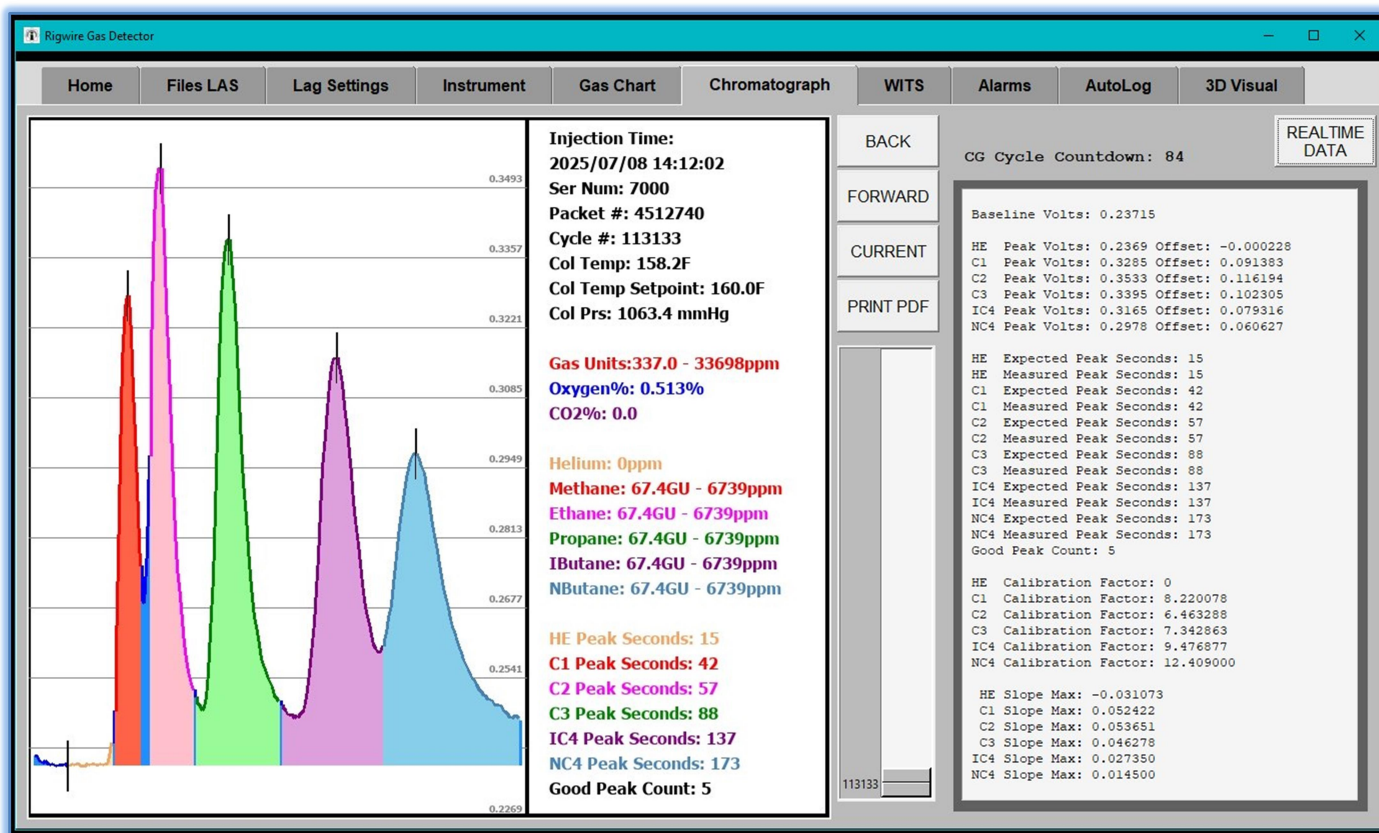


RIGWIRE SYSTEM INTERFACE SOFTWARE MANUAL

From iBall Instruments LLC.



Rigwire Interface Software user manual for use with the Rigwire Gas Detector and Gas Chromatograph System.

For Windows 10 And 11 Operating Systems
Only Digitally Signed And Delivered

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Call or visit our website Today for more information on the new Rigwire Gas Detector and Chromatograph system.

RIGWIRE.COM

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INTRODUCTION

The Rigwire System Interface Software is designed to be the primary interface software for the Rigwire System.

It was written to be intuitive to the common user that is familiar with (1) computer systems and computer software and (2) mudlogging equipment, terminology, and common reports.

Installation is designed to be easy and in a single installable EXE package that can be quickly and easily downloaded from Rigwire.com. The software will check from time to time to see if it is the latest version running and alert the user if there is a new version available to download and install.

GNU GENERAL PUBLIC LICENSE:

NOTICE: This Rigwire Interface Software was written in the Python 3.13.3 Language and is covered under the GNU GENERAL PUBLIC LICENSE - Version 3, 29 June 2007. The GNU General Public License is a free, copyleft license for software.

The GNU General Public License is intended to guarantee your freedom to share and change all versions of a program.

DATABASE STRUCTURE:

This software uses the open source version of SQLITE3 to store all data and items related to data collected using this software and is easily opened and utilized by customers and third party vendors. This allows for maximum transportability of the raw data collected at any well site. Security of this data solely relies on the user of this software and the computer on which it resides.

COMMUNICATIONS:

This software utilizes both Serial port connections and Ethernet connections on the computer in which it is installed. Serial port connections are scanned every few seconds to look for (1) an open port that connects this software to the Rigwire System and (2) A WITS source; An open port to an available WITS data stream at 9600 Baud, 8 data bits, No parity bit, and 1 stop bit (8N1). If the WITS is coming from the Rigwire System connection then the WITS scan stops.

This software will continue to scan the computer for these two connections non-stop until both are found. This alleviates the user to know or to find what serial ports are available on the computer.

This software sends two types of Ethernet UDP packages to Rigwire.com. (1) Troubleshooting data is sent to iBall Instruments Technical support so they can utilize to help troubleshoot problems in the field, and (2) A simple billing packet data is sent to Rigwire.com every few minutes to keep track of utilization of the equipment in the field for billing purposes.

Both packets of UDP information are encrypted using RSA 2048-bit Public/Private key encryption before being sent. There is no private key information available to the user or the public and is only held on iBall Instruments encrypted server systems.

Integrated into the Rigwire System Interface Software are two Local Host Ethernet TCP communication ports designed to allow for maximum flexibility and integration to the software.

(1) **A raw Command Line Interface TCP port** is available to the local computer system at (Local Host) **127.0.0.1:7777**. This allows the computer user to interface directly to the software using third party applications.

(2) **A raw TCP WITS output** is available at (Local Host) **127.0.0.1:8888**. Connecting to this port will allow the user to receive direct raw TCP WITS information. This is to allow third party logging programs like MainLog® software to directly interface with the Rigwire System Software.

These Local Host ports are not accessible to any system outside of the computer on which it resides.

PRINTING:

All printing functions in this Rigwire System Interface Software will only generate Postscript Data Files or PDF files.

There are no provisions for this software to print to a hardware printer. This allows for porting of this software to other platforms such as Linux or handheld devices.

LAS FILE GENERATION:

All LAS file generation follows the common protocol of LAS version 2.0 or LAS version 3.0 and has been tested using the common test method found on the testing application LasApps 2.4.21.7

TEXT MESSAGING:

This software utilizes a prototype method of sending text messages directly to a responsible person. Since this method is prototype in nature, there are no guarantees that the text message would be correctly sent or in a short time period. Further, it is the users responsibility to correctly set the text messaging frequency and level of messaging so as to not be over-burdened with messages.

REMOTE TECHNICAL ASSISTANCE – [405 570 4449](tel:4055704449):

For any problems, hassles, complaints, questions, or comments, please do not hesitate to contact iBall Instruments 24-7 Technical Support.

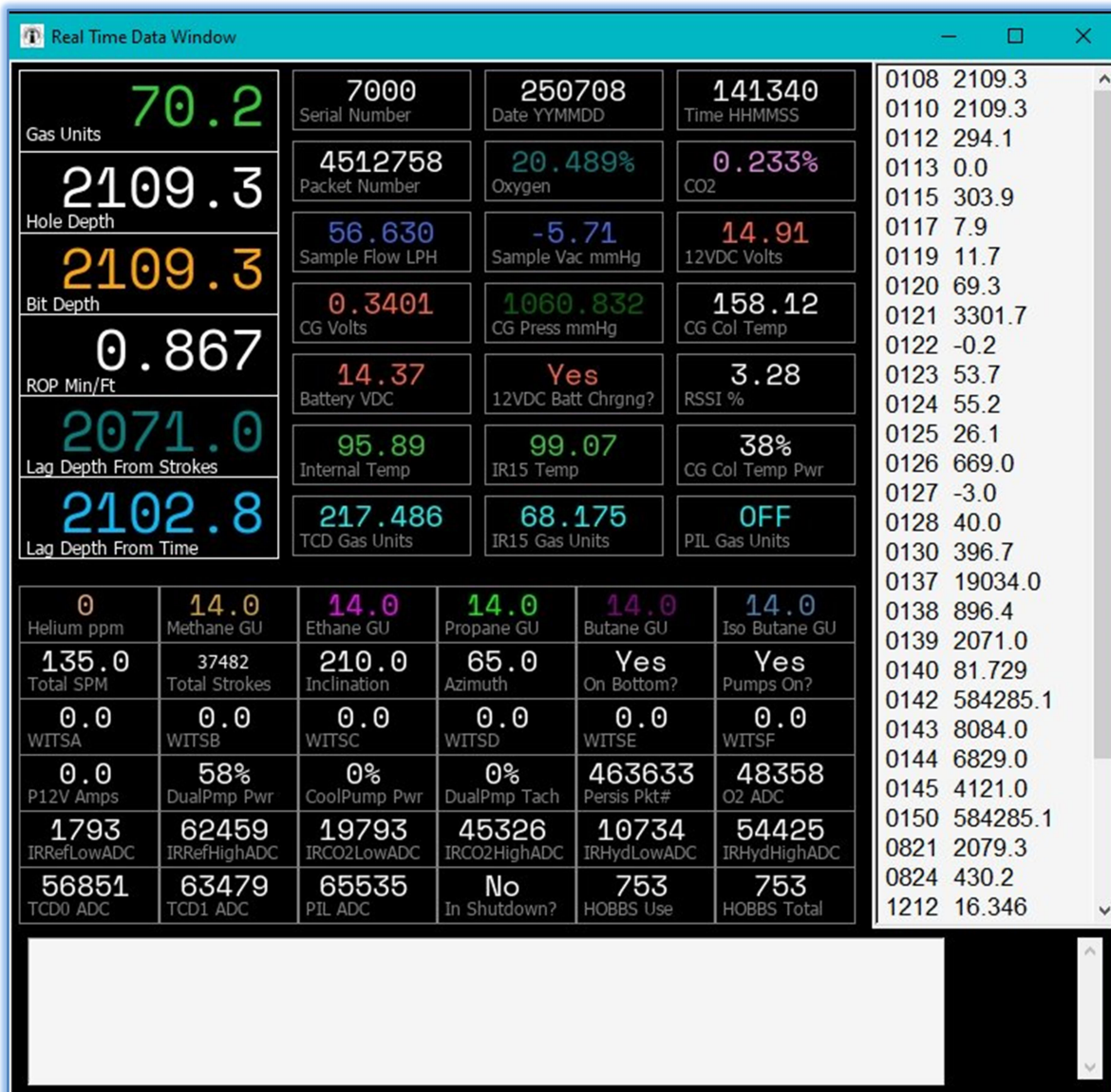
IMPORTANT INFORMATION

iBall Instruments uses remotepc.com HelpDesk® software for remote technical support assistance.

<https://www.remotepc.com/remote-desktop-helpdesk/download.htm>

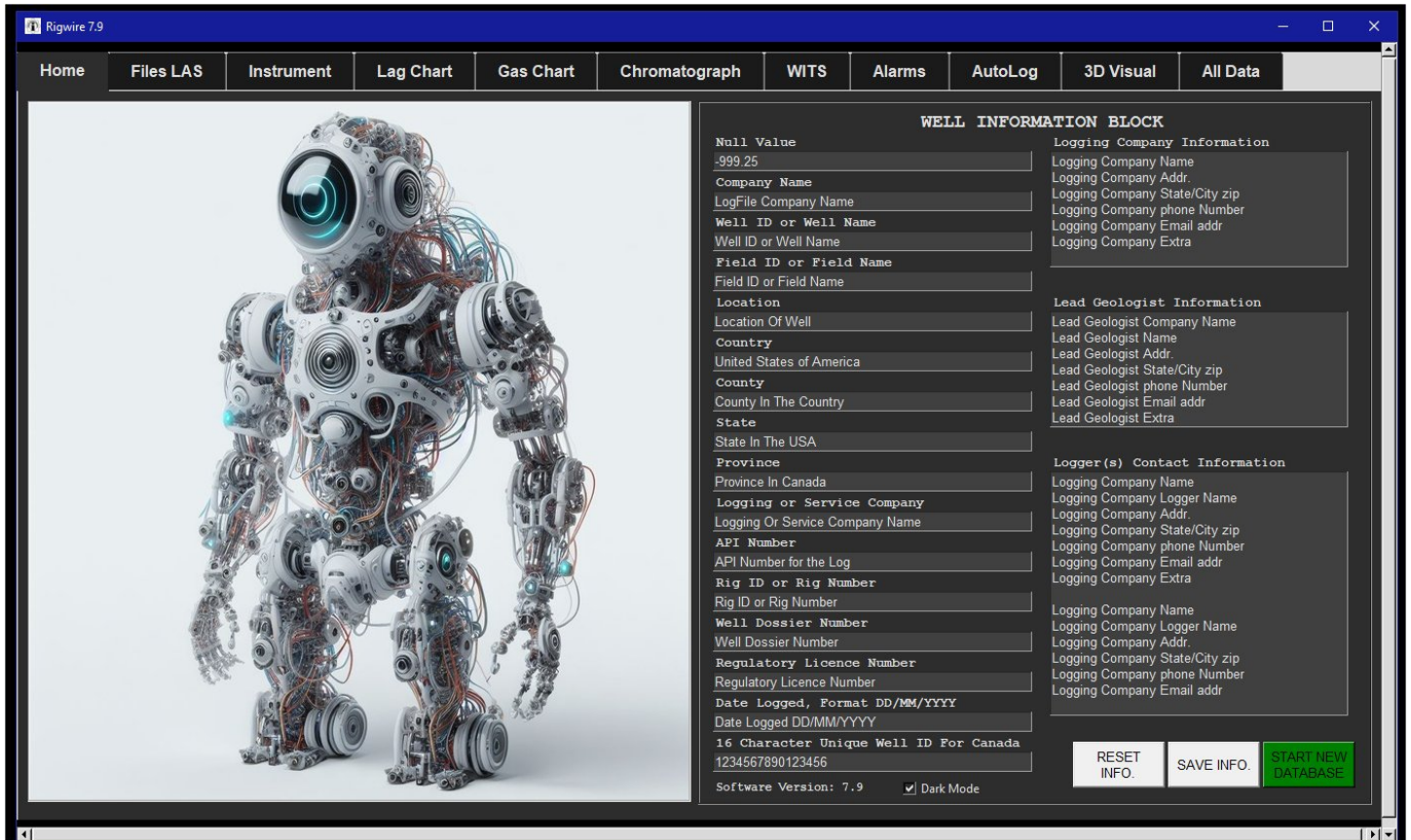
Please download and install this FREE software before calling technical support on the installation or utilization of this Rigwire System Interface Software.

