on the Vision(s) and your computer, and must be configured correctly.

Note: *Windows 95 does not provide the DCOM functions required for use with DataViewer, VisionNet, nor VisionNet Plus.*

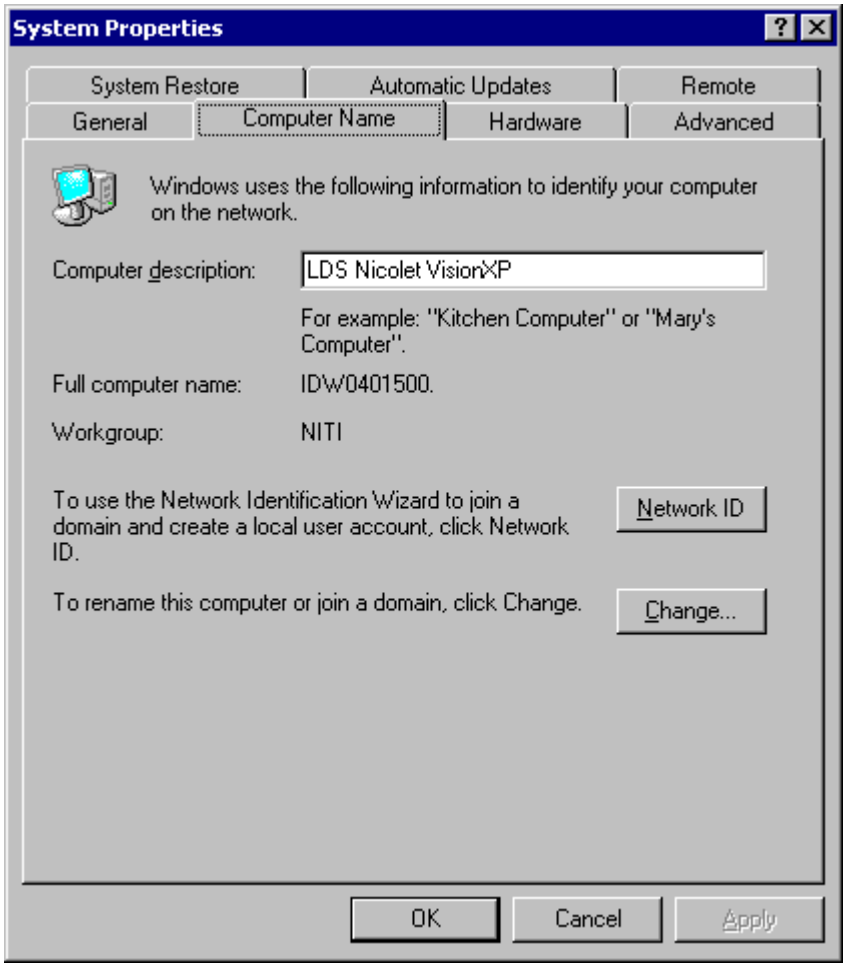
Each Vision has a built-in Ethernet network adapter that has been configured using Windows XP defaults. The controlling computer must also have an Ethernet adapter installed.

Workgroup Setup

The first step is to name all the participating Visions and computers, and place them in the same workgroup. Perform the following steps on each system. These instructions assume that each PC is running Windows XP, although that is not required. For other operating systems, these options may be found in slightly different locations.

