

Features

- Configure inputs to and outputs from Detect.
- Collect and display unfiltered, live bit run data from the EM dipole.
- Save bit run data to a file.
- Playback previously recorded bit run data.
- Display parity and checksum errors.
- Transmit WITS parameters to any WITS-compatible program.
- Monitor incoming data parameters to confirm they are within preset limits.
- Monitor and send qualified survey data over WITS.
- Send downlink commands to the EM dipole while it is downhole.
- Change the packets the dipole sends using custom packets.
- Establish communications with depth tracking hardware and/or third party software.
- Print reports with bit run settings.

Applications

- Configure Model AP250 EM MWD Systems
- Interfaces with Applied Physics Systems Virtual Drill Software - Detect sends bit run data from the sensor to Virtual Drill
- Import custom packet files created using Applied Physics Systems Configuration Utility Software

Supported Devices

- Applied Physics Systems EM Dipole

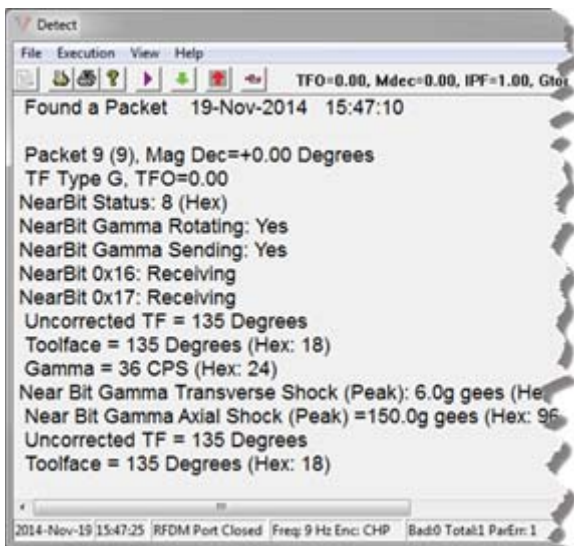
Detect is part of the Applied Physics Systems Software Suite, which includes:

- Configuration Utility
- Directional Sensor Configuration Utility
- Log Viewer
- Depth Tracker
- Firmware Update Sensor
- Universal Roll Test
- *Detect
- Firmware Update Utility
- Virtual Drill

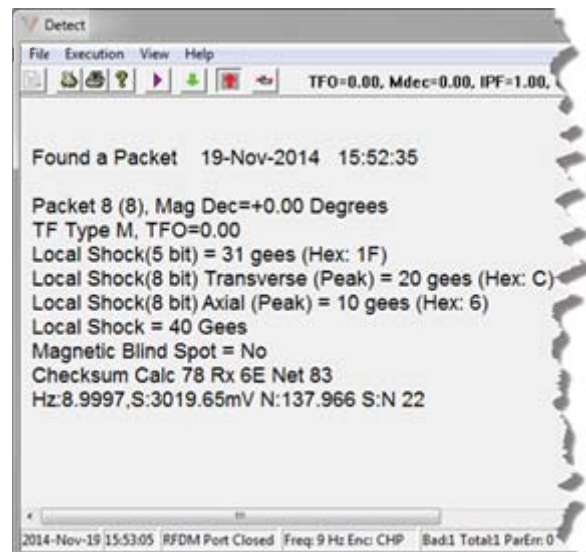
*For more information about Detect Software, see [Detect Help](#).

Detect supports EM Dipole, Near Bit, Shock and Vibration, and custom data packets.

Near Bit Data Packets



Shock and Vibration Data Packets



Menus

A variety of configuration and bit run functions can be accessed through Detect's menus.









Some of the menu items can also be accessed using the icons.