RIGWIRE INTERFACE SOFTWARE REAL TIME DATA WINDOW



In the upper corner of almost all the software tabs, there is a button labeled REALTIME DATA (two lines). Pressing this button opens the Real Time Data pop-up window. This window shows many real time data points for the user to help troubleshoot or monitor critical functions of the Rigwire System.

While this window does not have any user buttons or functions, the output is updated about once per second while the window is open. On the bottom white window, current warnings and errors will be displayed. The right hand side white column will hold the most current WITS channel information and the black boxes will show all current critical operating parameters. If a parameter is out of range or bounds, a yellow warning box will appear around the parameter that is being scrutinized by the system software and should bring attention to the user.



RIGWIRE INTERFACE SOFTWARE TAB 1 HOME TAB

The left side of the Home tab is a picture. **This picture will change over time.** This picture is designed to be informative to the user as to new items, products, information, and helpful links to aid in the use of the Rigwire System.

The right hand side of the Home tab has places to set up your job. When first starting the Rigwire System Interface Software the Home Tab will be the first tab displayed. If the user is starting a new well or job, they should fill in all the contact information requested on the right hand side of the Home Tab.

The Information filled out in the Home Tab is used in the LAS file header, the AutoLog header, as well as any other reports that the Rigwire System Interface Software will generate.

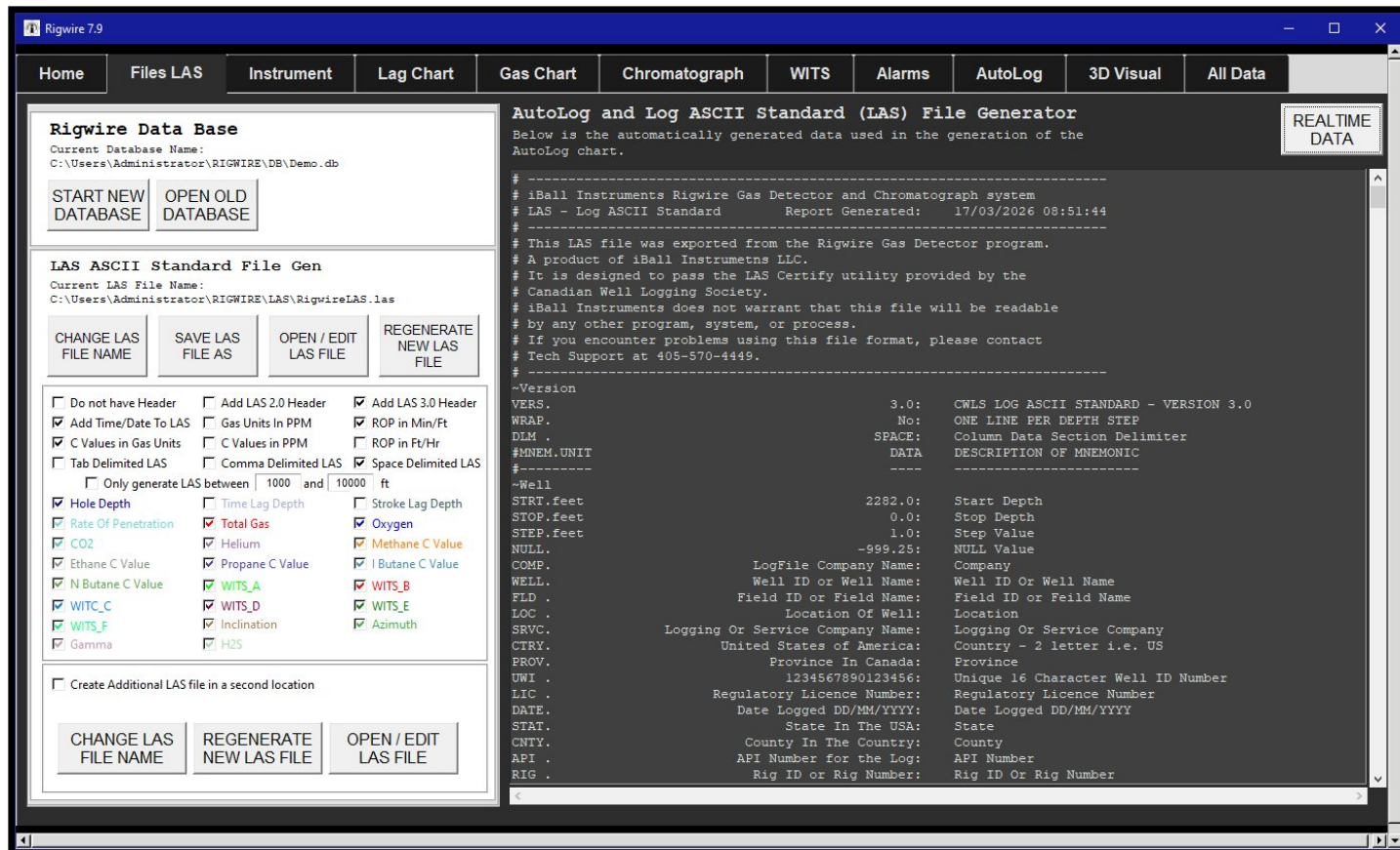
To the right of the WELL INFORMATION BLOCK are three text areas: Logging Company Information, Lead Geologist Information, and Logger(s) Contact Information. These are used on reports and logs with the same fields as the LAS header.

The Home tab also shows the Software Version label on the well-information panel. A Dark Mode checkbox switches the interface between light and dark themes (default is dark).

At the bottom of the Home Tab there is a RESET INFO. button. This button resets the well information fields to the un-edited state (as in the default layout).

The SAVE INFO. button saves all information you have typed into the fields into the current database. YOU MUST CLICK THIS BUTTON TO SAVE THE INFORMATION INTO THE DATABASE.

The **Start New Database button** will ask you for a new database name (such as the job or site name) and then generate a brand new empty database. This should be used when starting a new job or new project.



RIGWIRE INTERFACE SOFTWARE TAB 2 FILES LAS TAB

On the left hand side are a number of buttons and checkboxes. The Start New Database button will ask you for a new database name (such as the job or site name) and then generate a brand new empty database. This should be used when starting a new job or new project.

The **Open Old Database button** will allow you to open an old database and start collecting data into a previous database already created.

The **Change LAS File Name button** will allow the user to change the current and active file name for the generated LAS Files.

The Save LAS File As button allows the user to save the already generated LAS file to a different file name. This keeps the original file name intact.

The **Open/Edit LAS File button** allows the user to open and look at a previously saved LAS file without changing the current and active LAS file name.

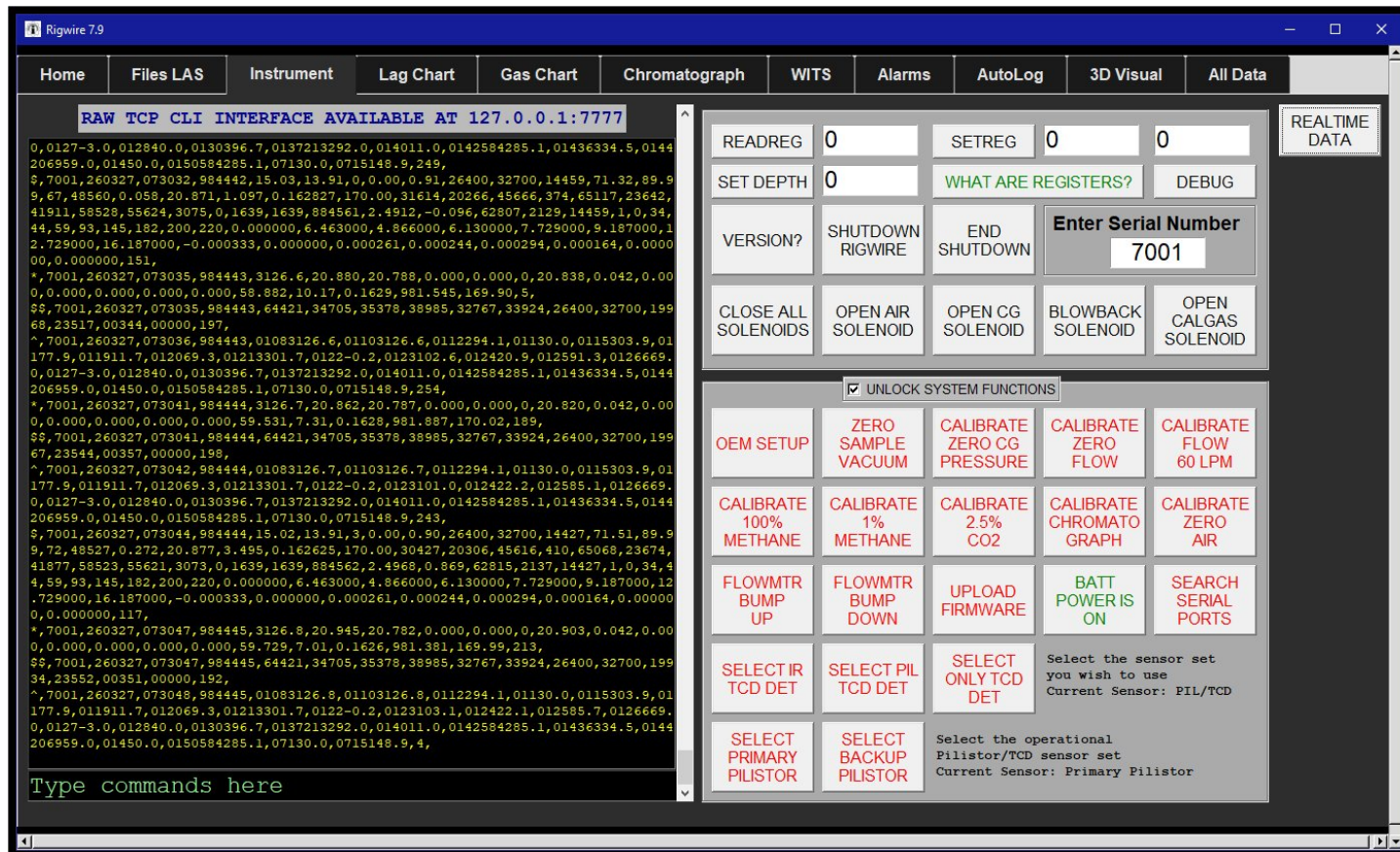
The **Regenerate New LAS File button** is probably the button used the most on this Tab. This button is hit every time the user wants to generate a new LAS file from the collected data.

For assistance, please call Technical Support at 405 570 4449

Below these buttons are a number of check boxes. These check boxes are the selectable items that will be put into any generated LAS file. Some check boxes are exclusive to others in that one cannot be on at the same time as another.

The bottom of the left hand side allows the user to generate additional LAS files with different names in a second and different location.

The right hand side of the Tab 2 is the actual output of the LAS generation. This allows the user to visually inspect the LAS file to make sure this is what is desired for an output.



RIGWIRE INTERFACE SOFTWARE TAB 3 INSTRUMENT TAB

The Instrument tab allows the user to control the Rigwire System hardware.

On the left hand side, in yellow, raw data is coming in from the Rigwire System.

At the very bottom, below the yellow text, is a green text section. This is the section you would directly type a command to the Rigwire System. An Example would be “7000 READREG 100{cr}”

Explanations on how to send direct commands to the Rigwire System can be found in the “RIGWIRE GAS DETECTOR AND CHROMATOGRAPH EQUIPMENT MANUAL”. This manual is located at Rigwire.com

On the right hand side of this Tab, the user can read or set a register directly by setting the register number and the value the user would like to set the register to. For a quick explanation of the registers and what the functions are, the user can hit the What Are Registers? Button for a pop up window explaining the registers and the functions.

If the user needs to request the current version of the running firmware, the “Version?” button is available. The response would be similar to “@,7000,RIGWIRE FIRMWARE 29 BOOT LOADER 5,44,”

If the user needs to put the Rigwire System into Shutdown Mode – which is a type of sleep, then the user can put the unit into or out of Shutdown mode with the Shutdown On and Shutdown Off buttons. When putting

the Rigwire System into Shutdown the pumps are turned off and the column heater is powered down thereby saving power and not pulling in any sample gas.

CAUTION - UNLOCK SYSTEM FUNCTIONS - CAUTION

Check the check box Unlock System Functions in order to access the red buttons below the named line. System Functions allow the user lower level functions that directly affect the operation of the Rigwire System.