- Right click on the **My Computer** icon on the Desktop of your PC and select **Properties** in the pop-up menu. For each Vision, choose the ***Network*** option in the **Utilities Menu**. On Vision, you will need to use the drop down arrow of the **Address** line in the open dialog to select the Desktop. From the Desktop dialog, right click on **My Computer** and select **Properties.**

- Select the **Computer Name** tab. The following window appears:



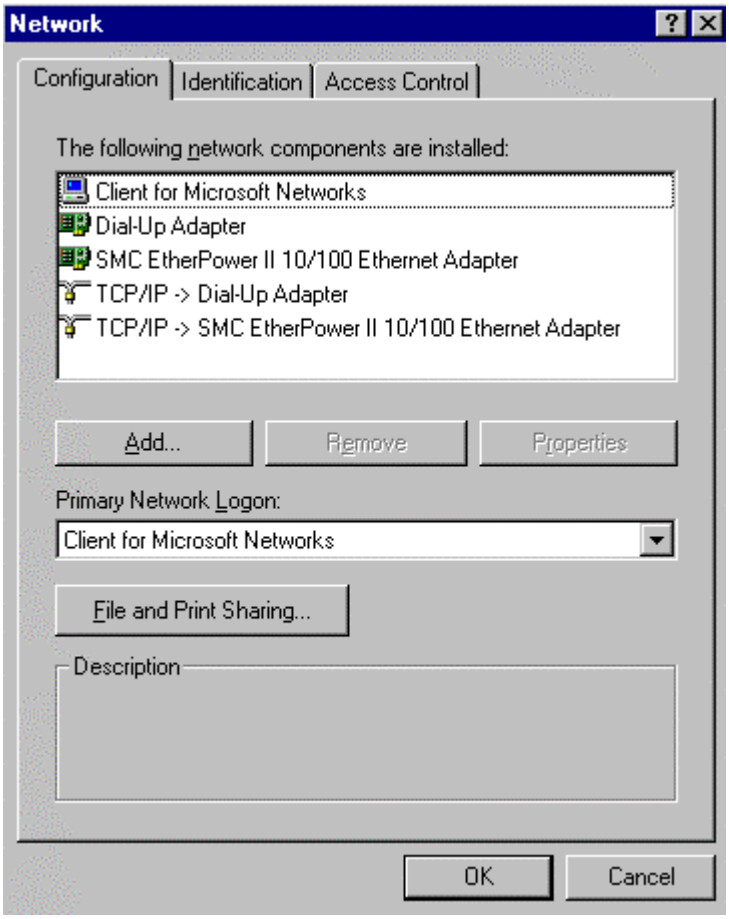
  Click on the **Change…** button if you need to change any of the settings.

- **Computer Name**: enter any name that is meaningful to you. For the LDS Nicolet Vision XP, the factory default value is the system serial number. This name is used to identify the system on the network. Each system must have a unique name.
- **Workgroup**: enter a name for your workgroup. All systems participating in Vision control, including the control computer, must be in the same Workgroup.
- **Computer Description**: enter a more detailed description such as “Vision pumping station 14” or “test rack 3”, etc. (This field is not available in Windows NT4.)
- Click **OK** to close the dialog when finished.

TCP/IP Setup

By default, Windows 95 doesn't install the TCP/IP protocol. To add the TCP/IP protocol, you must perform the following steps.

- In the Network Properties dialog, click on the **Configuration** Tab. (In Windows NT, click the **Protocols** tab.) It lists the network interfaces and the protocols that have been installed.