File Menu	Configure Detect	Configures inputs to and outputs from Detect.
	Configure Downlink	Configures the downlink for transmitting commands to the EM dipole when the string is downhole.
	Configure WTIS	Filters gamma data before it is output to a third party system.
	Select Custom Packet File	Selects a custom packet file previously created in Configuration Utility.
	Send 574 Downlink Setup	Sends a setup command string to the 574 Downlink Transmitter.
	Print Detect Settings	Prints a preformatted report displaying Detect settings.
	Exit	Exits Detect software.
Execution Menu	Go	Collects data from the EM dipole and displays it on the main screen.
View Menu	Toolbar	Enables or disables displaying the toolbar icon and messages at the top of the main screen.
	Status Bar	Enables or disables displaying the status bar at the bottom of the main screen.
	WITS Traffic Window	View WITS traffic with live data or from a playback file.
	Display Quality Measurements	View live or playback data to see when values are not within operator defined ranges.
	Display Survey Window	Allows the operator to review survey data before it is sent over WITS.
	Wave View	Displays the waveform of live data or data from a playback file.
	Reset Error Totals	Resets the packet tally totals, at the bottom of the main screen, to zero.
Help Menu	About	Displays the software version and contact information.
	Detect Help	Displays the help file.

Icons

A variety of configuration and bit run functions can be accessed through Detect's icons.

Functions for all icons can also be accessed through the menus, except for Playback Unfiltered Data and Stop Scrolling Log.

	Go	Same as Execution > Go on the menu.
	Configure Detect	Same as File > Configure Detect on the menu.
	Print Detect Settings	Same as File > Print Detect Settings on the menu.
	About	Same as Help > About on the menu.
	Playback Unfiltered Data	Plays back a binary data file from a previous bit run. This function is not listed on the menu.
	Configure Downlink	Same as File > Configure Downlink on the menu.
	Stop Scrolling Log	The toggle button starts and stops log scrolling on the main screen. Data logging continues even when scrolling has stopped. This function is not listed on the menu.
	Select Custom Packet File	Same as File > Select Custom Packets File on the menu.

Detect Main Screen

The Detect Main Screen consists of the following to access configuration and bit run functions:

Menu Bar - The menu bar consists of the file, execution, view, and help menus.

Toolbar Icons - The functions for most toolbar icons can also be executed through the menus.

Toolbar Messages (MWD Offsets) - Toolbar messages display some of the MWD offsets previously entered in Detect.

Messages are displayed on the main screen without units.