OEM SETUP – This button allows the user to bring the Rigwire System back to a previously known good operational state that came from the factory. This button will specifically open the air solenoid to allow air to be processed by the sensors. Then it will zero the O2 sensor (20.9%), Zero the Pelistor sensors, Zero the TCD sensors, Zero the IR sensor, and normalize the CO2 sensor. It will also quickly re-check the flow meter operation and re-zero the chromatograph sensors. Generally this button is used when some kind of failure has happened, or the user has incorrectly calibrated a sensor, or other malfunction that is correctable by calibration.

CALIBRATE SAMPLE VACUUM – This button allows the user to zero the sample vacuum sensor. Normally the user would bring the Rigwire System in to Shutdown mode and allowed to stabilize. This button would then be hit. This allows the Rigwire System to log a zero flow and zero vacuum draw on the sample pump. The Rigwire System then zeros the Sample line vacuum sensor.

CALIBRATE CG PRESSURE – This button allows the user to zero the chromatograph pressure sensor. Normally the user would bring the Rigwire System in to Shutdown mode and allowed to stabilize and the chromatograph pressure to zero out. This can take up to 5 minutes. This button would then be hit. This allows the Rigwire System to log a zero pressure on the chromatograph. The Rigwire System then zeros the chromatograph pressure sensor.

CALIBRATE ZERO FLOW – This button allows the user to zero the internal electronic flow meter. Normally the user would bring the Rigwire System in to Shutdown mode and allowed to stabilize with zero flow through the system. This button would then be hit. This allows the Rigwire System to log a zero flow on the internal electronic flow meter. The Rigwire System then zeros the electronic flow meter.

SPECIAL CARE SHOULD BE USED WHEN SELECTING ANY OF THESE BUTTONS. IMPROPER USE OF THESE BUTTONS CAN AND WILL CAUSE THE RIGWIRE SYSTEM TO FAIL DUE TO IMPROPER CALIBRATION CYCLES.

CALIBRATE FLOW 60 LPM – This button allows the user to set the internal electronic flow meter to a 60 LPM calibration point. When in normal operating mode, a flow meter is attached to the inlet of the Rigwire System. The System is then adjusted to 60 LPM. This button would then be hit. This allows the Rigwire System to log a 60 LPM flow on the internal electronic flow meter. The Rigwire System then sets the electronic flow meter to 60 LPM.

CALIBRATE 100% METHANE – This button allows the user to calibrate all operational sensors to 100% Methane. The user first has to have 100% Methane attached to the external calibration port. When 100% Methane is connected to the external calibration port, this button would be hit. The Rigwire System then draws in 100% Methane from the calibration port and stabilizes the output of the sensors and then stores all

the calibration points. After the calibration points are stored, the Rigwire System goes back into normal mode of operation.

WARNING – hitting this button without 100% Methane attached to the calibration point will cause the calibration to fail and the Rigwire System will be inaccurate or not correctly function.

CALIBRATE 1% METHANE – This button allows the user to calibrate all operational sensors to 1% Methane. The user first has to have 1% Methane attached to the external calibration port. When 1% Methane is connected to the external calibration port, this button would be hit. The Rigwire System then draws in 1% Methane from the calibration port and stabilizes the output of the sensors and then stores all the calibration points. After the calibration points are stored, the Rigwire System goes back into normal mode of operation.

WARNING – hitting this button without 1% Methane attached to the calibration point will cause the calibration to fail and the Rigwire System will be inaccurate or not correctly function.

WARNING – The Methane test gas must be 1% Methane with the balance being air (80/20 Nitrogen/Oxygen) mix. This is due to the utilization of Pelistor sensors that require the balance to have some Oxygen.

CALIBRATE 2.5% METHANE – This button allows the user to calibrate all operational sensors to 2.5% Methane. The user first has to have 2.5% Methane attached to the external calibration port. When 2.5% Methane is connected to the external calibration port, this button would be hit. The Rigwire System then draws in 2.5% Methane from the calibration port and stabilizes the output of the sensors and then stores all the calibration points. After the calibration points are stored, the Rigwire System goes back into normal mode of operation.

WARNING – hitting this button without 2.5% Methane attached to the calibration point will cause the calibration to fail and the Rigwire System will be inaccurate or not correctly function.

WARNING – The Methane test gas must be 2.5% Methane with the balance being air (80/20 Nitrogen/Oxygen) mix. This is due to the utilization of Pelistor sensors that require the balance to have some Oxygen.

CALIBRATE CHROMATOGRAPH – This button allows the user to calibrate the internal chromatograph using a 5 or 6 part mix of calibration gas attached to the external calibration port. The user must first have the 5 or 6 part mix calibration gas attached to the external calibration port. When the calibration gas is attached to the calibration port, this button would be hit. The Rigwire System goes through two calibration cycles. The Rigwire System first goes through a calibration cycle and then a verification calibration cycle. Both should look almost identical. Each cycle is 4 minutes long.

WARNING – hitting this button without 5 or 6 part calibration gas attached to the calibration point may cause the calibration to fail and the Rigwire System will be inaccurate or not correctly function.

CALIBRATE ZERO AIR – This button will allow the user to calibrate the zero points of all the operational gas sensors. This button can be hit at just about any point. No special gasses have to be attached since the system draws in common air for the zero gas point calibration.

FLOWMETER BUMP UP – This button allows the user to slightly speed up the flowmeter. If attaching a flow meter to the inlet of the Rigwire System and the user notices that the flow is slightly lower than indicated, the user can hit this button and slightly adjust the flow up.

FLOWMETER BUMP DOWN – This button allows the user to slightly slow down the flowmeter. If attaching a flow meter to the inlet of the Rigwire System and the user notices that the flow is slightly higher than indicated, the user can hit this button and slightly adjust the flow down.

UPLOAD FIRMWARE – The user is not encouraged to hit this button. It is used by technical support to remotely load custom loads of firmware into the Rigwire System.

BATT POWER IS ON – This button is used by the user to turn the internal battery off right before powering down the Rigwire System. This keeps the Rigwire System from running on when unplugged. When hitting the button the button will read BATT POWER IS OFF. Hitting it again will turn the battery back on.

SELECT IR TCD DET – This button allows the user to select the Infrared and TCD as the sensor pair to use for total gas units calculations.

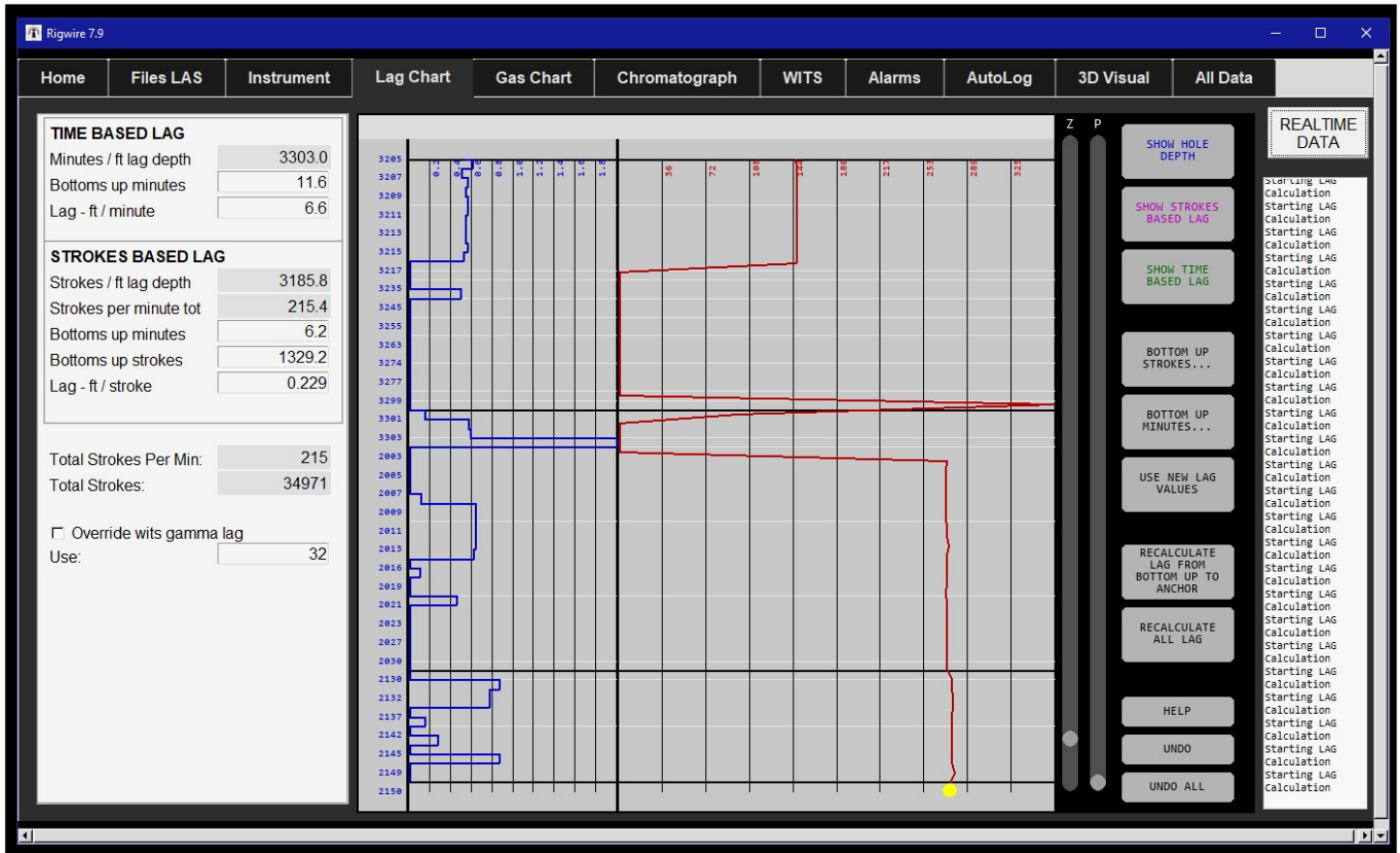
SELECT PIL TCD DET – This button allows the user to select the Pelistor and TCD as the sensor pair to use for total gas units calculations.

SELECT ONLY TCD DET – This button allows the user to only select the TCD sensor to use for total gas units calculations.

SELECT PRIMARY PELISTOR – This button allows the user to select the primary TCD/Pelistor sensor set.

SELECT BACKUP PELISTOR – This button allows the user to select the backup or secondary TCD/Pelistor sensor set.

The primary and secondary/backup TCD/Pelistor set of sensors are identical in part number. The user can switch from one to the other freely. The idea behind having this redundant set of sensors is because these sensors is considered a consumable item and over time will wear out and stop functioning as well as when new. Eventually the Pelistor can lose its sensitivity in total. The user should be aware of this and take appropriate steps to confirm Pelistor calibration and operation over time and use on the current project.



RIGWIRE INTERFACE SOFTWARE TAB 4 LAG CHART TAB

The Lag Chart tab combines a large interactive lag chart (with zoom and pan), a lag feedback text column, and the time-based and stroke-based lag fields described in the following subsections. The embedded chart reads packet rows from your job database and is the primary place to align gas with hole depth, stroke-lag depth, and time-lag depth, including rubber-band editing of the gas trace when you display gas in hole-depth mode.

The Time based lag AND the Strokes based lag for the Rigwire System Interface Software are both generated at the same time at all times.

Fields that are not gray are editable by the user.

All fields are re-calculated as data comes in on a real time basis.

If a time comes in that the user wishes to re-calculate the lag in the whole database, buttons are provided to recalculate the lag for either Time or Strokes based lag. This allows the user to make correctional changes, then recalculate the lag on an ongoing basis.

TAB LAYOUT

The Lag Chart tab is organized in three regions. On the left is a light-colored panel containing all lag-related numbers and the "Override wits gamma lag" checkbox. To the right of that panel is a large embedded interactive chart (Pygame) that plots packet data from your job database. Along the far right edge of the tab,

beside the chart, is a narrow vertical "Lag Feedback" text area that records messages from lag operations (for example recalculation status). As on other tabs, a REALTIME DATA button appears near the upper-right corner of the window.

TIME-BASED LAG (LEFT PANEL, TOP SECTION)

Under the heading TIME BASED LAG, the software maintains both time-based lag and stroke-based lag continuously; this section deals with minutes and feet per minute. The label "Minutes / ft lag depth" is a read-only display of the current time-lag depth value in minutes per foot (it is updated from the database and live calculations). "Bottoms up minutes" is an editable field for the bottoms-up time used in lag math. "Lag - ft / minute" is the corresponding feet-per-minute lag rate. When you edit related fields elsewhere in the application, these boxes may show red text if a value is inconsistent until you correct it or the software recomputes. Values here participate in the same lag model described in the overview paragraphs above: they are recalculated as new survey and gas data arrive.

STROKES-BASED LAG (LEFT PANEL, LOWER SECTION)

Under STROKES BASED LAG, the tab shows stroke-lag depth and supporting totals. "Strokes / ft lag depth" displays the current stroke-based lag depth. "Strokes per minute tot" shows the total strokes-per-minute figure coming from the system. "Bottoms up minutes" and "Bottoms up strokes" are editable fields used when you work in stroke-based units. "Lag - ft / stroke" is the feet-per-stroke lag increment. Below those, "Total Strokes Per Min:" and "Total Strokes:" are read-only labels that track cumulative stroke rate and total strokes so you can compare against your bottoms-up entries. Together, these fields let you align stroke-based lag with what the Rigwire unit and WITS stream are reporting.

OVERRIDE WITS GAMMA LAG

The checkbox "Override wits gamma lag" (on by default in the software) tells the system to use the application's gamma/lag handling instead of deferring entirely to WITS gamma lag when both are in play. Turn it off only if you intentionally want WITS-driven gamma lag behavior without that override. Below the checkbox, the Use: entry (default 32) holds the value used with WITS gamma lag override when that logic is applied.

