1 EDR Main Screen

1.1 EDR Main Screen

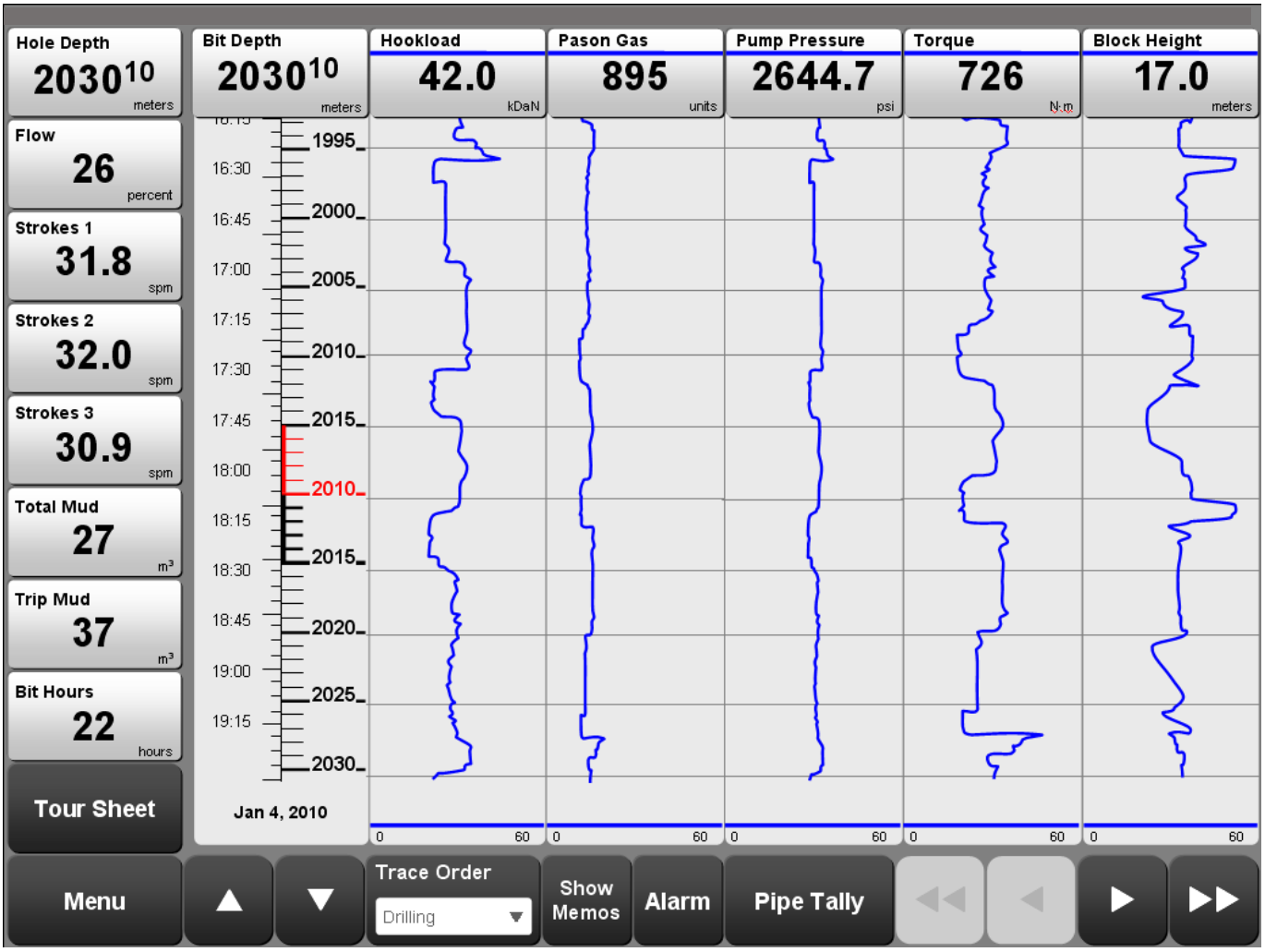


Figure 1: EDR Main Screen, 5 Plots, 1 Trace per Plot

The new EDR main screen components sections are:

1. Bottom button bar.
2. Real Time Boxes (on the left)
3. Hole Depth / Bit Depth Graph
4. Information Bar (Top of Screen): Workstation identity, Contractor / Well Name / Rig #, Current Time)
5. Trace Boxes (Boxes below the Information Bar)
6. Time / Depth Graph (Below Bit Depth).
7. Plots (Below the Trace boxes).
8. Graph Scale Range Indicators (Bottom of each trace graph).

Screen Background Color: (128,128,128)

The following figure depicts the common terminology used in this document when referring to the Chart, Plot, and Trace entities.

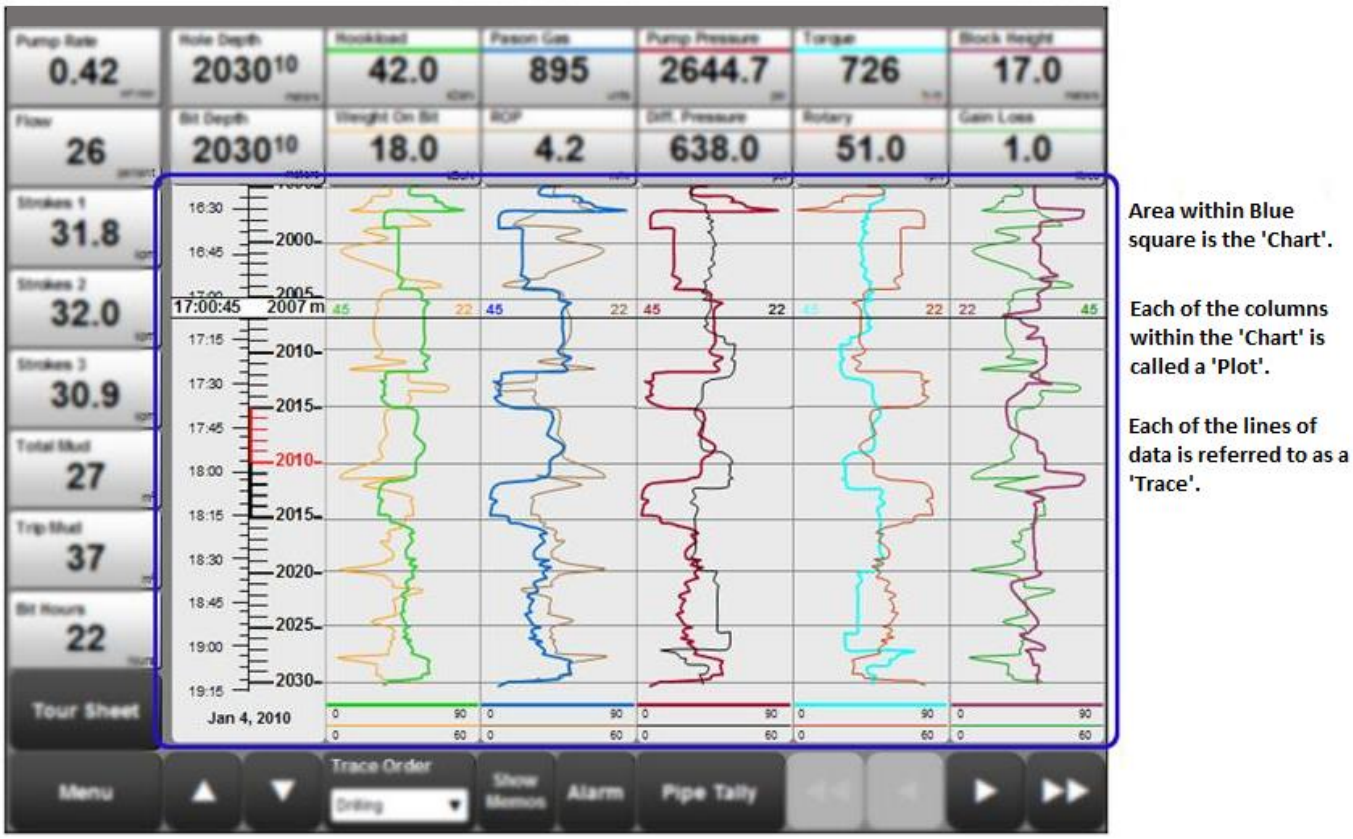
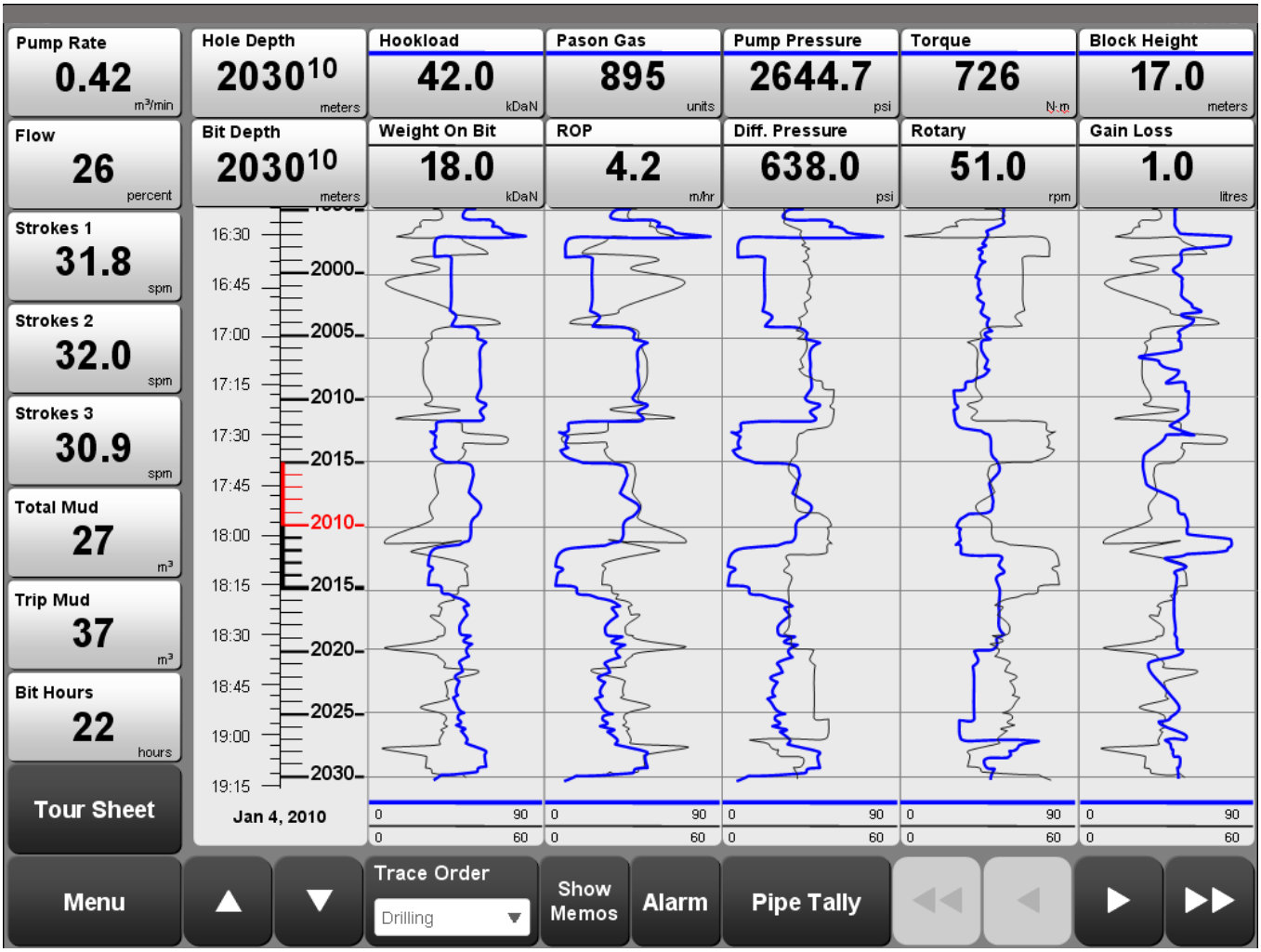


Figure 2: EDR Main Screen: Chart, Plots, Traces



1.2

Figure 3: EDR Main Screen, 5 Plots, 2 Traces per Plot

The EDR Main screen view changes slightly when configured for multiple traces per plot. Additional rows of traces are added and stacked as a second row of traces. The Hole Depth and Bit Depth become stacked in order to fill the space required by the additional rows.

It will also be possible to configure the trace color for each trace as part of the trace order configuration. By default the trace colors are blue (1 trace per plot view) and black (when in 2 trace per plot view).

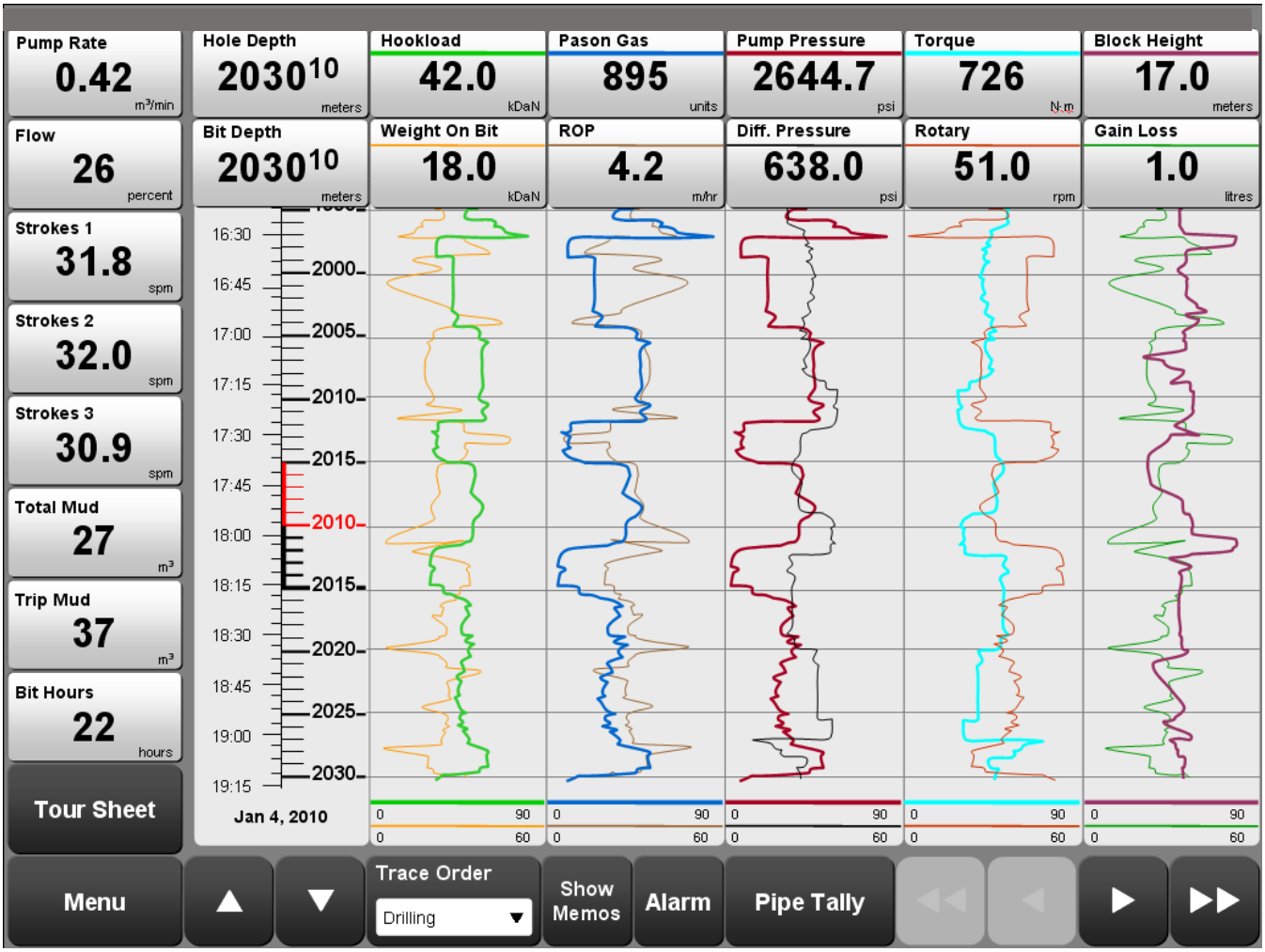


Figure 4: EDR Main Screen, 5 Plots, 2 Traces per Plot, non-default Colors Configured.