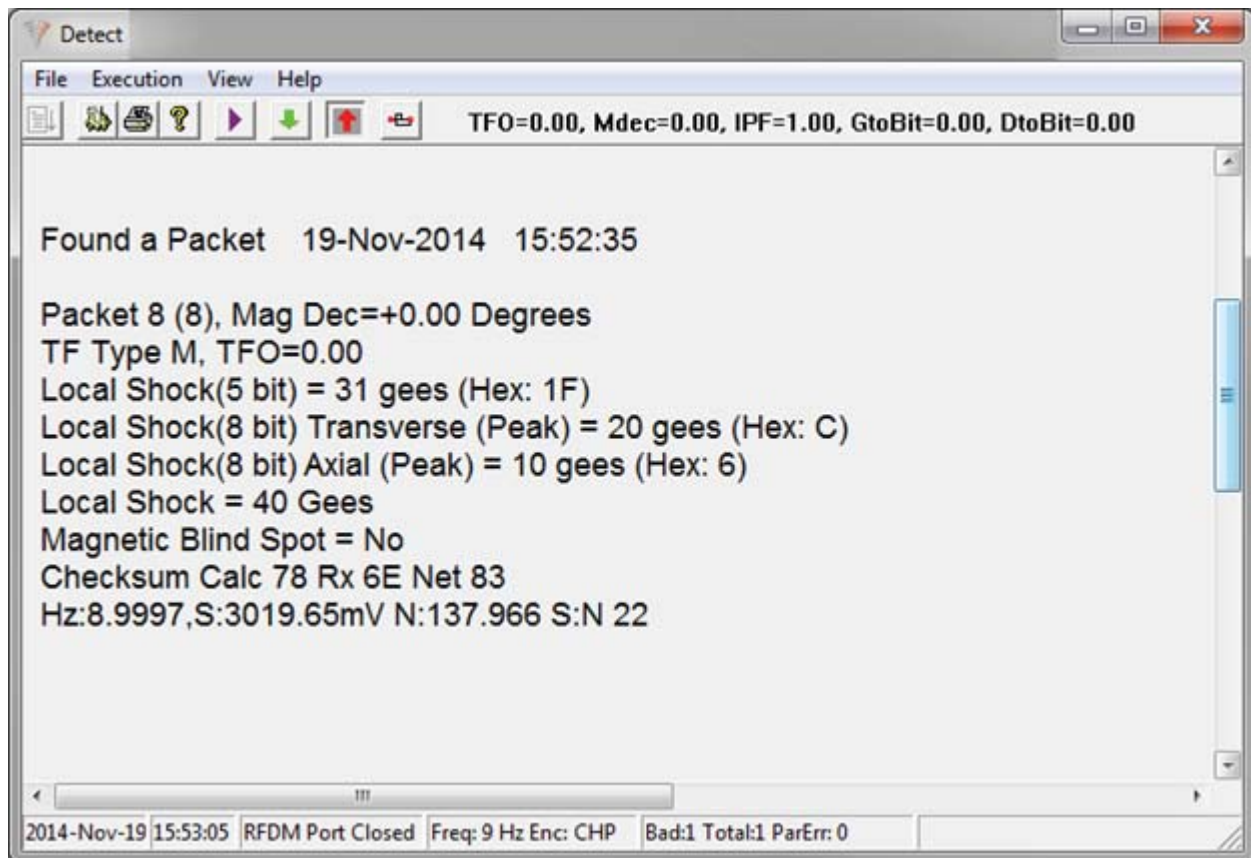
Displaying the toolbar icons and toolbar messages is optional.

Display Area - The display area shows live data being collected, data being played back, and informational and error messages.

Status Bar - The status bar displays information at the bottom of the main screen.

Displaying the status bar is optional.

The display area (below) shows live data being collected.