EMBEDDED LAG CHART — DATA AND VERTICAL AXIS

The large chart is not a simple picture; it is driven from the RWPacketData table in your current SQLite database (with a fallback path if a separate LAGCHART database is used). Rows are ordered by packet number (PktNum), which reflects chronological arrival order, not necessarily raw table row order. The chart's vertical progression follows that packet order so that the top of the visible window can represent older drilling and the bottom newer data (depending on how you pan and zoom). When loading, the software filters out rows where the bit is clearly off bottom: only rows where BitDepth and HoleDepth agree within a few feet are shown, so off-bottom noise does not clutter the lag display. Gas readings are always tied to the HoleDepth, StrokeLagDepth, and TimeLagDepth on the same row; the chart never reassigns gas to a different depth when you edit the trace visually.

THREE VERTICAL PANELS (LEFT TO RIGHT)

The plotting area is divided into three vertical strips. The far-left strip shows HoleDepth in whole feet (blue labeling) and acts as the depth scale for the view. The middle strip draws Rate of Penetration (ROP_Min_Ft) as a blue stair-step trace; the horizontal axis of that strip auto-scales from the minimum to maximum ROP among

the rows currently visible. The right strip draws the gas trace (GasUnits). Gas trace color and meaning depend on the display mode you select (see below): in hole-depth mode the trace is red; in stroke-lag mode purple; in time-lag mode dark green. The gas horizontal axis auto-scales from the minimum to maximum gas in the visible rows.

ZOOM (Z) AND PAN (P) SLIDERS

On the black area to the right of the three panels, two vertical sliders control the view. The Z slider zooms: moving toward the top shows more rows at once (zoomed out); toward the bottom shows fewer rows (zoomed in). The P slider pans: moving toward the top shifts the view toward older packets; toward the bottom shifts toward the newest packets. Together they let you inspect a long job in detail or back off to see broad trends.

MOUSE WHEEL ON THE CHART

With the pointer over the chart, rolling the mouse wheel without Shift pans the data (same idea as moving the P slider). Holding Shift while rolling the wheel zooms (same idea as moving the Z slider). The implementation applies smoothing so that zoom and pan changes ease over several frames instead of jumping harshly.

TOP INFORMATION BAR

When you move the mouse over the chart, a bar along the top of the chart area shows the row under the cursor: packet date and time, hole depth, ROP, stroke-lag depth, time-lag depth, and gas units. Text colors align with the trace colors so you can see at a glance which quantity you are reading.

DISPLAY MODE BUTTONS (ABOVE THE CHART)

SHOW HOLE DEPTH (blue labeling) plots gas versus hole depth and is the only mode in which you can use rubber-band editing and anchors (see below). SHOW STROKES BASED LAG (purple) plots gas against stroke-based lag depth; editing tools are disabled. SHOW TIME BASED LAG (dark green) plots gas against time-based lag depth; editing tools are likewise disabled. Switch modes to visualize how gas lines up under each depth definition.

RUBBER-BAND EDITING AND ANCHORS (SHOW HOLE DEPTH ONLY)

In hole-depth mode you can adjust the gas trace shape for a segment of the well. Yellow anchor dots mark fixed points along the trace; the first and last gas points always remain anchored and cannot be removed. Right-click near the red gas trace (within roughly twenty pixels) to add an interior anchor; double-right-click within a short time window removes an interior anchor. Left-click and drag on the trace between two anchors to "rubber band" the segment: the anchors stay fixed while the curve between them stretches vertically to follow your drag. When you release the mouse, GasUnits values for every row in that segment update to match the new shape, and the BOTTOM UP STROKES and BOTTOM UP MINUTES readouts are filled from the stroke and time difference between your click row and release row. A left-click in the gas panel that does not hit the trace starts a horizontal yellow reference line that moves with the mouse for visual reference only and does not change stored data.

ACTION BUTTONS ON THE CHART (SHOW HOLE DEPTH CONTEXT)

BOTTOM UP STROKES and BOTTOM UP MINUTES show "..." until you complete a rubber-band drag; then they show the stroke delta and elapsed minutes between the drag start and end rows. USE NEW LAG VALUES commits those values into the application's lag fields (for use elsewhere, including other tabs), clears the

rubber-band UI state, and resets the bottom-up labels. RECALCULATE LAG FROM BOTTOM UP TO ANCHOR runs a targeted database lag recalculation from the bottom of the data to a selected interior anchor when one exists, then resets the chart state similarly to undo-all. RECALCULATE ALL LAG starts a full background recalculation of lag columns across the database; when it finishes, the chart reloads and gas/anchors reset. HELP opens the built-in Lag Chart help text in a separate window (the same topics as this section, in shorter form). UNDO reverses the last committed rubber-band change. UNDO ALL discards in-memory gas edits and resets bottom-up displays and anchors to the last loaded or committed state.

AUTOMATIC REFRESH AND IDLE BEHAVIOR

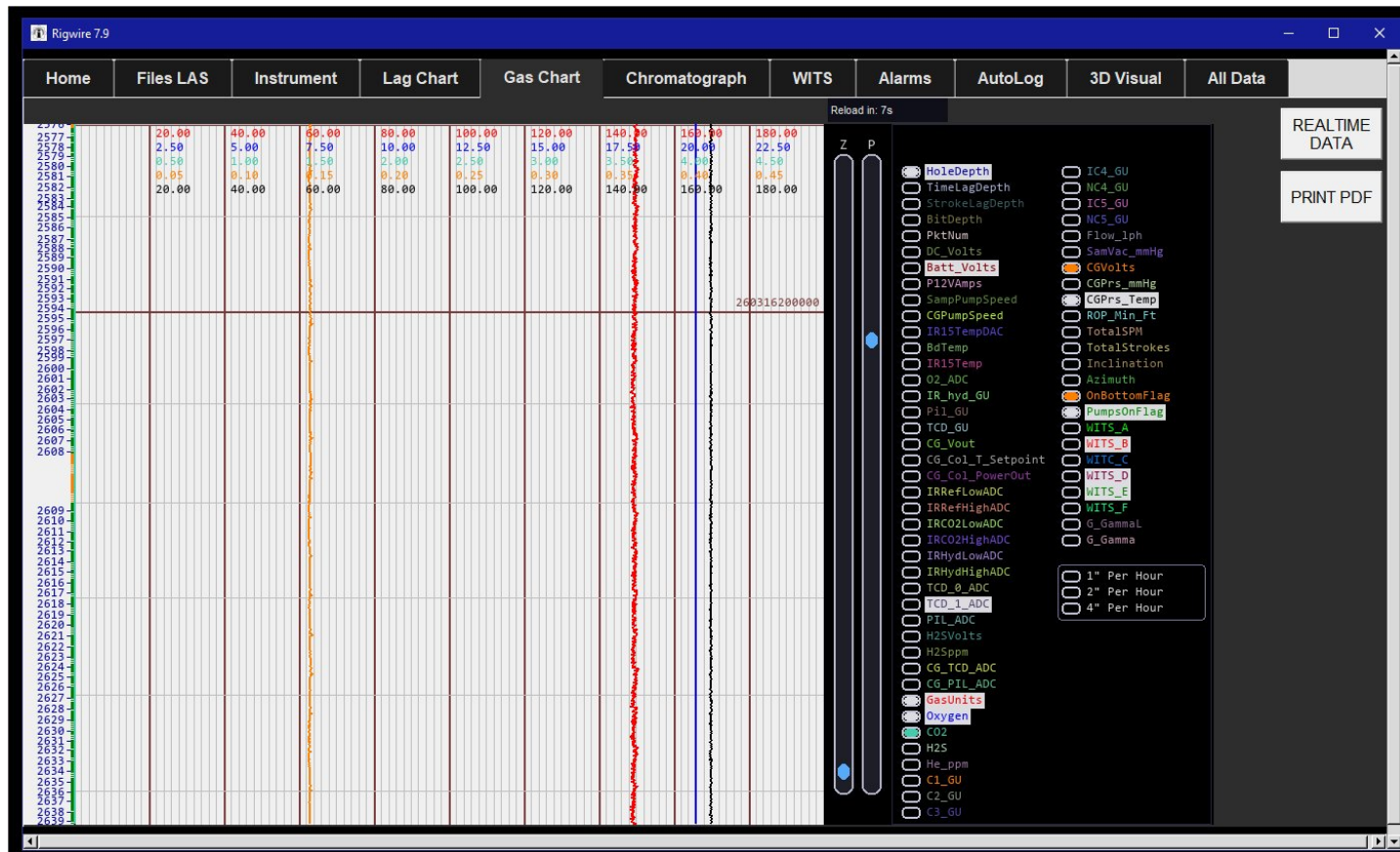
Approximately every sixty seconds the chart checks the database for new packets and merges in only new rows, avoiding a full reload on each tick. If new data arrive and you have not touched the sliders for several minutes, the view may move to keep the latest depth window sensible (roughly the last one thousand feet with pan at the "bottom" / newest data). If you do nothing—no wheel, no sliders, no buttons, no rubber-band—for about ten minutes, the view also resets to that last-one-thousand-foot window at the newest end. A full reload of all packet data happens at program startup and when you open a different database or create a new one from the Files LAS tab.

RELATIONSHIP TO DATABASE RECALCULATION (TAB TEXT ABOVE)

The paragraphs earlier in this section still apply: when you need to recompute lag throughout the database after changing correction inputs, use the recalculate controls described there (and any equivalent actions triggered from the chart's RECALCULATE ALL LAG). Time-based and stroke-based lag remain computed together; editable white fields accept your inputs, while gray fields are driven by the system.

ADDITIONAL NOTES FOR POWER USERS

The chart samples rows when many are visible so the display stays responsive (similar in spirit to the Gas Chart). After a full data reload, drawing may be throttled briefly so the window stays usable. If you open the on-screen HELP from the chart, you will see the same control names and behaviors described here in compact form. For the exact filtering rules (for example on-bottom checks and stroke-rate filters), refer to the application source module RW_LagChart and your Rigwire technical contact.



RIGWIRE INTERFACE SOFTWARE TAB 5 GAS CHART TAB

This tab allows the user to chart over time the outputs of various sensors and functions of the Rigwire System in total.

This easily allows the user to see the ongoing function of the equipment and progress of the drilling operation.

On the far left hand side is the depth in feet. This can be in Hole Depth, Time Lag Depth, or Stroke Lag Depth. Other items can be checked on or off on the right hand side.

The user can also select how much information to see by zooming in or out of the chart.

The top shows the scale of each item selected.

The only item that is not automatically scaled is the Gas Units. On the right hand side a box is provided to the user to select the maximum gas units to show on the gas chart.

Extra WITS channel recording (which channels feed the database and LAS, and their names) is set up on the Files LAS tab and WITS tab, not on the Gas Chart tab. The Gas Chart focuses on plotting and navigation as described in the subsections below.

TAB LAYOUT AND DATA

The Gas Chart tab fills the tab with an embedded Pygame surface (the chart and its control panel). The left portion of that surface is the plotting area; the right portion contains vertical Z (zoom) and P (pan) sliders and a two-column panel of checkboxes. Above the plot, a narrow text strip can show live values when you move the mouse over the chart. To the right of that strip, a countdown shows when the next automatic database merge is due. In the upper-right corner of the tab (outside the Pygame surface) are the REALTIME DATA and PRINT PDF buttons. The chart loads merged rows from both RWPacketData and RWPersistent in the current SQLite database, sorted by packet date and time.

REALTIME DATA AND PRINT PDF

REALTIME DATA opens the same Real Time Data window used on other tabs. PRINT PDF captures the entire embedded Gas Chart surface (plot plus sliders and checkbox panel exactly as on screen), saves it as an image under DEPENDANT, and sends it through the standard PDF print path used elsewhere in the software.

TOP INFORMATION STRIP AND RELOAD COUNTDOWN

When the mouse is over the plotting area (the left chart region), the strip at the top can show the packet date and time, hole depth, GasUnits, and any other checked trace fields for the row under the cursor. Updates follow the chart redraw rate (more frequent while you pan or zoom; throttled when idle to save CPU). The "Reload in: Ns" label counts down to the next background refresh: approximately every 60 seconds the software merges in new rows from roughly the last hour of data without discarding older history already loaded. If new data arrive and you have not moved the P slider for several minutes, the view may jump to the newest end of the data (pan toward the bottom of the slider range).

ZOOM (Z) AND PAN (P) SLIDERS

On the right side of the Pygame surface, two vertical sliders match the behavior of other charts in Rigwire. Z controls how many rows are visible at once (zoom out shows more elapsed time; zoom in shows fewer rows and more detail). P controls which slice of the merged time series is visible (move toward older data at one end and toward the newest packets at the other). Drag either thumb with the left mouse button.

MOUSE WHEEL ON THE CHART

With the pointer over the chart plotting area, rolling the mouse wheel without Shift pans along the time axis (same idea as the P slider). Holding Shift while rolling adjusts zoom (same idea as the Z slider). The host applies smoothing so that wheel motion is distributed over several frames instead of jumping abruptly. The step size for pan can depend on how far zoomed in you are.

LEFT AND RIGHT MOUSE BUTTONS

Left-click and drag on the Z and P sliders moves the thumbs. Left-click elsewhere in the Pygame surface is forwarded to the chart so interactive controls inside the panel behave as implemented. Right-click on a **checkbox row** in the right-hand panel opens a small dialog for that field: you can choose a trace color with the system color picker, and for ordinary trace fields you can set a minimum, maximum, and Autorange. Depth-only and flag-tic fields only get color editing. When you click OK, colors and ranges are saved to DEPENDANT ChartSettings.txt and linked labels on the Files LAS tab and WITS tab (where applicable) update to match. Right-click on the **plotting area** (not on a checkbox) resolves the packet number at the pointer, finds the closest chromatograph record in the database, switches to the Chromatograph tab, and loads that cycle so you can inspect the gas chromatograph that corresponds to that point in time.

WHAT THE CHART DRAWS

The plot area shows a time grid: strong horizontal lines mark hour boundaries with a time label; lighter lines mark ten-minute subdivisions. Vertical lines divide the trace area into ten major columns and finer tenths for reading values. Selected depth fields (HoleDepth, TimeLagDepth, StrokeLagDepth, BitDepth) appear as labeled tick marks on the far left. OnBottomFlag and PumpsOnFlag, when selected, draw short tick marks in the left margin when their conditions are met (on-bottom / pumps on), rather than full-width traces. Each selected numeric trace is drawn as a connected line in its assigned color, scaled horizontally using either automatic min/max from the visible window or the fixed min/max you set in the right-click dialog. Along the top of the trace grid, small labels show the scaled value at each ten-percent horizontal position for each active trace. Very large visible windows may sample rows so the display stays responsive.