1.3

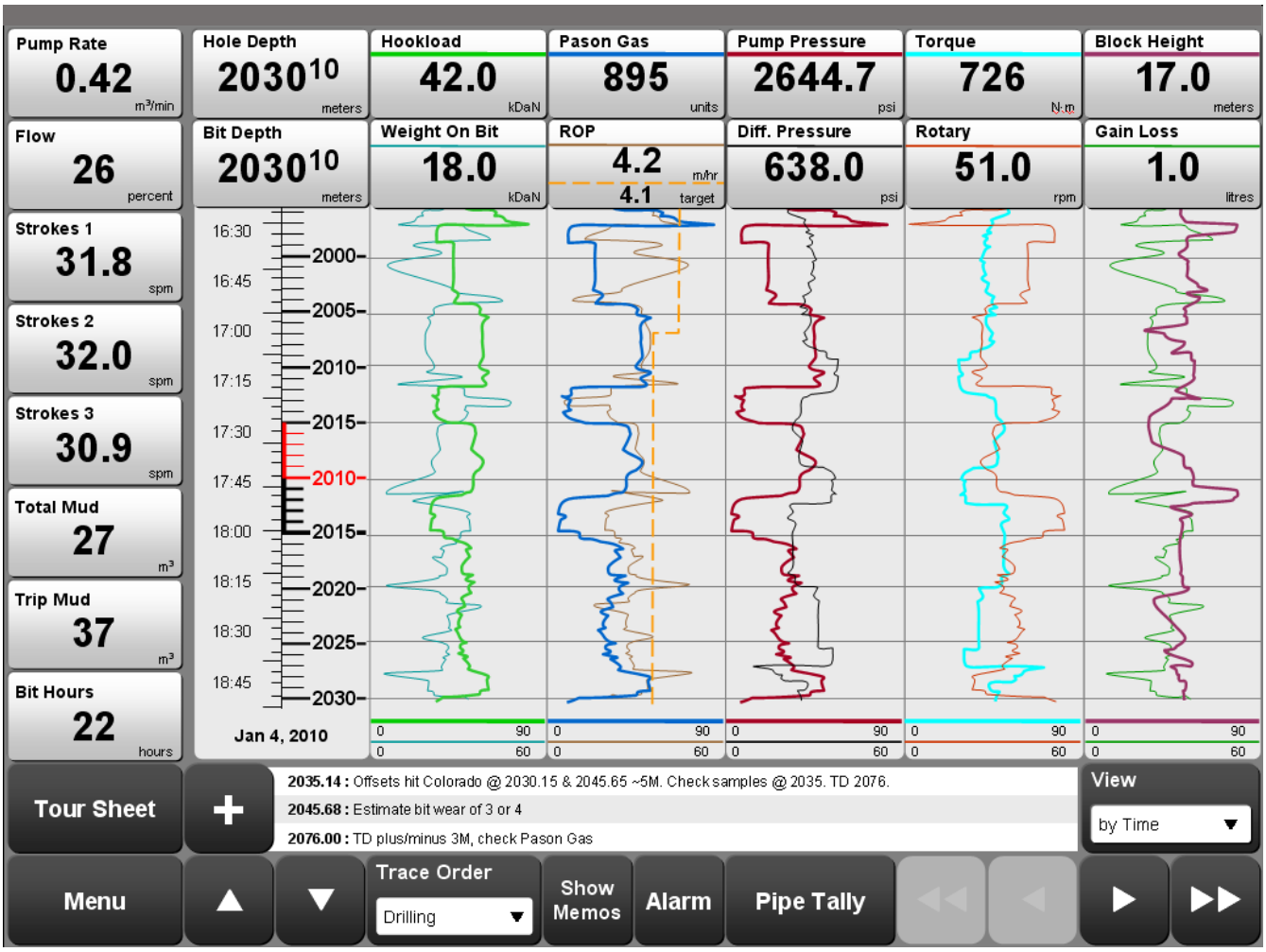


Figure 5: EDR Main Screen, 5 Plots, 2 Traces per Plot, Tracker Plan Enabled

It will also be possible to stack traces that contain the tracker plan. This limits the screen space available for graphing due to the display of the tracker status bar.

1.4 Information Bar

The Information Bar is located at the top of the screen as shown in the figure below:

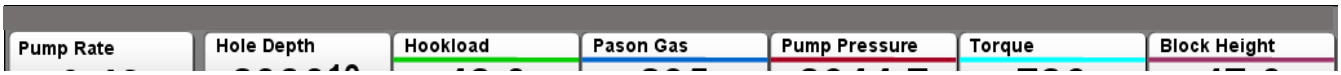


Figure 6: Information Bar

1.4.1 Font Sizes and Colors

The example shown was drawn in 10pt Arial font, RGB (234,234,234).

1.4.2 Workstation Label

The workstation label is located at the far left of the Information Bar and contains the workstation identity. This identity will be the same as exists in the system today: RMPC, DHC, OPERATOR WKSTN, GEOLOGIST WKSTN, DHC WKSTN.

1.4.3 Operator Label

The operator label is located in the middle of the screen. It contains the following information:

<Well Name> <Short Contractor Name> <Rig #>

1.4.4 Time

The current time of the TPC is displayed in the upper right hand corner.

1.4.5 Upgrade Button

If an upgrade is available for download, an upgrade option button is displayed just to the left of the current time display.

This button is only visible on the RMPC and will not be available on the workstations or the DHC.

1.5 General Look and Feel

The screen shots presented in this document show a look and feel that is an updated version of the look on the current product.

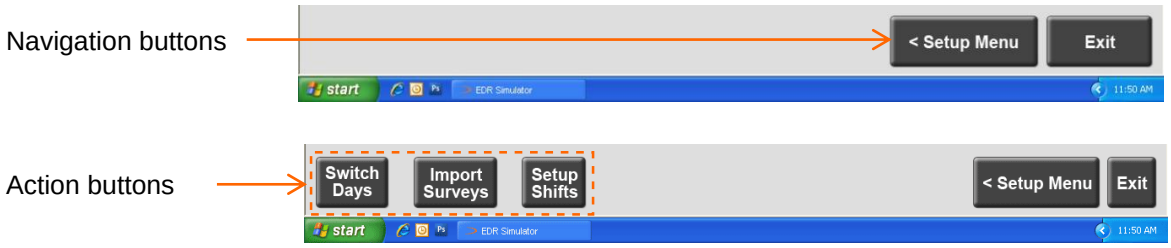
This look will be phased in over time.

1.5.1 Button Conventions

When referring to buttons in this document, there are two styles that will be referred to.

1.5.1.1 Primary Buttons

In the Tero UI Style Guide these are referred to as Navigation Buttons or Action Buttons. Throughout this document, these will be referred to as Primary Buttons.



1.5.1.2 Secondary Buttons

These buttons generally appear in dialogs and in locations other than the bottom of the main screen.

Using an example from the Tero UI Style Guide, the following is what is referred to when referencing a Secondary Button.

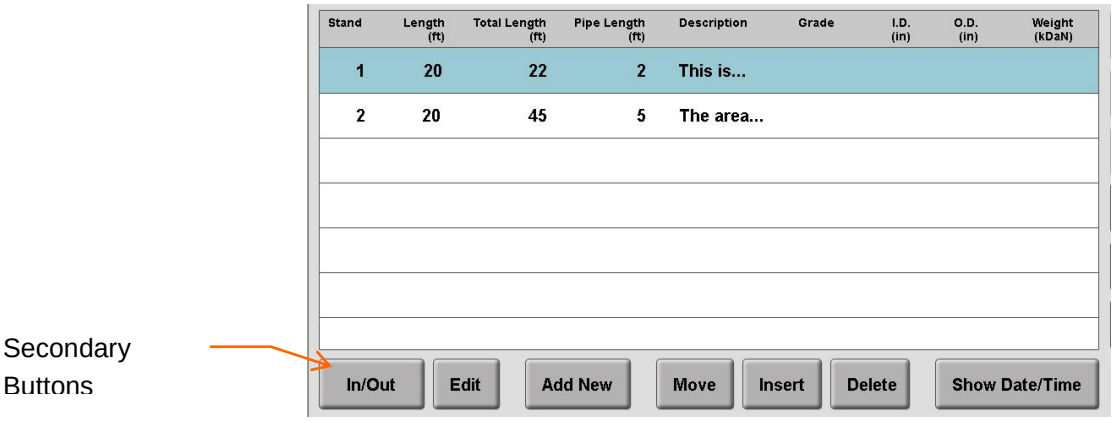
1.5.1.3 Grey Out State in List Items

In cases where list items are greyed, the look shall be as follows:

- Text and Arror color shall change to 192,192,192.
- Box and text size, border and fill remain the same.
- User is not able to act on the item.

1.5.2

1.5.3



1.5.4

1.5.5 Phase 1

In Phase 1 the Main Screen Boxes are updated to match the look presented in this document. Any other screens that show boxes and buttons will continue to follow the existing look and feel. Buttons on new screens will follow the existing look and feel.

1.5.6 Phase 2

This phase will align the button looks as they are presented in this document. All screens will follow the updated button look.

Boxes will also be updated on the subscreens to create a new look to match this document.

1.6 Bottom Button Bar

Figure 7: Bottom Button Bar

Description	
The bottom button bar contains several utility buttons that operator on the graphs or link to other screens. Referring to the Tero Style Guide, these buttons follow the look of the Tero Navigation Button and Tero Action Button for touch screen designs. Figure 7: Bottom Button Bar shows an updated look to these buttons that will be phased in. The first release of the product will follow the button styles, as described in the current style guide. The second release of the product will update the look to align the buttons with how they appear on all screen shots in this document.	
Requirements	
The user can link to the menu screen. The user can page the plots up or down in time or depth depending on the screen configuration. The user can page the trace order one full page forward or backward. The user can scroll the trace order one plot at a time. When navigating away from the main screen, only a single row of Boxes will be displayed on the top row of the screen. For example, if the user were to click on the Pipe Tally button they would be taken to the Pipe Tally Screen. Only a single row of boxes would be displayed along the top of the screen, even if stacking were enabled.	
Sub Components	
Menu Button	Tero Navigation Button (See Tero User Interface Style Guide).
Up / Down Buttons	Tero Navigation Button. Follow existing enabled and disabled colors and look.
Trace Order Menu	Described in section Trace Order Menu, Trace Order Menu
Show / Clear Memos	Tero Action Button
Alarm Button	Tero Navigation Button
Pipe Tally	Tero Navigation Button
Double Arrow Buttons	Tero Action Button. Follow existing enabled and disabled colors and look.
Single Arrow Buttons	Tero Action Button. Follow existing enabled and disabled colors and look.
User Actions	
Click / Press ‘M’ key	Takes the user to the Menu subscreen.
Up / Down buttons pressed.	Scrolls the plots forward or backward in time.
Up / Down arrow keys pressed.	Same action as the button up / down arrow button press.

Right / Left double arrow buttons pressed.	Pages the plots in the order by a full screen worth of plots. I.e. in 5 plot configuration, the right arrow displays the next 5 plots in the order.
Right / Left arrow keys pressed.	Same action as Right / Left double arrow button.
Right / Left single arrow button pressed.	Scrolls the plots left or right, one plot at a time. For example: pressing '>' displays the next plot in the order and moves the left most plot out of the displayable area.
Right / Left angle bracket key pressed.	Same action as the single arrow button.
Click Show / Clear Memos button	Clears the visible memos from the screen. Described in section Memos Display, Memos Display.
Click Alarm Button	Takes the user to the Global Alarm Setup dialog box. Displays 'Horn Off' in amber color if the horn is set to 'off'. Displays 'Alarms Disabled' in amber color if the alarm system is disabled. Amber Color spec: (255, 210, 0). Displays 'Alarms Enabled' if: Alarm System is enabled AND the horn is configured as 'On'. Displays 'ALARM' and flashes red and light grey if any trace is in an alarm state. The Red RGB value is specified in the UI Style guide.
Click Pipe Tally Button	The user is taken to the existing Pipe Tally screen.

1.7 Trace Order Menu

The Trace Menu will allow the user to conveniently switch between trace orders, as well as providing access to common Trace Order Management functions and configuration options.

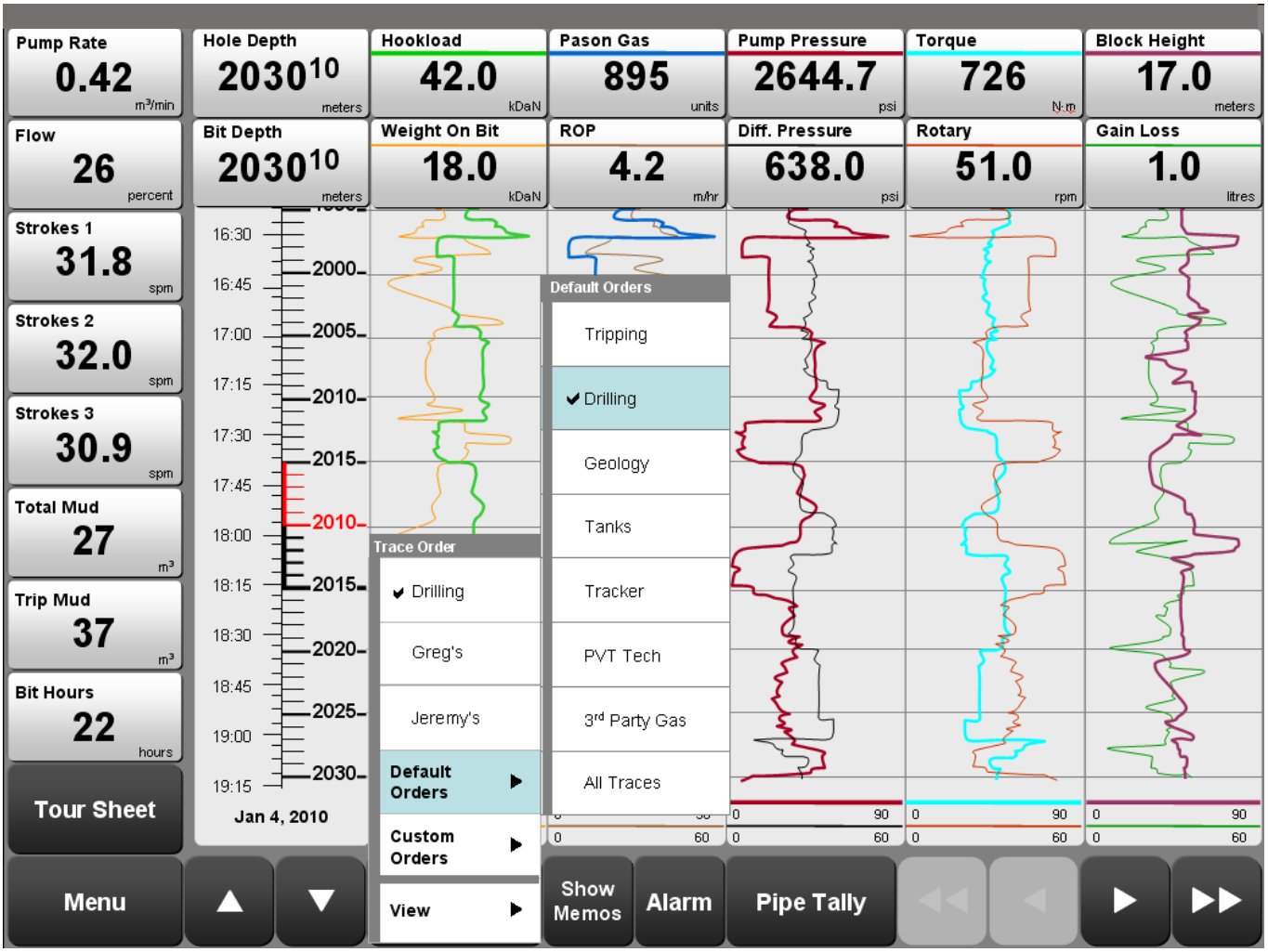


Figure 8: Trace Menu, Default Order Selection.