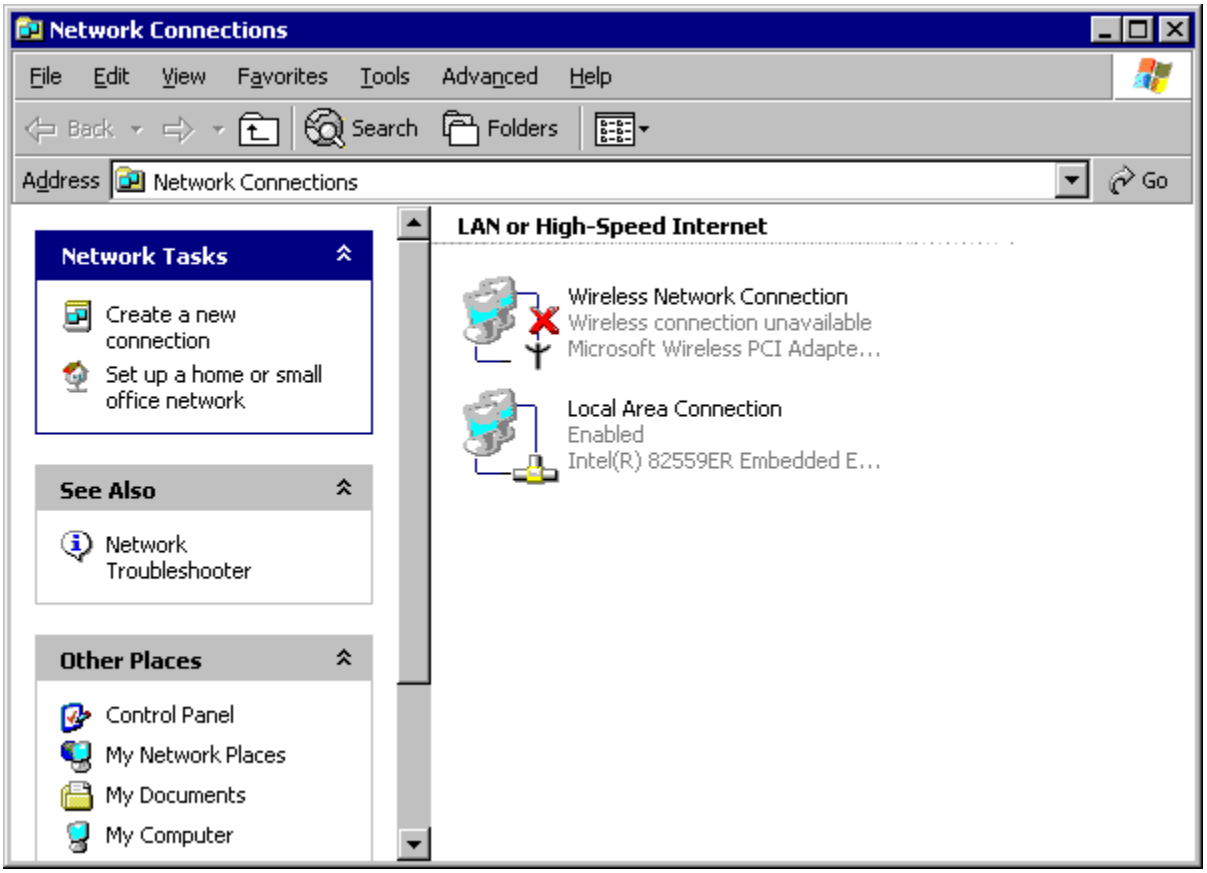


- If **TCP/IP** is not listed, select the **Add** button.
- In the list of Network Component Types, select **Protocol** and select the **Add…** button.
- Go to the **Manufacturers** list and select Microsoft.
  In the list labeled **Protocols** select **TCP/IP** and press **OK**. For your PC, you may need your original Windows system CD.