DARK MODE AND SETTINGS FILE

The Gas Chart theme (dark/light) follows the Dark Mode checkbox on the Home tab. Field colors, checkbox on/off states, range options, and the optional inches-per-hour display correction are stored in DEPENDANT ChartSettings.txt so your layout survives restarts.

FIELD LABELS G_RecordA THROUGH G_RecordF

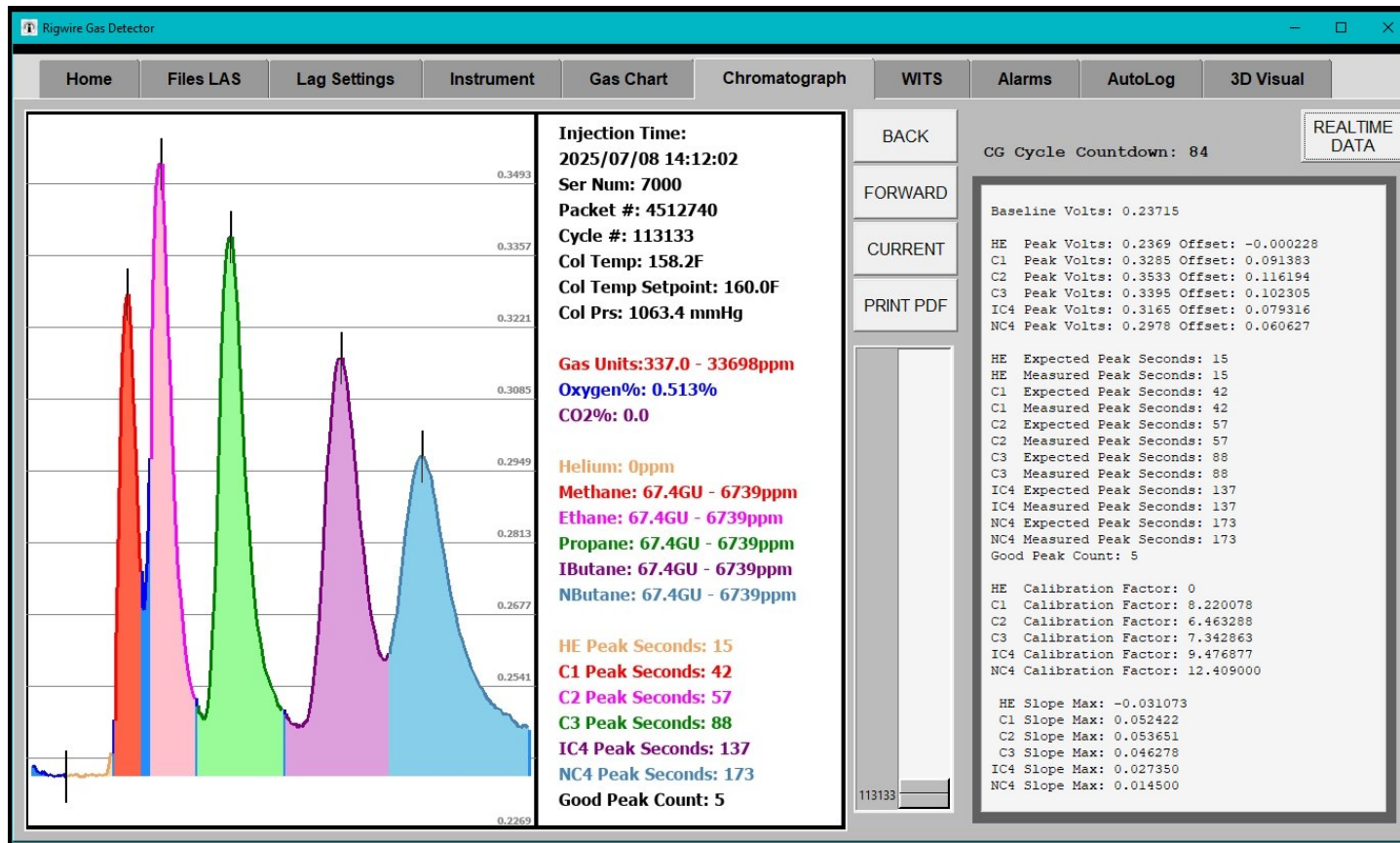
For database columns G_RecordA through G_RecordF, the checkbox text on the Gas Chart can be replaced by the descriptive text you enter next to the corresponding WITS record pair on the WITS tab, so the panel shows a meaningful name instead of the raw column name.

CHECKBOXES (GENERAL DESCRIPTION)

The right-hand panel lists one checkbox per available data column (except a small set of internal or diagnostic fields that are hidden from this list). Checkboxes determine which signals are plotted and which participate in the mouse-over readout. Depth-related fields are listed first, followed by the remaining channels in two columns. At least one depth field must remain selected; the software will force HoleDepth on if all depth choices would otherwise be off. GasUnits and other traces share the horizontal axis of the plot; each checked trace uses its color and scaling rules. A separate small group of three mutually exclusive options—1 inch per hour, 2 inches per hour, and 4 inches per hour—sets a vertical zoom preset based on how many rows per hour you want to see per inch of screen; choosing one of these adjusts the Z slider to match. Manually dragging the Z slider clears those inch-per-hour presets. Use the checkboxes to tailor which parameters you monitor; use the right-click dialog on each row for color and (where applicable) fixed scale limits.

RELATIONSHIP TO FILES LAS AND WITS

Selecting which channels are recorded into the LAS file and how extra WITS channels are named is done primarily on the Files LAS tab and the WITS tab. The Gas Chart is for visualization and quick navigation to chromatograph data; its colors stay synchronized with the corresponding LAS checkboxes where those fields overlap.



RIGWIRE INTERFACE SOFTWARE TAB 6 CHROMATOGRAPH TAB

Tab 6 allows for the user to monitor, in real time, the output of the 4 minute chromatograph.

A large amount of data is supplied for every chromatograph cycle that the user can use to verify and monitor the function of the chromatograph as well as monitor the output.

The user has 4 buttons that allow the ability to scroll forward and back through the database to look at each individual chromatograph cycle output.

The CG Cycle Countdown counter allows the user to judge when the current cycle will be complete.

Almost all functions, including baseline zero are automated in the Rigwire System. No user intervention is needed to maintain the chromatograph in the Rigwire System.

CHROMATOGRAPH TAB - LAYOUT AND DATA SOURCES

In the main window, Chromatograph is the sixth tab (after Home, Files LAS, Instrument, Lag Chart, and Gas Chart). The tab is built around a large image on the left that shows one chromatograph cycle at a time, a vertical column of control buttons and a record slider to the left of the data panel, and a wide text panel on the right. At the top of the right column is a CG Cycle Countdown label; below it is a monospace text box that lists numerical diagnostics for the selected cycle. A REALTIME DATA button sits at the upper-right corner of the tab, consistent with other tabs.

WHERE THE DATA COMES FROM

Each displayed cycle is one row from the RWChromatograph table in your current job database. Records are ordered by insertion order (rowid). The software counts rows to obtain a total number of cycles and maps your current position to a 1-based record index (first record, second record, ..., last record). That index is what the vertical slider and BACK / FORWARD / CURRENT buttons use, not the raw cycle number field by itself - so gaps in cycle numbering in the database do not break navigation. The selected row supplies packet number, serial number, date/time string, cycle number, column temperature and pressure, total gas units, component concentrations (helium through normal butane in ppm or related units), oxygen and CO₂ where stored, peak timing arrays, a block of detector samples used to draw the trace, and other fields used for timing and calibration displays.

THE MAIN GRAPH IMAGE (LEFT SIDE)

The picture shown in the large label is rendered into DEPENDANT CGOutput.jpg from a fixed canvas template (CGcanvas.jpg) and the sample block for that database row. The drawing code plots the Pelistor (total hydrocarbon) trace over the length of the cycle, applies automatic vertical scaling from the minimum and maximum samples, draws a grid, and marks recognized peaks for helium, methane (C1), ethane, propane, isobutane, and normal butane with distinct colors. A text band on the image summarizes key values for that cycle: identifiers, cycle number, column conditions, total gas and species in gas units and ppm as applicable, oxygen and CO₂, peak times in seconds, and good-peak count - so the graphic is both a chromatogram view and a quick-read status panel. If there are not enough valid samples to form a graph (roughly when the trace list is too short), the generator may show an error-style message instead of a full plot, and the right-hand text explains that the cycle did not have enough data.

THE RIGHT-HAND TEXT PANEL (NUMERIC DETAIL)

When a full plot is generated, the text box is filled with detailed diagnostics, including: a baseline voltage estimate; for each peak region, peak voltage and offset from baseline; expected versus measured peak arrival times in seconds for HE, C1, C2, C3, IC4, and NC4; good peak count; calibration factors for each species; and slope maxima used in chromatograph processing. The exact layout follows the live data for the selected record. When data are insufficient, the panel may instead show a short message referencing the cycle number and the lack of enough points to graph.

CG CYCLE COUNTDOWN LABEL

The label titled CG Cycle Countdown shows a running countdown value maintained by the main application timer. It helps you judge how long until the next expected chromatograph cycle completes relative to the instrument timing (the same counter is decremented in the global UI loop). It is informational and does not replace the chromatograph hardware cycle; use it as a rough visual timer alongside the trace.

BACK, FORWARD, AND CURRENT

BACK moves to the previous stored chromatograph record (lower 1-based index), refreshes the database row, regenerates CGOutput.jpg, and updates the image. FORWARD moves to the next record (up to the last). CURRENT jumps to the most recent record (the last row in the table) and aligns the slider to that index. These actions reset the chromatograph refresh timer behavior so that automatic updates do not immediately overwrite your manual selection; scrolling timers are adjusted so you have time to review before the next automatic refresh.

VERTICAL SLIDER AND MOUSE WHEEL

The vertical scale control spans record 1 through the total number of chromatograph rows. Dragging the thumb or letting it settle after a move triggers a debounced update: the software loads that record index, regenerates the chart image, and refreshes the label. You can also spin the mouse wheel while the pointer is over the main chromatograph image: wheel up moves toward earlier records, wheel down toward later records, one record per notch (scaled for fast spinning).

AUTOMATIC REFRESH

On a repeating timer, the application may reload the current chromatograph index from the database and redraw the picture so that new cycles appearing in RWChromatograph while you watch are reflected. If you have not interacted with the chromatograph controls for a long interval, the view can snap to follow new data depending on timer state; manual BACK, FORWARD, CURRENT, or slider use resets related timers so your place is respected.

PRINT PDF

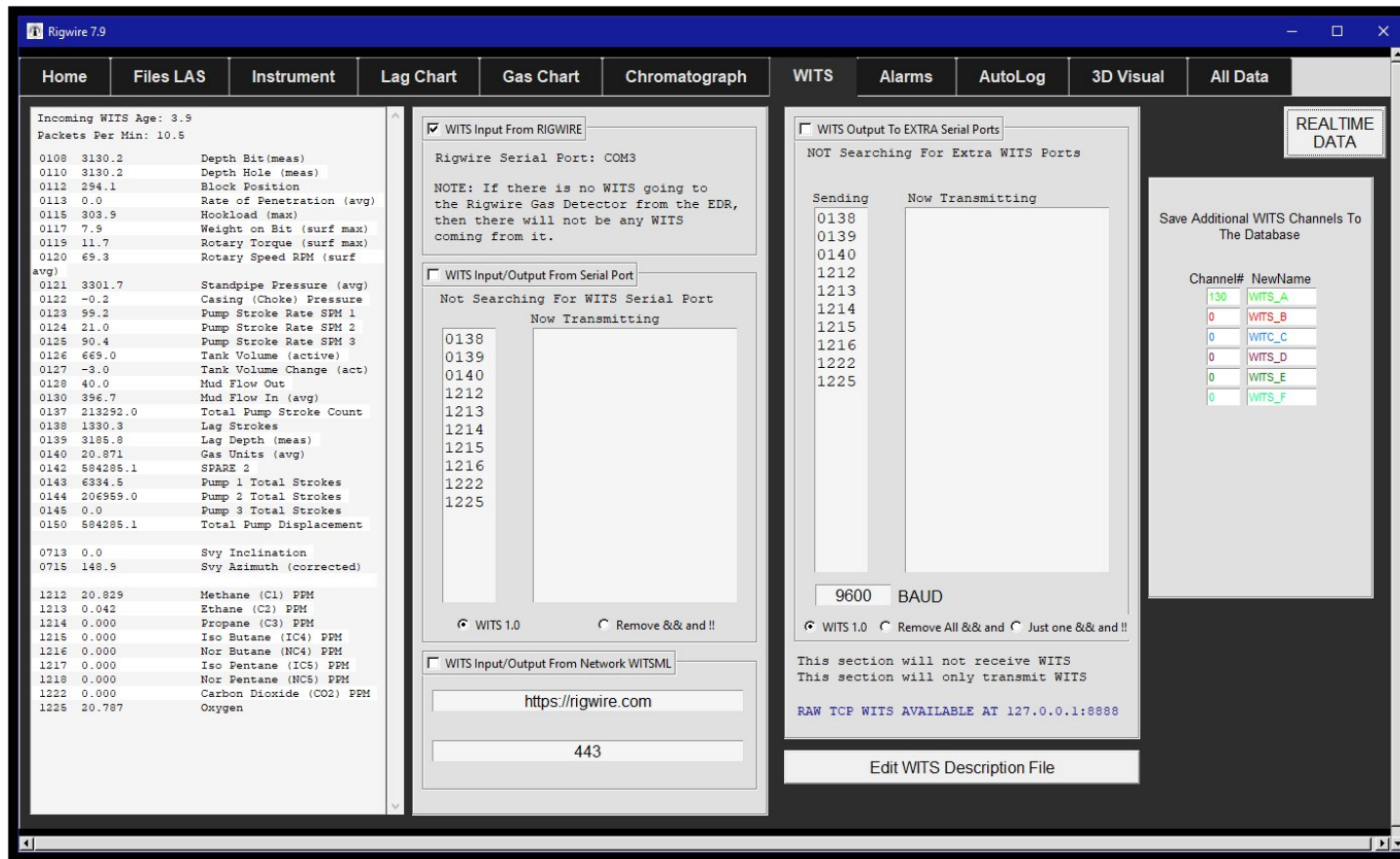
PRINT PDF exports the current CGOutput.jpg (the same composite image you see on the tab) through the standard Rigwire PDF/print path for chromatograph hard copy.

