xBolt

Real Time Operations

EXTREME™

Objectives

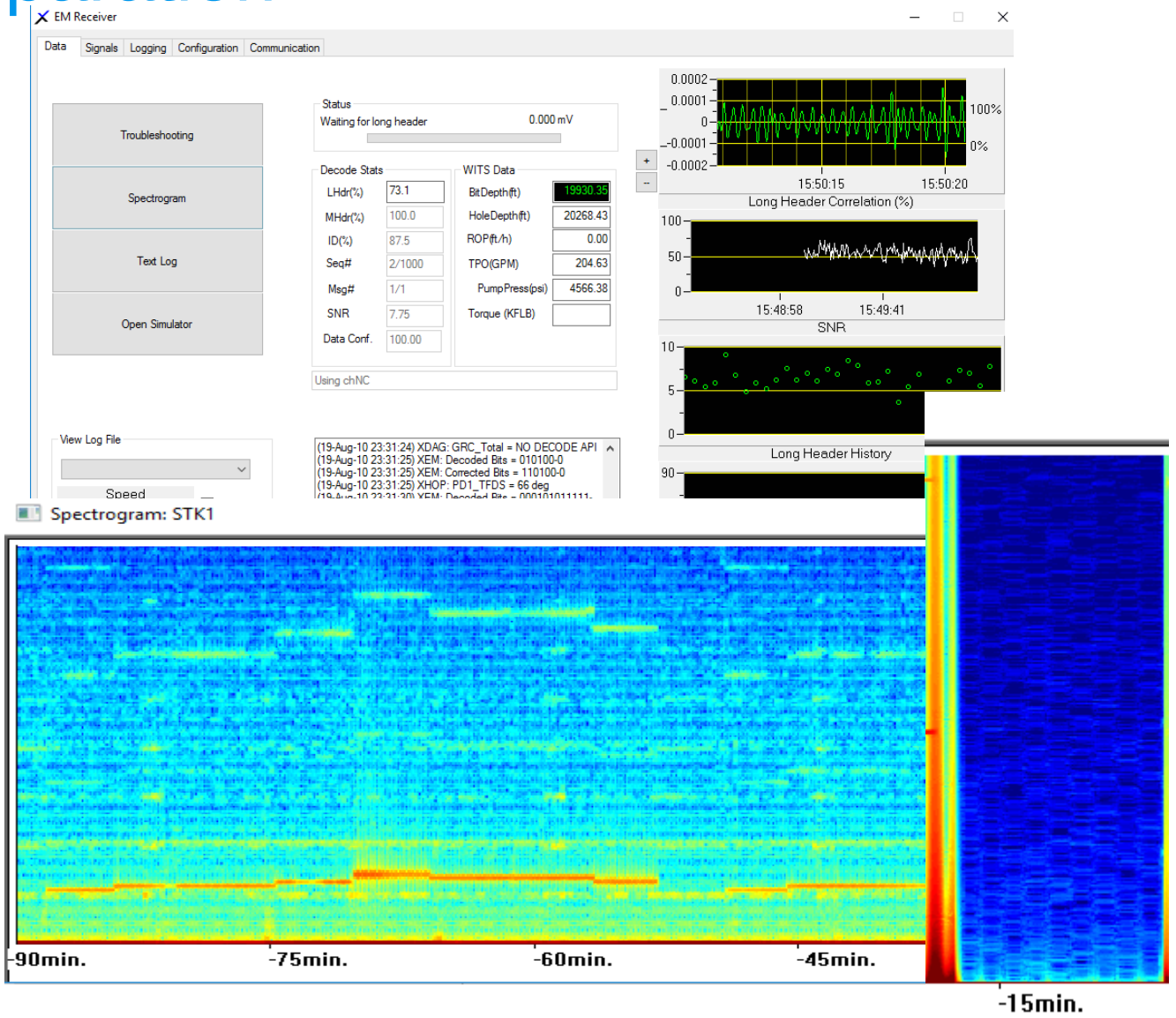
- Validate good SHT
- Use xBolt downlinking features
- Learn receiver options within Xdirect
- xBolt Basic troubleshooting
- Learn logging functions within XDirect

xBolt Real Time Operations

Shallow Hole Test

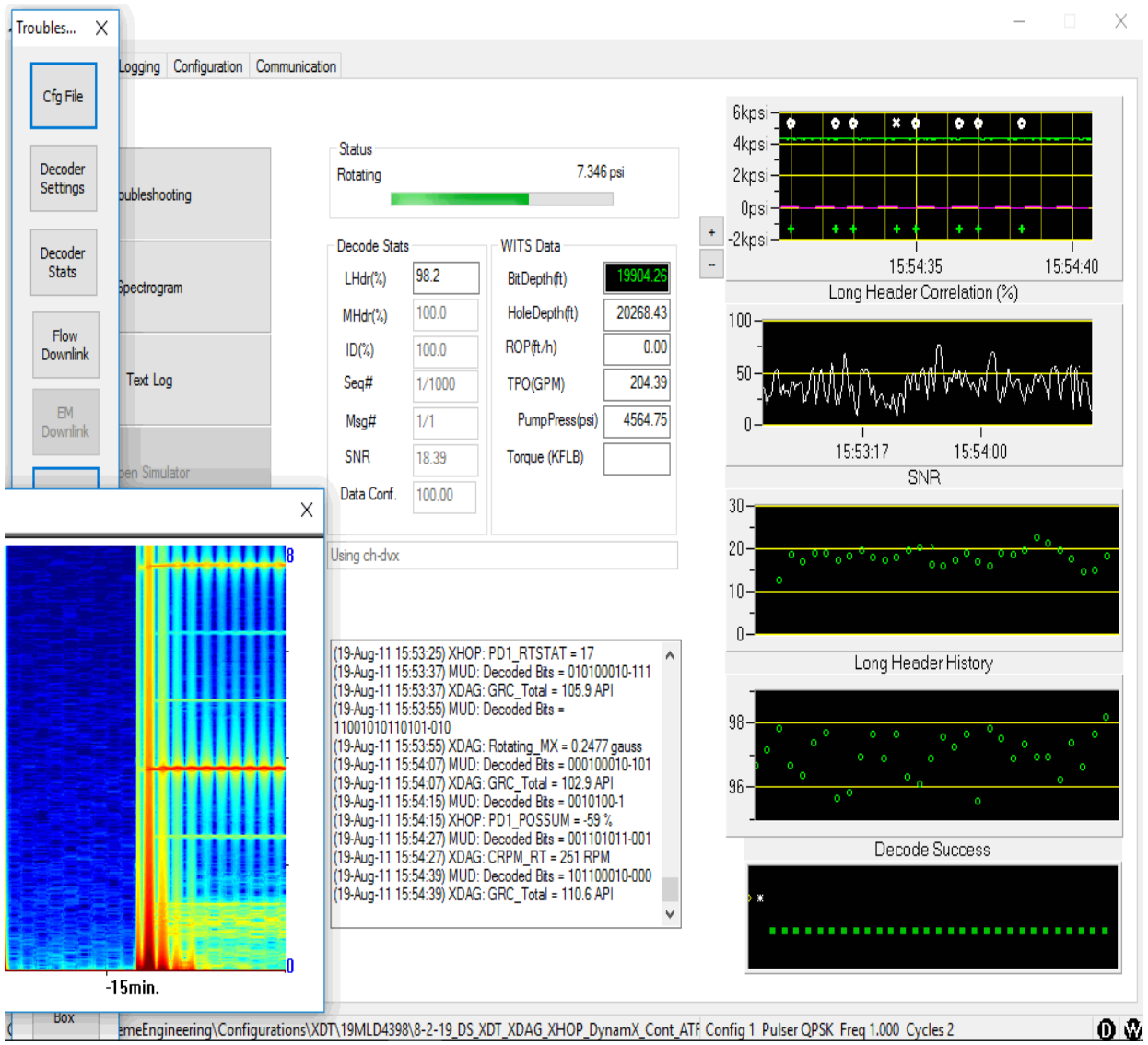
xBolt Shallow Hole Test Preparation

- Open X-Pulse RX and verify trace is scrolling
  - Pressure reading should be close to 0 and spectrogram should should small traces of noise
  - If pressure is showing a large negative number (ie -1500 psi), check all connections first and then check sensor
- Open XM4 RX and verify trace is scrolling
  - Each channel should show traces of noise in spectrogram
  - Measure resistance with downlinker to verify connections
- Confirm “Launcher” is open
- Confirm WITS is being received into X-Pulse RX / XM4 RX



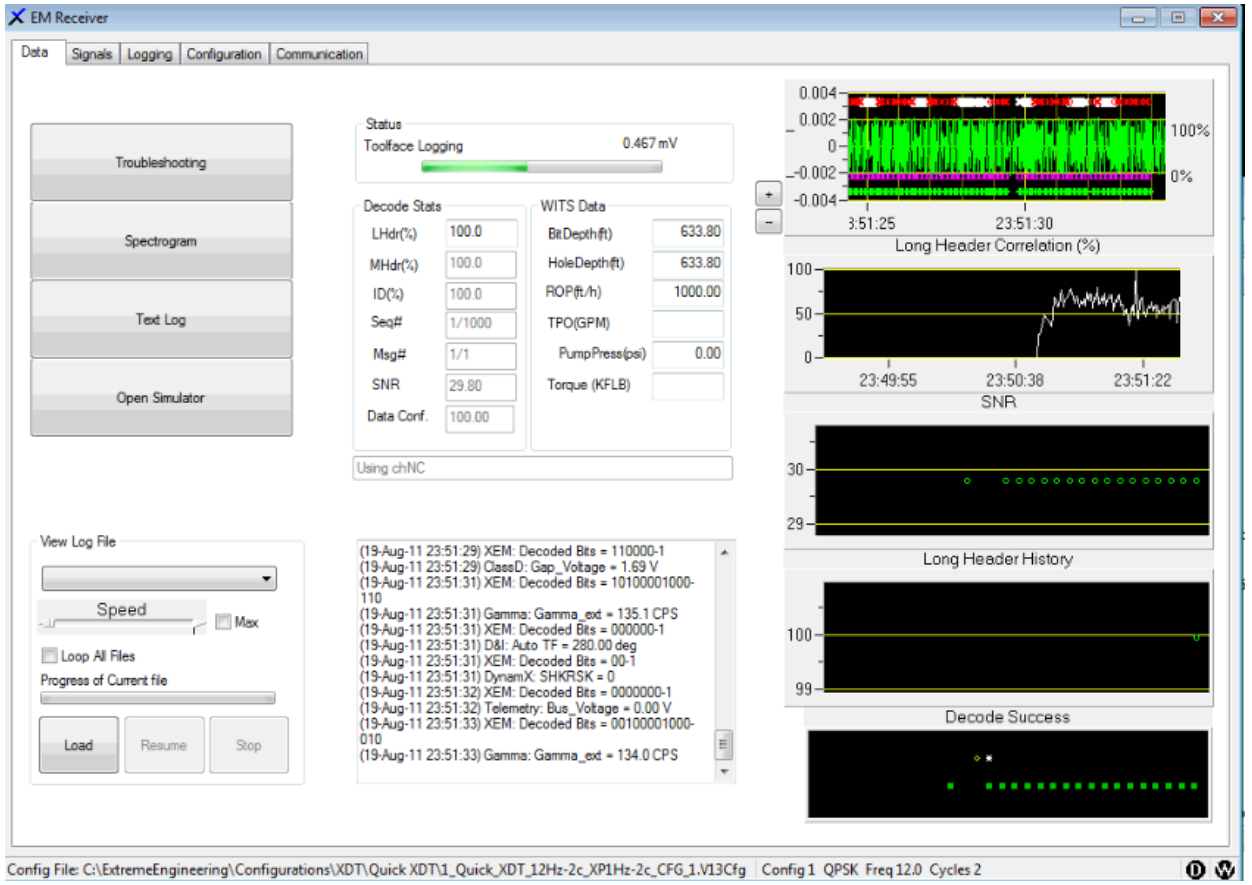
xBolt Shallow Hole Test

- Mud Pulse SHT may be conducted after picking up BHA
- EM SHT must be conducted after tripping in beyond casing shoe
  - Recommended to have gap sub at least 30 feet outside of shoe to complete test



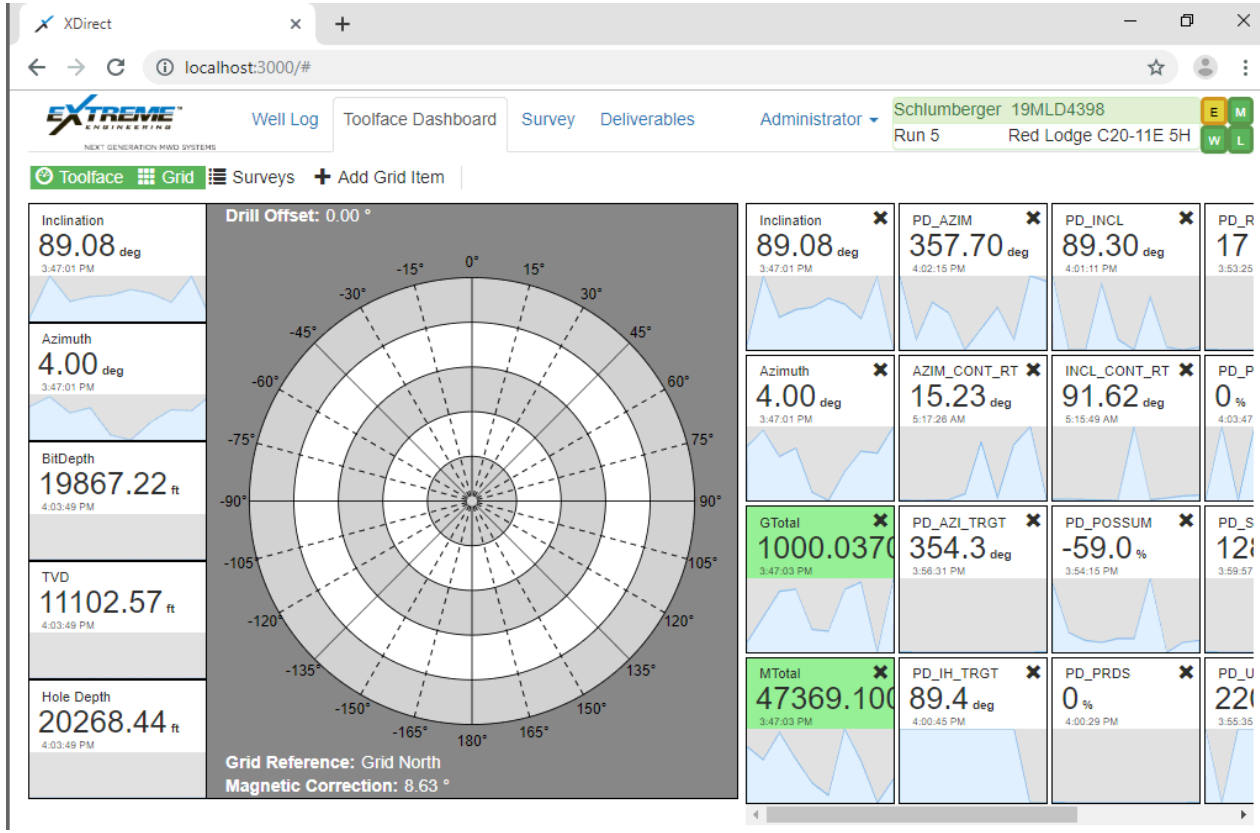
xBolt Shallow Hole Test

- Consult with DD and Company man for SHT parameters prior to testing. Recommended to flow 10-15% above minimum flow of all tools in BHA
- Bring flow up to planned flow rate and monitor spectrogram for signal
- Monitor the following parameters during SHT
  - Signal Strength
  - SNR
  - Decode Success
  - Pump Pressure
  - Gap Voltage (EM)
  - Gap Current (EM)
- If testing at shallow depth, safety disabled may be needed for the tool to transmit EM



xBolt Shallow Hole Test

- Monitor real time data coming from tool
  - Total G must be in FAC
  - Total M & Mag. Dip will be out of FAC if inside casing
  - Verify gamma data is not reading 0, unexpectedly high or locked up
  - Verify continuous AX/MX are close to survey
  - Monitor all shock data and stop SHT if shocks are high
  - Verify RT comms is working as expected if not inside casing
  - Gap Voltage * Gap Current ~= Tool Power Setting