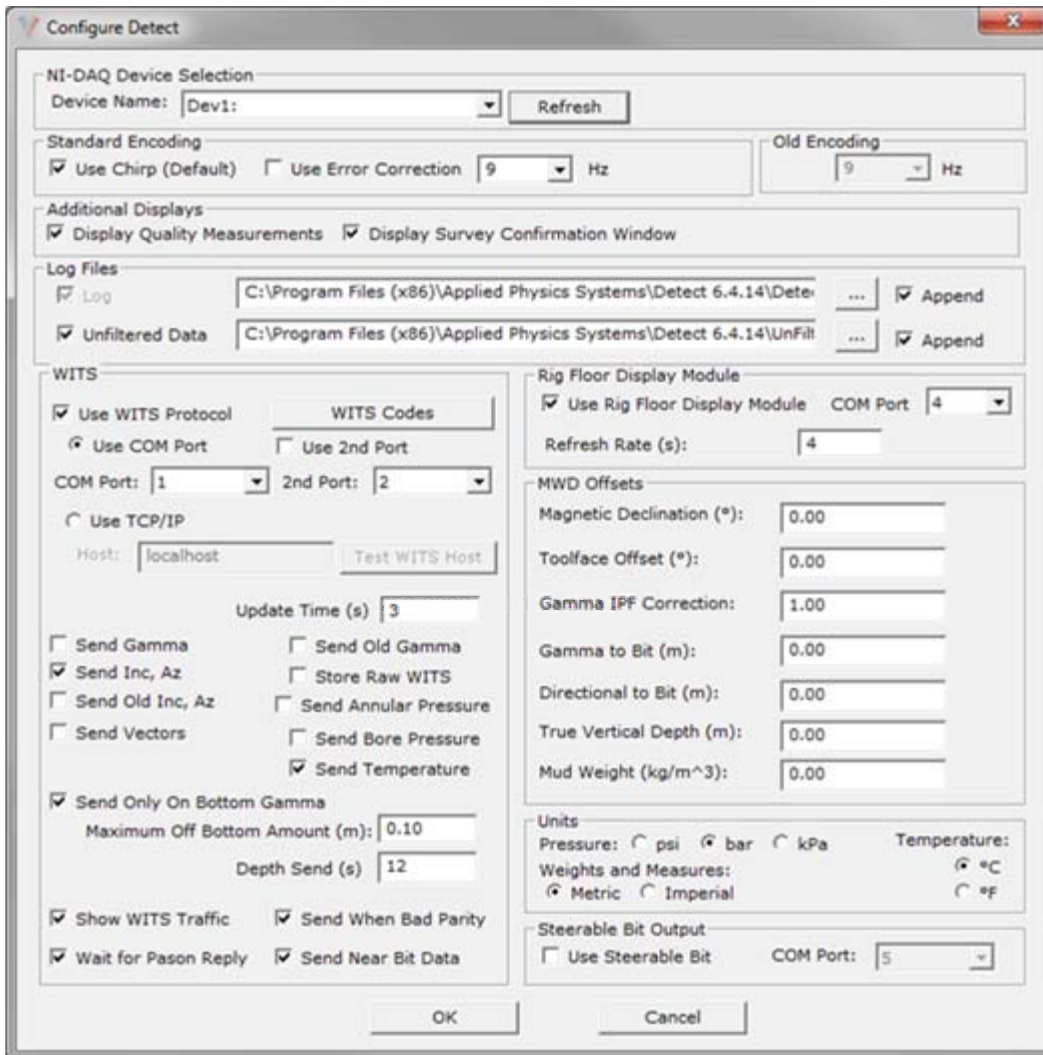
Configure Detect

Use Configure Detect to configure communication with the EM dipole and manage how Detect communicates with peripherals.

The Configure Detect screen contains nine configurable regions.

NI-DAQ Device Selection	Encoding Mode	Additional Displays
Log Files	WITS	Rig Floor Display Module
MWD Offsets	Units	Steerable Bit Output

Note: The only recommended default for Detect is Chirp for the Encoding Mode.



The screenshot shows the 'Configure Detect' dialog box with the following settings:

- NI-DAQ Device Selection:** Device Name: Dev1, Refresh button.
- Standard Encoding:** Use Chirp (Default), Use Error Correction, 9 Hz. Old Encoding: 9 Hz.
- Additional Displays:** Display Quality Measurements, Display Survey Confirmation Window.
- Log Files:** Log, C:\Program Files (x86)\Applied Physics Systems\Detect 6.4.14\Detect, Append. Unfiltered Data, C:\Program Files (x86)\Applied Physics Systems\Detect 6.4.14\UnFilter, Append.
- WITS:** Use WITS Protocol, WITS Codes button. Use COM Port, Use 2nd Port. COM Port: 1, 2nd Port: 2. Use TCP/IP, Host: localhost, Test WITS Host button. Update Time (s): 3. Send Gamma, Send Old Gamma, Send Inc, Az, Store Raw WITS, Send Old Inc, Az, Send Annular Pressure, Send Vectors, Send Bore Pressure, Send Temperature. Send Only On Bottom Gamma, Maximum Off Bottom Amount (m): 0.10, Depth Send (s): 12. Show WITS Traffic, Send When Bad Parity, Wait for Pason Reply, Send Near Bit Data.
- Rig Floor Display Module:** Use Rig Floor Display Module, COM Port: 4, Refresh Rate (s): 4.
- MWD Offsets:** Magnetic Declination (*): 0.00, Toolface Offset (*): 0.00, Gamma IPF Correction: 1.00, Gamma to Bit (m): 0.00, Directional to Bit (m): 0.00, True Vertical Depth (m): 0.00, Mud Weight (kg/m³): 0.00.
- Units:** Pressure: psi, bar, kPa. Temperature: °C, °F. Weights and Measures: Metric, Imperial.
- Steerable Bit Output:** Use Steerable Bit, COM Port: 5.