REALTIME DATA

REALTIME DATA opens the same Real Time Data auxiliary window used on other tabs for live rig and diagnostic values.

RELATIONSHIP TO OTHER TABS

From the Gas Chart tab, a right-click on the time-series plot (not on a checkbox) can locate the nearest chromatograph row by packet number and switch to this tab with that cycle loaded - useful for jumping from a gas event to the corresponding chromatogram. Opening a different database from the Files LAS tab reloads chromatograph data along with other views.



RIGWIRE INTERFACE SOFTWARE TAB 7 WITS TAB

Tab 7 allows the user to monitor and select WITS control items.

On the far left window is the WITS that is currently coming in and being processed by the system.

The Middle Window is the feedback to the user about the connection to the Rigwire System as well as where the WITS data will be coming from.

The right hand window is feedback to the user as to transmitting WITS information to a third party such as MainLog® logging software.

WITS information can be used by the Rigwire System Interface Software from one of two sources.

(1) From the Rigwire System - in that the Rigwire System has the 10 pin Pason® cable attached to the Rigwire System and is receiving WITS information from the EDR cable. That WITS information is being retransmitted to the Rigwire System Interface Software wirelessly.

(2) From a serial port attached to the computer. In this manor, the Rigwire System is sending information to the computer through one serial port, and the WITS information is coming in through a second serial port through an EDR interface computer.

WITS TAB - LAYOUT AND OPERATIONS

In the main window, WITS is the seventh tab (after Home, Files LAS, Instrument, Lag Chart, Gas Chart, and Chromatograph). The tab is divided into a large live WITS listing on the left, configuration for where WITS enters and leaves the PC in the center, an optional extra serial output block on the right, and a column of "Save Additional WITS Channels" entries tied to the database and Gas Chart. A REALTIME DATA button appears at the upper right, consistent with other tabs.

MAIN WITS LIST (LEFT PANEL)

The primary text area is a monospace, word-wrapped list with a vertical scrollbar. It is refreshed on the GUI timer and shows every current WITS item in sorted order. Each line begins with the four-character WITS item code, followed by the numeric or text payload from the rig, then tabbed spacing and a human-readable description. Descriptions come from the file DEPENDANT WITSDesc.TXT in the job folder (editable from this tab). If a code is not listed in that file, the description shows as Unknown. Items are grouped visually: when the first two digits of the item code change, the display inserts extra blank lines and alternates light row shading so blocks of related codes are easier to scan. The top few lines of the box are reserved visually for two status labels (see below) that overlay the upper-left corner of the same region.

INCOMING WITS AGE AND PACKETS PER MINUTE

Incoming WITS Age is a running counter in seconds since the last time a good WITS packet was accepted and processed; it increases continuously until fresh WITS arrives, then resets. Use it to see whether the stream has stalled. Packets Per Minute is derived from the spacing between qualifying updates (for example, when certain depth-related items are used as timing references) and gives a rough idea of update rate from the EDR or serial path.

RIGWIRE SERIAL STATUS (CENTER TOP)

The label Rigwire Serial Port shows which COM port is bound to the main Rigwire gas detector link when one has been found, or a searching state when the application is still scanning. This is separate from the dedicated WITS serial path below it.

WITS INPUT SOURCE (THREE-WAY CHOICE)

Exactly one of three modes should be active; they share one setting and behave like radio options. WITS Input From RIGWIRE means WITS is carried in on the same Rigwire detector serial stream. When valid WITS arrives that way, the application may switch into this mode automatically so the live list tracks the Rigwire feed. WITS Input/Output From Serial Port uses a separate serial port discovered in the background for bidirectional WITS: incoming WITS updates the global list and downstream logic; outgoing traffic can mirror selected channels to external equipment (see Sending and Now Transmitting). WITS Input/Output From Network WITSML selects a network-oriented path; the IP and Port entry fields below that option are intended for the WITSML endpoint (defaults are shown in the boxes). Keep your selected mode consistent with how the rig actually delivers WITS, or you will see stale age, alarms, or missing items.

NOTE ON EDR AND RIGWIRE WITS

The on-screen note explains that if no WITS is sent to the Rigwire gas detector from the EDR, there will be no WITS available from that path. Use the appropriate input mode and cabling for your site.

PRIMARY WITS SERIAL PATH (SENDING AND NOW TRANSMITTING)

When serial WITS I/O is enabled and a WITS serial port is open, the left small text box labeled Sending holds one WITS item code per line (typically four digits per line). The application builds a third-party WITS string from the current live values for those codes. The right box, Now Transmitting, shows the formatted output actually sent on the primary WITS serial line so you can verify delimiters and line breaks. Two format choices apply to this path: standard WITS 1.0 framing, or a variant that strips certain delimiter characters (Remove && and !!). If serial WITS is not active or the port is missing, the transmit box is cleared to a placeholder.

EXTRA WITS SERIAL OUTPUT

WITS Output To EXTRA Serial Ports enables a second transmit-only path. The status line indicates whether the software is searching for an extra serial port, which port was selected, or that extra output is off. The Sending and Now Transmitting pair on the right side of this block works like the primary path but uses its own channel list and its own format options: WITS 1.0, Remove All && and !!, or Just one && and !!. The BAUD field sets the extra port speed; you normally set the baud while the extra output is disabled, then enable the feature. A label states that this section does not receive WITS; it only transmits. Small unlabeled controls in this area are used internally for port selection and are not meant for routine use.

RAW TCP WITS ON LOCALHOST

The label RAW TCP WITS AVAILABLE AT 127.0.0.1:8888 means the application can expose a local TCP listener on port 8888. Other programs on the same computer can connect to that address to receive the aggregated EDR-oriented WITS stream that Rigwire prepares for forwarding, without replacing the main serial workflows.

EDIT WITS DESCRIPTION FILE

Edit WITS Description File opens DEPENDANT WITSDesc.TXT in your default editor. That file maps WITS item codes to the text shown in the main list. The application can create a default file if none exists. Reload or restart may be needed for edits to take full effect.

SAVE ADDITIONAL WITS CHANNELS TO THE DATABASE

Six paired fields (Channel# and NewName) define optional extra WITS channels labeled WITSA through WITSF by default. For each pair you enter the four-digit WITS item number to capture and a short name. Live data matching those item numbers fills the corresponding record slots A through F used elsewhere in the software (for example Gas Chart traces and database storage). Colors match the Gas Chart convention. Related checkboxes on the Files LAS tab let you choose which of these named channels are saved to the database; those controls are created in tandem with this tab and stay in sync when names change.

REALTIME DATA

REALTIME DATA opens the same Real Time Data auxiliary window used on other tabs. When that window is open, the WITS list there is updated from the same sorted WITS data as the main tab.

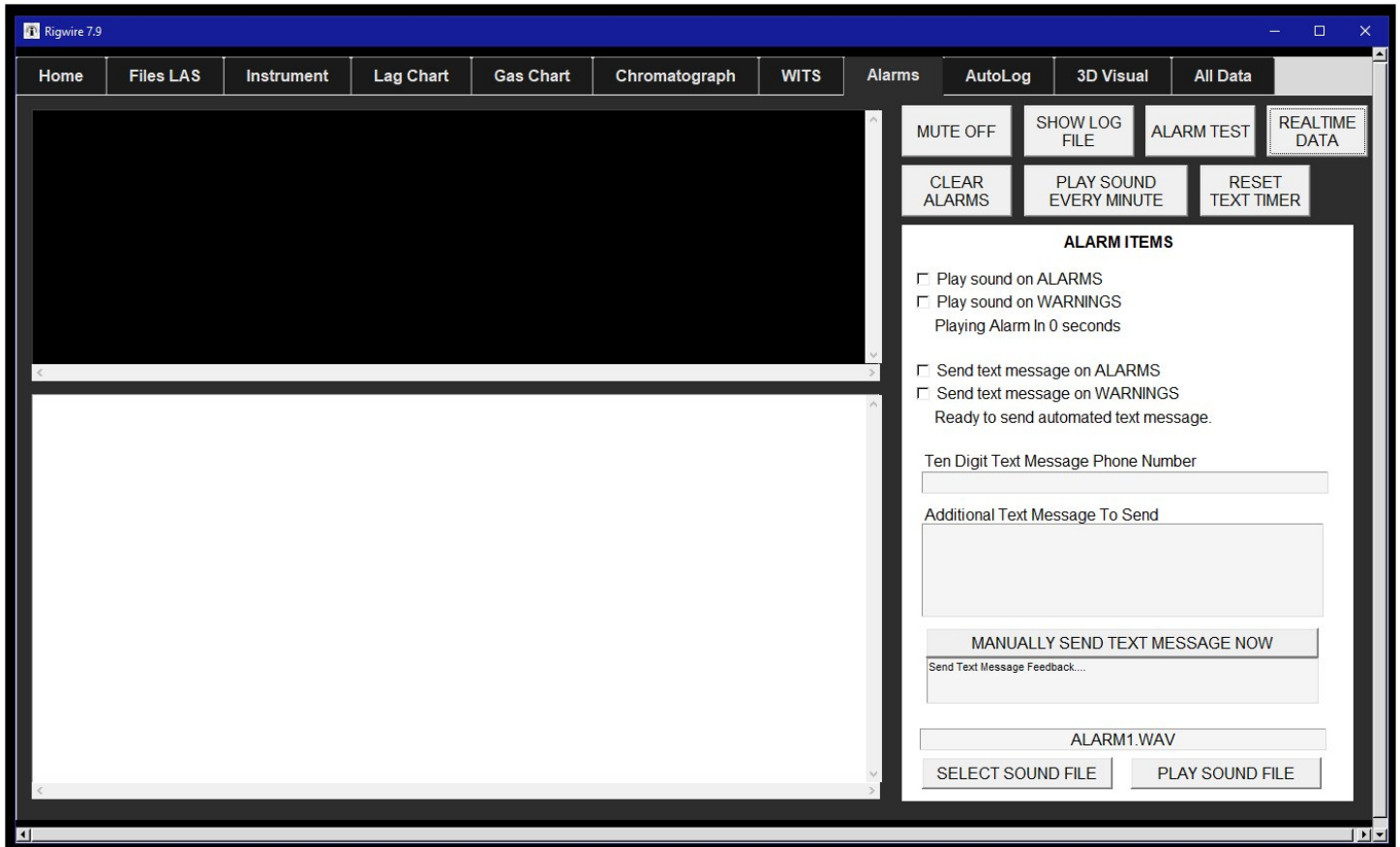
ALARMS AND TIMEOUTS

For assistance, please call Technical Support at 405 570 4449

The application can raise alarms when WITS from the EDR stops for too long, when the Rigwire link has no WITS, or when the dedicated WITS serial port times out while serial mode is selected. Use Incoming WITS Age and the status labels together with the Alarms tab to diagnose feed problems.

RELATED SETTING ON THE LAG CHART TAB

Override wits gamma lag on the Lag Chart tab controls whether gamma lag is taken from WITS item 821 as received or overridden by a fixed calculation. That affects depth and lag processing tied to WITS, not the layout of the WITS tab itself.



RIGWIRE INTERFACE SOFTWARE TAB 8 ALARMS TAB

Tab 8 allows the user to monitor and keep track of current and past warnings and alarms that the Rigwire System or software generates. This tab allows the user to set different levels of alert that the user can receive in both audio and text message formats.

ALARMS TAB - LAYOUT AND OPERATIONS

In the main window, Alarms is the eighth tab (after Home, Files LAS, Instrument, Lag Chart, Gas Chart, Chromatograph, and WITS). The tab is built around two large read-only text areas on the left (active alarms above, history below), a compact control strip at the upper right for mute, logging, testing, and sound timing, a white panel of alarm-related checkboxes and countdown labels, and text messaging plus sound file controls along the right edge. REALTIME DATA sits at the far upper right like other tabs.

ACTIVE ALARMS PANEL (UPPER LEFT)

The upper text box has a black background and white monospace text with no word wrap, so long lines extend horizontally. Vertical and horizontal scrollbars let you review full messages. Each active line shows a remaining-time value and the alarm string. Lines whose text includes the word WARNING are drawn in yellow; all other active alarms are drawn in red (errors and general alarms). The list is maintained by the alarm subsystem: new conditions are added from many parts of the application (gas limits, WITS timeouts, serial faults, chromatograph issues, shutdown mode, and dozens of other checks). An alarm entry persists for a fixed countdown in seconds; when that countdown reaches zero, the message is removed from this panel and appended to the history panel below. If the same condition is reported again, duplicate detection refreshes

the timer rather than stacking many identical lines (matching is based on the first part of the message text). Messages shorter than fifteen characters are ignored so that brief fragments do not create noise. For about the first two minutes after the program starts, new alarms are suppressed so that startup transients do not flood the display.

ALARM HISTORY PANEL (LOWER LEFT)

The lower text box has a white background and black monospace text, also without word wrap, with vertical and horizontal scrollbars. When an alarm expires from the active queue, it is recorded here with a date and time stamp and the message text. The history is rebuilt so that the most recent cleared alarms appear toward the top after the fixed header line. This area is for review only; you do not edit it directly.

MAIN WINDOW VISUAL ALERT

While at least one alarm is active, a narrow color strip on the main window border flashes between red (when any active line is not a WARNING) and yellow (when a WARNING is present in the mix) so that you can notice a problem even when the Alarms tab is not visible. When the active list is empty, that strip returns to black.

REALTIME DATA

REALTIME DATA opens the same Real Time Data auxiliary window used on other tabs.