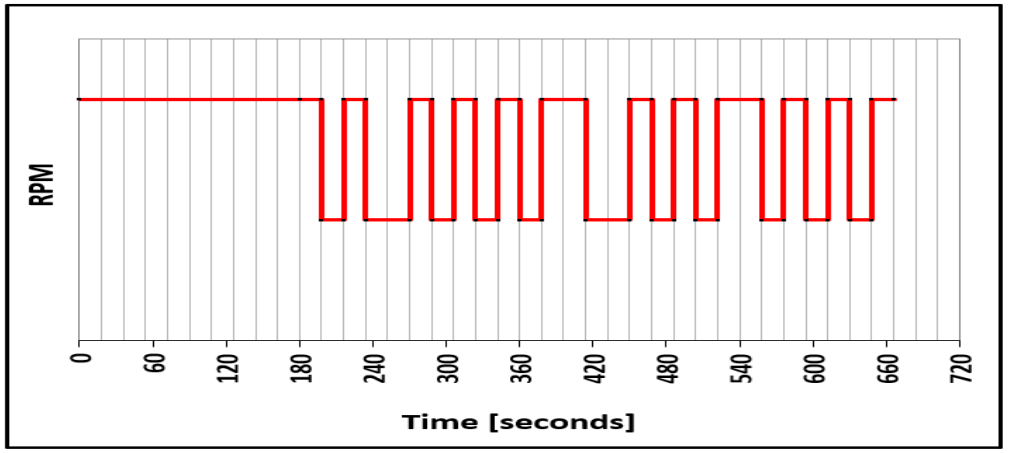


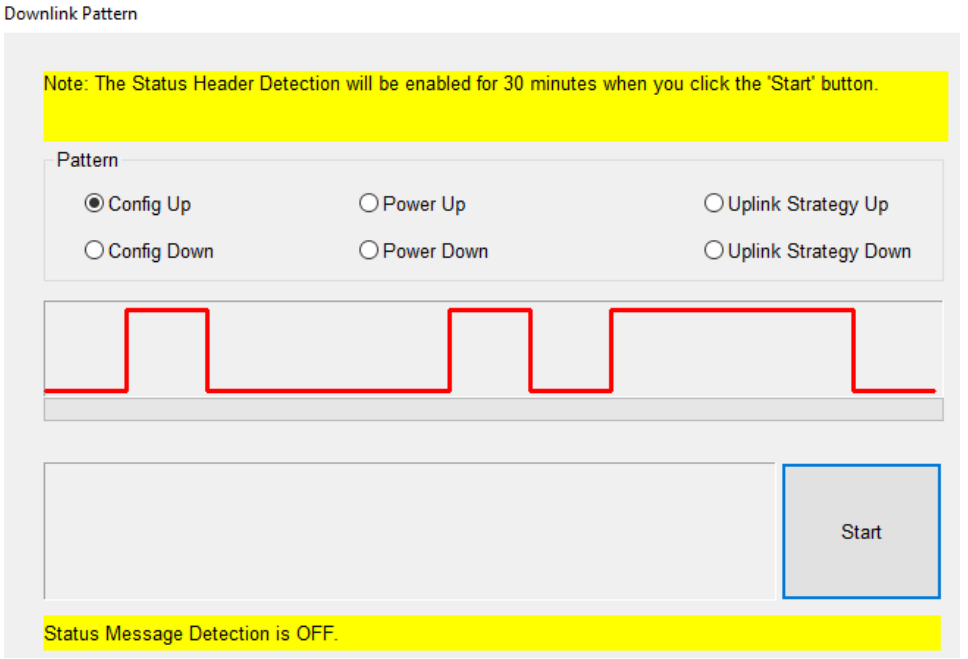
xBolt Real Time Operations

Downlinking

xBolt Downlinking Methods

- Flow On/Off
- EM Downlink
- Collar RPM
- Pressure



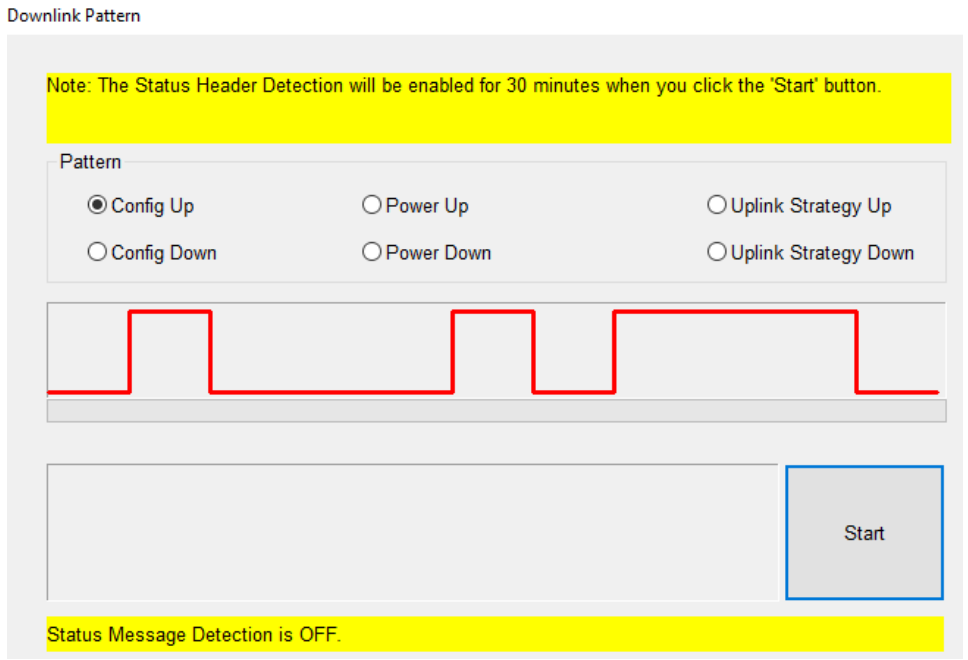


xBolt Real Time Operations

Flow On/Off Downlink

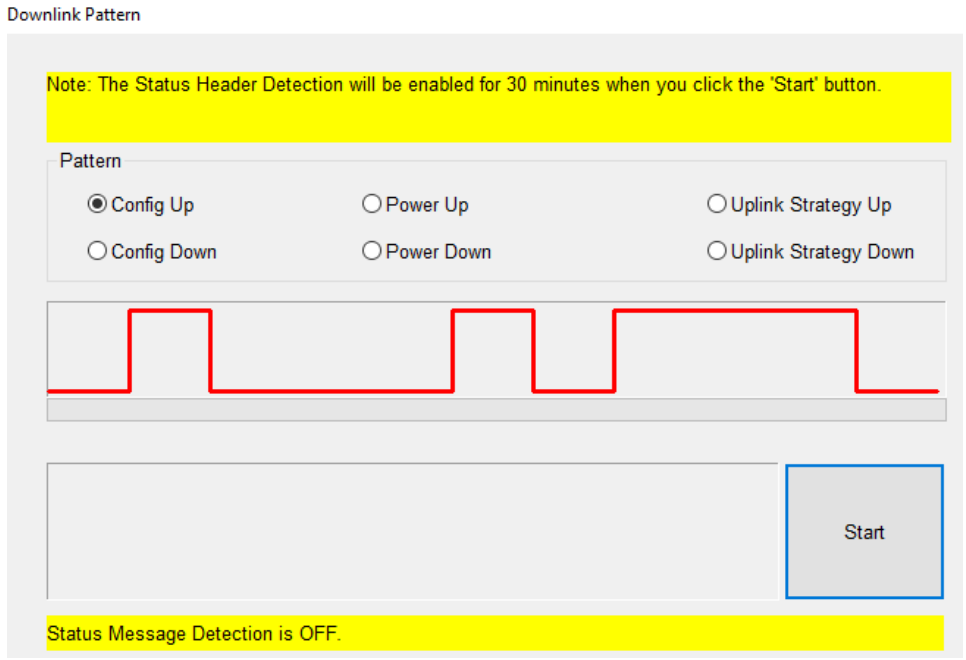
xBolt Downlinking – Flow On/Off

- Tool recognizes “flow” through vibration
- Flow or vibration must go above/below vibration thresholds
- Flow on/off downlinks achievable via flow, rpm or pipe movement when flow is off
- Timings found in XM4/X-Pulse receivers
- When in MP, use X-Pulse RX flow downlink, when EM, use XM4 flow downlink



xBolt Downlinking – Flow On/Off Options

- Config Up
  - Increase config number by 1
  - Will wrap from config 8 to config 1
- Config Down
  - Decrease config number by 1
  - Will wrap from config 1 to config 8
- Power Up
  - Sets tool to 20W power setting
- Power Down
  - Sets tool to 3W power setting
- Uplink Strategy Up*
  - Sets uplink strategy to Mud Pulse
- Uplink Strategy Down*
  - Sets uplink strategy to EM



*Uplink strategy should not be changed using flow on/off downlink due to IP restrictions, however, this may be done via pipe translation or rotation of drill string to generate vibration

xBolt Real Time Operations

EM Downlink

xBolt Downlinking – EM Downlinking - Safety

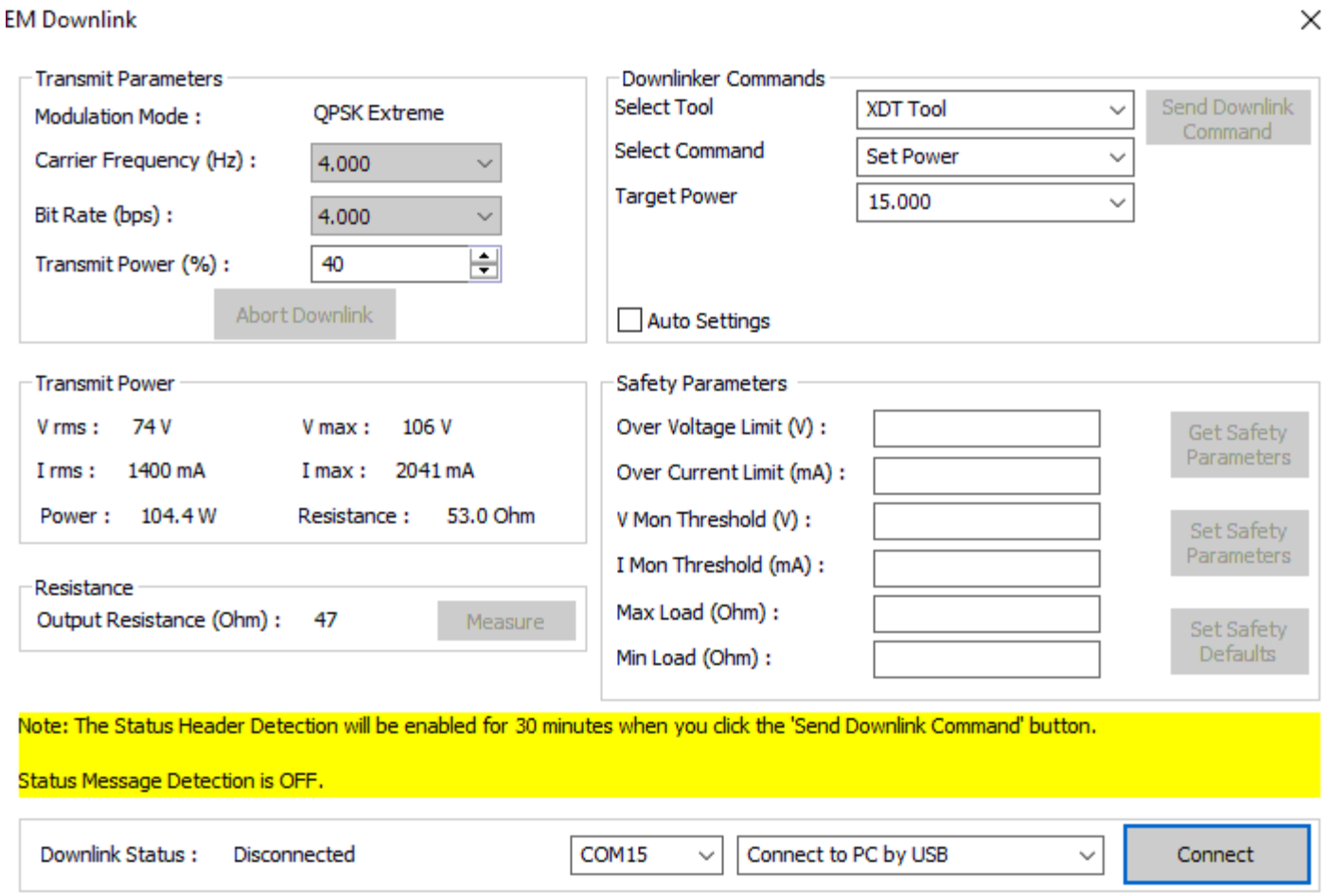
- Improper use may lead to serious injury or death EM Downlinking may
- Improper installation could lead to fire
- EM downlink connections and equipment should always be outside of Zone 1 (use stakes or offset wellheads)
- Consult company representative and rig manager prior to driving stakes or connecting to wellheads
- Check cables frequently for damage
- Always verify no one is handling stake or cables when transmitting downlinks

Zone	Definition
0	*In which ignitable concentrations of flammable gases or vapors are:* • Present continuously • Present for long periods of time
1	*In which ignitable concentrations of flammable gases or vapors are:* • Likely to exist under normal operating conditions • May exist frequently because of repair, maintenance operations, or leakage
2	*In which ignitable concentrations of flammable gases or vapors are:* • Not likely to occur in normal operation • Occur for only a short period of time • Become hazardous only in case of an accident or some unusual operating condition.

Per NEC article 505-9, CEC Section 18, EN60079-10, IEC 60079-10

xBolt Downlinking – EM Downlinking

- When flow is off and tool is not transmitting EM, tool “listens” for EM downlinks
- Only applicable when gap probe is in string
- Downlink power >> Uplink Power (ie. Tool can see downlinks when EM signal is too weak to see on surface)

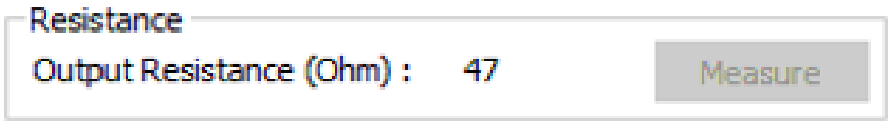


xBolt Downlinking – EM Downlinking – Key Factors

- For downhole operations, resistance should be idealy be less than 100 ohms
- The lower the resistance, the more power available to safely transmit downlink
- Good grounds are essential for successful downlinking (offset wellheads or ProXimity antennas make for the best downlink connections)
- Stakes should be off man-made pads as grounds are often poor, look for swampy or wet areas nearby
- Frozen ground will not provide an effective grounding source, stakes or casing must go below frozen layer to reach good ground
- If resistance measurements are high between downlinking stakes, reduce resistance by “daisy chaining” stakes together.
- Watch video for grounding tips: https://www.youtube.com/watch?v=G2OtgeDkTLs

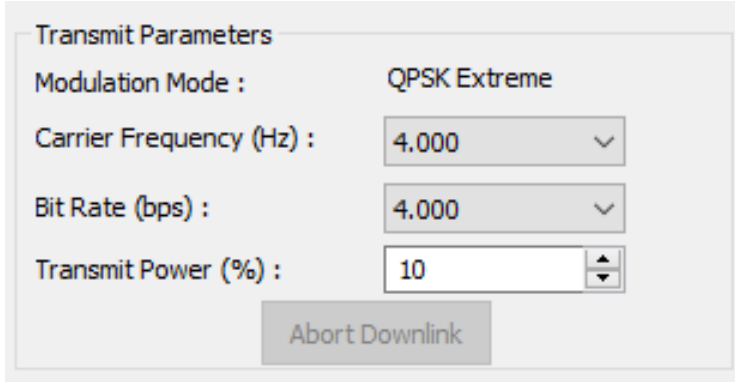
xBolt Downlinking – EM Downlinking – Resistance Measurement

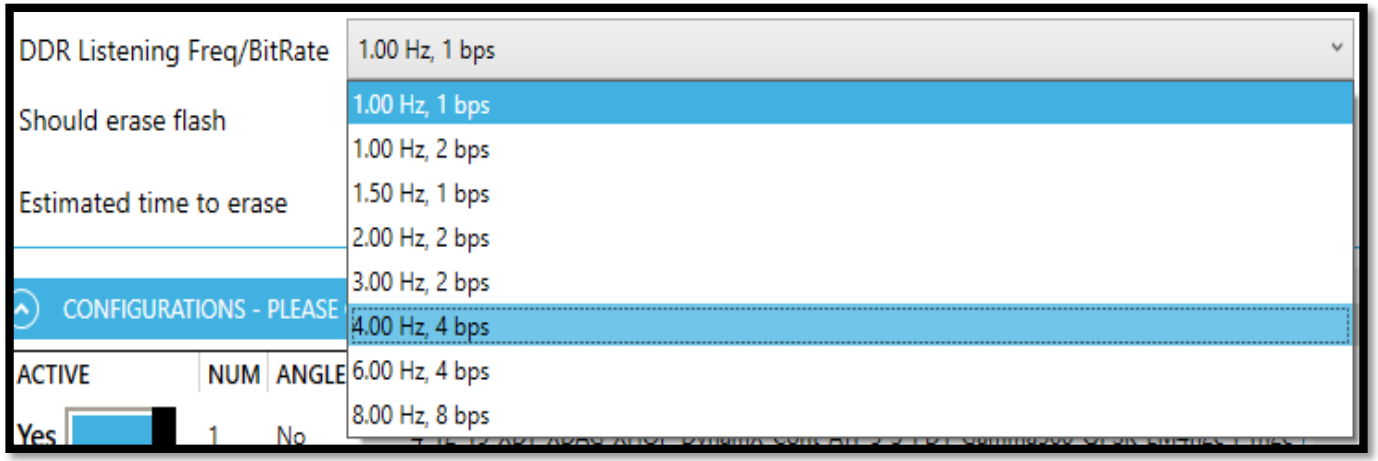
- Resistance
  - Measures resistance between two stake connections
  - When connected to load box for bank test, resistance measurement is generally between 250-450 Ohms
  - Resistance will vary when connected to stake based on ground quality
  - Ideally, for downlinks to downhole tools, resistance should be less than 100 Ohms



xBolt Downlinking – EM Downlinking – Transmit Parameters

- Carrier Frequency/Bit Rate*
  - Frequency and bit rate at which tool listens for downlinks
  - Tool only listens in one bit rate/frequency dictated during programming
  - Programmable options shown on right
- Transmit Power
  - Target power percentage output by downlinker
  - If power setting is too high, safety alarm will trigger
  - If too low, downlink may not take
  - Use 10% (default) to 20% in bank testing
- Abort Downlink / Safety Alarm
  - Downlinks may be aborted while sending
  - If safety alarm triggers, abort downlink button will change to “Safety Alarm”, Safety Alarm button must be clicked to send another downlink

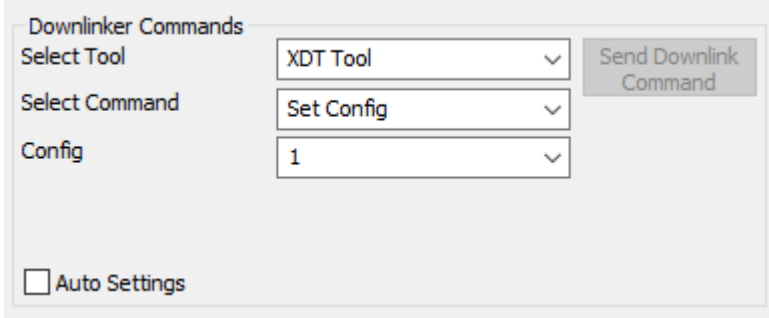


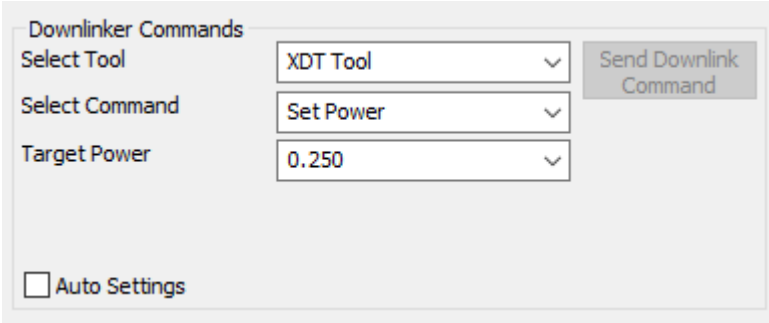


*4Hz/4BPS is most commonly used bit rate/frequency

xBolt Downlinking – EM Downlinking – Transmit Parameters

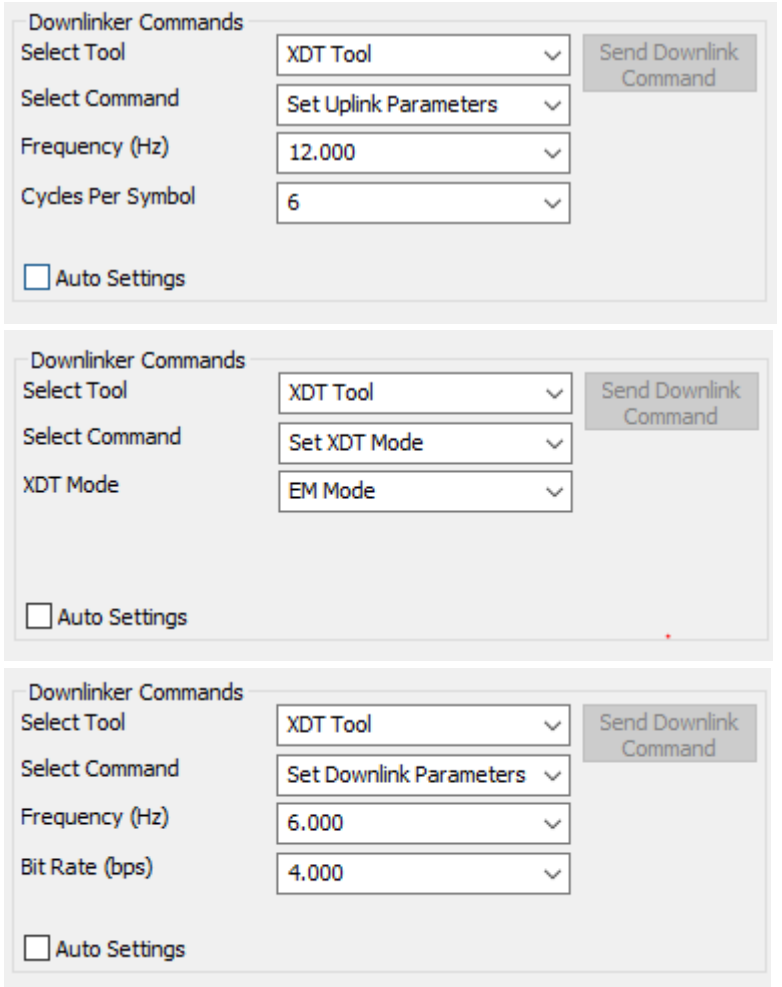
- Select Tool
  - Two Options: XEM or XDT
  - Use XDT when running xBolt
- Select Command
  - Set Config
    - Changes between different configs in tool
    - Tool will send status message upon receipt of config change downlink
  - Set Power
    - Changes maximum EM uplink power setting of tool
    - 42 options between 0.25W and 20W





xBolt Downlinking – EM Downlinking – Transmit Parameters (Cont.)