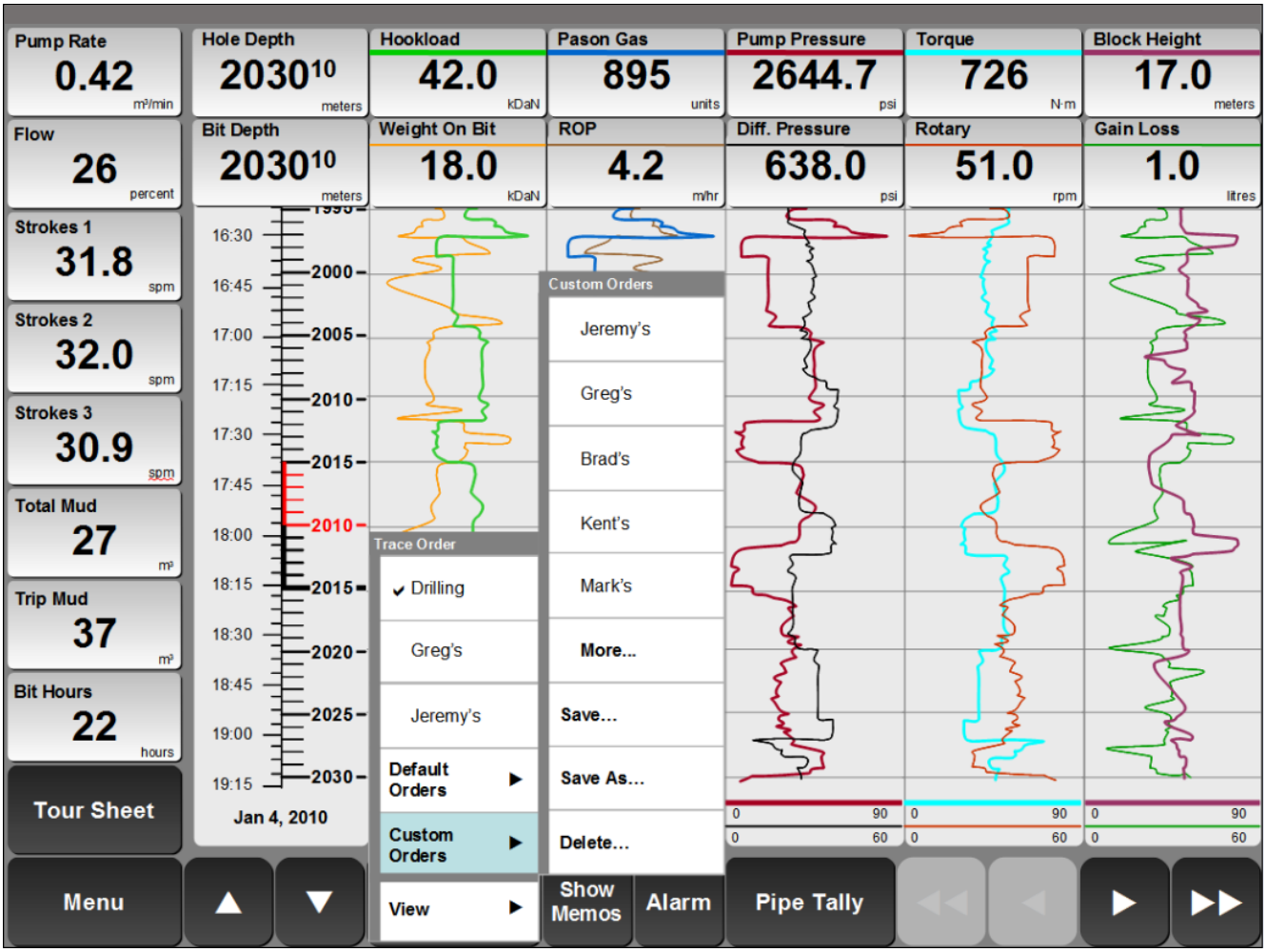


Figure 9: Trace Menu, Custom Order Selection

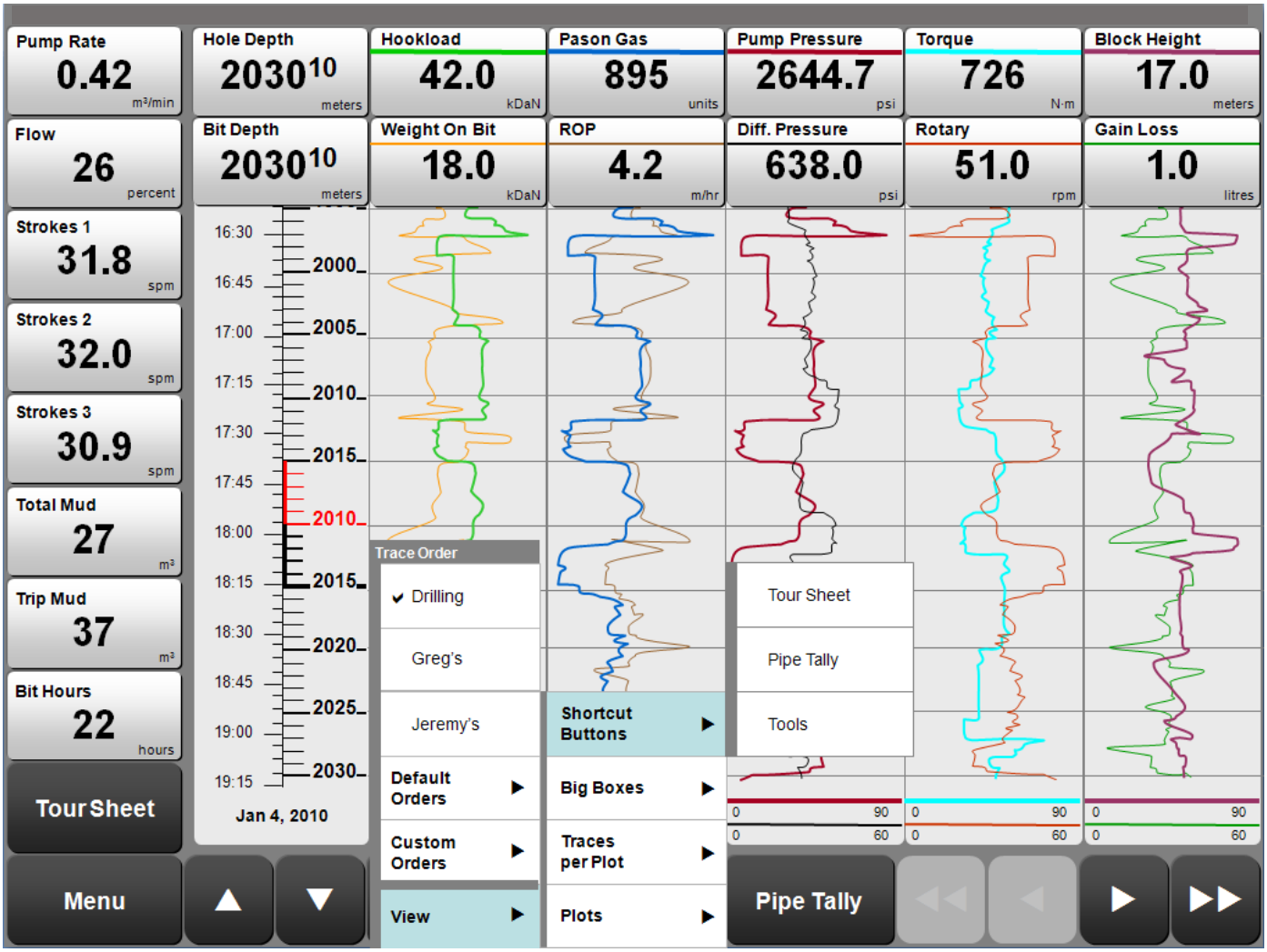


Figure 10: Trace Menu, View Option Selection

Description
The Trace Menu is located on the Button Bar located at the bottom of the screen. Its functions is to allow convenient access to the available trace orders, common screen configuration options related to the Trace Order, and options to create and save new trace orders.
Requirements
The Trace Menu will follow the standard look and feel for button menus, as depicted in the Main EDR Screen section. When not clicked, the button menu will display the name of the currently selected trace order. Any currently configured or selected menu items are displayed with a check to the left of the selected entry. The user can change order from this menu, as well as change display options for the order. The user can save and delete the current trace order. For greyed out items, follow the style mentioned in Grey Out State in List Items, Grey Out State in List Items.

Sub Components	
1. Highlighted selection display.	A light blue indicator is used to show the selected row of the menu. This color follow the style guide table row selection color: #9ACAD3 (154,202,211).
2. Selected Order Display	When the button has not been clicked, it will display the currently selected Trace Order name.
3. Default Orders	Lists the default trace orders that are provided with the EDR.

4. Custom Orders	Lists the 5 most recently used Custom Trace Orders. **More**: Opens a dialog that lists all orders in alphabetical order. If a new order is selected, it will show up in the Trace Order menu button, the last 3 orders section, and in the Custom Order Section as a selection. **Save:** Grey out if the selected order is a Default Order. **Save As:** Allows the user to save the changes to the current order in a new custom order. **Delete:** Grey out if the selected order is a Default Order.
5. View	**Shortcut Buttons:** Displays, in order from top to bottom, the Boxes that are configured as Shortcuts. **Big Boxes:** Displays 9 or 16 box view options. **Traces per Plot:** Configuration of the # of traces per plot. This setting is stored and associated with the current trace order. For the first phase of the project, selections are 1 or 2. **Plots:** Configuration of the # of plots to be displayed on the screen. Note: this is not required for the first project phase.
User Actions	
Open Menu	• Clicking on the menu will open the menu and display the first tier of menu options.
Select a Default Order	• User clicks on the Trace Order Menu. • User selects 'Default Orders'. • User selects one of the default orders. 1. The Box Order, Plot Orders, and EZView orders are all updated to reflect the selection. 2. A check is placed next to the selected order in the Default Orders section and in the last selected section of the menu. 3. The Trace Order Menu is closed.
Select a Custom Order	• User clicks on the Trace Order Menu. • User selects 'Custom Orders'. • User selects one of the custom orders if it is visible in the menu: 1. The Box Order and Plot Orders are updated to reflect the selection. EZView is also updated if EZView is currently being displayed on screen. 2. A check is placed next to the selected order in the Default Orders section and in the last selected section of the menu. 3. The Trace Order Menu is closed. • If the order is not visible in the Menu, user clicks 'More Orders': 1. Trace Order Menu is closed. 2. A dialog is displayed which lists all of the available orders, sorted alphabetically.

	3. The user makes a selection. 4. The user clicks 'Ok' to apply the selection. ▪ The selected order is updated, on screen. ▪ The Trace Order menu button displays the newly selected order.
Select different order, unsaved changes in current order	If the user has unsaved changes in their current order and selects a different order: • The user selects a custom or default order. • A Dialog is displayed that gives the user the option to: 1. Save As a new Custom order. 2. Save to the current order (only available if the current order is not a Default order) • Figure 11: Change Trace Order: Default (unsaved, modified) to a different order. • Figure 12: Change Trace Order: Custom Order (unsaved, modified)
Changes made to a Default or Custom Order.	• The currently selected order is a default order. • The user makes a change to the trace order. • The Trace Order menu displays the selected order name with a '*' to the right of it. E.g. 'Drilling*'. • The change is stored in a temporary trace order named 'Drilling*'. • The temporary trace order is deleted if: 1. The user changes to another order and selects 'Don't Save'. 2. The user saves the order (Only applicable to Custom Trace Orders). In this case the change is stored in the custom order and the '*' will be removed from the order display. 3. The user saves the order under a new name. In this case the changes are applied and stored in a custom order with the new name. The newly saved order becomes the currently selected order.
Unsaved changes made to a default/custom order, power is lost, and then restored. or Unsaved changes made to a default/custom order, user restarts thin client.	• Before power loss or closing the client, all changes would have been saved, as they are made, in the temporary order name: <Order>*. • When client is restarted, the temporary order is restored and displayed on screen. • The selected order will be displayed as <Order>*.
Configure # of Traces Per Chart	• The user clicks on 'View' → Traces / Plot • The user selects from 1, or 2. The current selection is shown with a 'check'. • The plot display is updated to reflect the change. • The selected Trace Order is updated to store the change to the display.
Switch to EZ View	• The user clicks on 'View' → Big Boxes • The user selects either 9 or 16 box views.

(Option not available in first release).	• The screen is updated to display 9 or 16 boxes.
Save the current order	• User selects 'Custom Orders' → 'Save'. • The order is saved using the current name. • If the order is a default order, this option is greyed out.
Save the current order with a different name.	• The user selects 'Custom Orders' and 'Save As …' • The user is prompted to enter the name of the new order. • The order is saved under the new name and will show up in the 'Custom Orders' menu. The Custom Orders menu will display the custom orders in alphabetical order. • The selected order is changed to the new order.
Delete the current order	• The user clicks on 'Custom Order' → Delete. • The user is provided with a dialog that lists the custom orders. • The user must select an Order to delete from the list of custom orders. • When the user selects an order and clicks 'Ok', the user is prompted to confirm the deletion of the selected order. • If the currently selected order is deleted, the Default Drilling Trace Order is set as the current order. • If the user selects 'Cancel' from the deletion dialog, no action is taken to delete the order.
Modify a shortcut button	• User selects 'Trace Order' → Selects a shortcut. • The user is taken to the shortcut button edit dialog. See Shortcut Box, Shortcut Box.

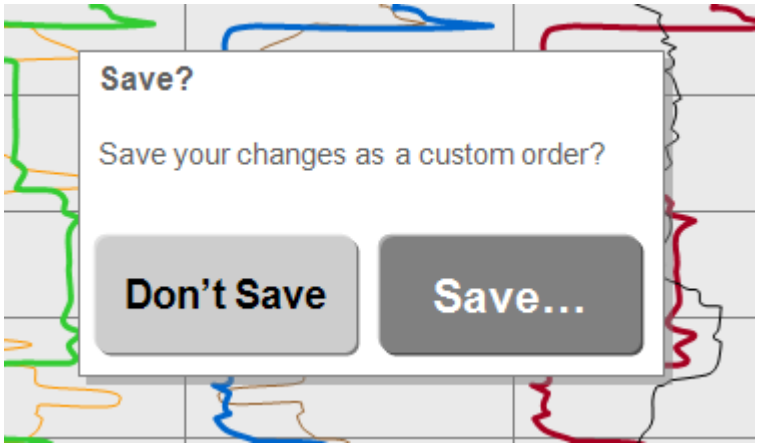


Figure 11: Change Trace Order: Default (unsaved, modified) to a different order.

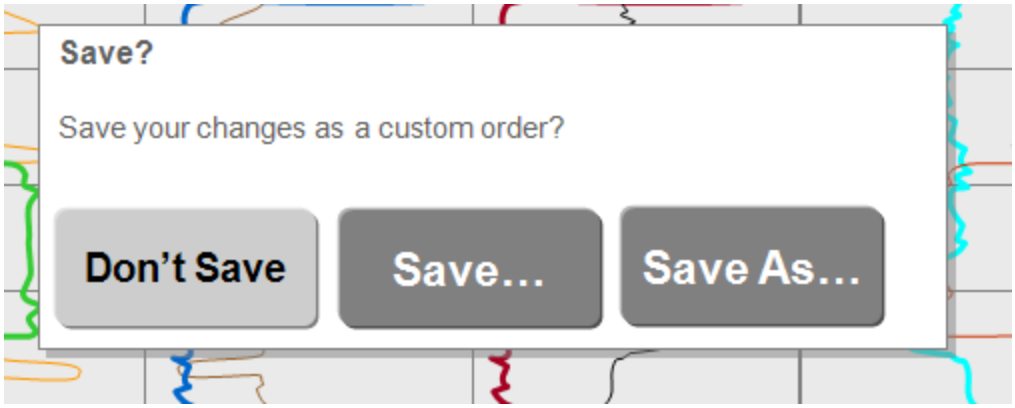


Figure 12: Change Trace Order: Custom Order (unsaved, modified)

1.8 Real Time Box Container

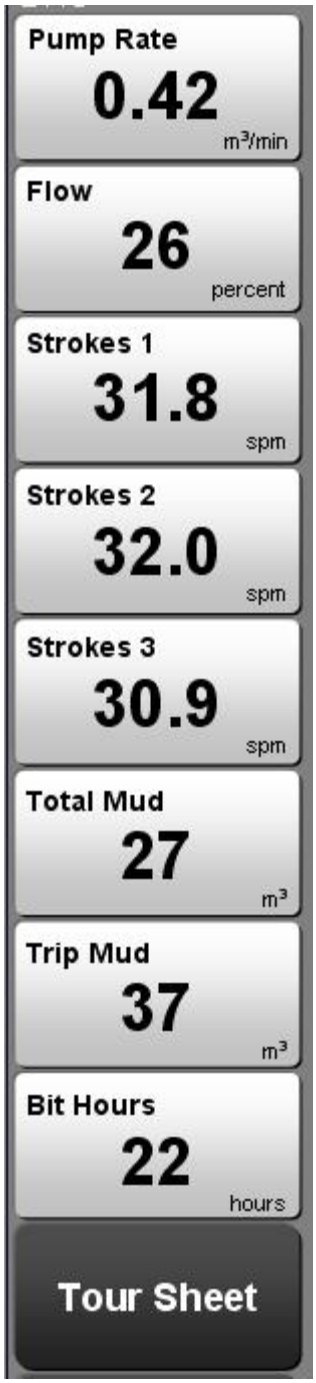


Figure 13: Real Time Box Container

Description
The Real Time Container is on the far left side of the screen, and excludes the Menu button. This area contains 9 Real Time Boxes and/or Shortcuts.
Requirements
The Boxes in this container can be configured as Shortcuts or as Real Time Boxes. Clicking on a Shortcut takes the user to the associated subscreen. The available Shortcuts to other screens are: - Calculator - Chat - Choke - Diagnostics Menu - Direction Survey - Megajoules - Memo - Tero Gas - Sample - Setup - Tools - Tour Sheet - Wireline. The behavior contained in each of the above screens remains unchanged and subsequently is not covered in this document. The Real Time Box will display the following information: 1. Name of the trace at the top. 2. Value of the Trace. 3. Trace Units. The Hole Depth Box, if displayed, cannot be configured as another trace. When a Real Time Box is selected, its display changes to a solid black background with white text.

Sub Components	
Real Time Box	See Real Time Boxes and Trace Boxes, Real Time Boxes and Trace Boxes.
Shortcut Box	Displays the shortcut to another screen, Shortcut Box, Shortcut Box.
Empty Box	Box with an empty configuration representation. See Empty Box, Empty Box.
User Actions	
Click on Real Time Box	Open the Real Time Box dialog
Click on Shortcut Box	Navigate to the screen specified by the shortcut.
Click on Empty Box	Display the Shortcut Dialog: Shortcut Dialog, Shortcut Dialog.