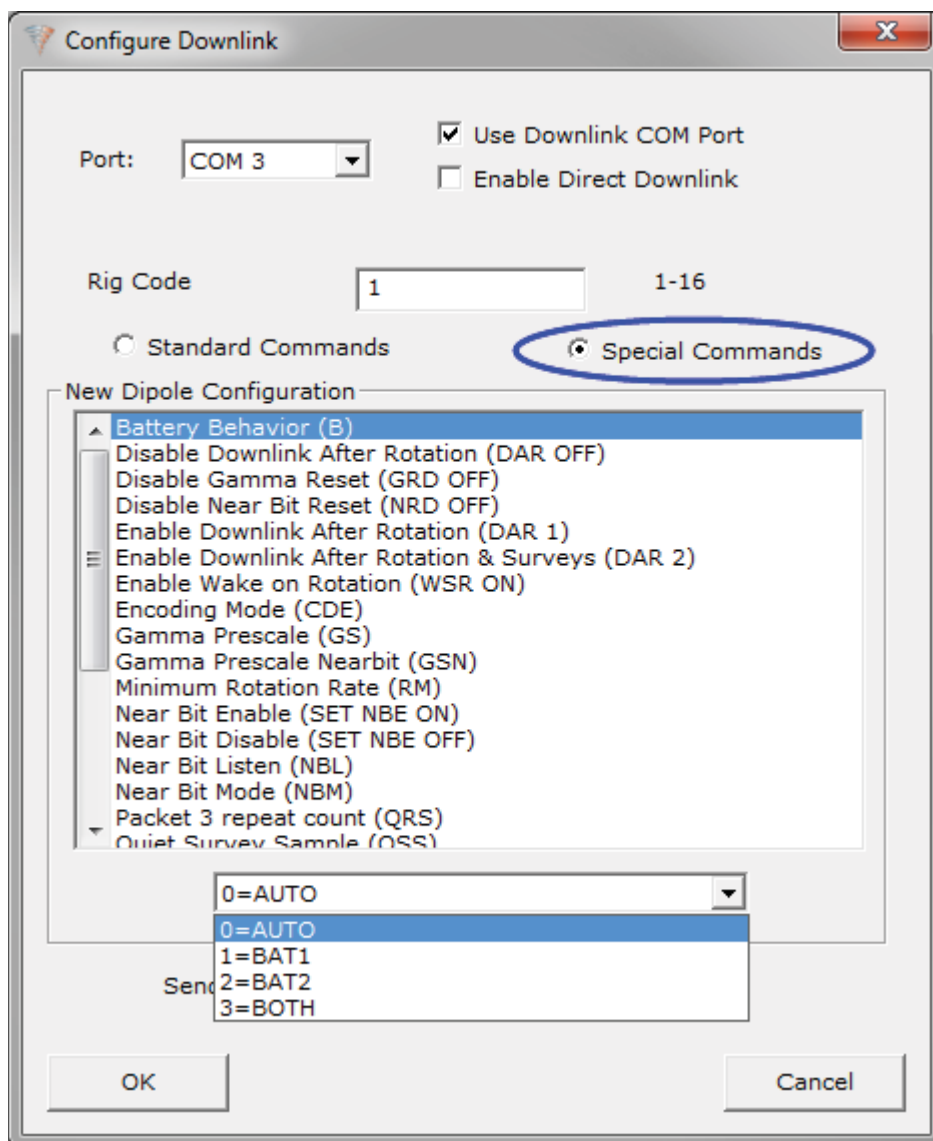
Configure Downlink

Use Configure Downlink to send commands to the EM dipole to change its configuration while it's downhole during a bit run.