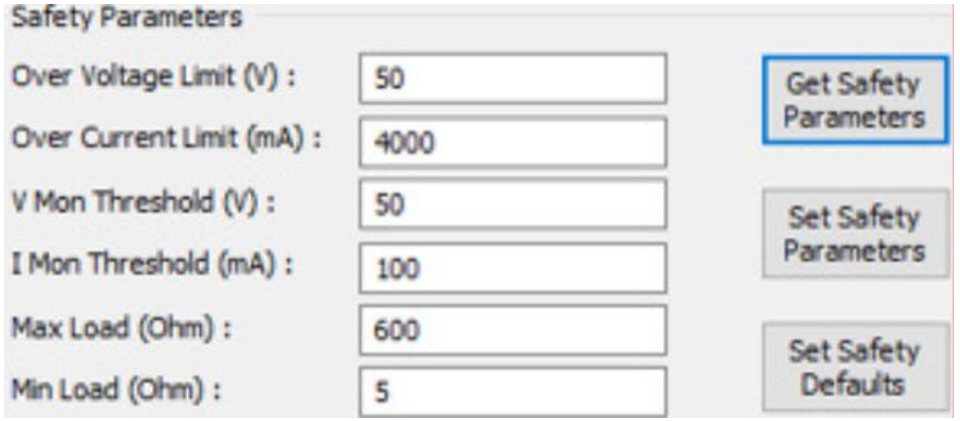
- Select Command (cont.)
  - Set Uplink Parameters
    - Change tool's bit rate and frequency for transmission independent of config
    - Currently only applicable for EM, soon to be supported in MP uplink
  - Set XDT Mode
    - Change between tool's 6 different telemetry strategies
  - Set Downlink Parameters*
    - Change tool's listening bit rate/frequency
    - Requires second downlink sent in new bit rate/frequency within 150 seconds of previous downlink
  - Auto Settings
    - Automatically calculates safety parameters and transmit power



*It is not recommended to change downlink parameters downhole

xBolt Downlinking – EM Downlinking – Safety Parameters

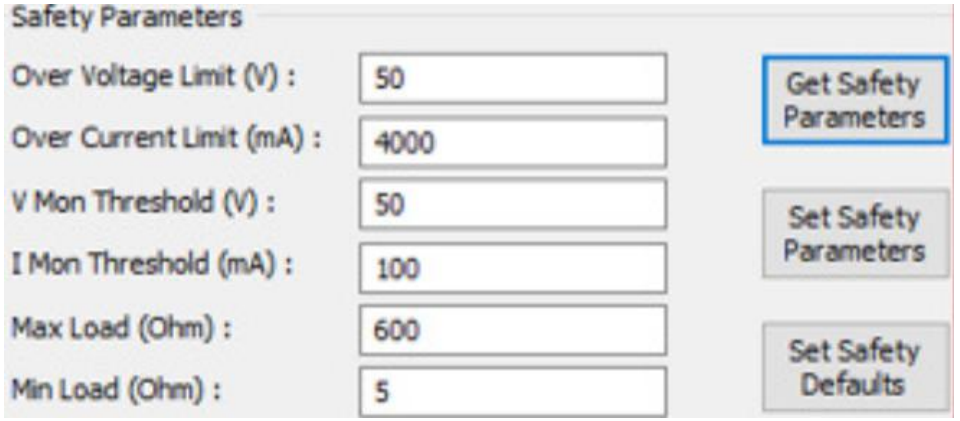
- Over Voltage Limit
  - Max allowed output voltage (ie. if output voltage is more than this, safety alarm will be triggered)
- Over Current Limit
  - Max allowed output current (ie. if output current is more than this, safety alarm will be triggered)
- V Mon Threshold
  - Monitoring minimum output voltage inside down-linker (don't change this default)
- I Mon Threshold
  - Monitoring minimum output current inside down-linker (don't change this default)
- Max Load
  - Maximum measured resistance before triggering safety
- Min Load
  - Minimum measured resistance before triggering safety



*Leave values as default

xBolt Downlinking – EM Downlinking – Safety Parameters (cont.)

- Get Safety Parameters
  - Sends request to downlinker for current safety settings
- Set Safety Parameters
  - When parameters overridden by user, set safety parameters will update downlinker's safety parameter settings
  - Must be clicked after making changes to take effect
- Set Safety Defaults
  - Sets software defaults to current values listed

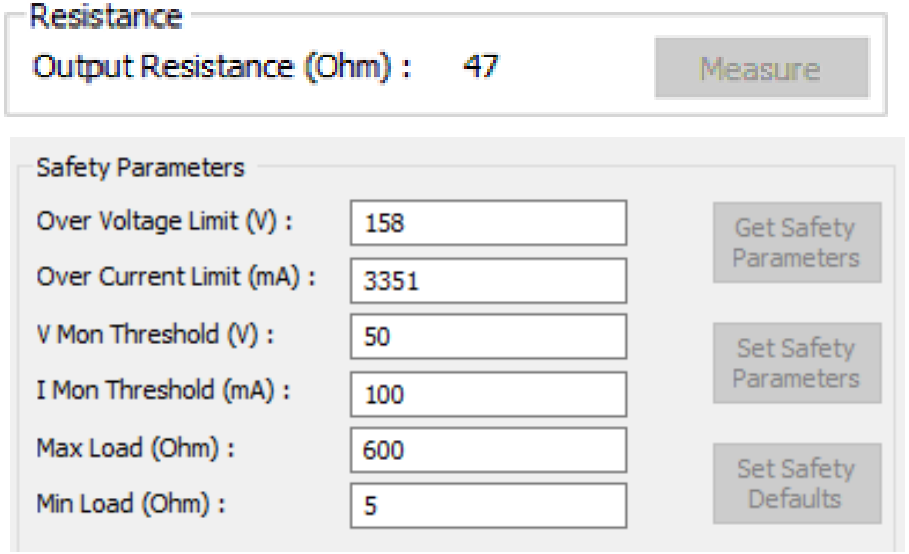


xBolt Downlinking – EM Downlinking – Safety Parameters (cont.)

- Formulas for setting safety parameters

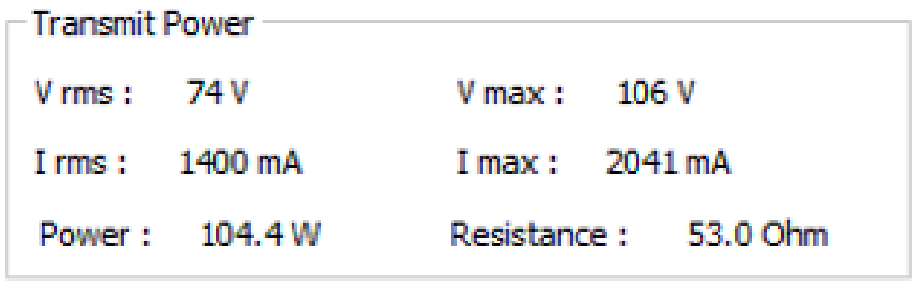
First, measure Resistance in downlinker application

- If resistance <= 37.5 Ohms
  - Over Voltage Limit = Resistance*4.2
  - Over Current Limit = 4200
  - Transmit Power = Resistance*2.22
- If resistance >=37.5 Ohms
  - Over Voltage Limit = 158
  - Over Current Limit = 157500 / Resistance
  - Transmit Power = 84 (if safety alarm triggers, lower power by 10% until alarm no longer triggers)



xBolt Downlinking – EM Downlinking – Transmit Power

- Transmit Power section populates after each downlink
- V rms
  - Displays RMS voltage of last downlink
- I rms
  - Displays RMS current of last downlink
- V max
  - Displays max voltage of last downlink
- I max
  - Displays max current of last downlink
- Power*
  - Display RMS power of last downlink
- Resistance
  - Shows resistance measurement of last downlink



*Transmit power should always be much higher than tool's power setting. If tool is transmitting at 10W and surface decode is poor, downhole downlink detection may also be poor if transmit power is 10W

xBolt Real Time Operations

Collar RPM Downlinking

xBolt Downlinking – Collar RPM

- CRPM downlink similar to PowerDrive CRPM downlinks (Hi/Lo RPM)
- RPM must vary by a minimum of 15%
- Currently only supported with XDAG (no XJDI support)
- Supported in V74 MCU firmware or greater and V38 XDAG firmware or greater

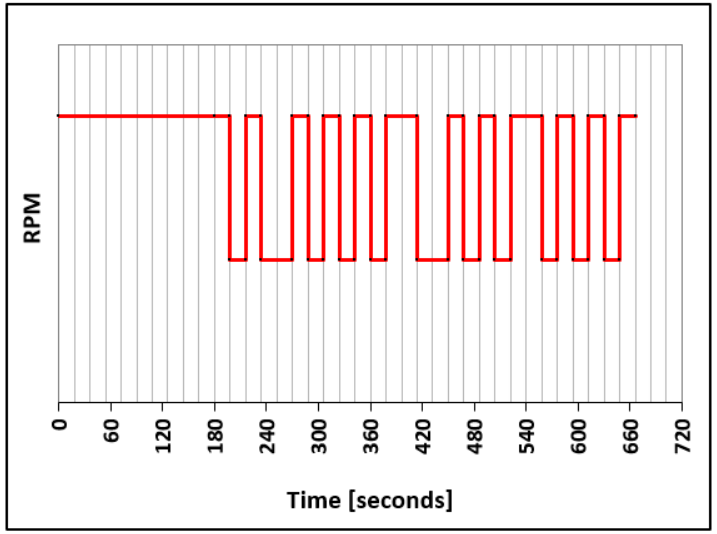
Lagun Fast Rotary Downlink Timing Sheet 2019_05_22

Bit Period [seconds]:	36
Command:	EM Uplink 4 Hz / 2 bps
Tool on > 3 mins before Downlink:	No

Downlink Timing		Comments
At:	Go:	
0:00	H	Start of Steady Rotation before downlink
3:00	**H**	**Start of Downlink Sequence**
3:18	L	Reduce Collar Rotation
3:36	**H**	**Increase Collar Rotation**
3:54	L	Reduce Collar Rotation
4:30	**H**	**Increase Collar Rotation**
4:48	L	Reduce Collar Rotation
5:06	**H**	**Increase Collar Rotation**
5:24	L	Reduce Collar Rotation
5:42	**H**	**Increase Collar Rotation**
6:00	L	Reduce Collar Rotation
6:18	**H**	**Increase Collar Rotation**
6:54	L	Reduce Collar Rotation
7:30	**H**	**Increase Collar Rotation**
7:48	L	Reduce Collar Rotation
8:06	**H**	**Increase Collar Rotation**
8:24	L	Reduce Collar Rotation
8:42	**H**	**Increase Collar Rotation**
9:18	L	Reduce Collar Rotation
9:36	**H**	**Increase Collar Rotation**
9:54	L	Reduce Collar Rotation
10:12	**H**	**Increase Collar Rotation**
10:30	L	Reduce Collar Rotation
10:48	**H**	**Increase Collar Rotation**
11:06	H	End of downlink.
		Resume Drilling

Note:

- Pumps do not need to be cycled to initiate a downlink.
- A "quiet period" with a steady flow and rotation is required before downlink starts
- Rotary downlinks can typically be performed while drilling (re-try off bottom if unsuccessful)
- Vary RPM by 15% (re-try with higher % change if unsuccessful)



xBolt Real Time Operations

Pressure Downlink

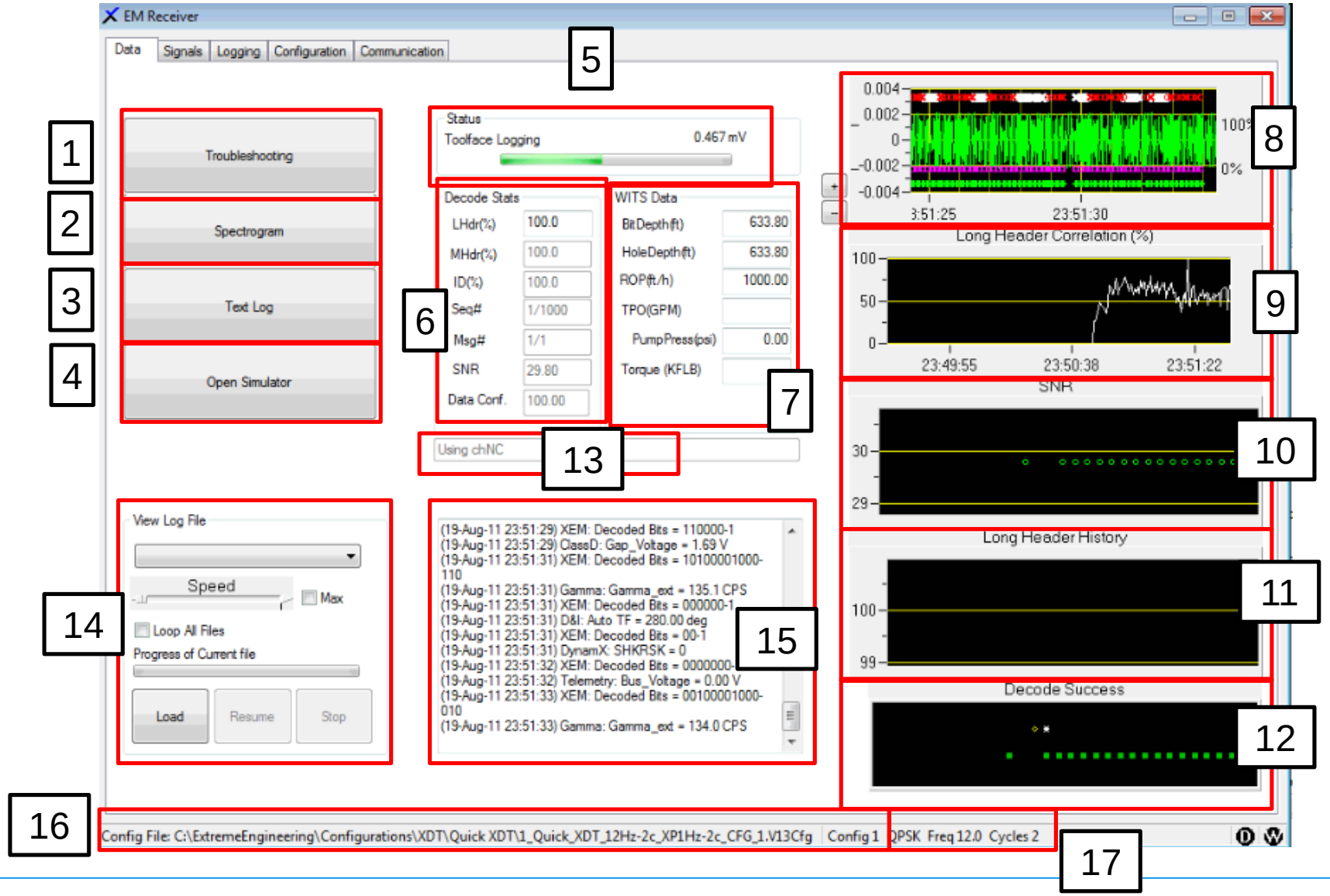
xBolt Downlinking – Pressure

- Pressure downlink similar to PowerDrive flow downlinks (Hi/Lo Flow rate)
- Still in development, should be in testing by Q1, 2020

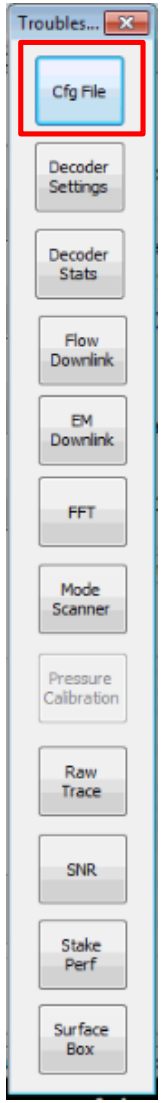
xBolt Real Time Operations

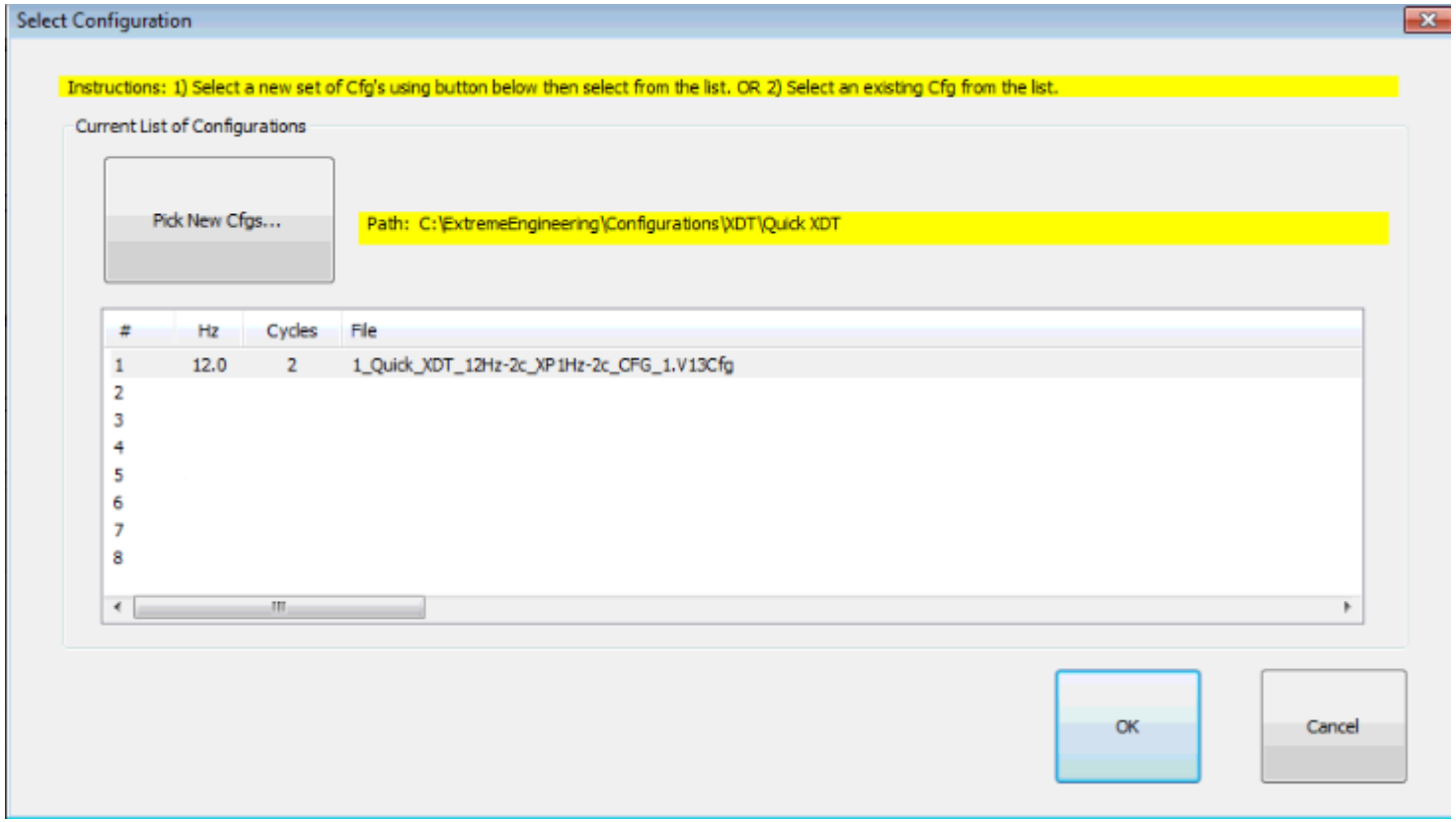
xDirect Receivers

xDirect Receivers



xDirect Receivers – Troubleshooting Tab





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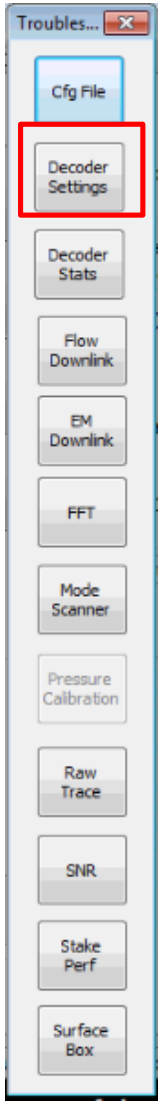