1.8.1

1.9 Boxes

1.10

1.10.1 Real Time Boxes and Trace Boxes

A Box that is not associated with a plot is called a Real Time Box. Real Time Boxes are displayed as follows:

Figure 14: Real Time Boxes

A box associated with a Plot is called a Trace Box. Trace Boxes are displayed as follows:

Figure 15: Trace Boxes

Figure 16: Trace Box Components

Box Size: 145px wide, 75 px high (for the 5 plot display)

Note: The size represents the desired minimum size of the Boxes.

By design only the Trace Boxes will stretch and become larger when displayed on displays larger than 1024x768. In Phase 2 of this project it will become necessary to scale the Trace Boxes in cases where 6 Plots are selected on a smaller display.

Shadowing: 1px at top and left, 2px at bottom and right

Simple Gradient:

- 3 band gradient
- Top Band: 18px, (245,245,245)
- Middle Band: 26px, (230,230,230)
- Bottom Band: 18px, (220,220,220)
- A resizable ratio of 1:2:1 will be maintained when scaling these boxes.

Text Color: Black (0,0,0)

The general components of the Boxes are:

- Trace Label (Top Band Area)
    - Title case text.
    - Text: Top is 2px from top, bottom is 4px from bottom.
    - Left align text, 5px spacing from left.
    - Size text to find in the 12px vertical space that remains.
- Trace color indicator: Only visible for Trace Boxes.
    - Line thickness will be 4px.
    - Color matches the color configured for the Trace.
- Current Value (Middle Band)
    - Top of text is 8px from the top of Middle Band.

- Bottom of text is 4px from the bottom of Middle Band.
- Size text to fit in remaining 24px area.
- Text is centered, with a 5px margin on right and left sides.

- Units (Bottom Band)
  - Text: 4 px from top of Bottom Band, 5 px from bottom.
  - Size text to fit within top and bottom margins (9 px high)
  - Mixed case text.
  - Right align text with 5px margin on the right.

When support is added for screen resizing and for more than 5 Plots, these boxes will have to be capable of resizing the text and the box to fit within different sized areas.

1.10.2 Shortcut Box

If a Box is configured as a Shortcut, the value display area will show the name of the shortcut. The Box becomes a Tero Navigation Button in this case.

1.10.3 Empty Box

If a Box does not have a Trace associated with it then it will have a header that displays 'Click to add …'. The value display area will contain a '+' symbol and the unit display area will be empty.

1.10.4 Alarm State

If the box is in an alarm state, the text is changed to Red, as indicated below.

Figure 17: Trace Box Alarm Display

1.10.5 Tracker Plans

The Tracker Plan trace value is shown on the Plot if Tracker is enabled. This will be shown with a dashed, orange line color below the parameter value, as displayed below.

Tracker Orange RGB Value: (234,129,0)

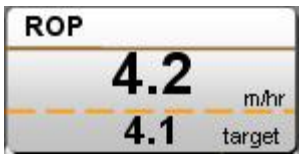


Figure 18: Trace Box with Plan

When a trace goes into an alarm state, all text turns red, except for the Tracker target values. The reason for this is that Tracker does not have alarming implemented as of the writing of this document, and representing target values as being in an alarm state could be misleading.

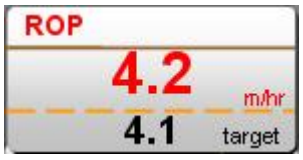


Figure 19: Trace Box, with Plan, in Alarm State

The Real Time boxes will appear as above, with the exception of the Plot Color indicator.

1.10.6 Error Displays

There are two types of sensor display to indicate a problem with the sensor or sensor reading.

If an out of range value has been received from a sensor, the box will show an empty reading area.

Figure 20: Sensor reading out of range.

If data has not been received from the sensor, double dashes are displayed in place of the sensor reading.

Figure 21: Data not being received from sensor.

1.10.7 Error Display: TPC Not Receiving Data

If the DHC stop sending data to the TPC, all clients will detect this condition and change the display of all Current Reading Boxes to reflect the fact that new data is no longer being received. The display of all boxes changes to a darker solid grey background with light grey text.

Background Color: (128,128,128)

Text Color: (192,192,192)

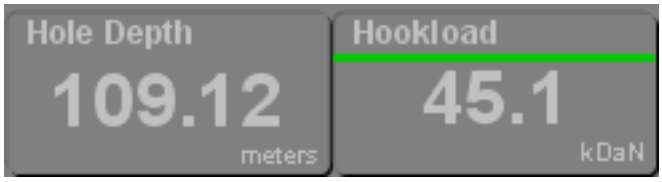
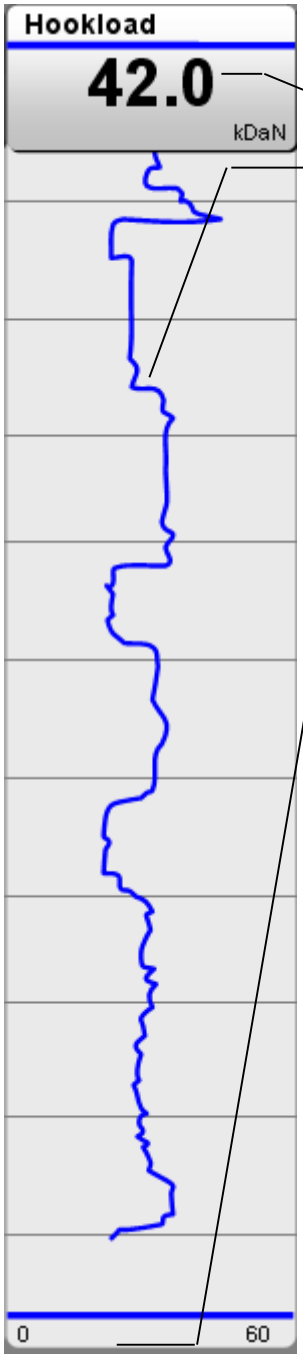


Figure 22: TPC Not Receiving Data, Example of Real Time Box (Left) and Trace Box (Right)

1.11 Plots

1.11.1 1 Trace Per Plot View



Plots will consist of the following components:

- 1 - 2 Trace Boxes at the top of the Plot.
- A Trace displaying the data.
    - The color of the Trace is configurable and matches the line color in the Trace Box.
- A scale range indicator.
    - The indicator color matches the color of the Trace and Trace Box color indicators.
    - When in alarm condition and the alarm limit displays are enabled (Menu → Setup → Screen → 'Show Alarm Limits'):
        - Shows the alarm limit that was exceeded in Red.
- Plot Background Color: (234,234,234)
- Plot Horizontal Line Color: (128,128,128)
- Default Blue Trace Color: (0,0,255)

Figure 23: Unstacked Trace.

Figure 24: Stacked Traces, With Alarm Limit Indicators Enabled

1.11.2 Stacked Display

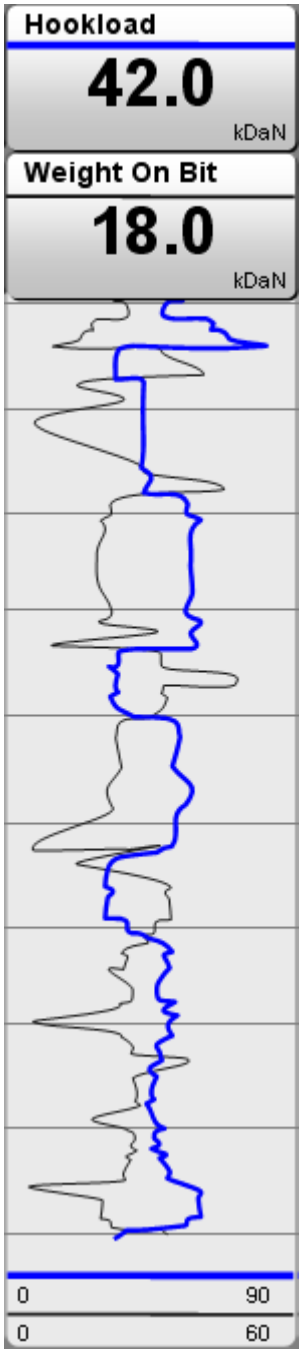


Figure 25: Stacked Trace Plot

- Default top Trace Color is Blue (0,0,255)
- Default bottom Trace color is Black (0,0,0)
- Both trace lines are of equal thickness.
- Scale range indicator order matches order of the Boxes. Blue on top, black on bottom.

1.11.3 Fat Trace Display

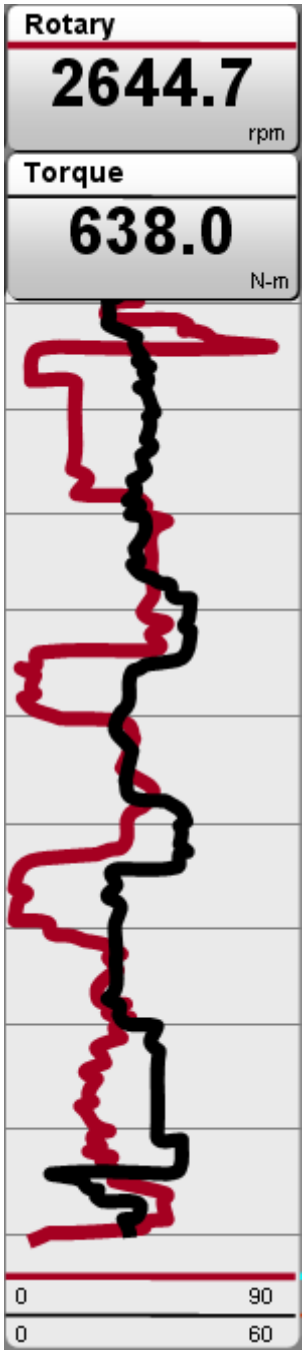


Figure 26: Fat Graph Display

Fat Traces are available for only a few traces:

- Hook Load
- Standpipe Pressure
- Rotary Rpm
- Rotary Torque
- Weight on Bit

This mode of display can turned off from the EDR screen setup (not part of this FD).

When in Fat display, each graph will display the following:

- Line for Max value.
- Line for Min value.
- Solid graph fill between max and min values.

Display conventions:

- The Graph associated with the Trace Box on the top row is displayed over top of the graph associated with the second Real Time Box row.

User Actions:

- Clicking on the scale range indicator will move the associated trace to the foreground.

1.11.4

1.11.5 Scale Range Indicator

Description	
The scale range indicator display the min and max scale ranges associated with a particular trace.	
Requirements	
Display the min / max values of the associated Trace scale. Indicate the color of the associated trace. Display alarm setting in Red when a trace is in an alarm state.	
Sub Components	
Min / Max Scale Indicator	Indicates the min and max display values of the graph.
Alarm indicator	When in alarm state, the value of the alarm limit that was exceeded is displayed in Red.

Trace color indicator	A solid colored line that matches the color of the Trace associated with the scale.
User Actions	
Click on range indicator.	The Trace associated with the range indicator will be displayed on top of all other traces.

1.11.6 Current Reading Bar

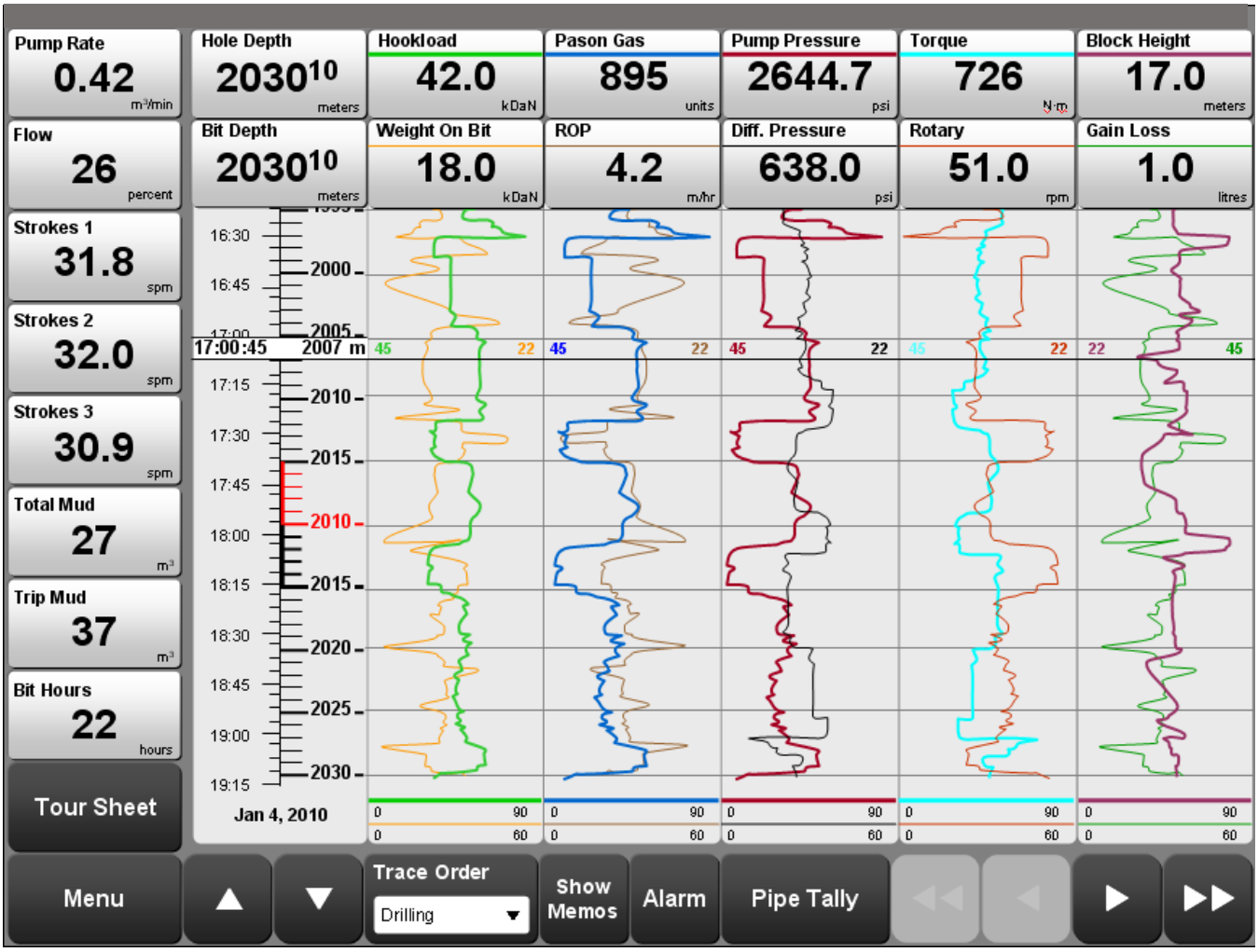


Figure 27: Current Reading Bar

Description
The current reading bar will display the values associated with the graph position that the line intersects.
Requirements
Clicking on any Plot will display the bar. The bar can be moved up or down using page up / page down buttons. The top of the bar displays the max values for the graph at the selected time or depth. - In the time / depth graph, the time and hole depth are displayed on top of the bar. - In the time / depth graph, the bit depth is displayed below the bar. For Fat traces, the min value is displayed below the bar, only if Fat curves are enabled.

The text color will match the color of the graph. If tracker is enabled, the planned value is displayed above the max value for the trace.	
Sub Components	
Reading Values	Displayed as description in requirements.
User Actions	
Click on Graph	Current reading line is displayed or moved from previous position.
Page Up Button	Moves the current reading bar up by one increment and updates the display.
Page Down Button	Moves the current reading bar down by one increment and updates the display.
User clicks on scale or in workstation display area.	Current reading bar is removed from the display.