Note: The 574 Downlink Transmitter is optional equipment. Configuring the downlink is optional, because it may not be necessary to change the dipole configuration during a bit run.

- Use Standard Commands to send a downlink command with multiple effects to the EM dipole.
- Use Special Commands to send a downlink command with a single effect to the EM dipole.

The example below shows a special command.



View Menu: WITS Traffic Windows

Use WITS Traffic Window to view the WITS traffic with live data or from a playback file.

- A pop-up window displays WITS traffic.
- Use the scroll bar on the right to scroll the data.
- The top window displays raw WITS data.
- The bottom window displays interpreted WITS data.





View Menu: Display Quality Measurements

Use Display Quality Measurements to view live or playback data to see when values are not within operator defined ranges.

From the Display Quality Measurements screen, you can select preset ranges or enter new ranges for the following parameters:

Magnetic Total (Gauss) Gravitational total (gees) Gamma (CPS) Dip Angle (°) Toolface (°)

- Shock and vibration are represented by a range of colors, depending on their value.
- Data in the Current column stays white when it is within the specified range.
- Data in the Current column turns red when it is not within the specified range.

Shock			Vibration		
	Green	< 17 gees		Green	< 4 gees
	Yellow	17 to < 26 gees		Yellow	4 to < 6 gees
	Orange	26 to < 35 gees		Orange	6 to < 8 gees
	Red	35+ gees		Red	8+ gees

	Target	Tolerance	Minimum	Current	Maximum
Magnetic Total (Gauss)	0.40000	1.00000	-0.60000	0.39922	1.40000
Gravitational Total (gees)	0.90000	0.20000	0.70000	0.99922	1.10000
Gamma (CPS)	200.0	200.0	0.0000	18.0	400.0000
Dip Angle (°)	0.00000	5.00000	-5.0000	0.00000	5.0000
Toolface (°)	0.0	360.0	-360.0000	11.3	360.0000
Magnetic Declination (°)				0.0	

SHOCK VIB

Latest Value Within Range

Start Stop

View Menu: Display Survey Window

Use Display Survey Window to review survey data before it is sent over WITS.

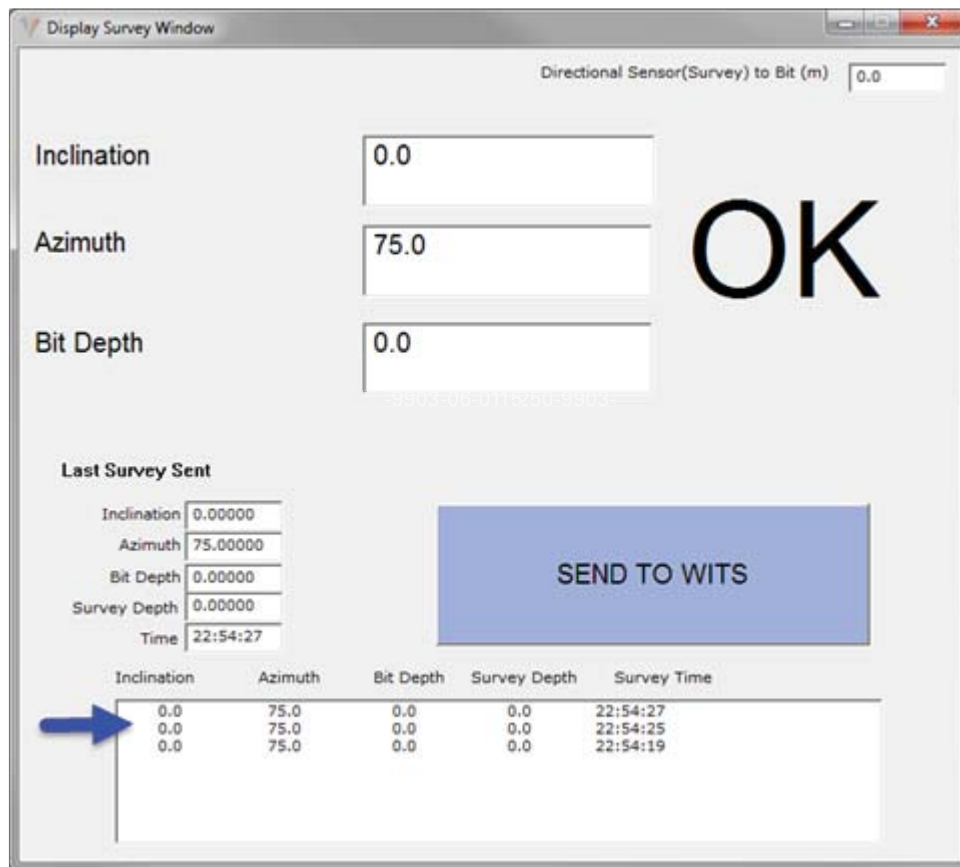
From the Display Quality Survey Window screen, you can select preset ranges or enter new ranges for the following parameters:

Magnetic Total (Gauss) Gravitational total (gees) Gamma (CPS) Dip Angle (°) Toolface (°)

- When data is not within the range, it can not be sent to WITS and the following message appears:
Qualifiers have not passed. Will not send survey over WITS.
- Display Survey Window appears at the end of a survey packet (type 0, 1, etc.) only when parity and CRC are correct and qualifiers are met.
- Each time data is sent to WITS, the data appear in the bottom window.
- The data remains even when the window is closed and reopened.

In the example below, data is within range and can be sent to WITS.

Click SEND TO WITS to send the data to WITS.

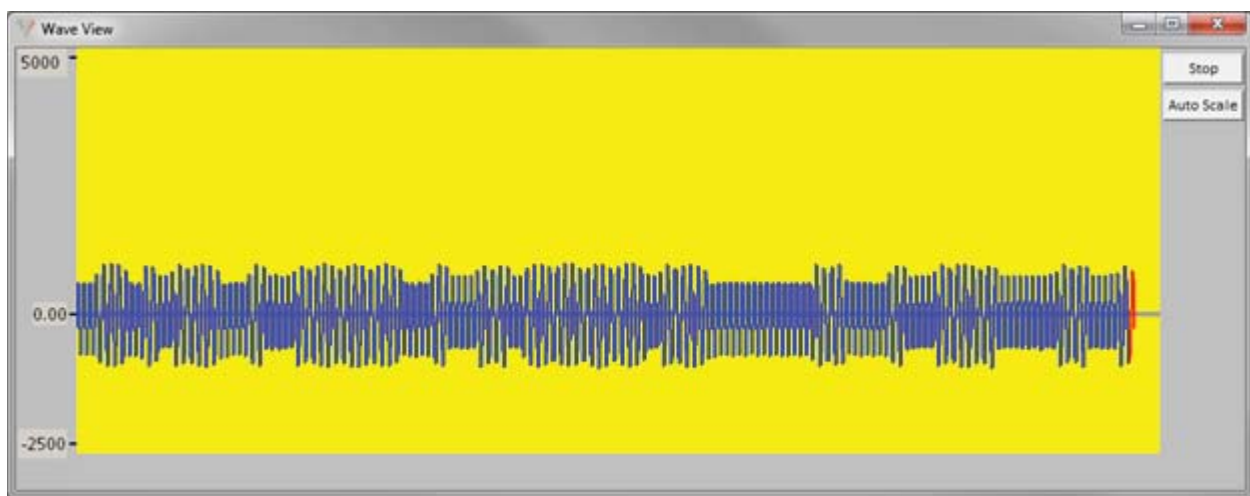




View Menu: Wave View

Use Wave View to display the waveform of live data or data from a playback file.

- Click Stop to freeze the wave view.
- Once stopped, the Start button appears.
- Click Start to restart the wave view.



- Click Auto Scale to view the waveform in auto scale mode.