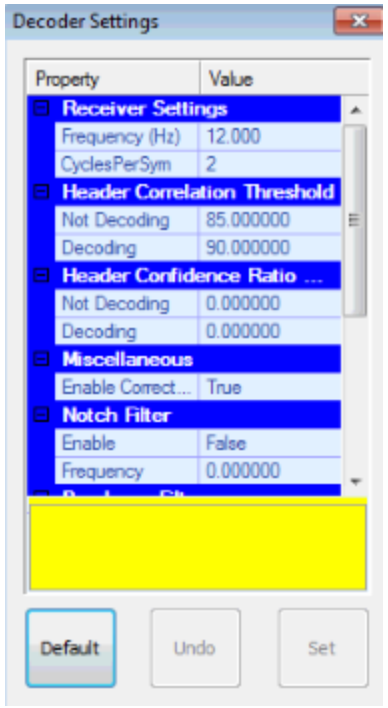

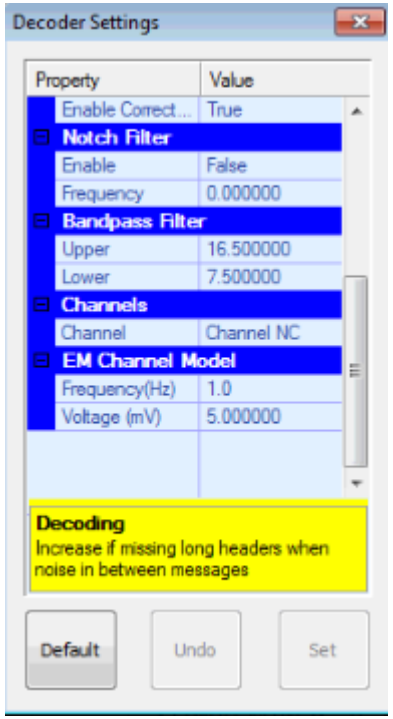

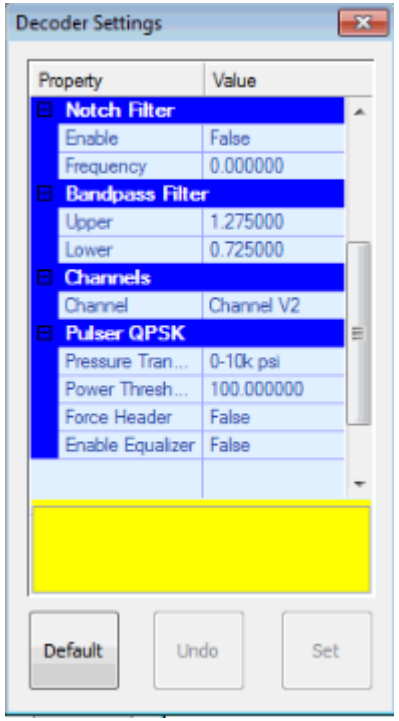

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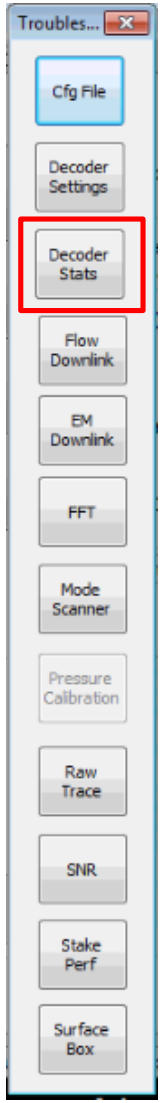
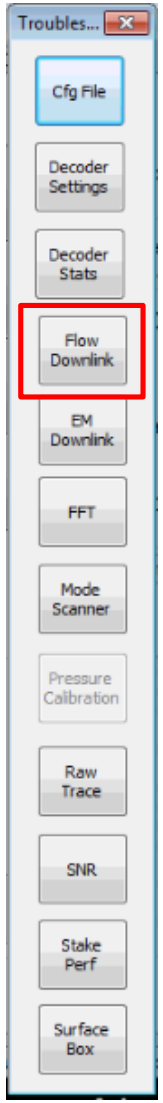
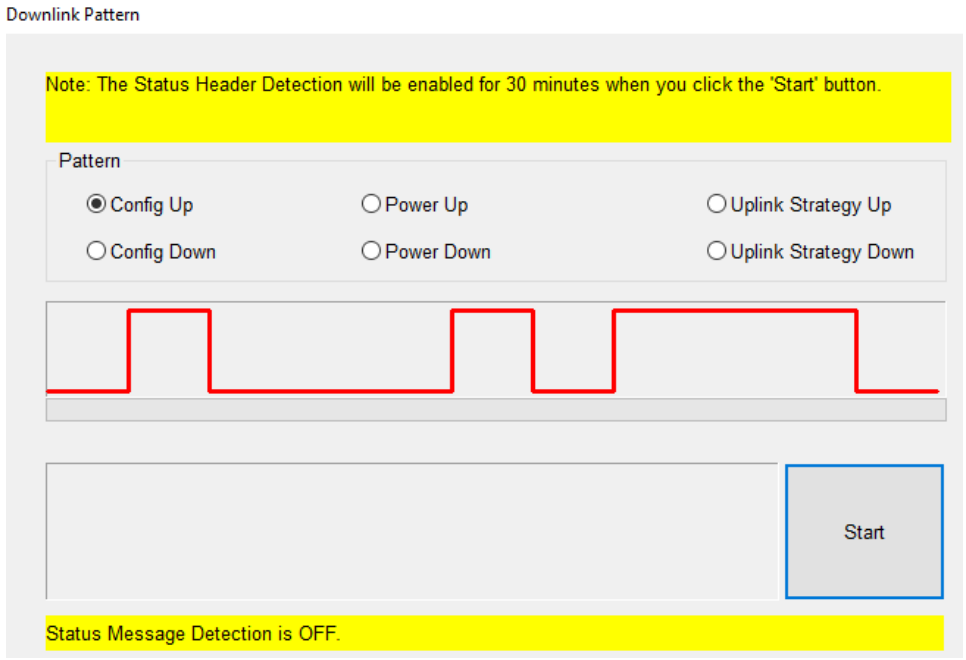


Decoder Statistics

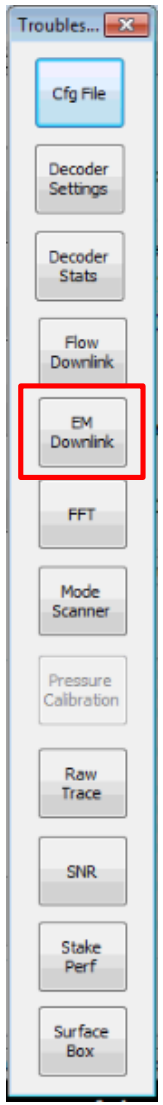
Channel	DC Offset	Found Hr	Chose Hr	Quick RMS	Long RMS (10 sec)
ch1	0.018127	39		0.018167	0.018166
ch2	0.018423	0		0.018424	0.018424
ch3	0.018353	0		0.018354	0.018354
ch4	0.018475	0		0.018475	0.018475
chNC		39		0.018167	0.018166

xDirect Receivers – Troubleshooting Tab (cont)





xDirect Receivers – Troubleshooting Tab (cont)



EM Downlink

Transmit Parameters

Modulation Mode : QPSK Extreme

Carrier Frequency (Hz) : 4.000

Bit Rate (bps) : 4.000

Transmit Power (%) : 40

Abort Downlink

Downlinker Commands

Select Tool: XDT Tool

Select Command: Set Power

Target Power: 15.000

Send Downlink Command

Auto Settings

Transmit Power

V rms : 74 V V max : 106 V

I rms : 1400 mA I max : 2041 mA

Power : 104.4 W Resistance : 53.0 Ohm

Resistance

Output Resistance (Ohm) : 47

Measure

Safety Parameters

Over Voltage Limit (V) :

Over Current Limit (mA) :

V Mon Threshold (V) :

I Mon Threshold (mA) :

Max Load (Ohm) :

Min Load (Ohm) :

Get Safety Parameters

Set Safety Parameters

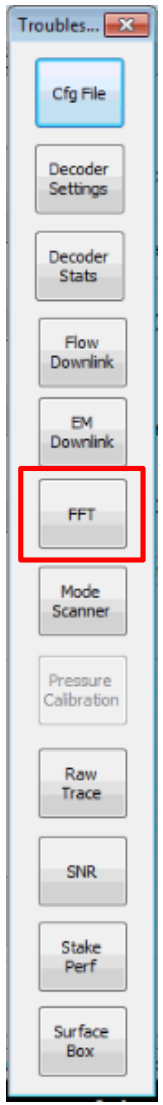
Set Safety Defaults

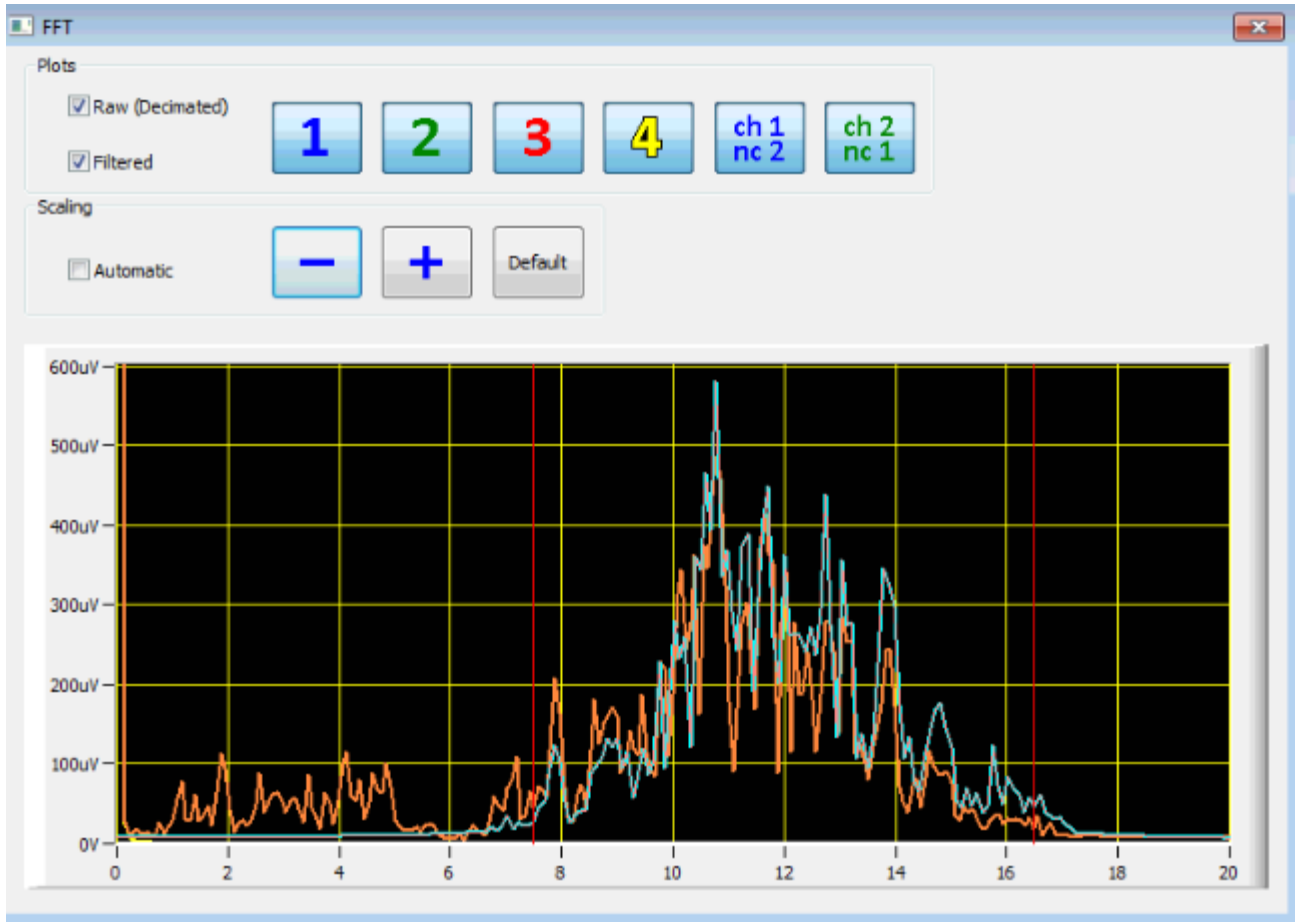
Note: The Status Header Detection will be enabled for 30 minutes when you click the 'Send Downlink Command' button.

Status Message Detection is OFF.

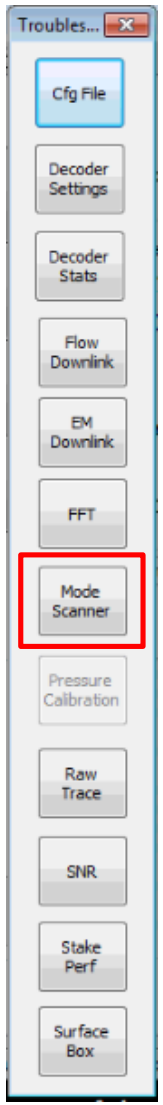
Downlink Status : Disconnected COM15 Connect to PC by USB Connect

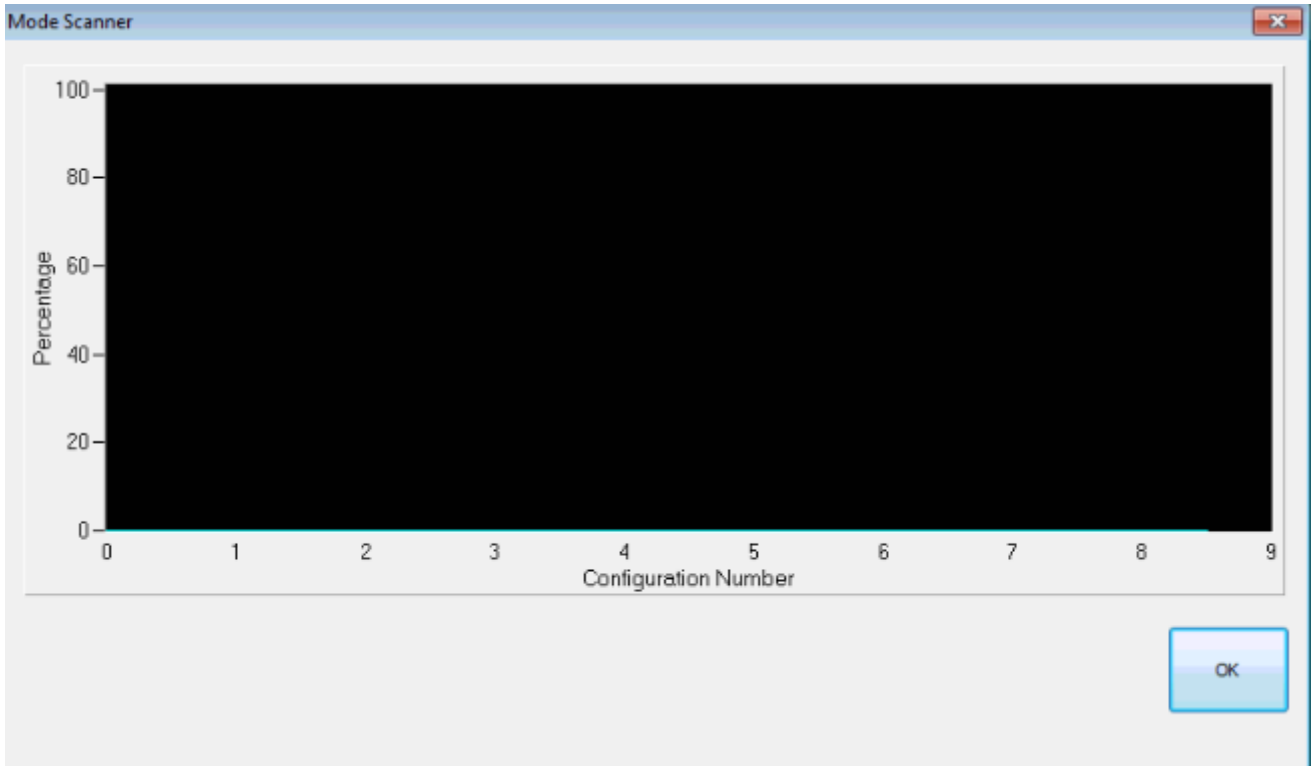
xDirect Receivers – Troubleshooting Tab (cont)



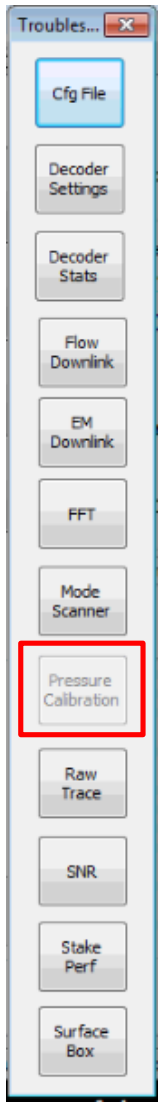


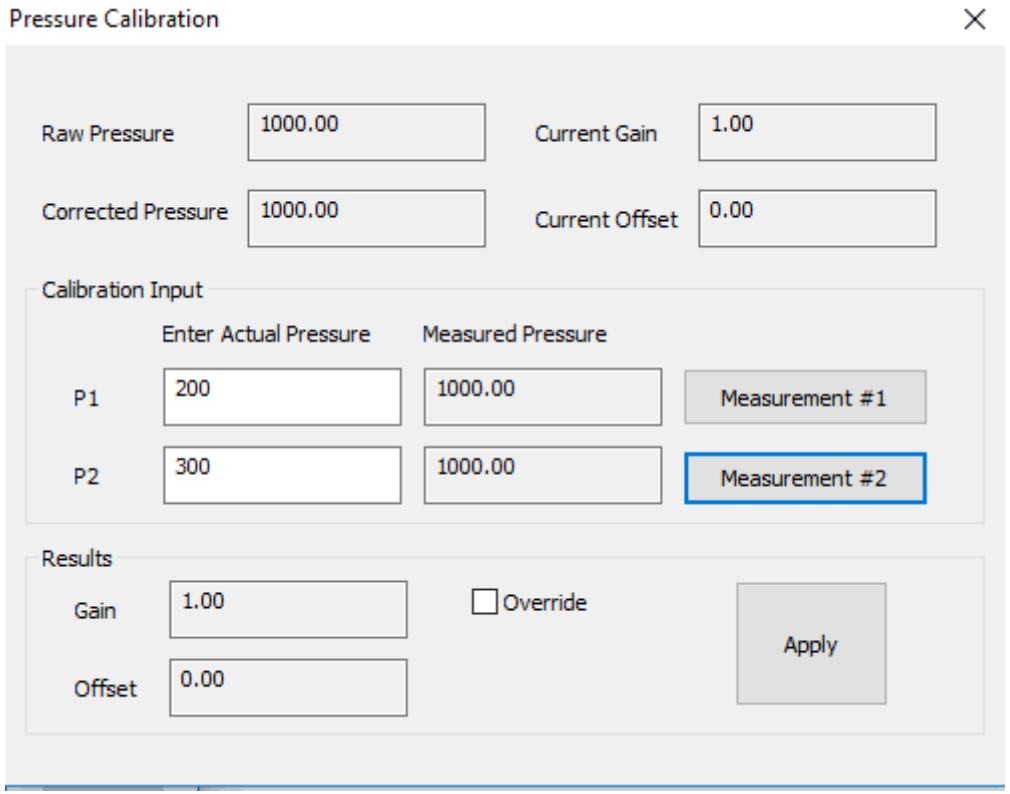
xDirect Receivers – Troubleshooting Tab (cont)