1.11.7 Time / Depth Plot

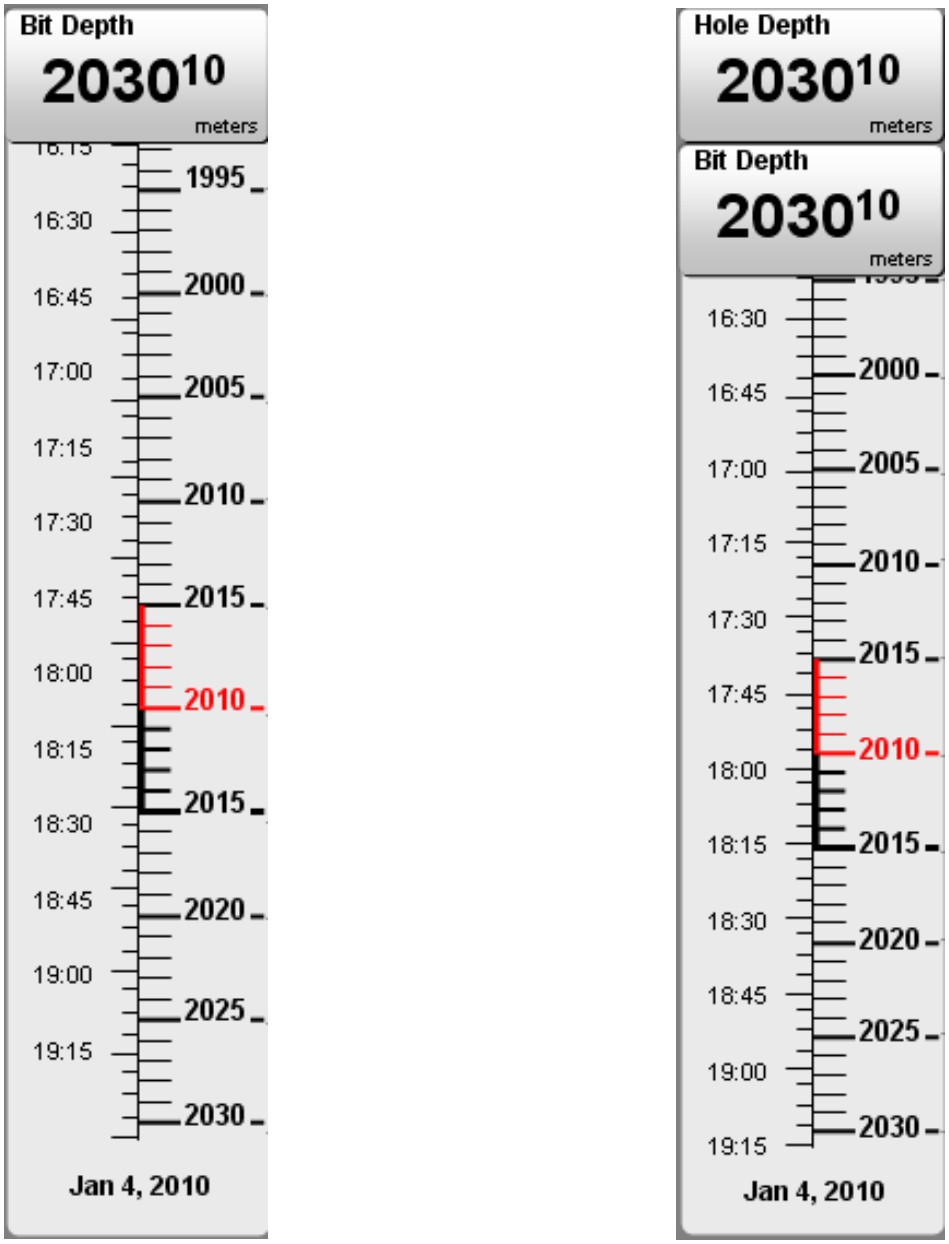


Figure 28: Time / Depth Plot (Left Figure: Single Trace / Plot View, Right: Multi Trace / Plot View)

Description	
The Time / Depth graph will display both the time scale and the depth scale in a single trace graph. The graph will have the ability to show a time based view or a depth based view.	
Requirements	
Plot Depth and Time in a single plot. Display the Current Date being viewed. For Time View: - The Time is displayed on the left of the plot and is used as the axis for all other Plots, including the Depth side of the Plot. For Depth View: - The Depth is displayed on the left of the plot and is used as the axis for all other Plots, including the Time side of the Plot.	
Sub Components	
Depth Graph	Display the depth tick increments every 0.2 m or ½ foot, if configured in the screen setup. Display the major depth tick increments depending on the scale setting. For example 10 m increments. For each major depth increment, display text indicating the depth associated with the tick. When tripping out of the hole, a solid red bar is displayed. The depth ticks are shown coming out of this bar. The bar indicates that the bit is not on bottom. When going into the hole, a solid black bar is displayed with the depth ticks shown coming out of this bar. The bar indicates that the bit is not on bottom. When going into the hole, if the bit is on bottom, the solid black bar is not displayed.
Date Display	The current date being viewed in the graph is displayed at the bottom of the depth/time graph. When spanning the midnight time boundary, the date of the previous day is displayed in place of the midnight time.
User Actions	
Click on Plot	Displays the dipstick across all the plots.

When in the Time View:

- The time axis of the graph will display fixed time increments according to the current screen scaling.
- The time axis is displayed on the left side of the Time / Depth Plot.
- All other graphs, including the Depth, will align with the time axis.
    i. E.g. ROP Graph: ROP = f(time)
    ii. E.g. Depth graph: Depth = f(time)
- The Depth Graph will display a depth tick to represent that the bit has traveled a certain distance.
    i. E.g.: Fast drilling means the ticks are closer together, slow drilling means the ticks become farther apart.

When in the Depth View:

- The depth axis of the graph will display fixed depth increments according to the current screen scaling.

- The Depth View will show the well depth on the depth axis and the first time that those depths were reached on the time graph.
- Unlike the time view, the Depth View does not show a bit depth indicator and the graph does not have an indicator for when the bit was coming out of the hole.
- The depth axis is displayed on the left side of the Time / Depth Plot.
- All other graphs, will align with the depth axis as their y axis:
    i. E.g. ROP Graph: ROP = f(depth)
    ii. E.g. Time graph: Time = f(depth)
- The Time Graph will display a time tick to show how much time it took to drill from depth x to x+1:
    i. Slow drilling means the ticks are close together, fast drilling means the ticks are farther apart.

1.12 Change Trace Dialog

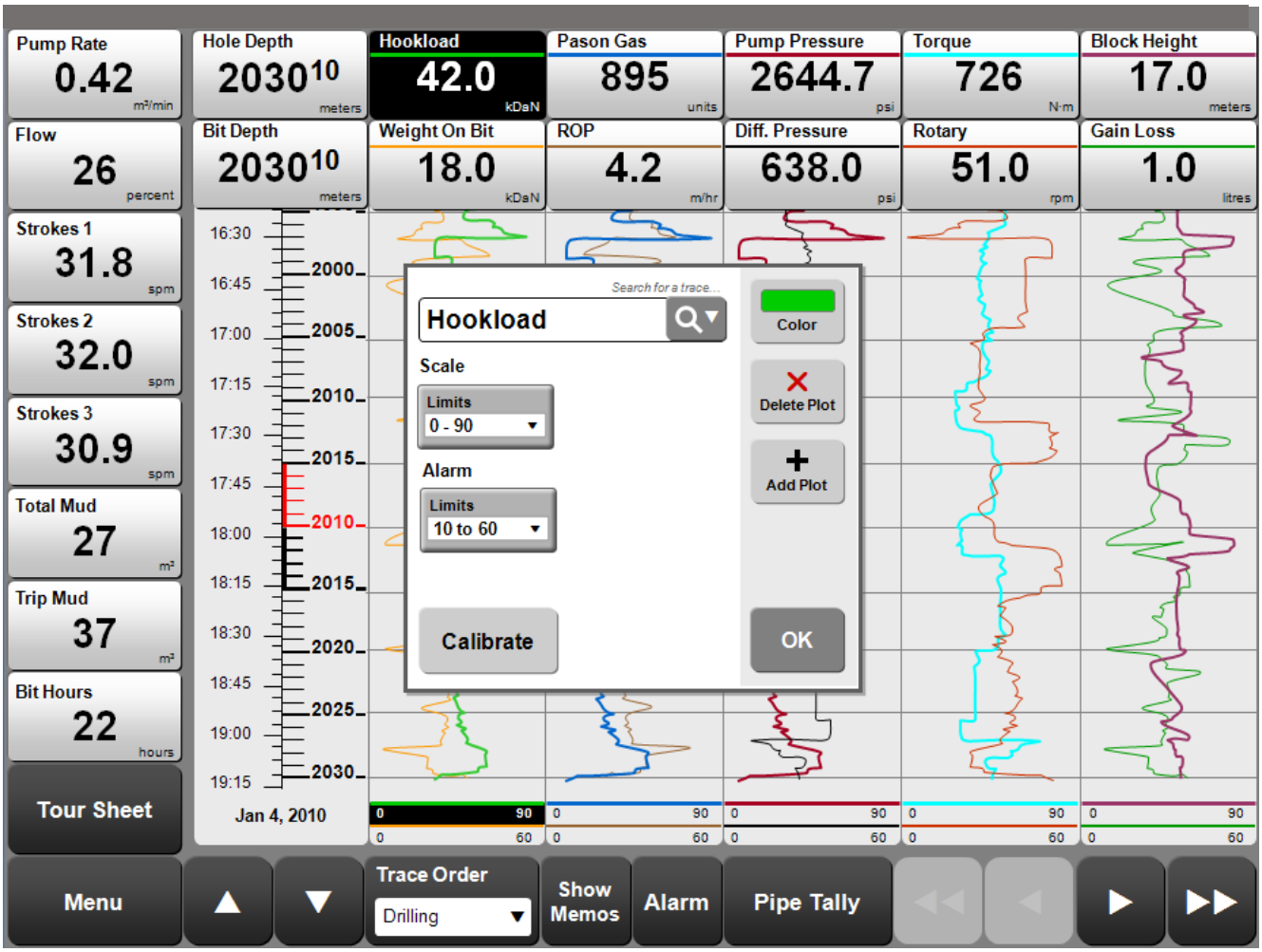


Figure 29: Change Trace Dialog

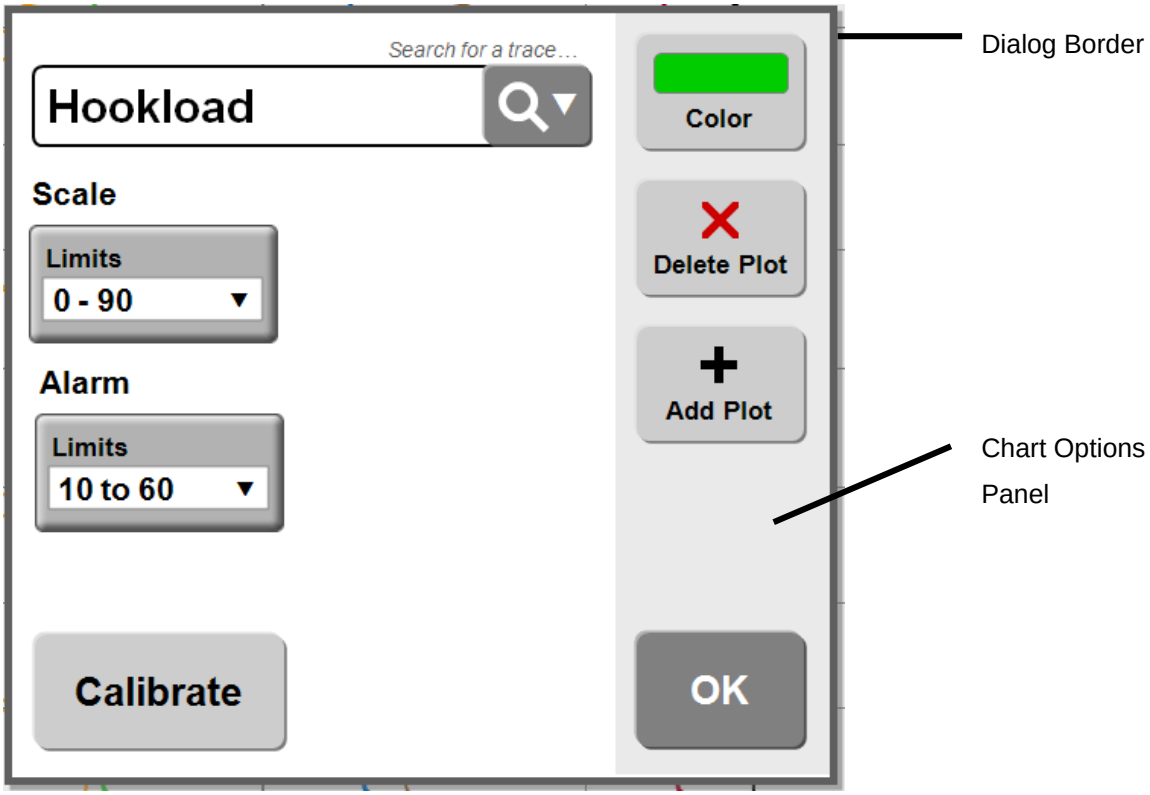
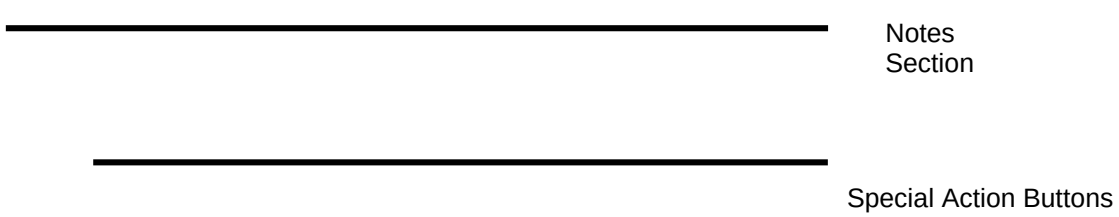


Figure 30: Change Trace Dialog: Component Areas

Description	
The Change Trace dialog is displayed when the user clicks on a Trace Box. It allows the user to change the alarm settings, scale ranges, special trace settings, the Trace associated with the Box and Plot, and the Trace color.	
Requirements	
The Change Trace Dialog allows the user to configure the following things: 1. The Trace to be displayed in the Box and in the Plot. 2. The alarm and scale properties of the trace. 3. Special settings of the selected trace. Examples are: zero WOB, display a trace in special circumstances.	
Sub Components	
Dialog Background Panel	Main container of all dialog components. RGB color value is white (255,255,255)
Trace ComboBox	This combo box allows the user to select a different trace from a list, or search for traces that match the typed text..
Scale Button	Display Value Button. Displays current setting, clicking opens a dialog to change the value.
Alarm Button	Display Value Button. Displays current setting, clicking opens a dialog to change the value.
Setup Section	Special settings for the trace are contained in this section. Not all traces have special settings, in which case these options are hidden. See section Setup, Special Actions Buttons, and Notes Section of Change Trace Dialog, Setup, Special Actions Buttons, and Notes Section of Change Trace Dialog for a complete description.
Special Action Buttons	Secondary Button. These change dynamically depending on the trace and are described in Setup, Special Actions Buttons, and Notes Section of Change Trace Dialog, Setup, Special Actions Buttons, and Notes Section of Change Trace Dialog.

Plot Options Panel	Contains the Color Chooser, Delete Plot, and Add Plot, and OK buttons. RGB color: (234,234,234)
Color Chooser	Secondary Button with 'Color' text and display of selected Color.
Delete Chart	Secondary Button.
Add Plot Button	Secondary Button.
Dialog Border	The dialog box order is drawn with 4 pixels in thick. RGB color: (0,0,0)
Ok Button.	Primary Button.
User Actions	
Click Ok	Exits the dialog.
Select or type in Trace Chooser.	See Trace Combobox, Trace Combobox.
Click Scale Button	Opens the Scale Settings dialog. See Scale Settings Dialog, Scale Settings Dialog.
Click Alarm Button	Opens the Alarm Settings dialog. See Alarm Settings Dialog, Alarm Settings Dialog.
Click Color Chooser	Opens the Color Chooser dialog.
Click Delete Plot	Removes the Plot from the screen and shifts all other plots over to fill the empty area. Removes the Traces that were displayed on the Plot from the Trace Order.
Click Add Plot	Inserts an empty Plot on the screen to the left of the Plot associated with the selected Trace. All other Plots shift over one plot location to the right. The rightmost Plot will be shifted off screen.