MUTE

MUTE cycles through three audio states each time you click. First click starts a ten-minute countdown during which alarm sounds are suppressed; the button shows the remaining seconds in red. A second click extends suppression to an indefinite audio-off state (still shown on the button). A third click returns to normal with no mute. Mute affects automated alarm sounds, not necessarily every other beep in the program.

SHOW LOG FILE

SHOW LOG FILE opens the Rigwire application log file (rigwire.log) in your default editor so you can inspect detailed events alongside what appears in the alarm list.

ALARM TEST

ALARM TEST injects one test WARNING and one test error-style alarm immediately, bypassing the startup suppression window, so you can verify colors, sounds, and messaging without waiting for a field fault.

CLEAR ALARMS

CLEAR ALARMS clears the active alarm queue and wipes the active alarm text box. It also resets the play-sound countdown timer. It does not erase the history list of alarms that have already aged out.

PLAY SOUND EVERY MINUTE (INTERVAL BUTTON)

This button does not play sound by itself; it sets how often the application is allowed to repeat the alarm sound while conditions remain active. Each click advances the interval in a cycle: one minute, then five minutes, then thirty minutes, then sixty minutes, then back to one minute. The button caption changes to show the current choice. The separate label Playing Alarm In ... seconds shows the live countdown until the next allowed replay. If you turn off both Play sound on ALARMS and Play sound on WARNINGS, the repeat countdown is forced to zero.

PLAY SOUND ON ALARMS AND PLAY SOUND ON WARNINGS

These checkboxes independently enable sound for non-WARNING alarms (red lines) and for WARNING-class alarms (yellow lines). You can silence one category while leaving the other. When enabled and not muted, the software plays the configured wave file after each interval while the corresponding alarm type is present.

SEND TEXT MESSAGE ON ALARMS AND SEND TEXT MESSAGE ON WARNINGS

These checkboxes enable automatic SMS-style notifications when the active alarm list is non-empty and the text cooldown has expired. The first checkbox prepends the outgoing body with Current Rigwire Warnings; the second prepends Current Rigwire ERRORS. In each case the message includes the same live alarm lines from the active queue, then your Additional Text Message text, then a note that automated texts are throttled. A long cooldown (six hours) applies after each automatic send; the status label shows either the remaining wait or Ready to send automated text message. Internet connectivity and the configured gateway are required.

RESET TEXT TIMER

RESET TEXT TIMER clears the automated-text cooldown immediately so the next qualifying alarm can trigger a new message without waiting for the long interval to expire. Use this after you have addressed a site issue or when you intentionally want another automatic notification.

TEN DIGIT TEXT MESSAGE PHONE NUMBER

Enter the destination mobile number digits only, at least ten characters, centered in the field. If the field is too short, sends are skipped.

ADDITIONAL TEXT MESSAGE TO SEND

This multi-line box holds free text that is appended to both automatic and manual outgoing messages (for example your name, rig, or instructions). Word wrap is on.

MANUALLY SEND TEXT MESSAGE NOW

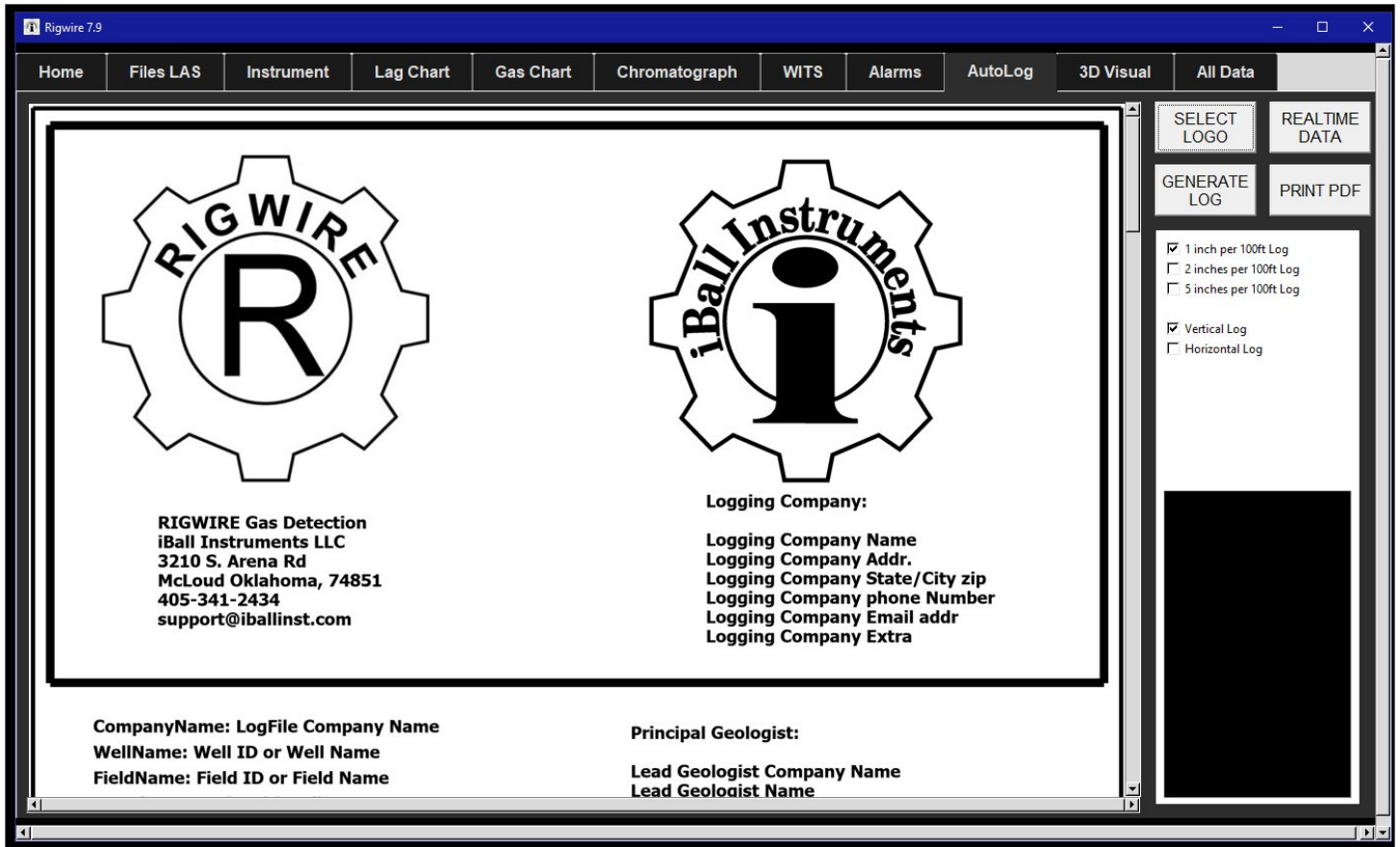
This button sends immediately using the phone number and additional text, subject to the same gateway and cooldown behavior as automatic sends. The small feedback box below shows the service response (success or failure) in green or red so you can confirm delivery.

ALARM SOUND FILE PATH, SELECT SOUND FILE, PLAY SOUND FILE

The entry field shows the file name of the wave file played for alarms. The file is loaded from the DEPENDANT folder under the current job directory. SELECT SOUND FILE opens a file dialog (wave files by default) and stores only the file name in settings. PLAY SOUND FILE plays that file once for a listening test. Actual alarm playback runs in a background thread so the user interface stays responsive.

WHERE ALARMS COME FROM

Beyond tests and operator actions, alarms originate throughout Rigwire: communication and WITS health, gas unit and component thresholds, H2S and flow limits, power and temperature excursions, chromatograph and battery warnings, shutdown state, service-hour notices, and more. Severity is conveyed by whether the word WARNING appears in the message and by color in the active list.



RIGWIRE INTERFACE SOFTWARE TAB 9 AUTOLOG TAB

Tab 9 allows the user to generate either a horizontal or vertical log based on the previously generated LAS file.

This tab is still under development into a full logging program that would be acceptable to geologists and final users of this data and information.

This log is directly generated from the LAS file found and generated in Tab 2.

AUTOLOG TAB - LAYOUT AND OPERATIONS

In the main window, AutoLog is the ninth tab. It is dedicated to generating, previewing, and printing paper-style log charts built from rig data. The layout is dominated by a large scrollable preview on the left (black background) that embeds full-page images, a column of action buttons at the upper right, a white panel of scale and orientation options below those buttons, and a smaller status text area low on the right. REALTIME DATA appears at the far upper right, consistent with other tabs.

MAIN PREVIEW AREA (AUTO LOG TEXT BOX)

The large area is a monospace text widget with no word wrap, white text on a black background, and both vertical and horizontal scrollbars. It is used primarily as an image canvas: the software inserts JPEG pictures generated under the job DEPENDANT folder (header page LogTitle.jpg and numbered pages LogGrid1.jpg, LogGrid2.jpg, and so on). After you run GENERATE LOG, you scroll through the full virtual log as a stack of page images. While generation runs in the background, the same box briefly shows status lines such as

Generating Logfile, progress dots as old grid files are removed, Creating header, and similar messages so you know the pipeline is active. On application startup, if LogTitle.jpg already exists, it may be preloaded into this view as an initial preview before you generate again.

VERTICAL VERSUS HORIZONTAL LOG

Three checkboxes share one setting for vertical scale (1, 2, or 5 inches per 100 feet of hole). They behave like radio buttons: one scale must be selected. The choice controls how much depth is packed onto each generated page when the log renderer steps through the database (finer scale means more pages for the same depth interval). Two additional checkboxes select log orientation: Vertical Log or Horizontal Log. Vertical mode runs the vertical log generator; horizontal mode runs the horizontal generator. Default at startup is horizontal. In the preview, vertical pages are shown at full letter-style size in the text box; horizontal grid pages are embedded at a reduced width and height so several can sit in the scroll area sensibly. For PDF export, horizontal grid images are rotated so they read correctly on the printed page.

SELECT LOGO

SELECT LOGO opens a file dialog starting in the PICS folder under the current job directory. You choose a company or client logo in JPEG form (other types may appear in the dialog). Only the file name is stored in settings; the next header generation picks up that name for use when drawing the log title sheet. The new name is written to the parameter file on the usual save cycle (within a couple of minutes).

GENERATE LOG

GENERATE LOG starts a background thread so the user interface stays responsive. The thread clears the preview, removes the previous LogTitle.jpg and all existing LogGrid*.jpg files in DEPENDANT, builds a new header image via the log header module, then builds either the vertical or horizontal grid image sequence according to the orientation checkboxes, and finally reloads all new images into the main preview. If you stop the application while this work runs, the thread is designed to exit cleanly. You should run GENERATE LOG after changing scale, orientation, logo, or significant depth data so the picture files match your intent.

PRINT PDF

PRINT PDF also runs in a background thread. It collects LogTitle.jpg and every consecutive LogGridN.jpg file in DEPENDANT, combines them into a multi-page PDF in the PRINT folder, names the file with the unit serial (four digits), the words Rigwire_AutoLog_VERT or Rigwire_AutoLog_HORIZ, and the current date and time, then opens the PDF with the default viewer on Windows. For horizontal logs, each grid page is rotated in the PDF so the printed layout matches the horizontal chart design. The first page (title) is not rotated.

STATUS BOX (LOWER RIGHT)

The smaller text box on the lower right has the same black background and white text as the main preview. It is used as a progress and status panel while the PDF builder runs: messages such as Generating PDF file, a trail of dots as each grid file is found, Loading all the PDF images, and Saving the PDF images. When finished, the box is cleared. It is a standard text widget, so you could type in it, but anything you type would be overwritten the next time a PDF job runs.

REALTIME DATA

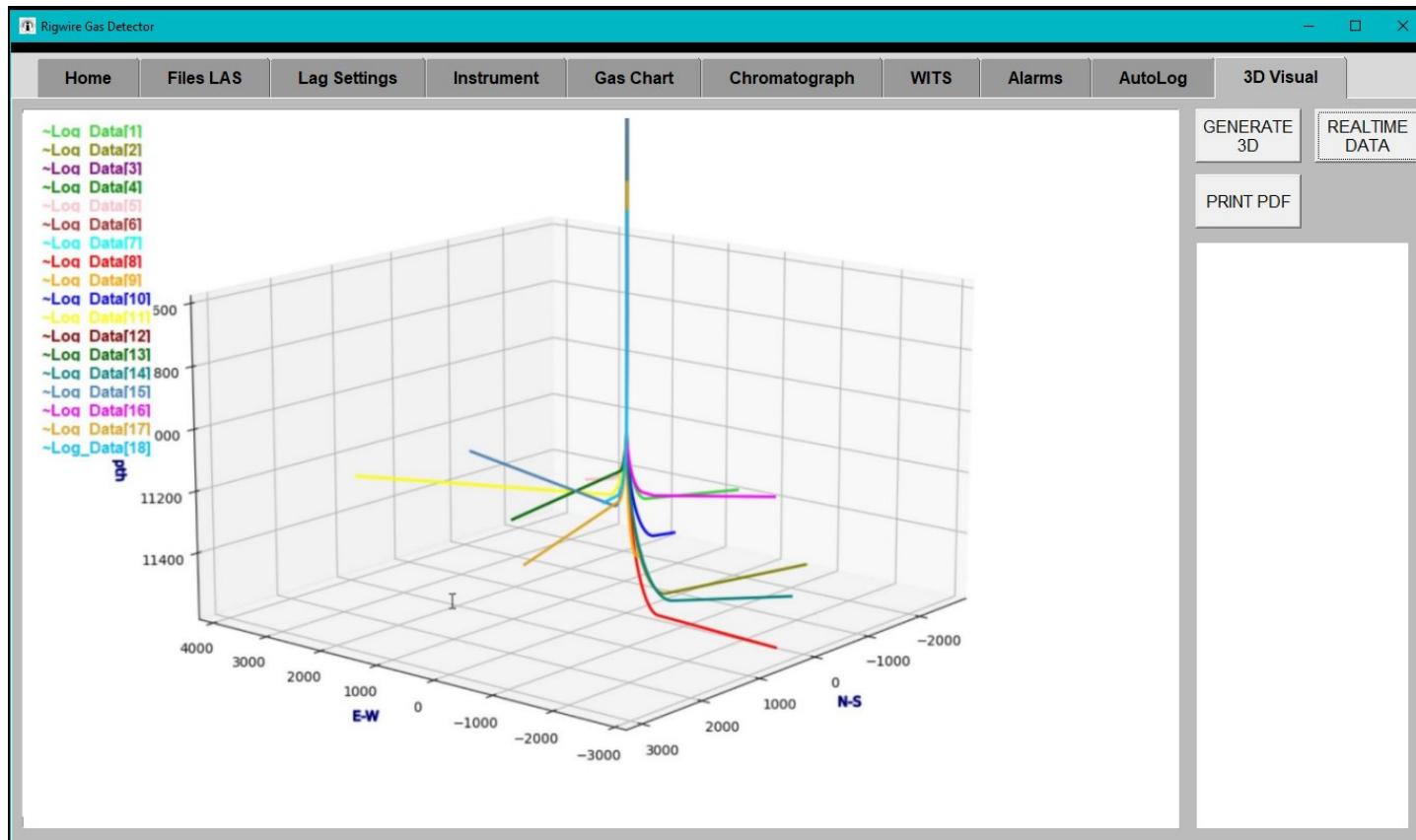
REALTIME DATA opens the same Real Time Data auxiliary window used on other tabs.