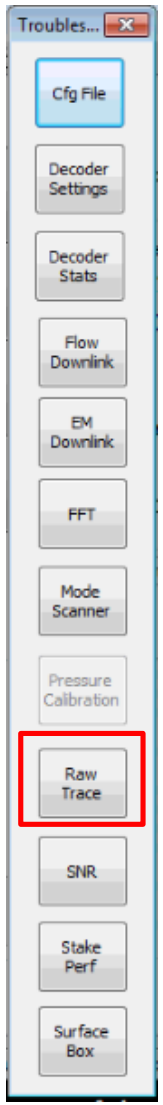


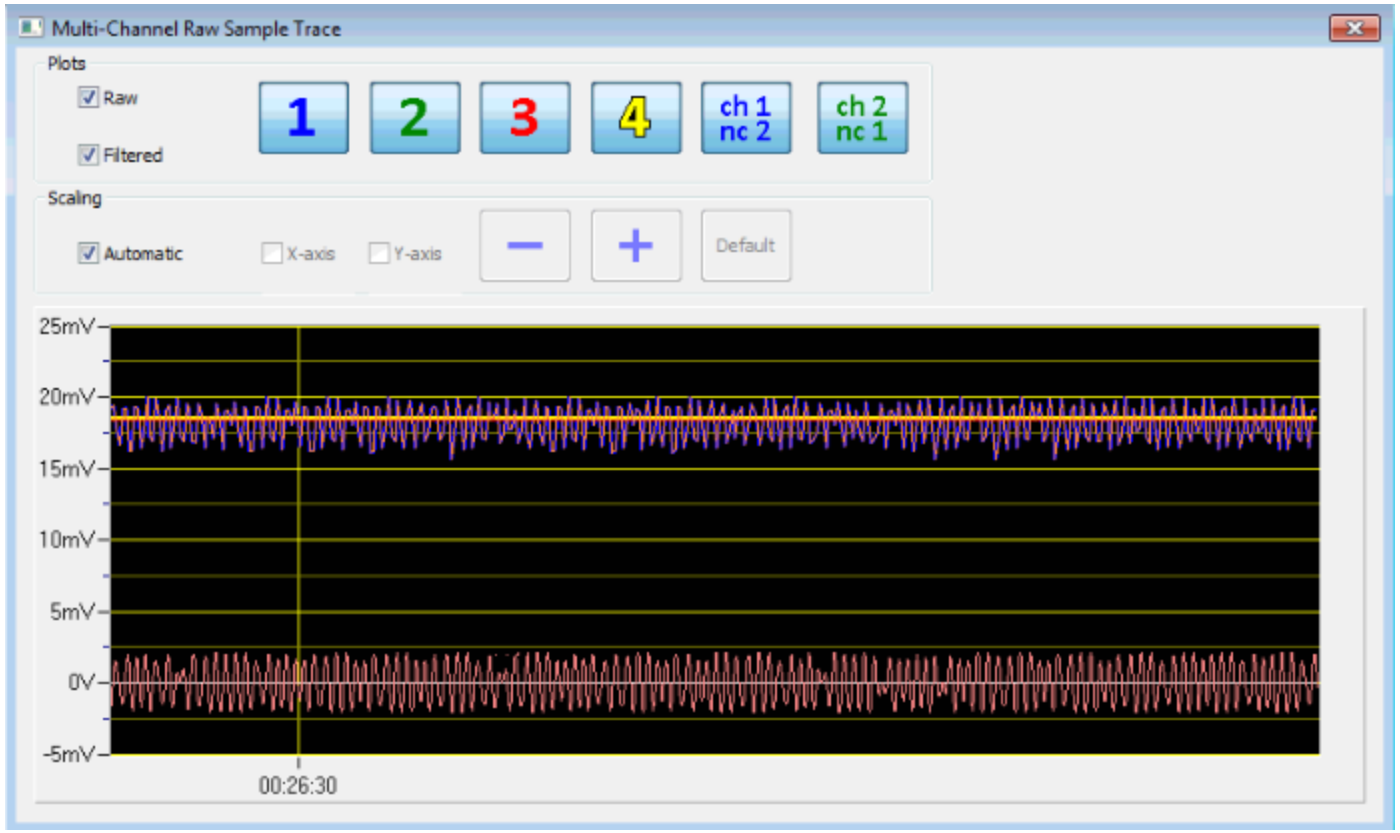
xDirect Receivers – Troubleshooting Tab (cont)



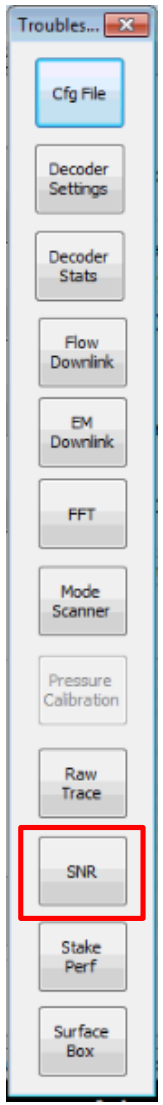


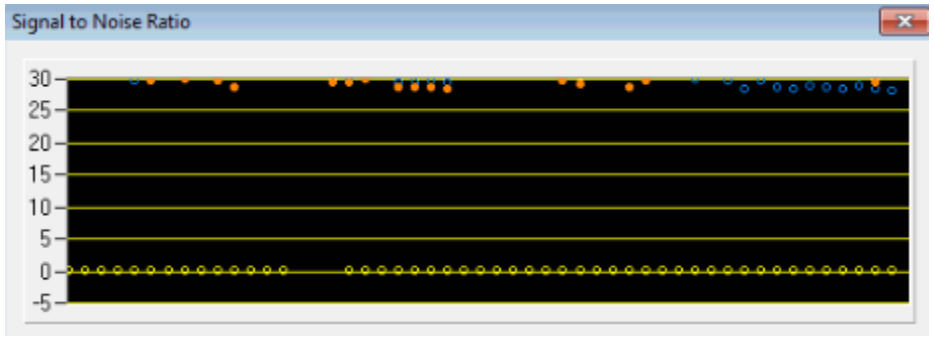
xDirect Receivers – Troubleshooting Tab (cont)



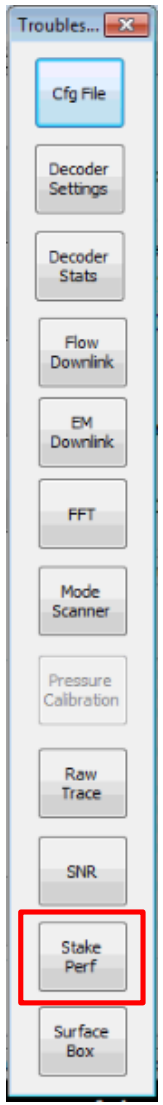


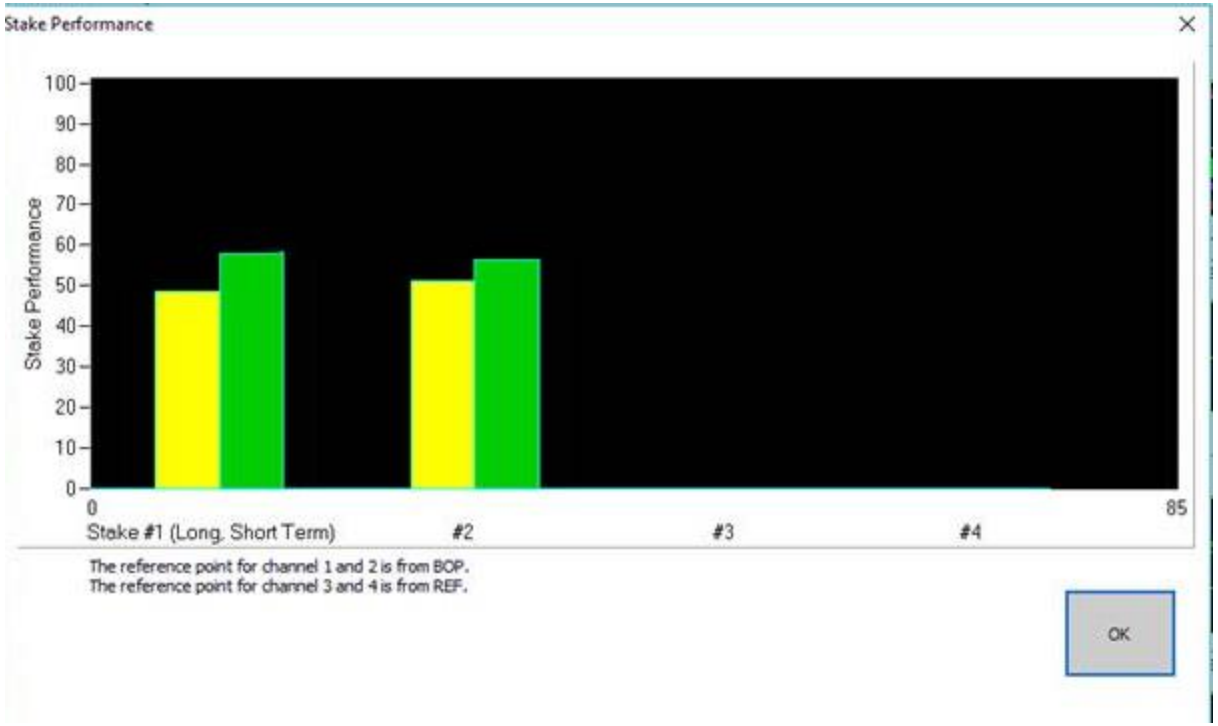
xDirect Receivers – Troubleshooting Tab (cont)



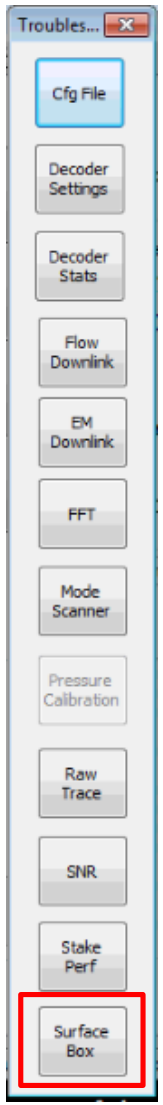


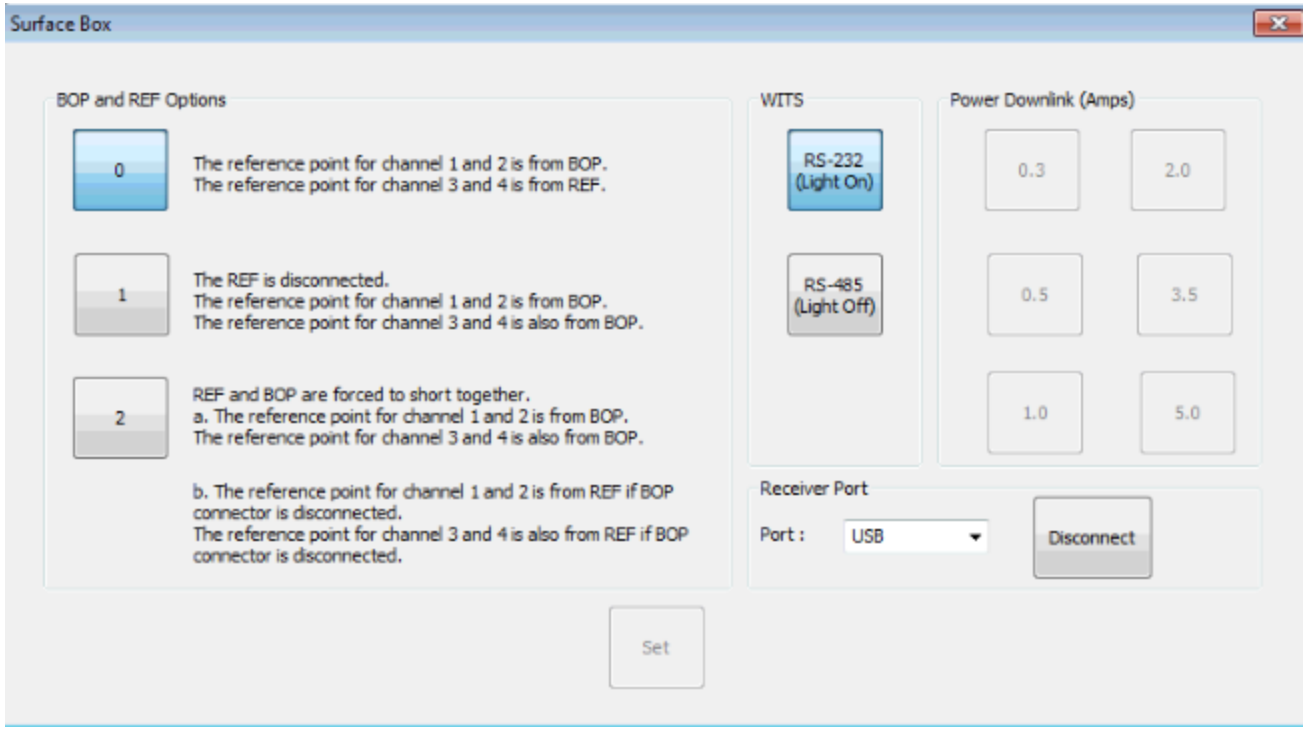
xDirect Receivers – Troubleshooting Tab (cont)





xDirect Receivers – Troubleshooting Tab (cont)





xBolt Real Time Operations

xBolt Basic Troubleshooting

xBolt Basic Troubleshooting – Common Issues

Downlinks Not Taking in Bank Test

- Verify Black Load Box is used
- Measure resistance in downlinker app and verify it is within normal range (250-450 Ohms for black load box)
- Verify Clamps are connected on both sides of gap probe (Connect clamps to Pulser and Bow Springs for DT or Landing Spider and Bow Springs for EM)
- Verify Downlink Transmit Parameters for bit rate and frequency match tool's programmed listening bit rate and frequency (Can be verified in pre-run report)

xBolt Basic Troubleshooting – Common Issues (cont.)

Erratic EM signal in bank test

- Verify Clamps are connected on both sides of gap probe (Connect clamps to Pulser and Bow Springs for DT or Landing Spider and Bow Springs for EM)
- Make sure cables are connected fully (common issue seen is between Black load box and BOP/ANT cables)
- Electrically Isolate Vibration Motor from tool
  - Connect motor on rubber centralizer
  - Wrap electrical tape around tool OD
  - Manually vibrate tool with vibration motor disconnected

xBolt Basic Troubleshooting – Common Issues (cont.)

No communication from D&I in Bank Test (-8888.0 TF, 0.0000 for raw axis surveys and continuous AX/MX)

- Electrically Isolate Vibration Motor from tool
  - Connect motor on rubber centralizer
  - Wrap electrical tape around tool OD
  - Manually vibrate tool with vibration motor disconnected
- Move location of vibration motor away from XDT and D&I
- First survey after reset will come through with all 0s, attempt second survey
- Verify configurations match directional being used (XDAG vs Legacy)

xBolt Basic Troubleshooting – Common Issues (cont.)

Poor decoding/missed pulses in MP mode on bank test

- Restart XDT Bank Test Receiver, over time receiver performance degrades
- Listen to pulser to see if clicking does not sound consistent
- In below freezing temps, warm pulser up inside prior to bank test to reduce viscosity in oil
- Reduce bit rate to 1 BPS or less

xBolt Basic Troubleshooting – Common Issues (cont.)

Battery Voltage tests failing in pre-run report

- If showing ~17V, turn XM4 tool power button off

xBolt Basic Troubleshooting – Common Issues (cont.)

No EM Signal when drilling surface hole

- Downlink tool to Safety Disabled Configuration as pressure can be too low to activate flow switch
- Verify using correct frequency/bitrate (check spectrogram)

xBolt Basic Troubleshooting – Common Issues (cont.)

Unable to measure resistance with downlinker

- Check cables and clamps are properly connected to stakes or well heads
- Try different inputs into EL+ and EL- and measure resistance
- Measure resistance using an EGT if available
- Verify grounding rods are driven as deep into the ground as possible. If ground is frozen, a good resistance may not be achievable without connecting to well heads or grounding rods driven below frozen layer

xBolt Basic Troubleshooting – Common Issues (cont.)

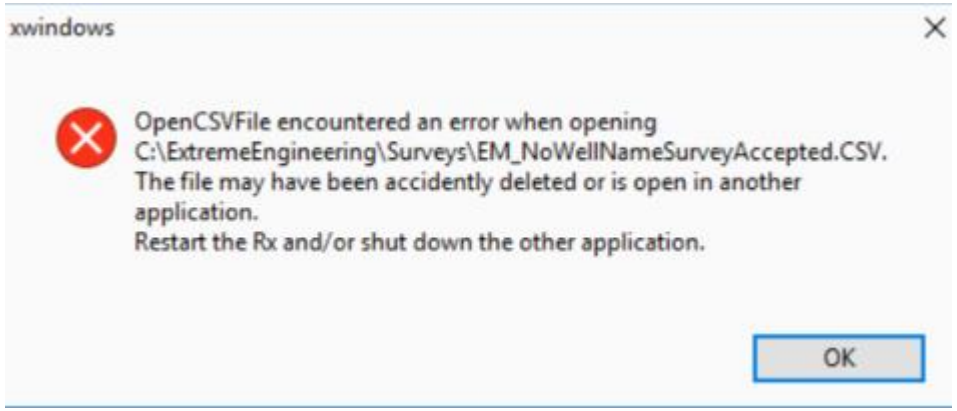
Tool not accepting downlinks downhole

- Verify Downlink Transmit Parameters for bit rate and frequency match tool's programmed listening bit rate and frequency (Can be verified in pre-run report)
- Measure resistance in downlinker app, the lower the resistance the more power that can be pushed into formation. Anything less than 35 Ohms is ideal, anything greater than 100 Ohms may make downlinking difficult. If resistance is greater than 100 Ohms, try using different stake inputs into EL+ and EL-, drive ground stakes deeper into ground, daisy chain multiple grounding rods together using grounding wire (Grounding rods should be at least double the distance apart from each other as the depth that they are driven into the ground. Ie if a rod is driven into the ground 3 ft, the second grounding rod in the daisy chain should be at least 6 ft or more away)

xBolt Basic Troubleshooting – Common Issues (cont.)