1.12.1 Setup, Special Actions Buttons, and Notes Section of Change Trace Dialog



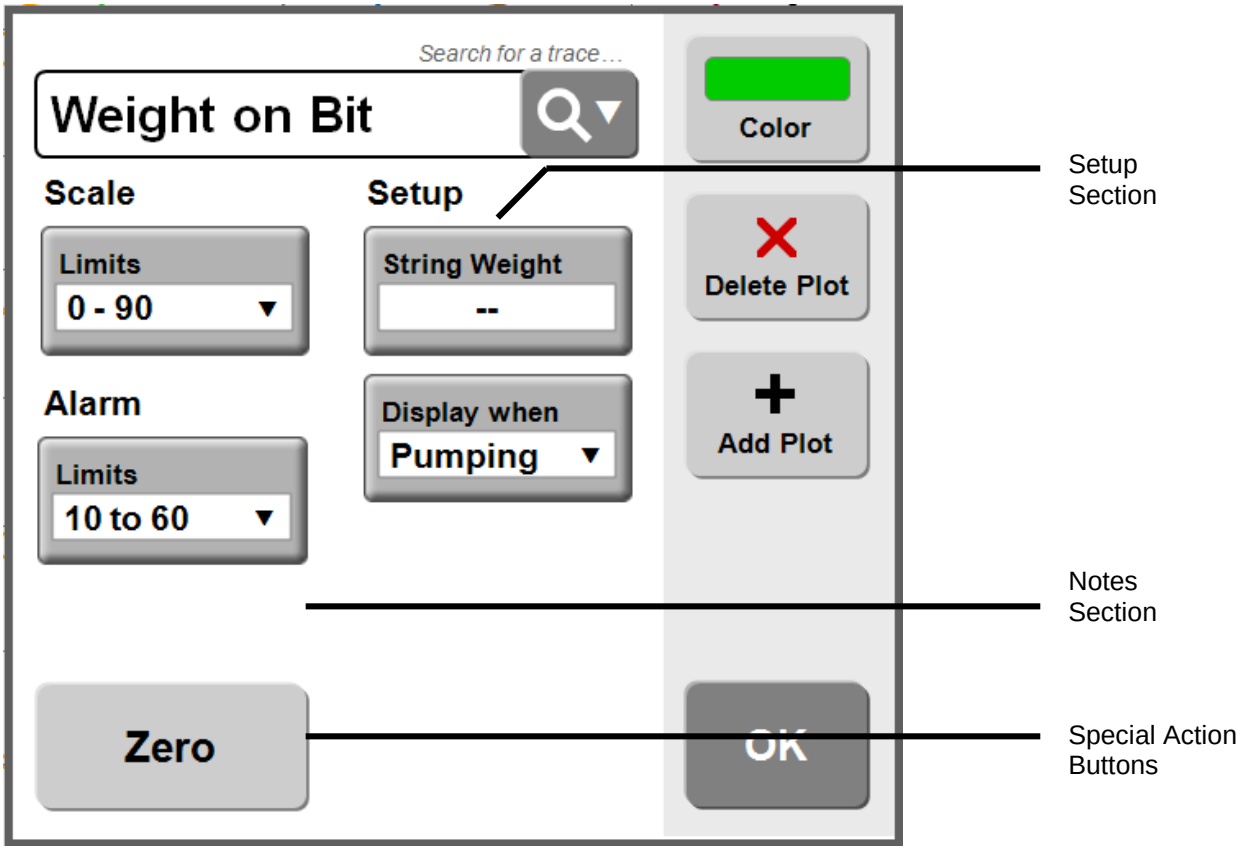


Figure 31: Change Trace Dialog, Special Sections

Description
The Special sections of the Change Trace Dialog Box are: Setup Section: Only visible on the DHC for a subset of the Traces. These are special settings for the Trace. Notes Section: A subset of the Traces display notes. The section at the bottom of the Dialog will be used to display the notes. Special Action Buttons. These are only available on the DHC for a subset of the traces only.
Requirements
General Rules: - Special Action buttons should appear on the bottom left of the dialog. - Special Action buttons are only visible on the DHC. The following traces have options in the special areas of the dialog: Bit Depth: Settings: Change Present value Hookload: Special Action Buttons: Calibrate Weight On Bit: Settings: String Weight, Display When .. Special Action Buttons: Zero Bit Hours: Settings: Change Present Value Circulation Hours: Settings: Change Present Value

MSE:
Settings: Hole Diameter, Mud Motor Present
Special Action Buttons: Mud Motor Config Shortcut

Mud Density:
Settings: Present Value Change

Mud Viscosity:
Settings: Present Value Change

Pump <X> Stokes:
Settings: Present Value
Special Action Buttons: Zero

Pump Total Strokes:
Special Action Buttons: Zero

Pump Rate:
Shortcut buttons: Calibrate
Notes on Pump 1-3 efficiency

Pump Displacement:
Shortcut buttons: Calibrate, Zero
Notes on Pump 1-3 efficiency

Block Height:
Settings: Present Value, Max Height

Over Pull:
Settings: Change string weight
Special Action Buttons: Zero

On Bottom ROP
Settings: Toggle Display units.

D-Exponent:
Settings: Hole Diameter

PVT Gain Loss:
Settings: Change Reference Volume
Special Action Buttons: Zero

Diff Pressure:
Settings: Change Reference Volume
Special Action Buttons: Zero

LEL Sensors, H2S Sensors:
Special Action Buttons: Haz Gas Setup

Sub Components	
Special Action Button	Secondary Button.
Chooser Box	List Button.
Settings Box	Value Button.
User Actions	
Trace Dependent	Note that some of the shortcuts will go to existing sub-screens not being modified by the Trace Enhancements project. For example: Calibration shortcuts, Zero settings shortcut.
Click Special Action Button	Links to an existing subscreen. For example: - Calibration screen. - Hazardous Gas Screen.

	Can also display a confirmation dialog. For example: - Zero
Click Settings Box	Selects the box, user can type in a value. Examples: - Change Present Value. A confirmation dialog should accompany the change in this case if the user clicks away from the box or presses enter.
Click Chooser Box	Displays the list of available chooser options. Selecting an items applies the change.

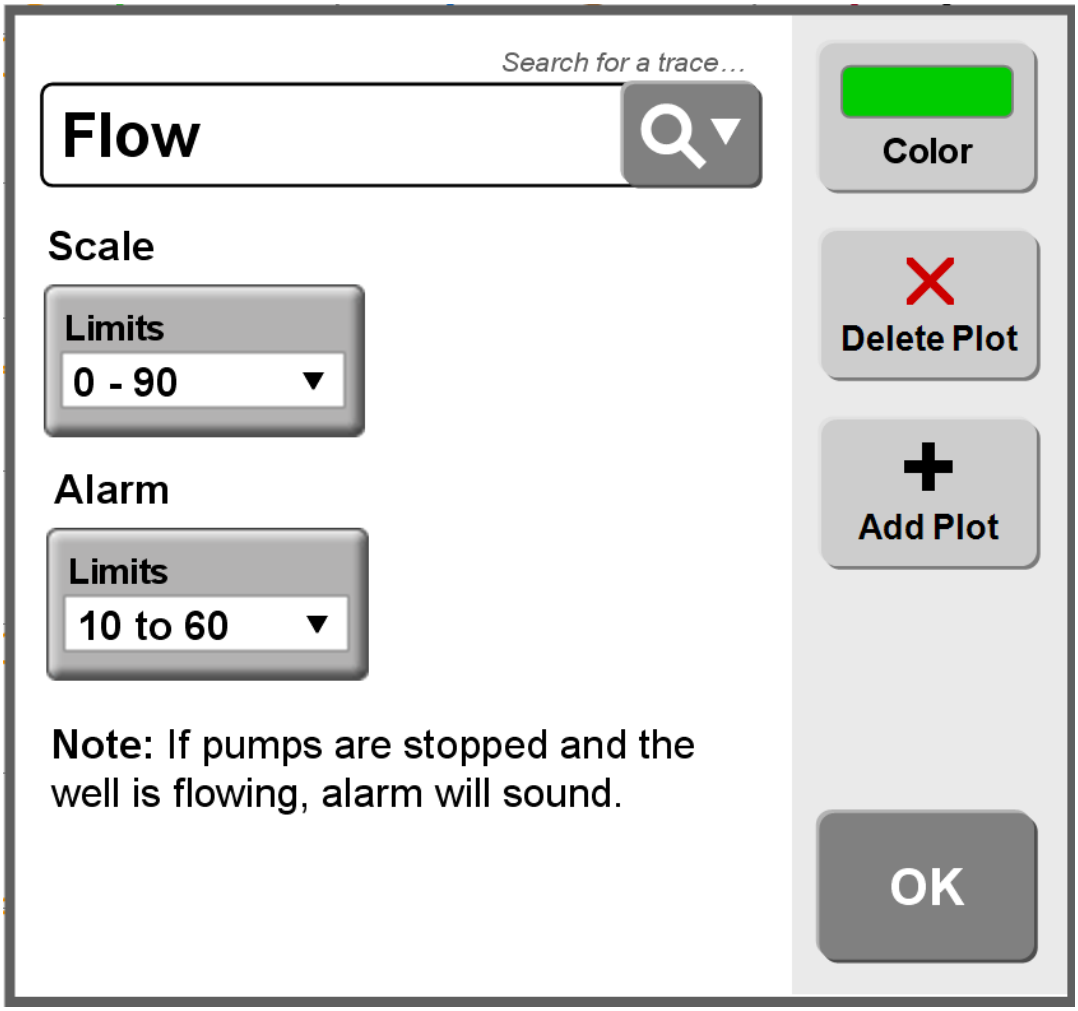


Figure 32: Change Trace Dialog: Example of dialog with note display.

1.12.2 Scale Settings Dialog

Description	
The Scale Settings Dialog allows the user to configure the scale ranges of the selected trace.	
Requirements	
The user can : - Change the viewable scale range for the trace. - See the changes being made to the graphs while they are being made – i.e. without closing the dialog.	
Sub Components	
Scale Limits Chooser	List Button. The scale limits list will contain:

	Auto, Min & Max (same as Zoom), list of trace dependent fixed ranges.
Scale Minimum, Maximum Button	Value Button. Only enabled when 'Min & Max' is selected. When a fixed range is selected in the 'Scale Limits', the box is greyed and displays the pre-fixed ranges. When Auto is selected, these boxes are hidden. The boxes allow the user to type in a scale value directly into the box.
Ok Button	Primary Button
User Actions	
Scale Limits Clicked, Auto is selected.	Graph auto scales, scale max / min boxes are disabled.
Scale Limits Clicked, Min & Max selected.	Scale Min/Max boxes are enabled.
Scale Limits Clicked, fixed range selected.	Selected range is displayed in box, max / min entry boxes disabled.
User clicks Minimum or Maximum box and types in value.	The value is saved and reflected in the graph display behind the box.
Click OK.	Close the Dialog.

1.12.3 Alarm Settings Dialog

Description	
The Alarm Settings Dialog allows the user to configure the alarm limits of the selected trace.	
Requirements	
The user can : - Change alarm settings for the trace by selecting: i. Disabled ii. Min & Max (only visible for Min/Max alarm traces) iii. Benchmark (only visible for Benchmark alarm traces) iv. Max (only visible for Max alarm traces) - Change the alarm Min / Max settings (Min&Max, Max alarm types). - Reset the alarm benchmark point and span (Benchmark types).	
Sub Components	
Alarm Type Chooser	List Button. The combobox will contain different lists, depending on the type of alarm associated with the trace (The type cannot be changed by the user). Min & Max Alarm: Disabled, Min & Max Benchmark Alarm: Disabled, Benchmark Max Alarm: Disabled, Max
Alarm Minimum Button	Value Button. Only applicable to Min & Max alarms. Grey out when alarm is disabled or Max alarm enabled. Allow direct text entry when enabled.
Alarm Maximum Button	Value Button. Applicable to Min & Max, and Max alarms. Grey out when alarm is disabled. Allow direct text entry when enabled.
Reset Benchmark Button	Set Current Value Button Clicking sets the value to the current trace value and displays the value that was set. User cannot enter the value directly.
Range Button	Value Button

User Actions	
Click Alarm Limits, Min & Max is selected	Enable entry boxes for min and max. Alarm configuration changes to Min & Max, alarm is enabled.
Click Alarm Limits, Benchmark is selected.	Enable entry boxes for Benchmark Reset and Plus Minus Range. Alarm configuration changes to Benchmark, alarm is enabled.
Click Alarm Limits, Disabled is selected.	The alarm is diabled for this trace. Limit selection boxes are greyed out.
Benchmark Alarm: Reset Benchmark Clicked	The benchmark point is set to the current value of the trace. The value is displayed in the box.
Benchmark Alarm: Range (+/-) Clicked	The user enters the +/- range for the benchmark.
Min & Max Alarm: Minimum or Maximum Clicked	User enters a new value for the minimum and maximum alarm settings.

1.12.4 Color Chooser Dialog

Description	
The Color Chooser Dialog allows the user to configure the alarm limits of the selected trace.	
Requirements	
The user can select a color they wish to use for the graph associated with the Trace.	
Sub Components	
Ok Button	Primary Button.
Color Chooser Component	This component presents a list of available colors to the user. 18 color choices will be provided by default.
Selected Color Display	This component displays the selected color to the user.
User Actions	
Click on Color in Color Chooser	The Selected Color is highlighted in the Selected Color display, the graphs, Trace Box, and Range Bar are all updated to reflect the color selection.
Click Ok.	The dialog box is closed.

1.12.4.1 RGB Definition of the 18 Colors

Figure 33: Color Definitions

From top to bottom, the corresponding RBG color values are:

80.30.0,

140.130.0

90.90.90

165.15.15

235.0.140

255.65.255

185.40.145

135.0.205

50.50.115

0.0.255

0.115.190

0.190.245

155.215.60

85.255.55

0.165.80

255.255.0

255.200.5

0.0.0

1.12.5 Trace Combobox

Description	
The Trace Combobox is a common component that will be used in different contexts to allow the user to select a trace.	
Requirements	
The user can click on the box to see a scrollable list of all traces, sorted alphabetically. Typing into the box will take the user to the first item that matches the typed text. Typing into the box will limit the displayed list to items that match on the typed text. The selected item is displayed in the combobox.	
Sub Components	
None selection.	Fixed entry in the menu, allows user to clear the trace configuration.
User Actions	
Click on box	Display an alphabetically sorted list of all displayable traces.
Select item from list	The item selected from the list will be applied in the current context. The Graphs and Boxes will be updated to reflect the selection.
Type into box	The user is presented with the first item that matches the text typed. For example: Typing G takes the user to the first item in the list that begins with G. Phase 2 Option: Limit the list displayed to only the text that is typed. For example: Typing 'Gas' display all the gas traces.
Select 'None' entry.	The Trace Box is changed to the Empty Box. The options in the associated dialog box are cleared.