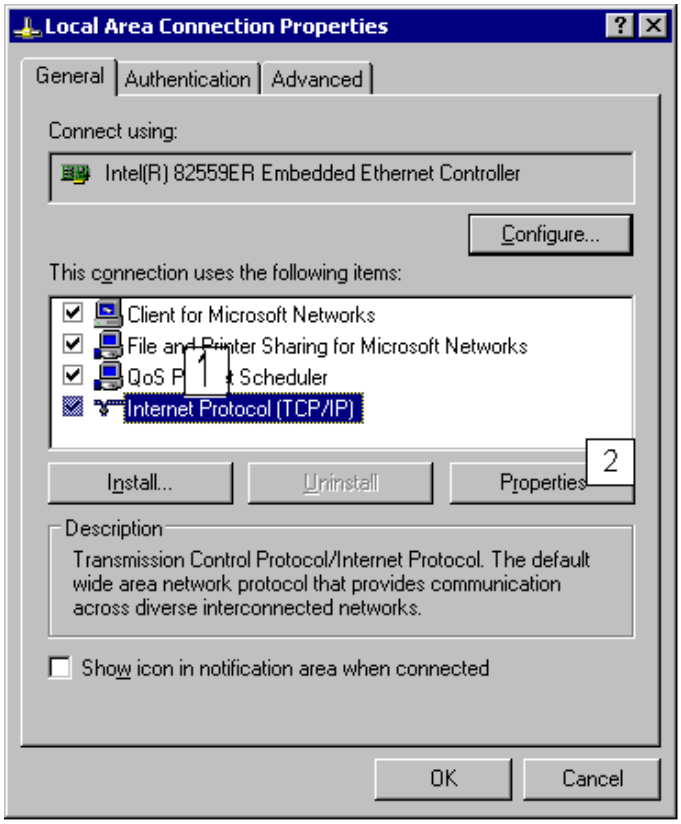
Windows XP

For your VisionXP and any host PC running a more recent version of Windows than Windows 95, the TCP/IP protocol is already installed. To set up the TCP/IP interface,

double click on the **My Network Places** icon on the desktop. From Vision, select the **Network** option from the **Utililties** menu. The following dialog will open:



Right click on **Local Area Connection** and choose **Properties**.



Select the **TCP/IP** option (1) and then click the **Properties** button (2).

The following steps depend on whether you have a Dynamic Host Configuration Protocol server (DHCP server) on your network or not. Ask your network administrator if a DHCP server is installed.

DHCP Server Present

- The DHCP server on your network will configure the TCP/IP protocol automatically. Make sure the **Obtain an IP address automatically** option is selected if a DHCP server is available, press **OK,** and restart the system.

No DHCP Server Present

- If no DHCP server is installed, ask your network Administrator for an IP address for each system and enter it in the IP address tab dialog. Enter the TCP/IP address and subnet mask of the system. If you don't have a network administrator, you can use the following range of addresses: 10.0.0.0 to 10.255.255.255 with subnet mask 255.0.0.0. Every system must have a unique TCP/IP address to identify it on the network.
- Select **OK** to exit the **TCP/IP** properties dialog.
- Select **OK** and restart the system.

Checking the Configuration

On your PC, double click on the **My Network Places** icon to open the **My Network Places** dialog box. Click on the **Entire Network** link in the left column to view all computers in your network. From your PC, you should be able to see each Vision that you want to control with VisionNet in your network.

If you don't get the result you are expecting, then you may have network cabling problems, security restrictions, or you may have forgotten a step. A convenient troubleshooting method is to connect only two systems to each other through an Ethernet "crossover" cable. This eliminates your local network and any difficulties associated with it. Contact your network administrator or Microsoft for information on how to configure TCP/IP networks. In general, it is not practical for LDS Nicolet to assist you with network configuration difficulties.

Step 2: Installing DCOM on Your PC

DCOM is included in Windows NT, Windows 2000, Windows ME, and Windows 98 (Second Edition) systems. If your PC uses any of these operating systems, loading DCOM is not required. If your PC uses Windows 95 or Windows 98 (First Edition) you must install DCOM on it to communicate with your Visions.

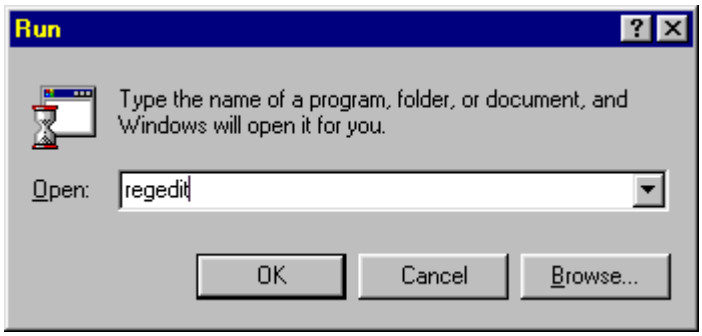
- Locate the installation program DCOM95.EXE. It is included on your VisionNet/Plus CD and is also available from the Microsoft Web site.
- Run DCOM95.
- After running DCOM95 you must restart the PC.