XM4 Receiver not opening and showing error:

- Open Task Manager > Find XEM Receiver (usually under background processes) and end task. Once task is ended, it should be possible to open XM4 receiver.
- Restart Computer

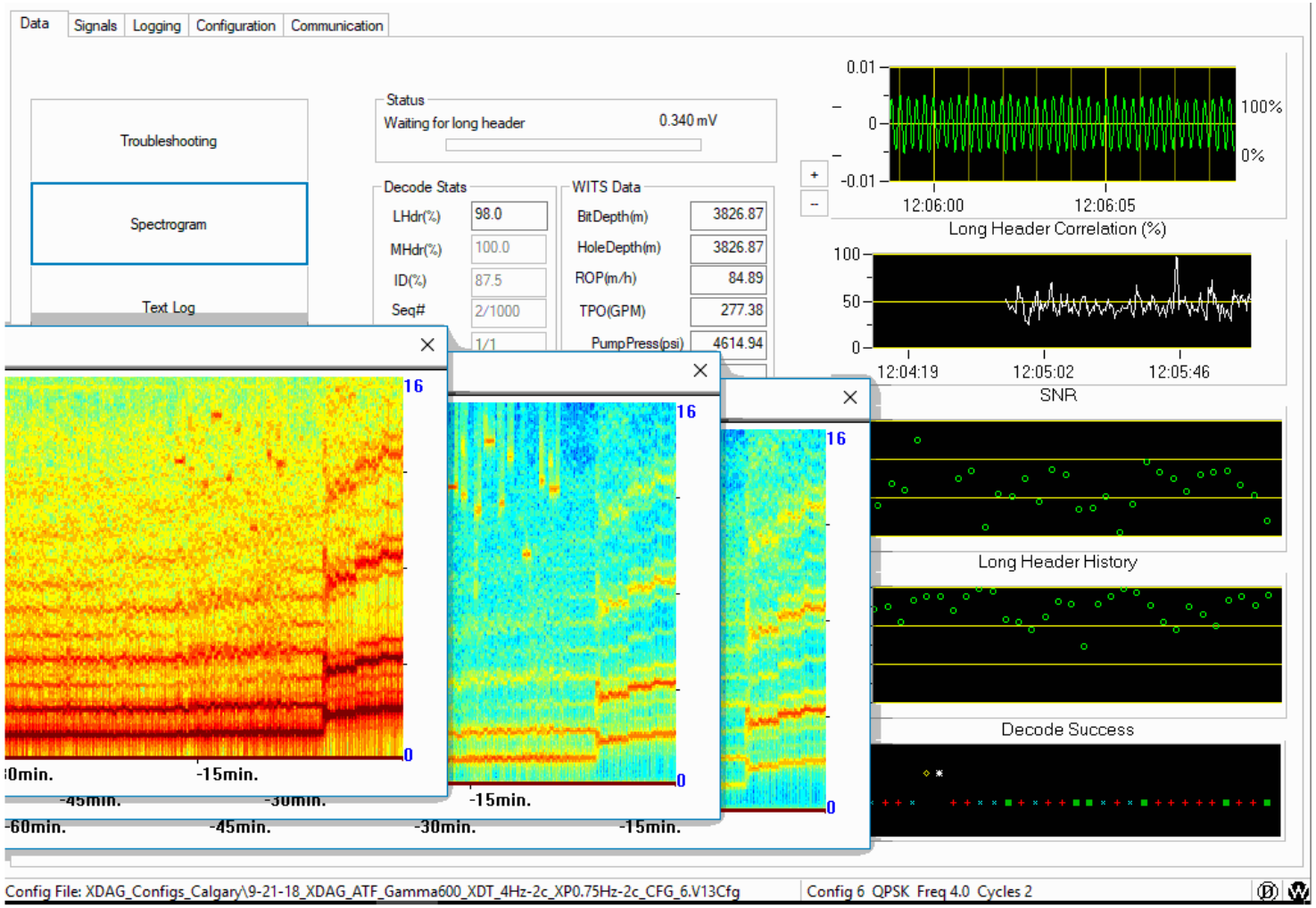


xBolt Basic Troubleshooting – Common Issues (cont.)

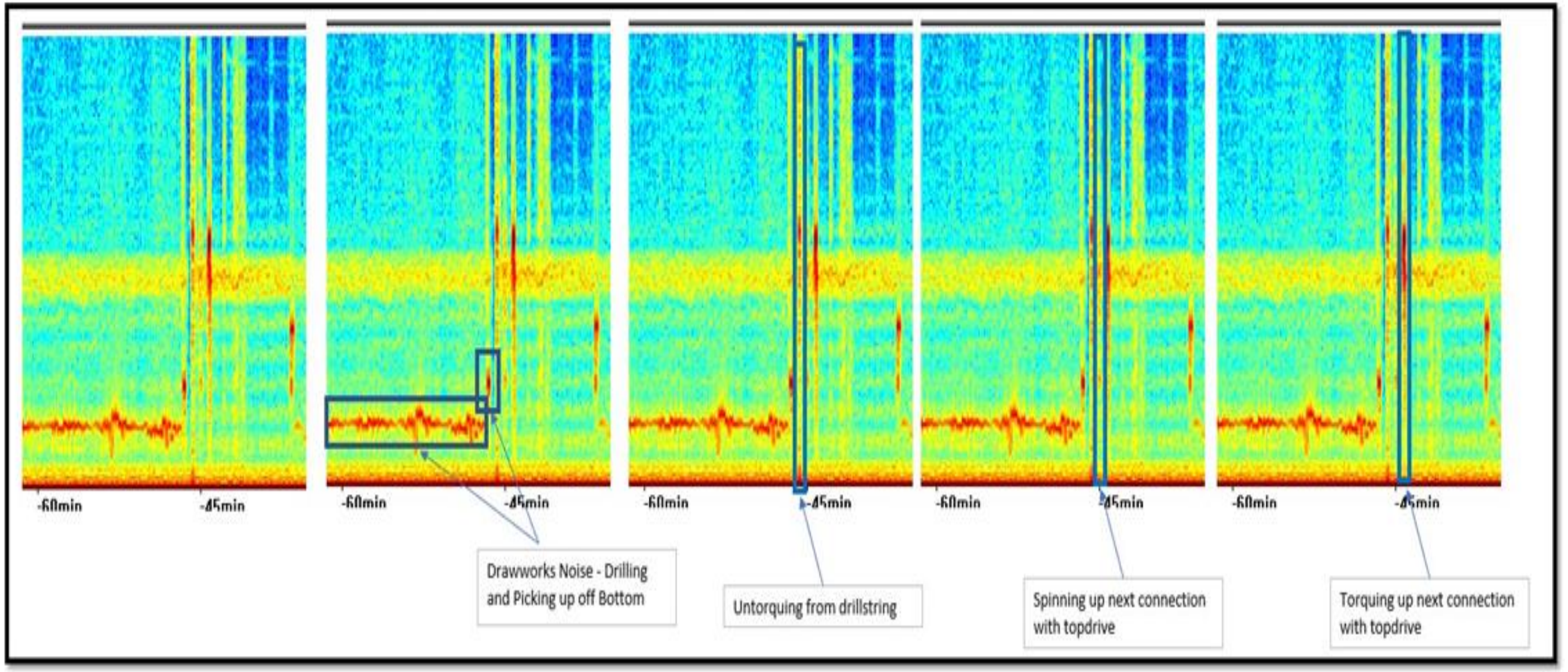
When connecting to Lagun-R tool string, PPP node doesn’t appear but all other nodes are present. PPP may also show bootload version for firmware during resets pending on board revision

- Remove battery/XM4 power from string, remove R-Pulser from string, apply power back to tool string and re-communicate. PPP node will sometimes disappear if R-Pulser motor has shorted

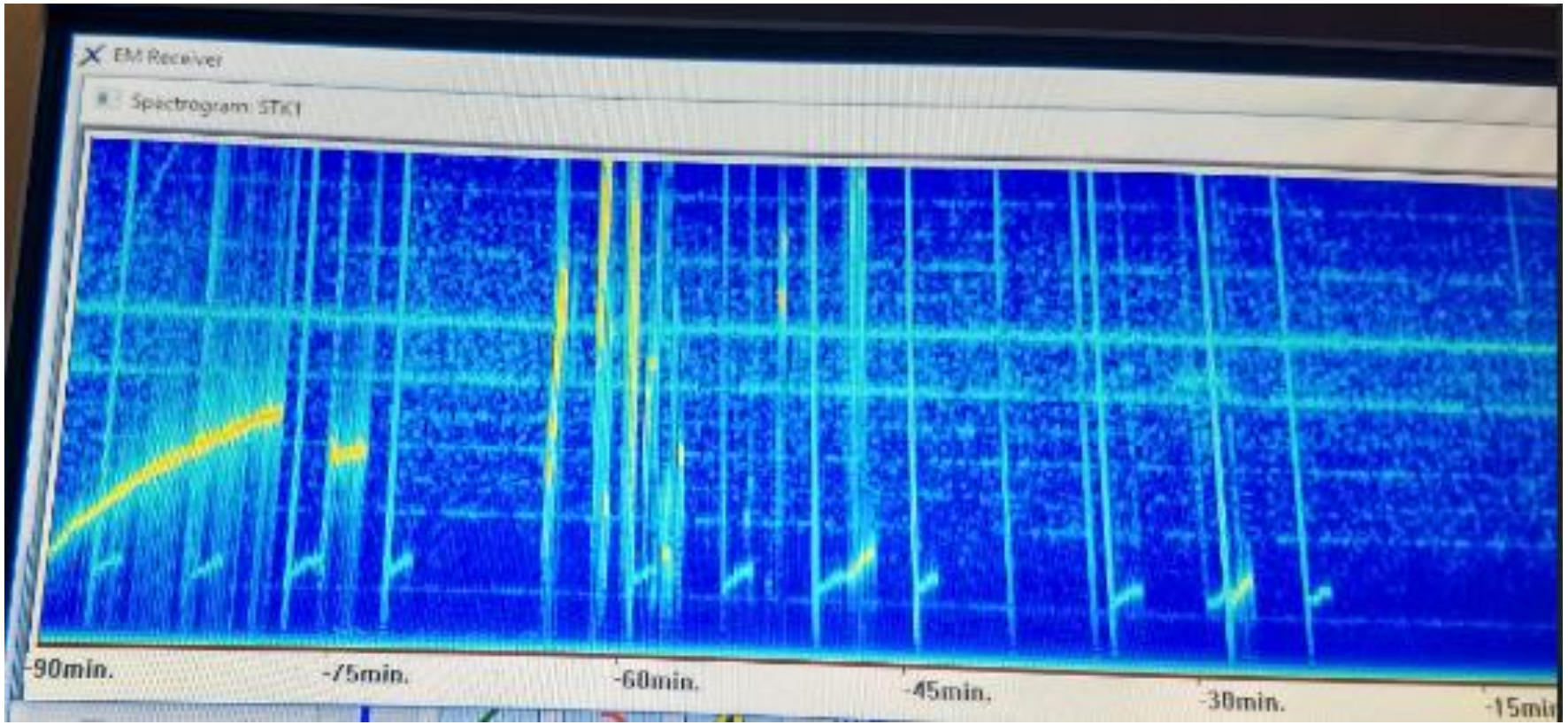
xBolt Basic Troubleshooting – EM Noise



xBolt Basic Troubleshooting – EM Noise (cont.)



xBolt Basic Troubleshooting – EM Noise (cont.)

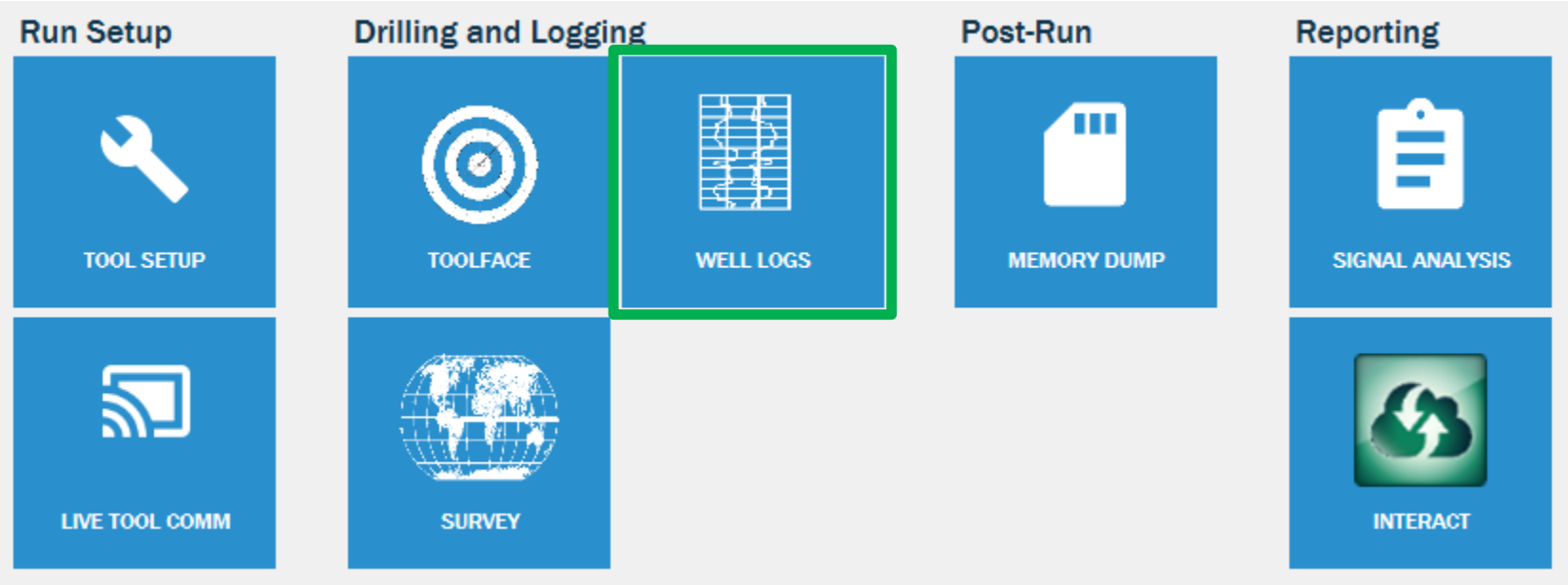


xBolt Real Time Operations

xDirect Logging

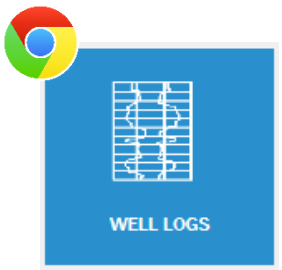
xDirect Logging

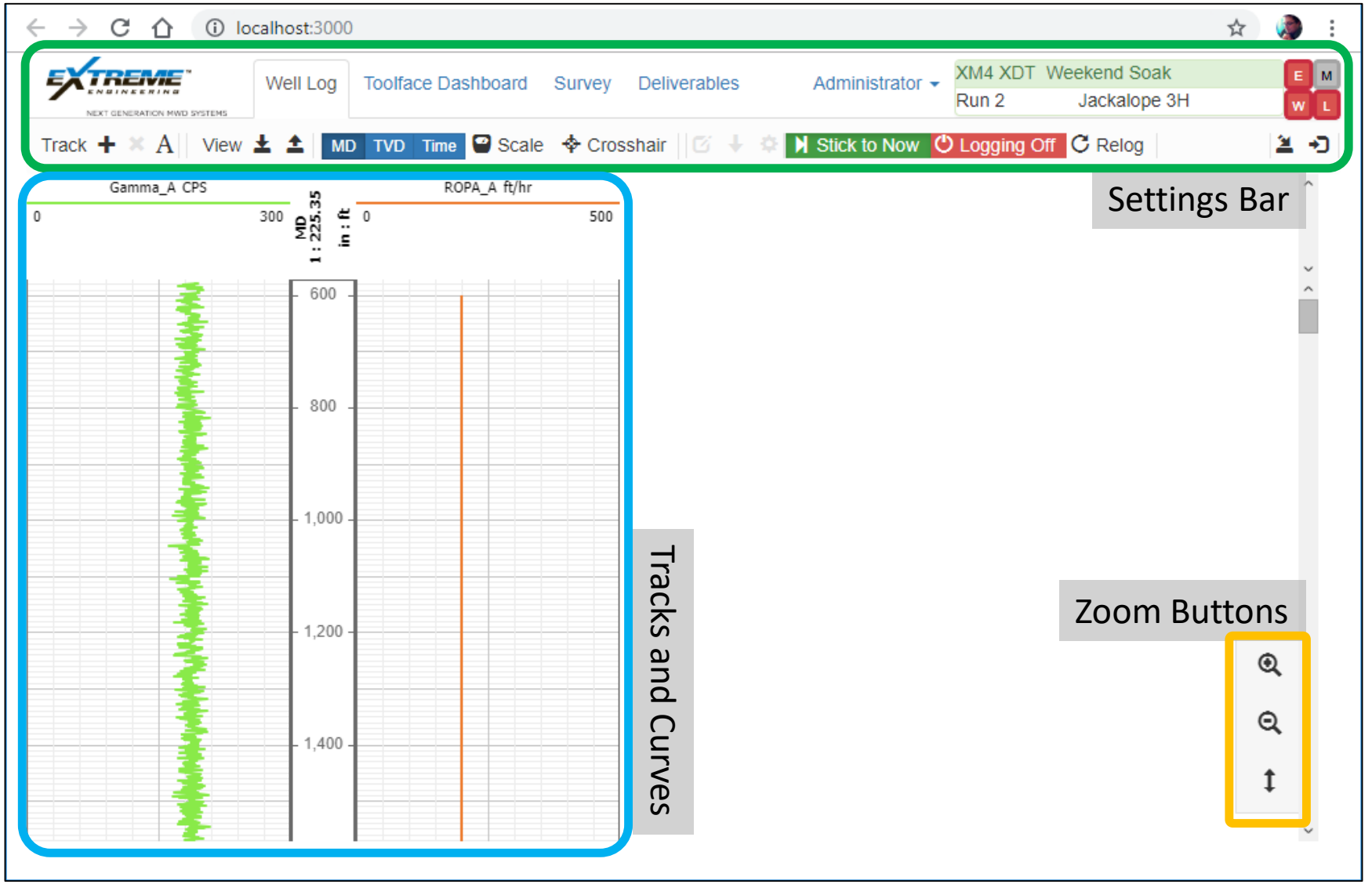
XDirect has many features available to its users.
This presentation focuses on Well Logs



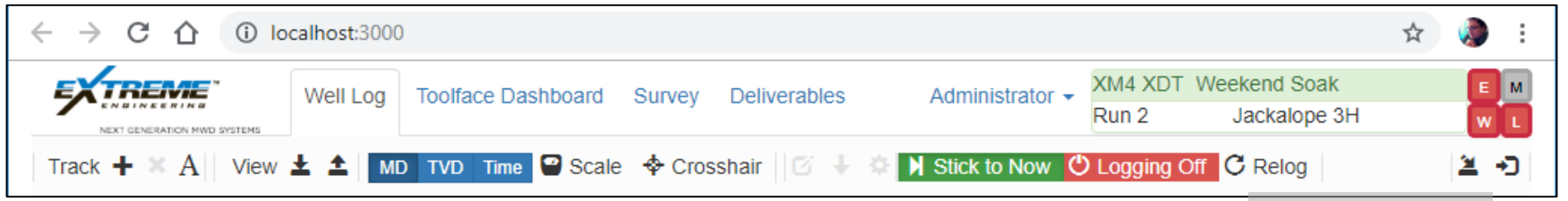
When **Well Logs** is selected from the main menu, a Google Chrome tab will open.

xDirect Logging

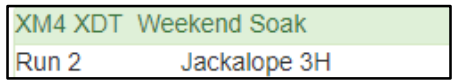




xDirect Logging



Settings Bar



Job and Run Information

EM/Mud/WITS/Logging indicators

Add/remove Tracks and Annotations

Save and Load Logging Templates

Toggle Measured Depth, Total Vertical Depth, or Time index

Toggle Scale presets

Toggle crosshair display for cursor

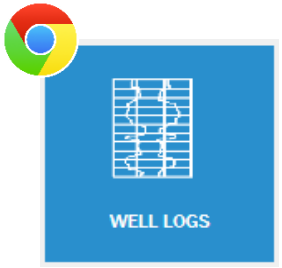
Edit Curve, Depth Shift, and Curve Properties

Toggle Stick to Now and Logging ON/OFF

Toggle Relog ON/OFF

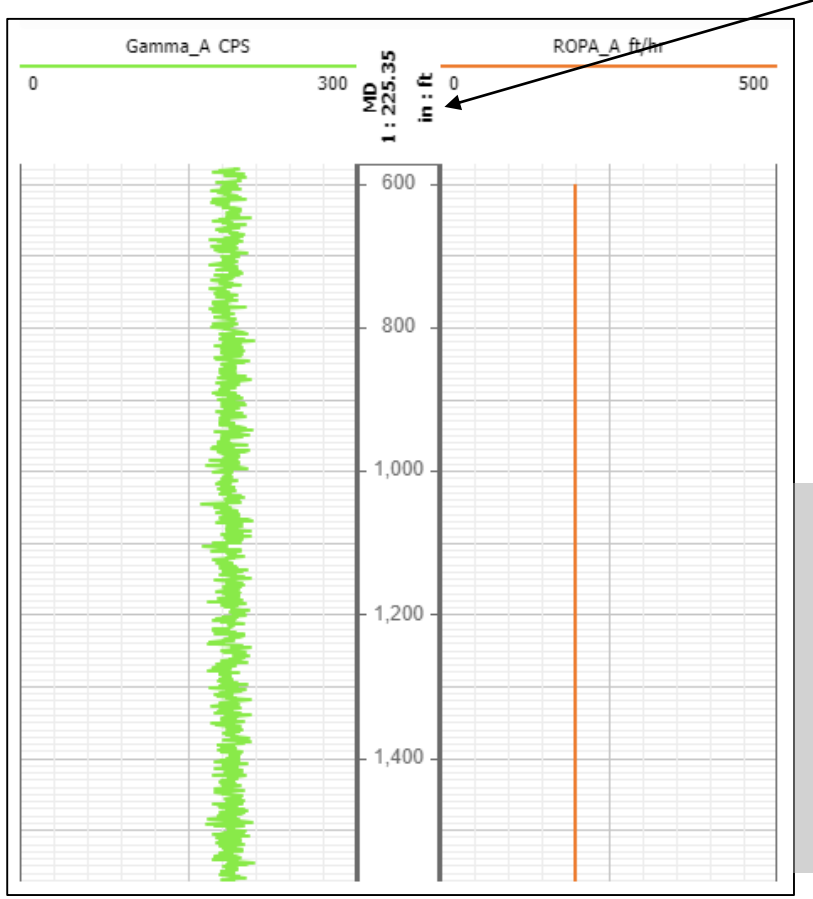
Import/Export log files

xDirect Logging



Tracks: Linear and Logarithmic tracks can contain multiple curves

Index Track: MD, TVD, or Time scale.