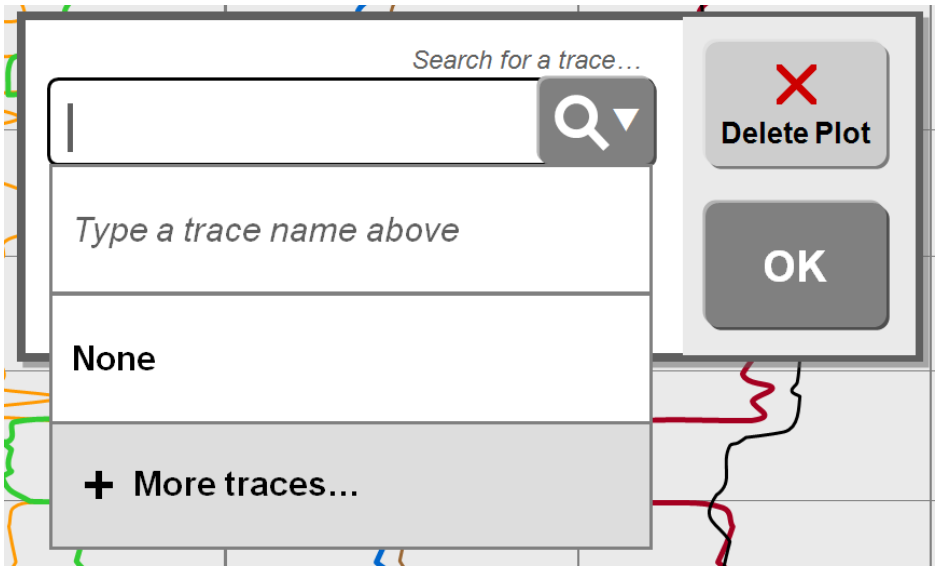


Figure 34: Trace ComboBox

1.13 Change Box Dialog

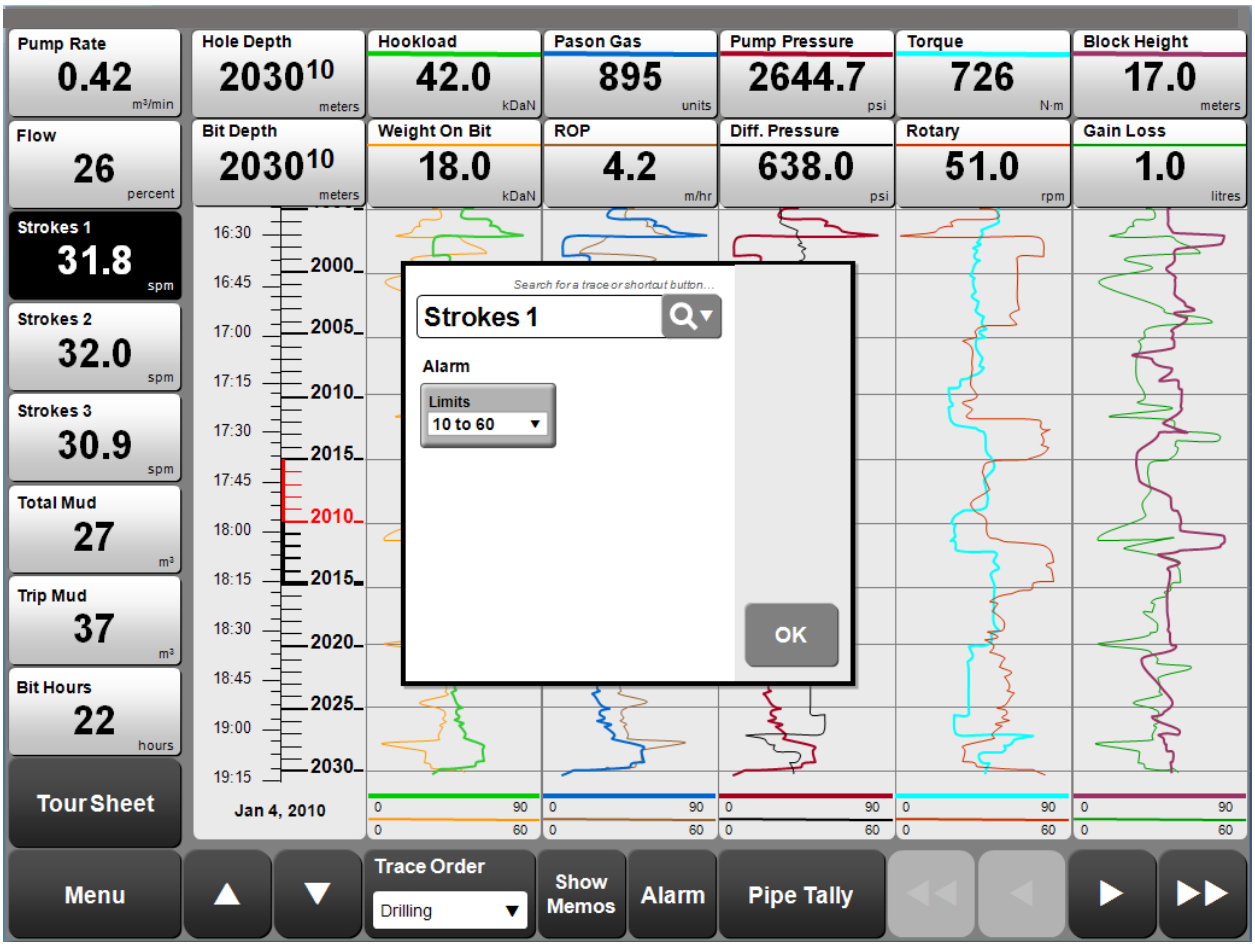


Figure 35: Change Box Dialog

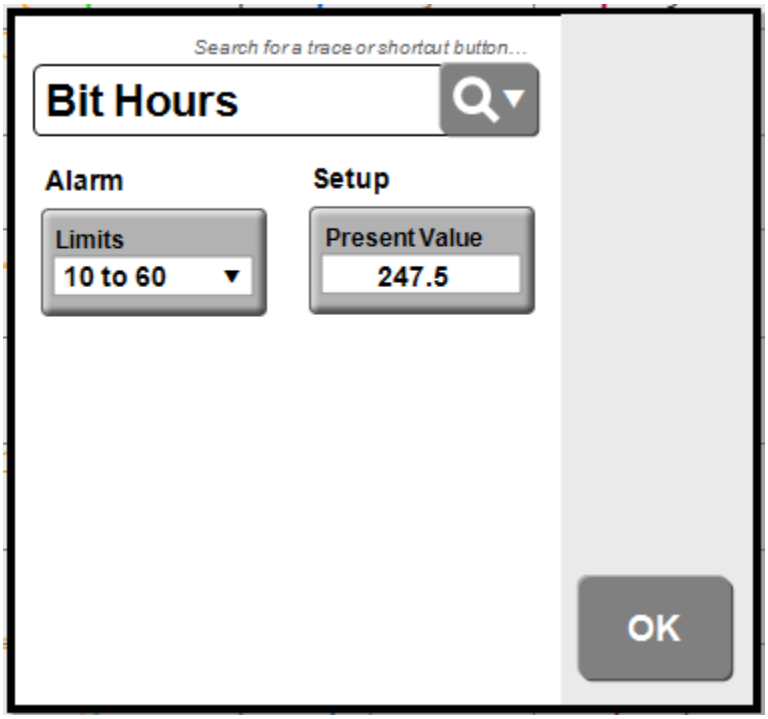


Figure 36: Change Box Dialog: Sample Layout

Description
The Change Box Dialog is displayed when any of the Real Time Boxes in the Real Time Box container are clicked. The dialog is used to configure trace settings, and alarm ranges, and Shortcuts. The dialog layout is shared with the Trace Box Dialog, the Change Box Dialog presents a sub-set of the options available on the Trace Box Dialog.
Requirements
The display presented in this dialog will change, depending on the Trace and the workstation. The full list of options is presented in the Trace Box section. The setup section is only visible on the DHC. The options for Charting will be hidden from the user in this context, for example: - Delete and Add Plot. - Scale Range settings. Trace Color. The selected Box in the Real Time Box Container is highlighted in Black with white text.

Sub Components	
Ok Button	Primary Button
Trace / Shortcut Combobox	Selects the trace or shortcut to be used for the box configuration.
Alarm Settings	Same as described in Change Trace Dialog, Change Trace Dialog
Setup Section	Same component as described in Change Trace Dialog, Change Trace Dialog.
Special Action Button	Same component as described in Change Trace Dialog, Change Trace Dialog.
User Actions	
Click on Ok	The dialog is closed.
Click on Trace / Shortcut Combobox	See description in Trace / Shortcut Combobox, Trace / Shortcut Combobox .
Type in Trace / Shortcut Combobox	See description in Trace / Shortcut Combobox, Trace / Shortcut Combobox.
Click on a different Real Time Box or Shortcut in the Real Time Box Container	The dialog for the associated button is displayed.

1.14

1.14.1 Trace / Shortcut Combobox

Description
The Box container can show Real Time Boxes or Shortcuts. The combobox allows the user to configure the button as either choice.
Requirements
The user can use this box to switch between Box or Shortcut configuration. For Box configurations, the user can select from all visible traces in the EDR. For Shortcut configuration, the following shortcuts will be available (following current system): - Autodriller, Calculator, Chat, Choke, Diagnostics, Directional Survey, Megajoules, Memo, Tero Gas, Sample, Setup, Tally, Tools, Tour Sheet, Wireline.

Sub Components	
None button	Clears the Trace Box and configures it with the empty box representation.

Configure as Shortcut button	Toggle the box to display available shortcuts. This is displayed when the current configuration is the Real Time Box.
Configure as Trace button	Toggle the box to display available Traces.
Trace or Shortcut list selections	This will be a scrollable list of available options.
User Actions	
Click on None	The selected Box will display the empty trace box. Options in the dialog box disappear.
Click on Shortcut button.	The list changes to display the available shortcuts. The dialog display will change if the Button configuration changes from a Shortcut to a Trace. - Shortcuts display the Shortcut Dialog. - Traces display the Trace dialog.
Click on Real Time Box button.	The list changes to display the available Traces. The dialog display will change if the Button configuration changes from a Shortcut to a Trace. - Shortcuts display the Shortcut Dialog. - Traces display the Trace dialog.
Type in combobox	Typing in the combobox will take the user to the entries that match the text that is types. For example: typing ‘R’ or ‘r’ takes the user to the list entries that start with ‘R’ or ‘r’.
Select an item	The ComboBox is closed and displays the selected item. The Shortcut box display is changed to display the newly configured shortcut. -

1.14.2 Shortcut Dialog

Description	
The Shortcut dialog allows the user to configure a Box as a different type of Shortcut. It also allows the user to switch a Shortcut Box to a Real Time Box. This Dialog is also used in the case where an Empty Box is clicked.	
Requirements	
The user can configure a Box as a Real Time Box or a Shortcut Box, or as an empty Box selection.	
Sub Components	
Dialog Border	RGB Color: (0,0,0) Thickness: 4 pixels
Dialog Panel	RGB Color (255,255,255)
Shortcut Combobox	
Delete button	Secondary Button
Ok button	Primary Button
User Actions	
Click on Shortcut Combobox	See description under Trace / Shortcut Combobox Trace / Shortcut Combobox
Click OK	Closes the Dialog.
Click Delete	Places an Empty Box in the Box container area and closes the Dialog.

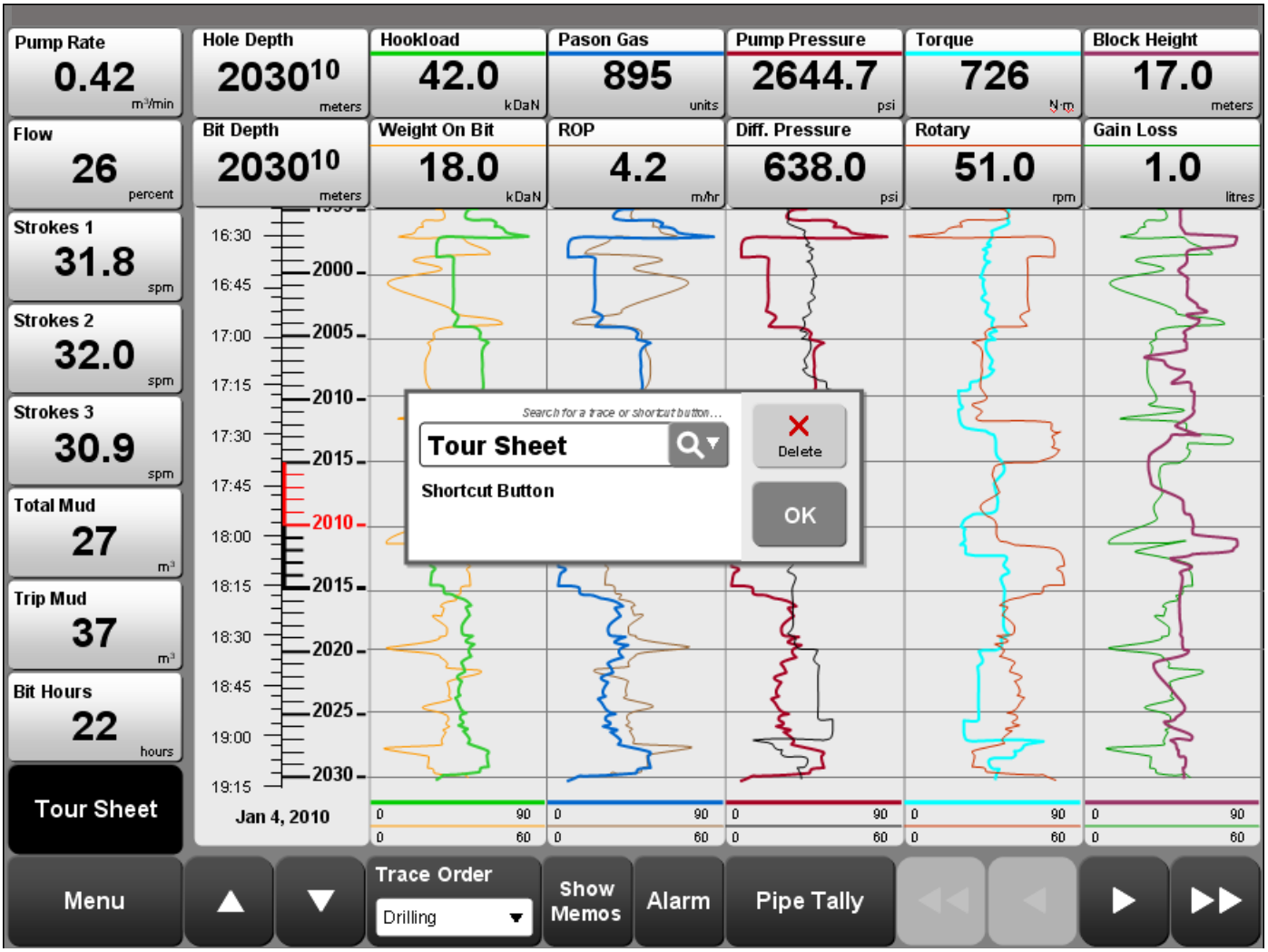


Figure 37: Change Box Dialog

1.15 Global Alarm Setup

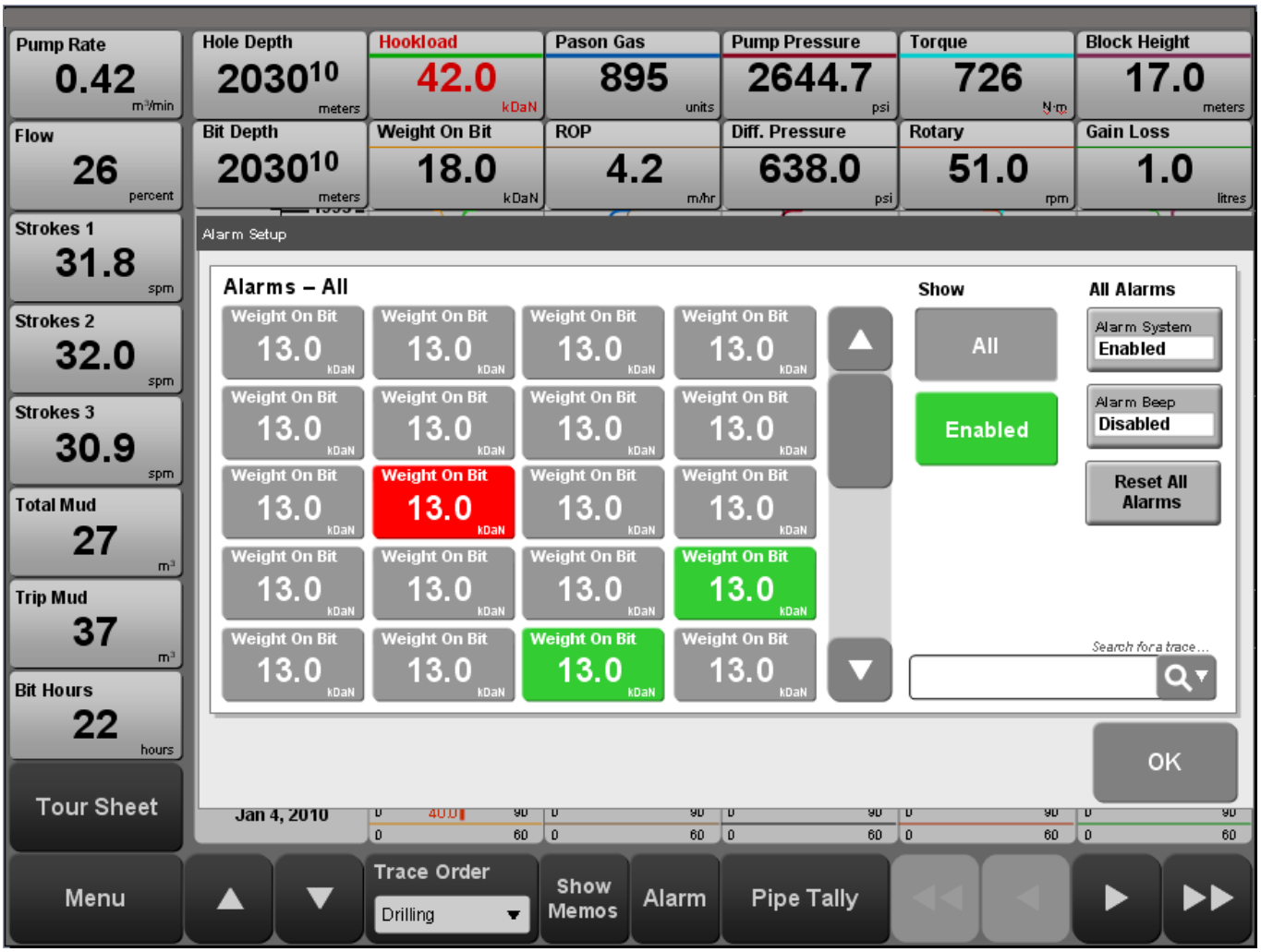


Figure 38: Global Alarm Setup

Description
The Global Alarm Setup screen provides a single view of all traces in the system and their alarm states. The user can globally toggle the alarm system between enabled and disabled. The user can configure the alarm beeping, as well as globally reset all alarms.
Requirements
The screen shows a list of all real time boxes in the system. If the alarm system is enabled: 1. Real time boxes that have an alarm enabled are shown in green. 2. Real time boxes that do not have an alarm enabled are shown in grey. 3. Real time boxes that are in an alarm state are shown in red. If the alarm system is disabled: 1. All real time boxes are shown in grey.

Sub Components	
Real Time Boxes	Boxes that display the current reading of a trace. These boxes will be listed in alphabetical order.
Alarm System Chooser	Displays the current state of the alarm system (enabled / disabled), and allows the user to change the current value.
Alarm Beep Chooser	Displays the current state of the alarm beep configuration (enabled / disabled). This component is disabled if the alarm system is off.
Reset All Alarms	This button allows the user to reset the alarms states. A confirmation dialog will be displayed asking the user to confirm the operation and explaining the action to be taken.

	The action to be taken is to zero all of the benchmark plus span alarms and turn off all of the high / low alarms.
All Boxes	Displays all real time boxes.
Alarms Enabled	Displays only the real time boxes with alarms configured.
Search Box	Allows the user to filter the displayed Real Time Boxes to only those that match the search criteria.
User Actions	
Clicks on a real time box	The Change Trace Dialog is displayed.,
Click the Alarm System chooser.	The alarm system is toggled on and off. This chooser is updated to display the currently selected state.
Click the Alarm Beep chooser	Alarm beep is toggled between on and off. This chooser is updated to display the currently selected state.
Click on 'Reset All Alarms'	Displays a confirmation dialog. If confirmed, zero all of the benchmark plus span alarms and turn off all of the high / low alarms.
Click on 'Show All'	All Real Time Boxes in the system are displayed.
Click on 'Show Enabled'	Only shows the Real Time Boxes that have alarms enabled.
Click on the scroll bar	The list of real time boxes is scrolled.
Type in the search box	The list of real time boxes is limited to those matching the text typed in the search box.