This completes the installation and network configuration.

Note for Windows NT4 and Windows 2000 systems:

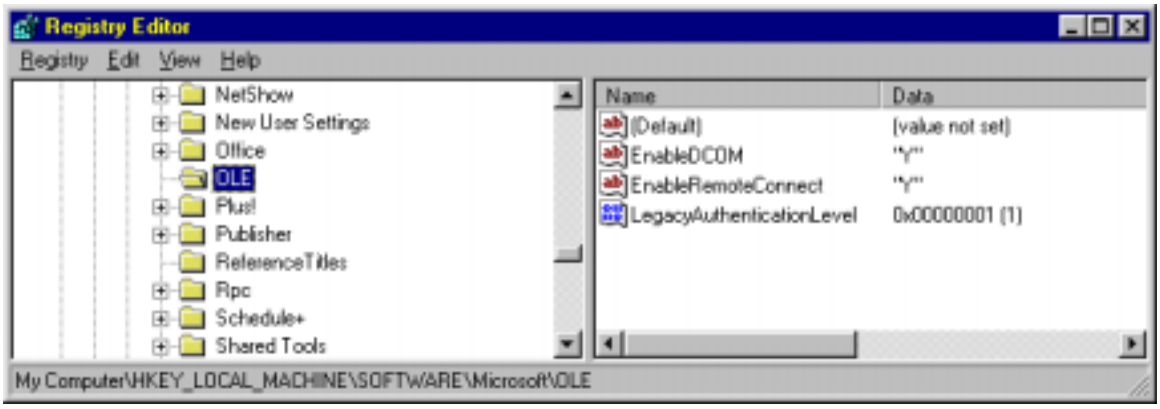
After installing DCOM it is necessary to configure the DCOM settings in the PC's registry to match those of a Vision data recorder. Some required Registry entries enabling Microsoft DCOM may be missing from your PC. In the default Windows installation, Microsoft does not enable DCOM Remote Connect. Check that the following Registry entries are set to the correct value on your PC.

1. Using the Run command in the Windows Start menu, run the program "Regedit".



2. When in the Registry Editor go to the key:

   My Computer\HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\OLE

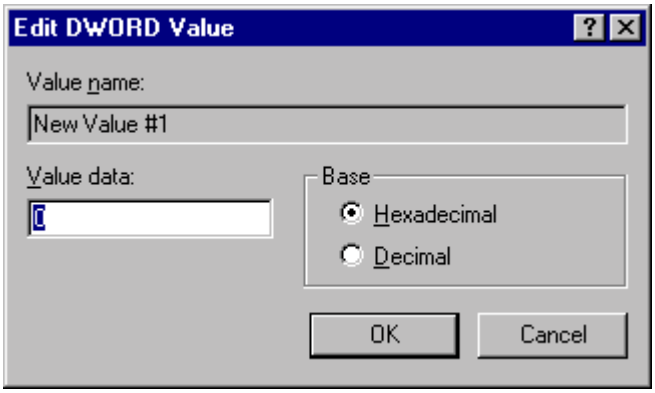


3. Check that the following entries exist and are set to the required value as shown below:

EnableDCOM	"Y"
EnableRemoteConnect	"Y"
LegacyAuthenticationLevel	0x00000001 (1)

   These entries must be present on all of your Vision systems.

4. To modify an entry, click on it and select Edit, Modify from the menu.



5. The key for LegacyAuthenticationLevel may not be present. To create a new entry for it, select Edit, New, and then DWord Value. Carefully type LegacyAuthenticationLevel (all as one word). Then double-click the entry and type 1 in the Data Value field.

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