Curves: Each curve represents a datapoint chosen from the Curve menu.
Each track can contain multiple curves.

Tracks and Curves

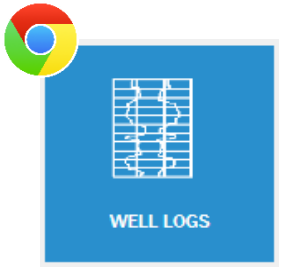
Zoom Buttons

- Zoom IN
- Zoom OUT
- Show ALL

xDirect Logging

XDirect Curve Basics

xDirect Logging

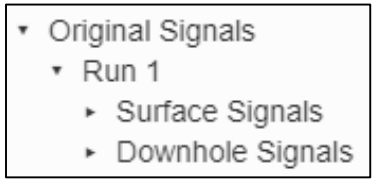


Understanding Curves

Curves are split into three main categories

- Original Signals
  Curves cannot be edited by the user
- Edited Signals
  Curves can be edited by user
- Auto Generated Signals
  Curves combine multiple runs, relogs, realtime and recorded mode.

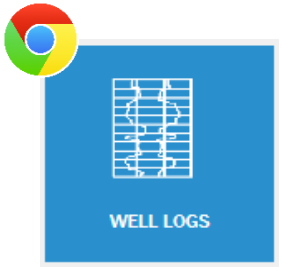
The Original and Edited categories are then grouped by Run number and Surface/Downhole indicators.



Curve suffixes help to easily identify which category they came from

- _R = ORIGINAL Real Time Surface Data
- _M = ORIGINAL Memory Downhole Recorded Data
- _E = EDITED Curve Data
- _A = Auto Generated Combined Data
- # = A number in the suffix represents a RUN and/or RELOG number

xDirect Logging



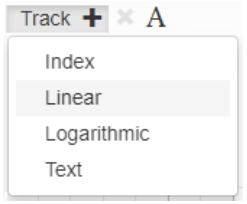
Common Task

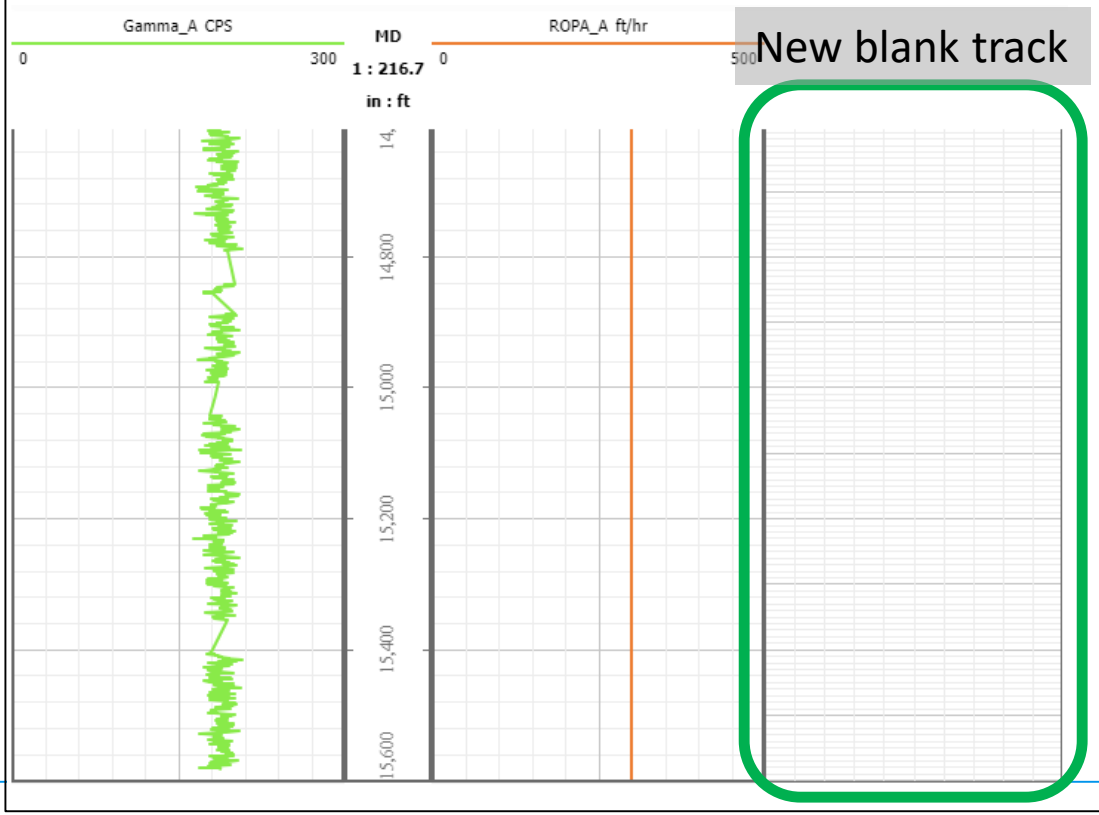
Add Tracks and Curves

xDirect Logging

Common Task #1 - **Add a new Track**

Select the **Add Track** button, then choose a Track Type.
Note: In this example, we will add a linear track.

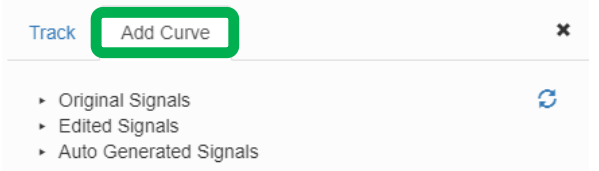




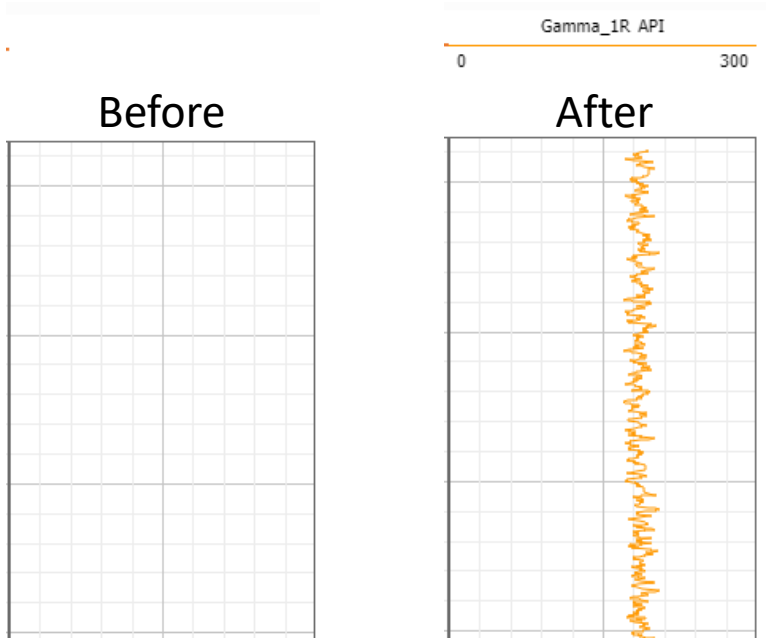
xDirect Logging

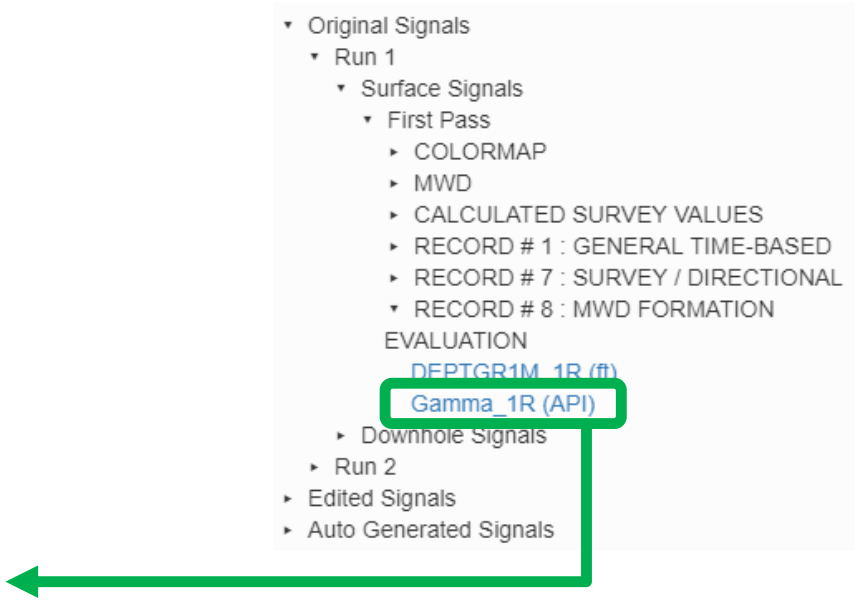
Common Task #2 - **Add a new Curve to a Track**

Double-click the desired track, then choose **Add Curve**.

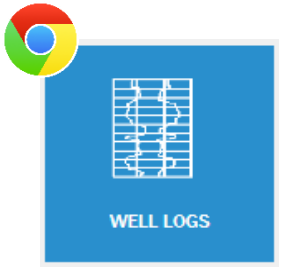


Use the menu to select a desired curve.





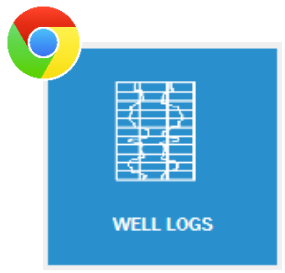
xDirect Logging



Common Task

Relogs

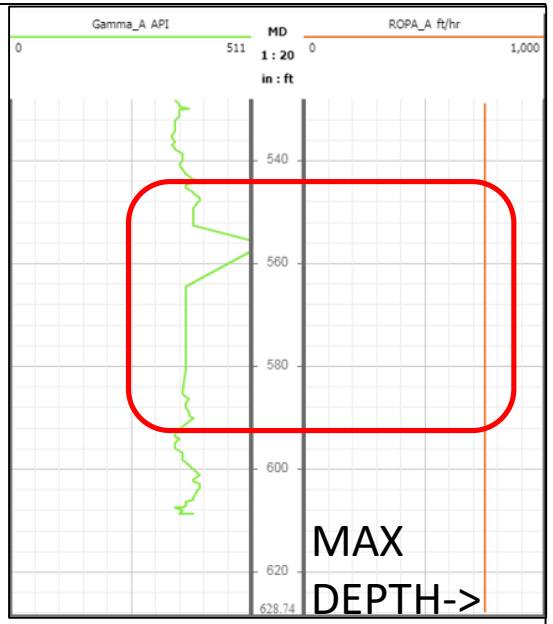
xDirect Logging



Common Task #3 - **Re-log a section**

1. Identify the section that needs to be relogged.

   In this example, the section is ~550 feet to 590 feet.



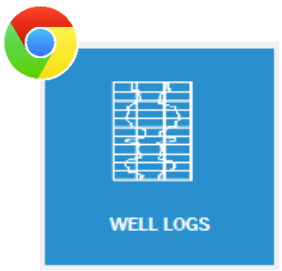
2. At the rig, pull up to the start of the desired relog section.

3. On the Logging screen, select Relog

4. Confirm that you want Relogging to begin.

5. Continue as normal, acquiring logging data and/or surveys from the tool.

xDirect Logging



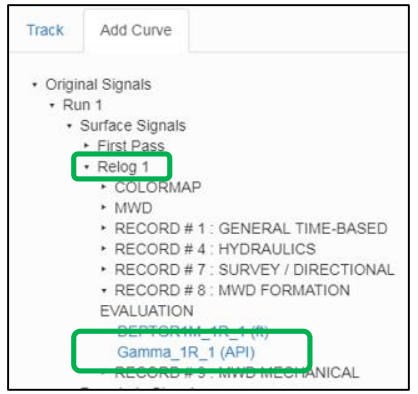
Common Task #3 - **Monitor the Re-log section** (optional)

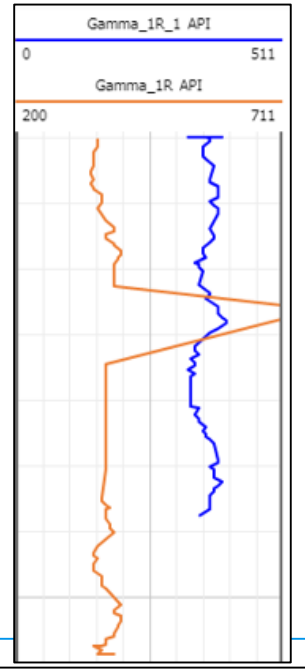
Add a new Track and add the Relog curve if you want to monitor the curve separately. This data will also carry over into the Auto Generated curve as it gets updated.

1. Create a new Track, then add a new Curve.
   In this example, the Relog 1 Gamma curve is chosen from the Run 1 Surface Signals category.

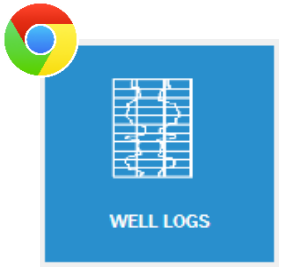
2. Add the First Pass Gamma curve (optional) to compare them on the same track. In this example, First Pass is orange and Relog 1 is blue.

When the tool reaches the maximum recorded depth, Relog will turn off automatically. The user can also turn Relog off manually in advance if they do not want to relog to max depth.





xDirect Logging



Common Task #3 - **Multiple Re-logs**

1. Identify the second section that needs to be relogged.

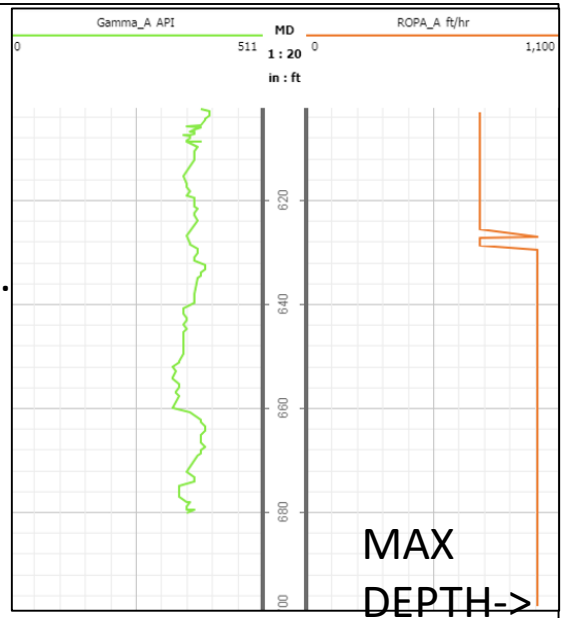
   In this example, the section starts at ~680 feet.

2. At the rig, pull up to the start of the desired relog section.

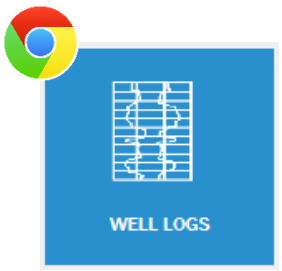
3. On the Logging screen, select Relog

4. Confirm that you want Relogging to begin.

5. Note that each Relog is numbered in the order they were created.

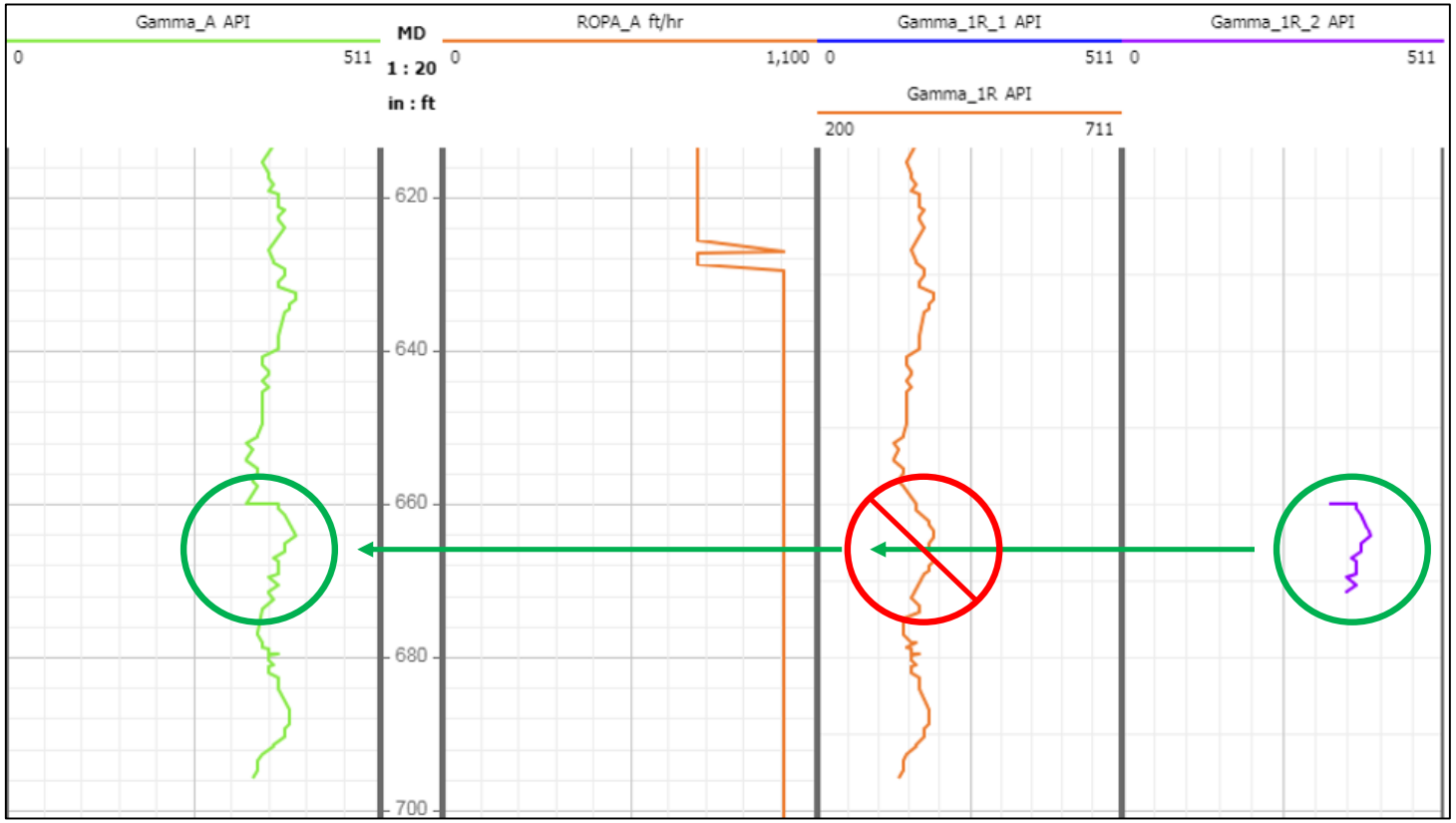


xDirect Logging

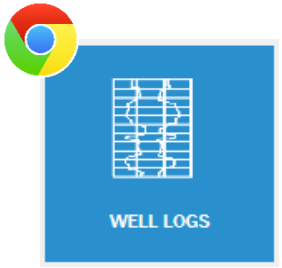


Common Task #3 - **Monitor second Re-log section** (optional)