1.16 Alarm Notifications

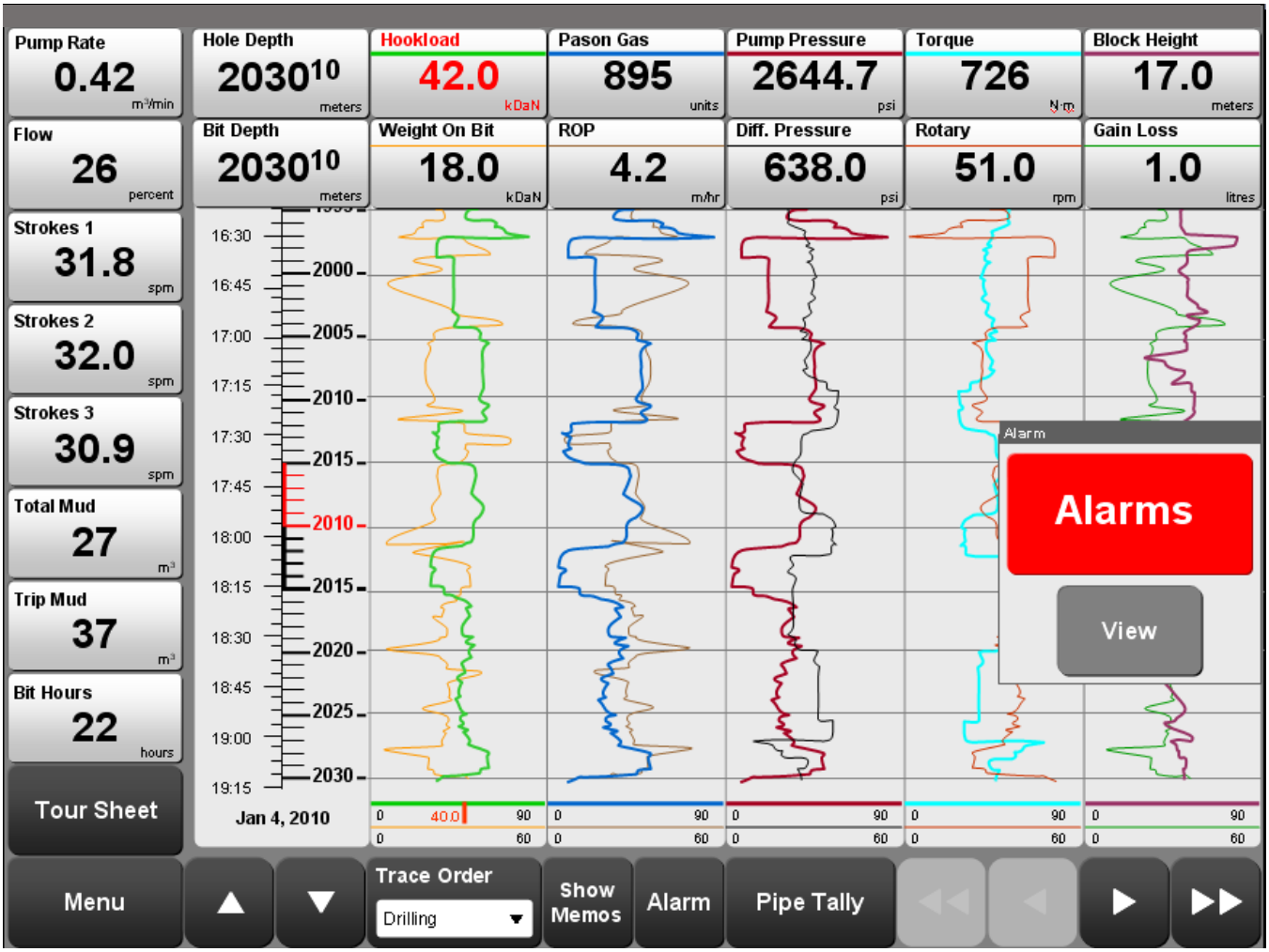


Figure 39: Alarm Notification

Description	
The alarm notification dialog is displayed when one or more of the traces is in an alarm state.	
Requirements	
As per existing behaviour, the alarm notifier is only displayed on the Main EDR trace screen, it is not displayed on any subscreens.	
Sub Components	
View Button	Primary Button.
Alarms Indicator	Red, non clickable area, highlights the fact that an alarm has occurred.
User Actions	
Click View Button	Takes the user to the alarm acknowledgement screen. This is a legacy EDR screen and is not covered in this document.

1.17 Memos Display

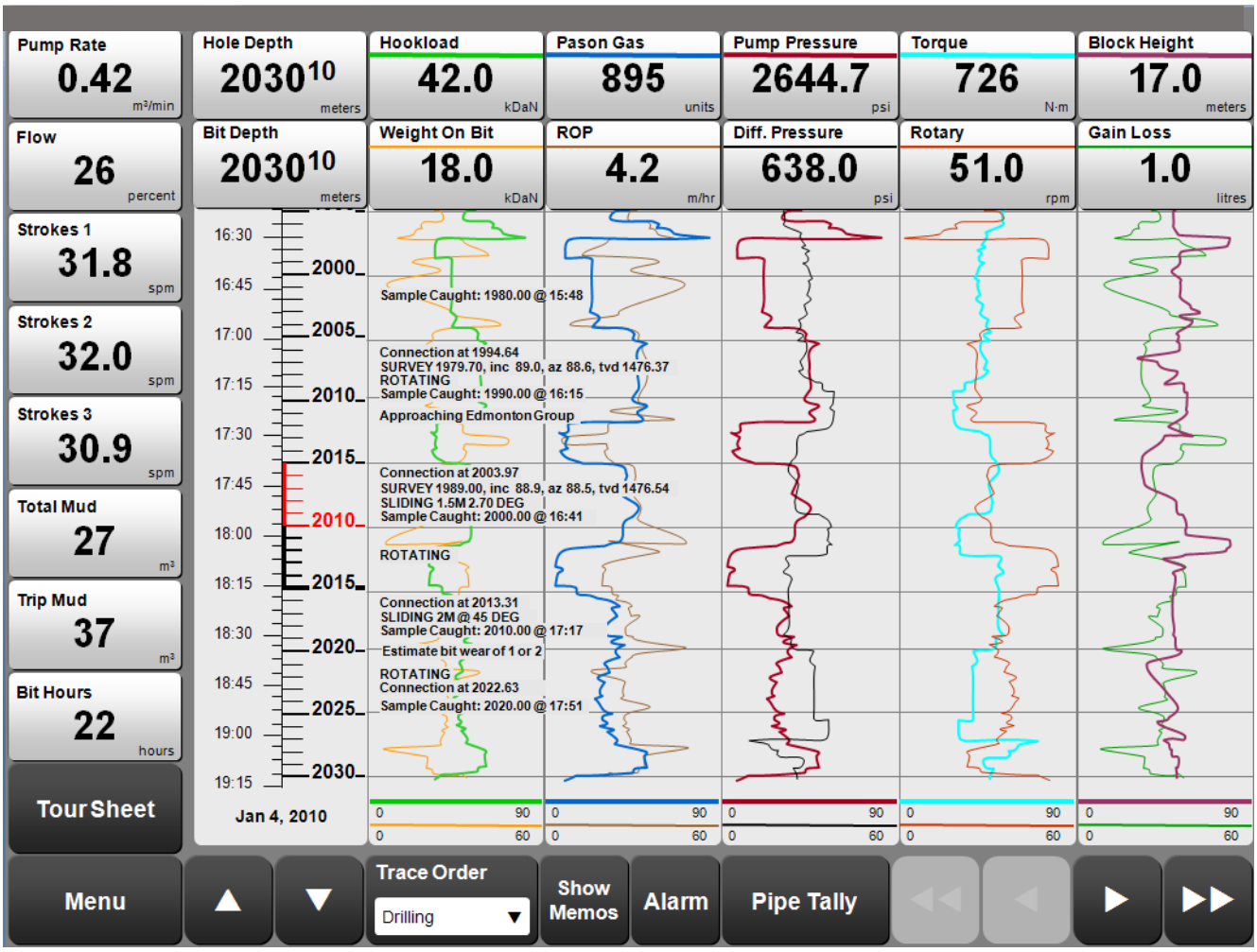


Figure 40: Memos Display Non-Default Trace Colors

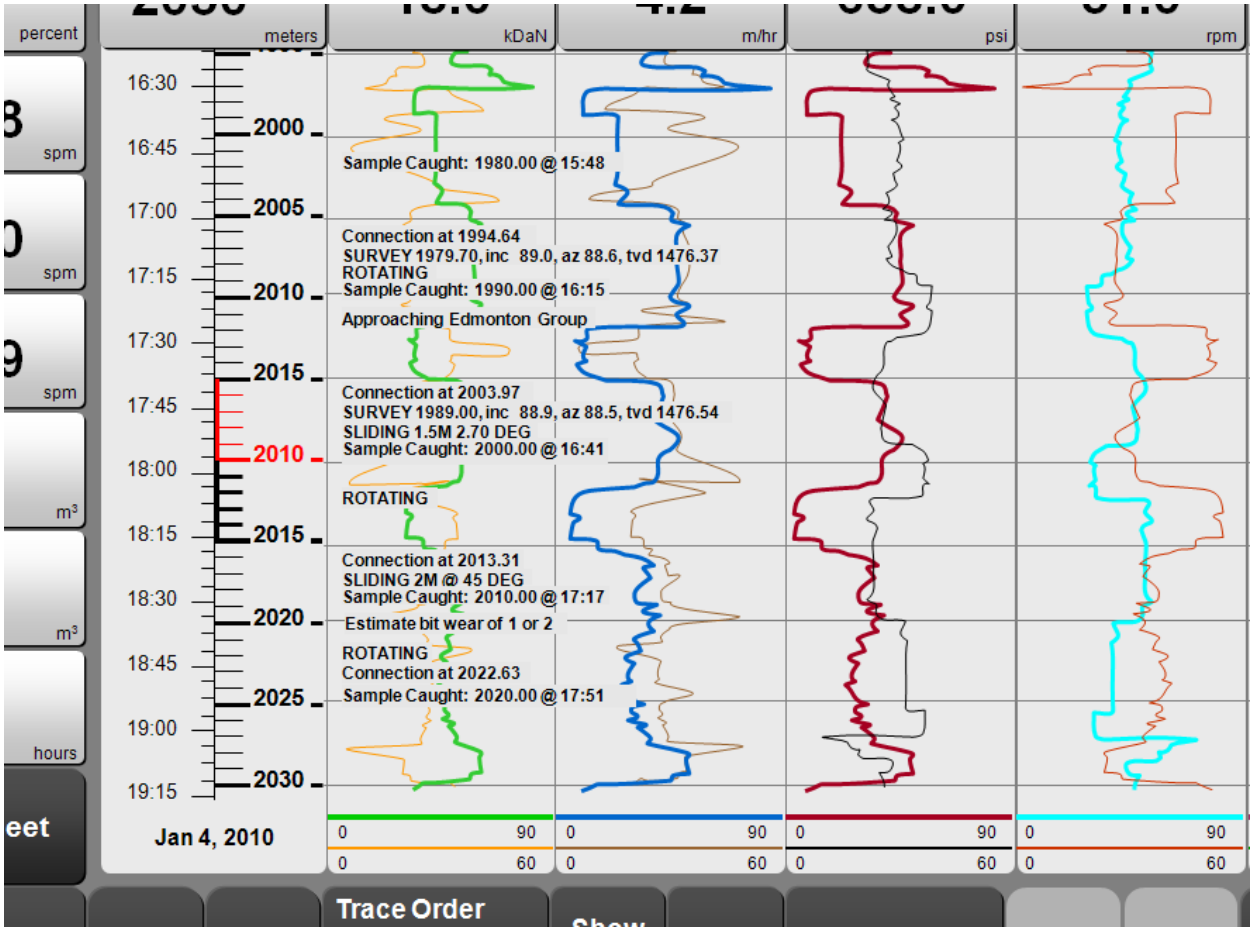


Figure 41: Memos Display, Default Trace Colors, Up Close

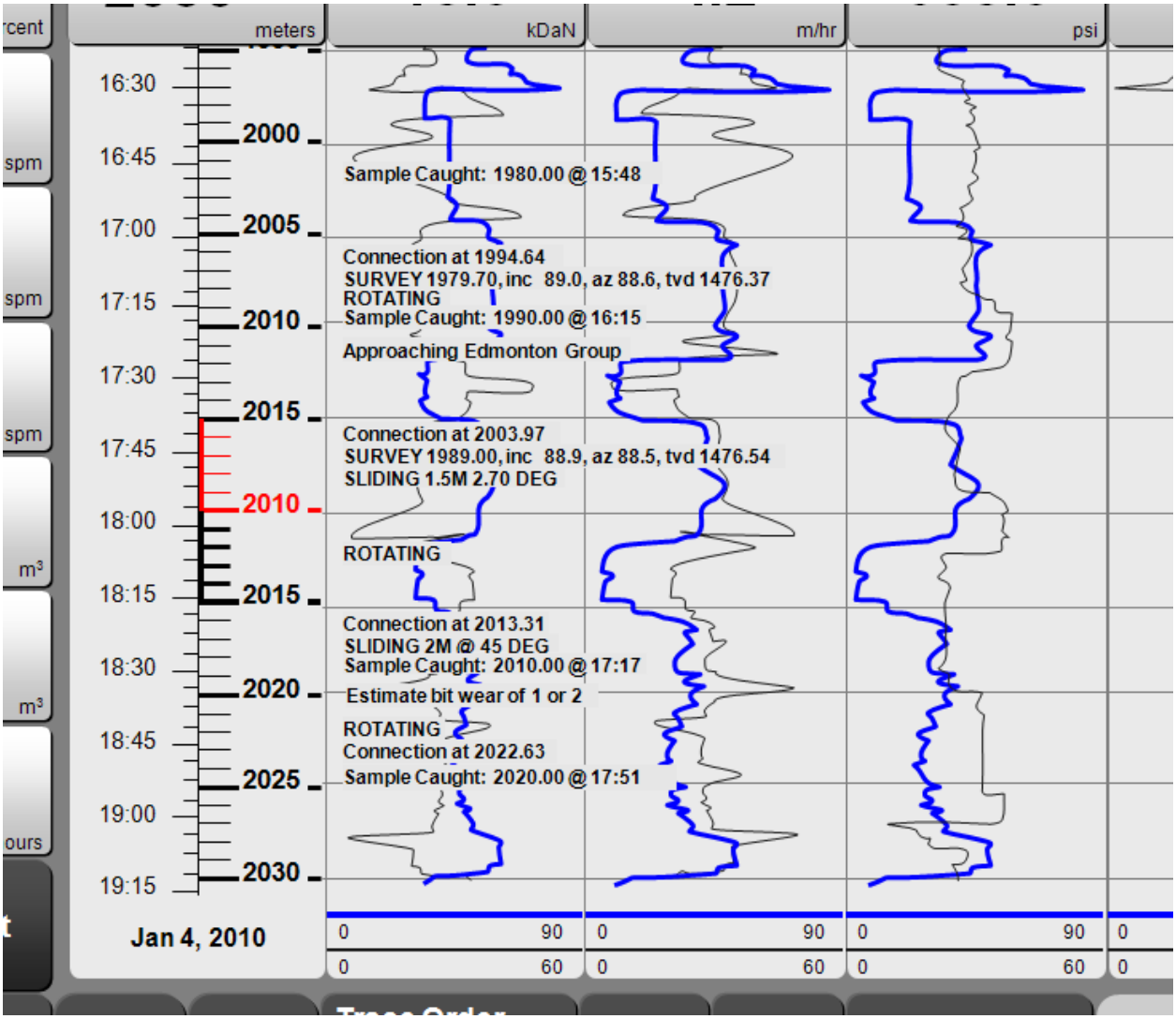


Figure 42: Memos Display, Default Trace Colors

Description	
The Memos are generated from any ThinClient using the existing Memos screen. The new EDR Main Screen will display the memos follow a similar convention to the current EDR.	
Requirements	
Memos are displayed over top of the trace graphs. Clicking 'Show Memos' will display all memos. Clicking 'Clear Memos' will clear all visible memos. New memos are displayed as they become available.	
Sub Components	
Show Memos / Clear Memos button	Shows all memos or Clears Memos from the display.
Memo Text	Font Shown: Arial 9, Bold Text. Display text with an opaque background that is the same color as the plot background.
User Actions	
Click on Show Memos	Shows all memos that are available for the current display. Changes button display to 'Hide Memos'.
Click on Hide Memos	Hides all memos, changes button display to 'Show Memos'.

1.18 EZ View

Figure 43: 16 Box EZ-View

Description	
The EZ View shows a set of large boxes that show the user a view of Real Time Boxes that is visible from across the room.	
Requirements	
The user can view 9 or 16 box EZ View through the Trace Order, Big Boxes Menu. The EZ View box order is stored as part of the trace order. The EZ View option is only available on the workstations. The user can re-configure any box simply by clicking on it. This will display the Change Box Dialog and present the following options for Box configuration: - Setup Options (per Trace). - Alarm Options - Special Action Buttons.	
Sub Components	
Real Time Boxes	As described in Section Boxes, Boxes.
User Actions	
Click on Real Time Box	Change Trace Dialog is displayed with applicable options visible.

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