RELATIONSHIP TO THE FILES LAS TAB

The Files LAS tab includes a separate read-only AutoLog-related text area and labels describing LAS file generation. That view shows automatically generated textual data tied to the same underlying job; the AutoLog tab here focuses on the graphical page preview and PDF output rather than raw LAS column text.

FILE LOCATIONS

Generated JPEGs live under the job folder in DEPENDANT. Exported PDFs are written to the PRINT subfolder. Company images for SELECT LOGO are picked from PICS by default.



RIGWIRE INTERFACE SOFTWARE TAB 10 3D VISUAL TAB

The 3D Visual Tab is an experimental tab that allows the user to visualize all the turn radius items on all the different tracts while drilling.

The user can - center button on the mouse – click and hold – and rotate in 3 dimensions the 3D generated picture.

Other functions allow the user to zoom in and out of the graphical representations of the azimuth and inclinations.

This picture is directly generated from the LAS file found and generated in Tab 2.

3D VISUAL TAB - LAYOUT AND OPERATIONS

In the main window, 3D Visual is the tenth tab (after Home, Files LAS, Instrument, Lag Chart, Gas Chart, Chromatograph, WITS, Alarms, and AutoLog). The tab shows a three-dimensional wellbore trace derived from survey data in the current LAS file, with action buttons at the upper right, a large embedded matplotlib figure on the left, and a vertical column of status labels along the left margin below the title area. REALTIME DATA appears at the far upper right, consistent with other tabs.

MAIN PLOT AREA

The large white region is a Tk text widget that hosts a matplotlib FigureCanvas. The figure uses a 3D axes with depth on the vertical axis (labeled Depth, increasing downward in survey convention), north-south horizontal

axis (N-S), and east-west horizontal axis (E-W). Axis labels use a blue outline style. Before any data is loaded, the plot shows empty axes with fixed horizontal limits (roughly plus or minus four thousand feet) and a depth window (zero to ten thousand) that is later adjusted when data are generated. After GENERATE 3D succeeds, one or more colored polylines show the bore path in plan and section. You can typically click and drag on the chart surface to rotate the view, and use the usual matplotlib mouse controls for zoom (exact behavior depends on the matplotlib backend). There is no separate navigation toolbar on this tab; interaction is through the canvas itself.

STATUS LABELS (LEFT COLUMN)

Up to thirty-five small labels sit in a column on the left side of the tab. The first label is the primary status line: it starts as No Data Loaded in bold black text. If the LAS file for the job is missing, it turns red and reads LAS File Is Missing. If the LAS file has no columns that can be identified as inclination and azimuth, it turns red and reads No Inclination or Azimuth found in LAS. When processing succeeds, the first label may show a segment title (for example a log section marker), and additional labels show names or markers for separate bore segments, each drawn in a color that matches the corresponding trace on the 3D plot. These labels are not editable; they are updated by the generator to tell you which color belongs to which LAS run or section.

WHITE PANEL (UPPER RIGHT OF PLOT COLUMN)

An empty white rectangular panel is reserved next to the buttons for layout balance; it carries no controls in the stock build.

GENERATE 3D

GENERATE 3D runs the 3D data generator. It reads the LAS file named for the current job from the LAS folder under the working directory. The parser honors LAS 2.0 style ASCII sections (starting at ~ASCII) and LAS 3.0 style sections (starting at ~Log_Data), detects delimiter type from the LAS header (space, tab, or comma) or from the Files LAS tab delimiter setting when needed, and skips header lines until tabular data begin. Each data row must include depth and columns whose names contain INC and AZI so the software can find inclination and azimuth. Rows are converted from spherical survey angles to incremental Cartesian steps, accumulated into a 3D path, and plotted. For LAS 3.0 files with multiple runs separated by ~Log markers, the code can draw multiple traces in different colors and label each run. Lines that contain a configured null placeholder in azimuth or inclination fields are skipped so bad values do not break the path. When finished, the figure is redrawn and axis limits may be set automatically for horizontal extent while depth limits are derived from the data window.

PRINT PDF

PRINT PDF exports the current 3D figure to an image file in the DEPENDANT folder (Output3D.jpg), converts that image to a single-page PDF in the PRINT folder, names it with the four-digit unit serial number, the text Rigwire_3D_Representation, and the current date and time, then opens the PDF with the default Windows viewer. Generate the plot first so the snapshot matches what you see on screen.

REALTIME DATA

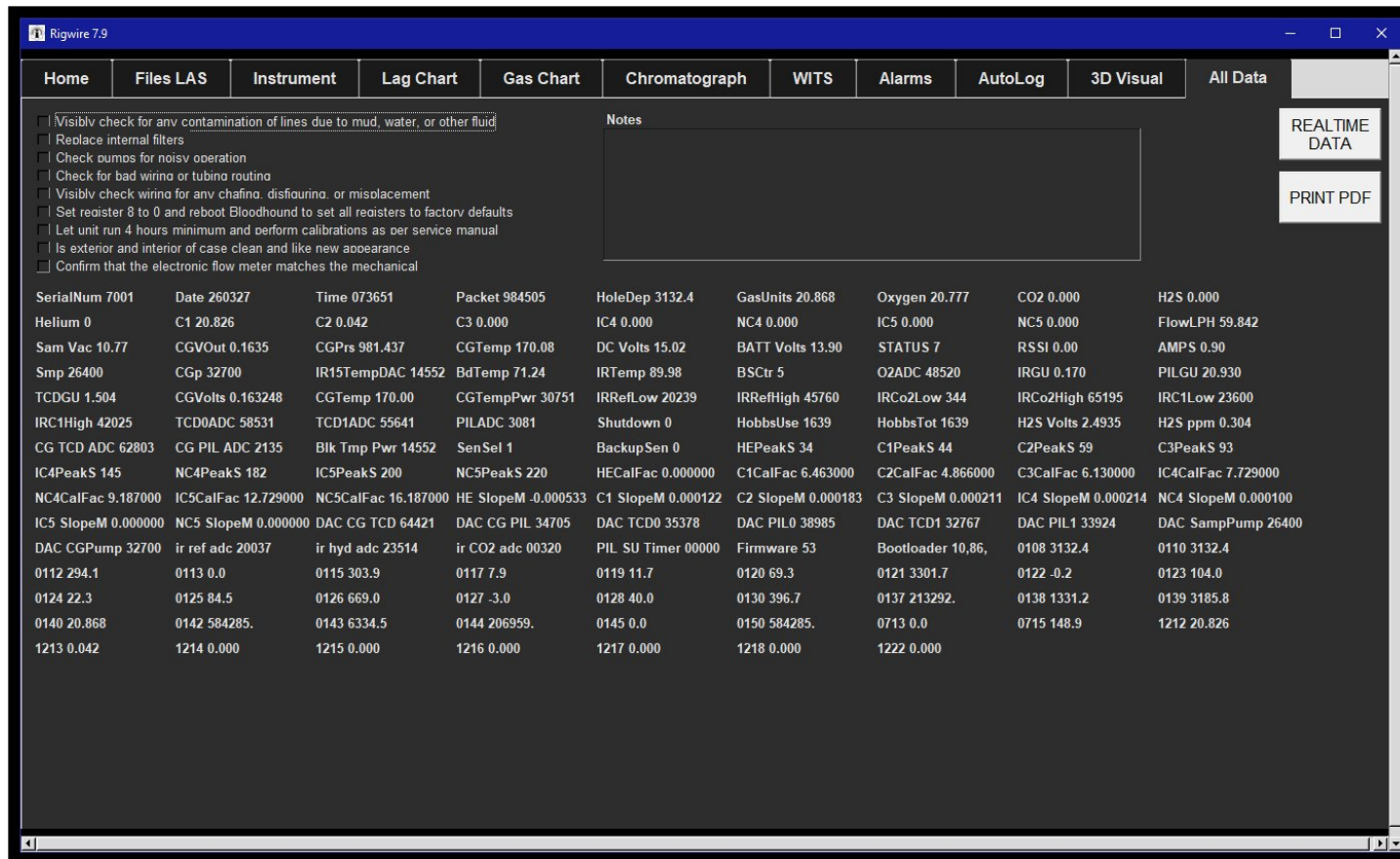
REALTIME DATA opens the same Real Time Data auxiliary window used on other tabs.

RELATIONSHIP TO THE FILES LAS TAB

The 3D view does not pick a LAS file on its own: it uses whatever LAS file name and delimiter options are associated with the job from the Files LAS tab (including comma, tab, or space-separated data). Ensure the correct LAS is selected and that INC and AZI columns are present before expecting a successful 3D plot.

OUTPUT FILES

Raster snapshot for printing: DEPENDANT Output3D.jpg. PDF output: PRINT folder, filename pattern containing Rigwire_3D_Representation and a timestamp.



RIGWIRE INTERFACE SOFTWARE TAB 11 ALL DATA TAB

The All Data tab is used for field service and monitoring. At the top is a nine-item checklist for routine inspection and service tasks. Next to the checklist is a Notes text box for free-form notes. The REALTIME DATA button matches the other tabs. PRINT PDF generates a PDF report of the current All Data view. Below the checklist is a large grid of live labels showing raw gas data, persistent diagnostic values, firmware versions, and WITS channels as they are updated.

ALL DATA TAB - LAYOUT AND OPERATIONS

In the main window, All Data is the eleventh and last tab. It combines a field-service checklist, free-form notes, a live grid of raw instrument and WITS values, REALTIME DATA, and PDF export. The tab follows the application dark or light theme: in dark mode the background is dark gray with light text; in light mode it uses the standard light gray panel with black text.

SERVICE AND INSPECTION CHECKLIST (NINE ITEMS)

Across the top of the tab, nine independent checkboxes list routine inspection and maintenance steps: checking lines for contamination, replacing internal filters, listening for noisy pumps, checking wiring and tubing routing, checking wiring for damage, resetting register 8 and rebooting the Bloodhound per procedure, minimum run time before calibration, case cleanliness, and comparing the electronic flow meter to the mechanical meter. Each box can be checked or cleared independently. The states are for your field record only in the running session; PRINT PDF captures their current on-or-off state on the report. Long labels wrap within a fixed width so the full text remains readable.

NOTES

To the right of the checklist, a Notes label heads a multi-line text area. You can type free-form comments (word wrap on) such as technician name, findings, or follow-up actions. This text is included in the PRINT PDF output in a column beside the checklist. The notes area is editable whenever the tab is visible.

REALTIME DATA

REALTIME DATA opens the same Real Time Data auxiliary window used on other tabs.

PRINT PDF

PRINT PDF builds a one-page PDF report and saves it under the job PRINT folder with a name containing the four-digit unit serial number, the text ALLDATA_REPORT, and the current date and time. The report includes a title line with serial and timestamp, the Service Inspection Checklist with each line marked as checked or unchecked, the Notes text or a placeholder if empty, and a Raw Data section. Raw Data is laid out in four columns of up to fifty lines each, covering the same one hundred ninety-eight label slots as the on-screen grid (truncated visually in the PDF to fit column width). The default viewer opens the PDF when generation completes.

RAW DATA GRID (ONE HUNDRED NINETY-EIGHT LABELS)

Below the checklist, the rest of the tab is a dense grid of read-only labels (bold Arial). They refresh on the main GUI timer (about once per second) when the All Data tab has been built. The layout wraps row by row with fixed horizontal and vertical spacing until the edge of the window, then continues on the next row. You cannot edit these fields; they mirror internal buffers.

What the grid shows, in logical groups:

Rows beginning near slot one show live gas-detector packet fields: serial number, date, time, packet number, hole depth, gas units, oxygen, CO₂, H₂S, helium through pentanes, sample flow, sample vacuum, chromatograph output volts, CG pressure, and CG temperature.

The next block shows raw persistent-register style values from the unit: DC and battery volts, status, RSSI, amps, sample-related counts, board and IR temperatures, oxygen ADC, gas-unit breakdowns for IR and TCD paths, shutdown and Hobbs-style hour meters, H₂S volts and ppm, CG TCD and PIL ADC readings, block temperature power, sensor selection and backup, chromatograph peak seconds for each species, calibration factors and slope maxima per species, DAC drives for CG and sample pumps and IR paths, IR ADC channels, PIL startup timer, and firmware and bootloader version strings.

Starting around slot ninety-eight, remaining positions display current WITS items from the sorted WITS list: each label shows the four-character WITS code and a short slice of the value (seven characters), for as many WITS entries as exist and as fit up to the one hundred ninety-eighth slot. If there are fewer than five WITS entries, the WITS portion of the grid may not populate.

PURPOSE

Use this tab when you need a single place to see a large slice of raw telemetry, to walk through a printed service checklist, and to archive a snapshot of checklist state, notes, and raw lines via PRINT PDF without hunting through other tabs.