Same process as adding a relog curve to the track.
Note how Gamma_A (Auto Curve) updates with the latest relog information.



xDirect Logging



Common Task

Remove Section of Curve Data

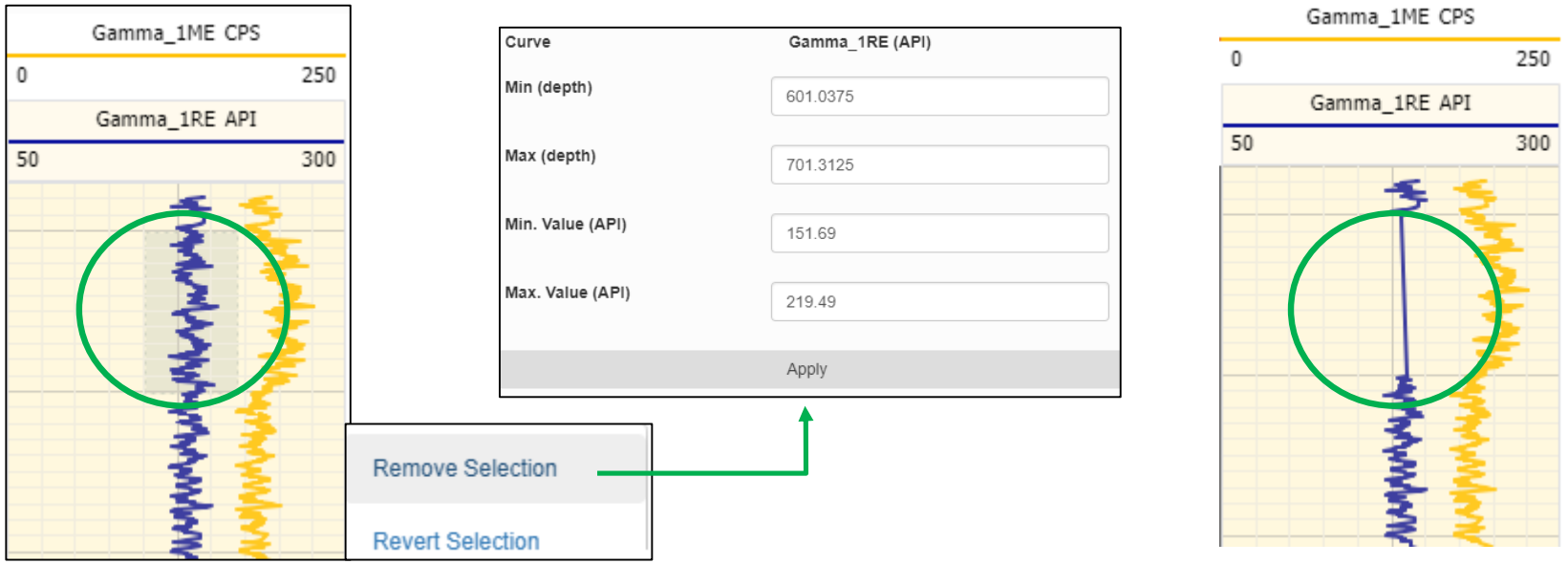
xDirect Logging

Common Task #4 - **Remove a section of data** (optional)

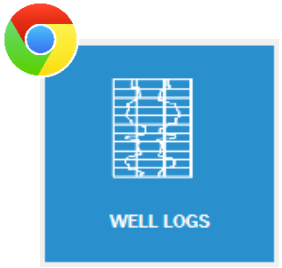
1. Select the header of the desired curve, then select Edit

2. Use the left-mouse button and make a box around the area you want to remove.

3. Select **Remove Selection**, change the ranges as desired, then select **Apply**.
   Note: Ensure the Max. Value is high enough to remove the highest peaks.



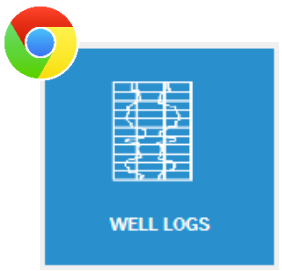
xDirect Logging



Common Task

Clip Spikes From Curve Data

xDirect Logging

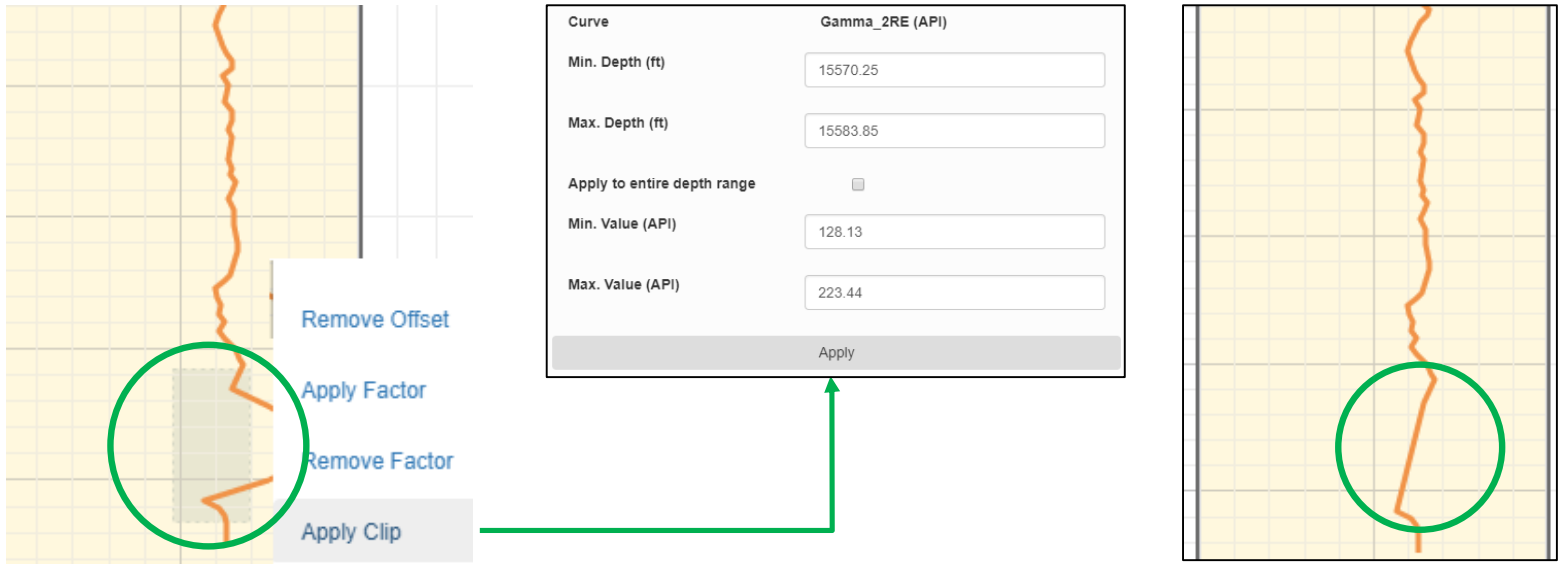


Common Task #5 - **Clip spikes from a section of data** (optional)

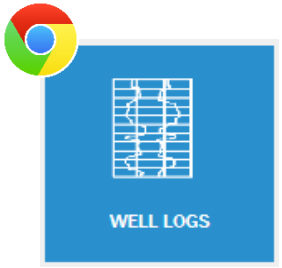
1. Select the header of the desired curve, then select Edit.

2. Use the left-mouse button and make a box around the area you want to keep, leaving the spikes *out* of the selection.

3. Select **Apply Clip**, then select **Apply**.



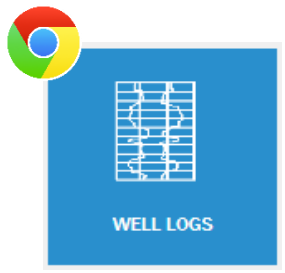
xDirect Logging



Common Task

Add Multiplication Factor To Curve Data

xDirect Logging

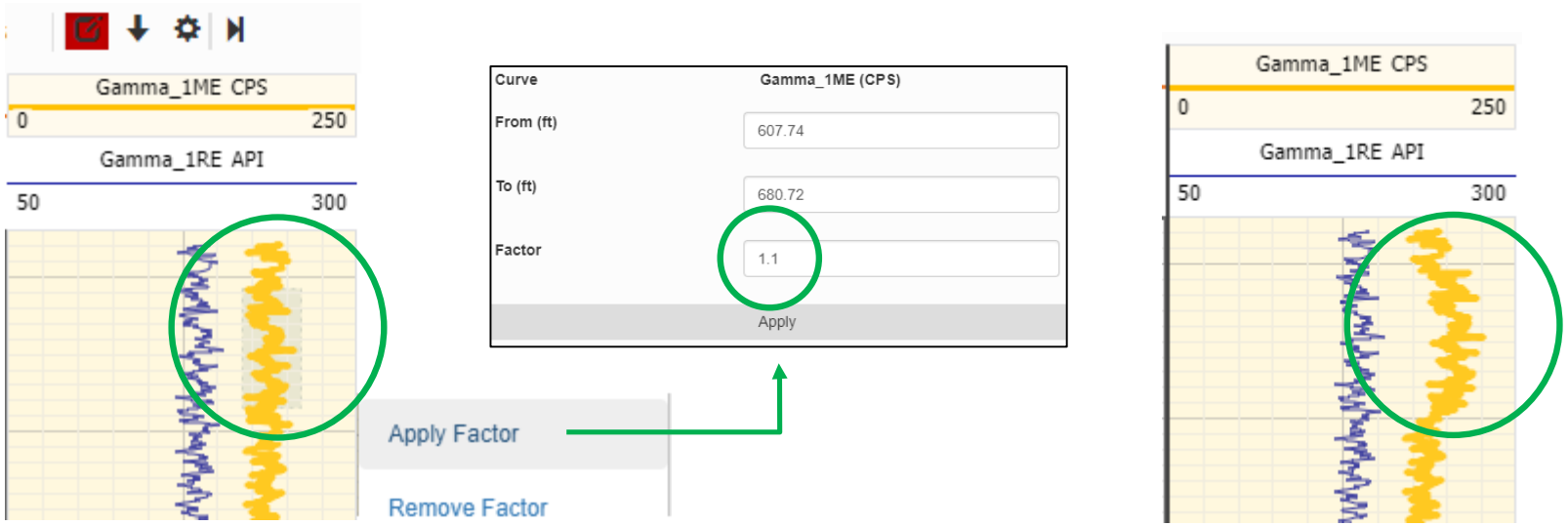


Common Task #6 - **Add multiplication factor to a section of data** (optional)

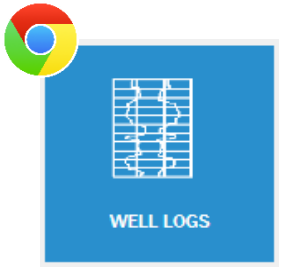
1. Select the header of the desired curve, then select Edit.

2. Use the left-mouse button and make a box around the area you want to edit.

3. Select **Apply Factor**, confirm the depth range, input a multiplier, then select **Apply**.
   Note: The user may need to refresh the page to see the changes.



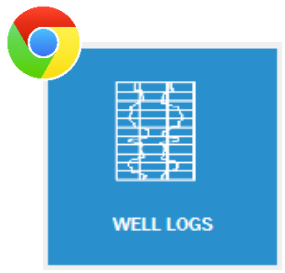
xDirect Logging



Common Task

Add Depth Offset To Curve Data

xDirect Logging

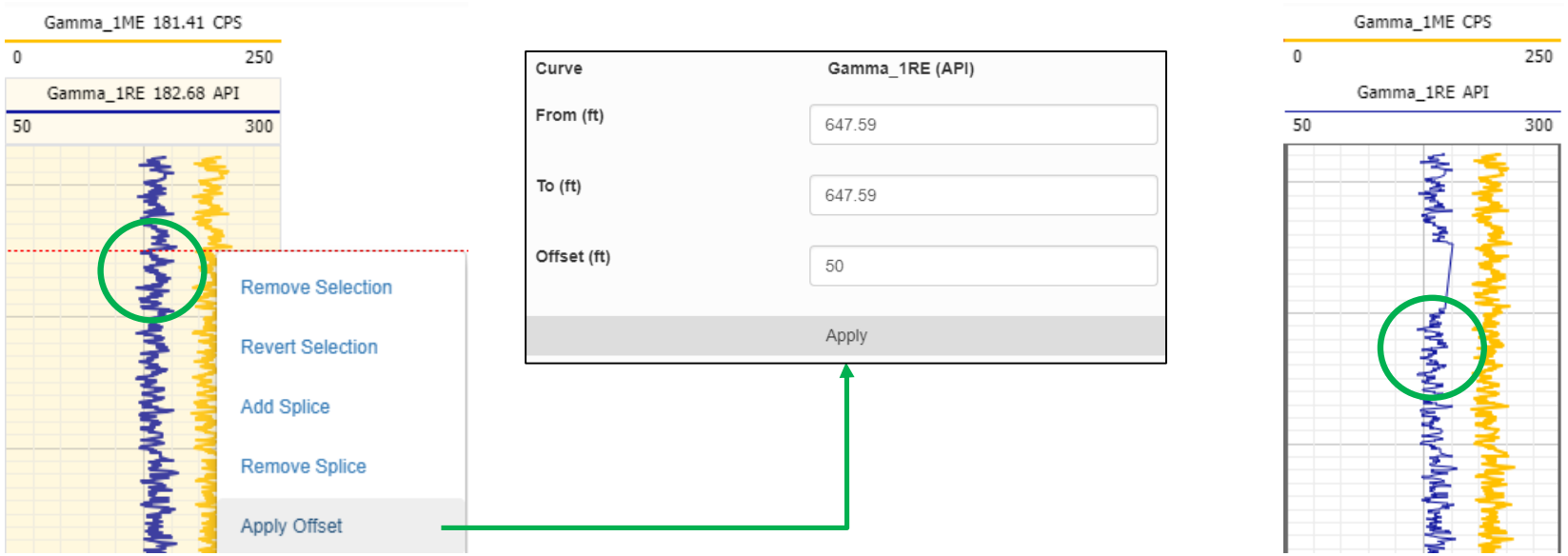


Common Task #7 - **Add offset to a section of data** (optional)

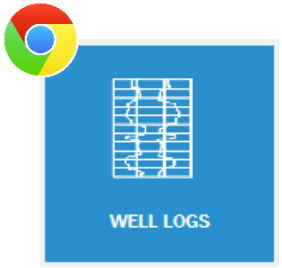
1. Select the header of the desired curve, then select Edit.

2. Use the left-mouse button to select the section of the data to offset.

3. Select **Apply Offset**, change the ranges as desired, then select **Apply**.



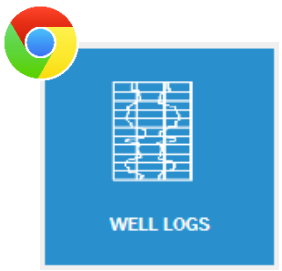
xDirect Logging



Common Task

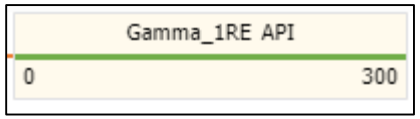
View/Remove Curve Edits

xDirect Logging



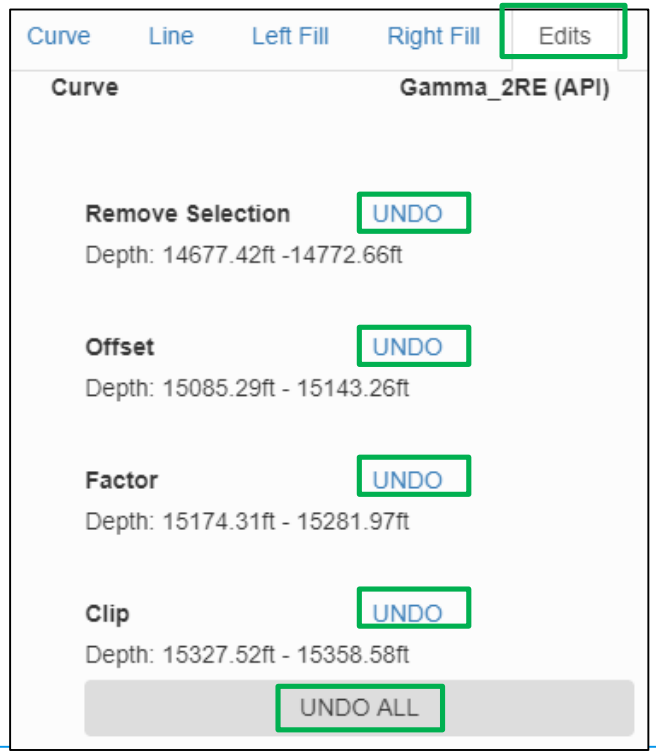
Common Task #8 - **View or Remove any or all edits to curves** (optional)

1. Select the header of the desired curve or track.



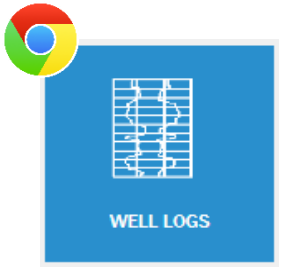
2. Open the EDITS tab.

3. To remove, select
   - UNDO ALL to remove all edits, or
   - UNDO for each specific edit.



NOTE: Edits are automatically applied to the edited curves *and* the Auto curves.

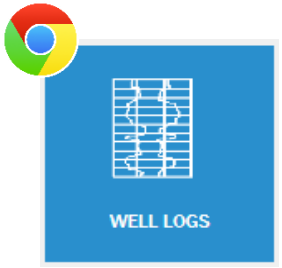
xDirect Logging



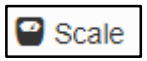
Common Task

Changing Standard Scales

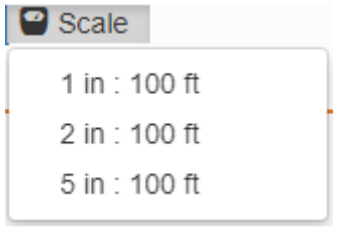
xDirect Logging



Common Task #9 - **Changing standard scales**

1. Select the Scale button. 

2. Select the scale option from the list.



3. Alternatively, use the Zoom buttons to manually adjust the scale:

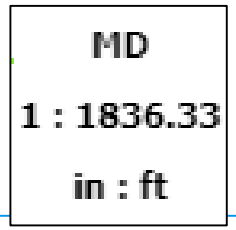
Zoom IN

Zoom OUT

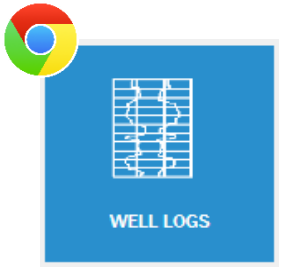
Show ALL

Note:

- The **Index** track will show the current scale.
- Only the Zoom buttons work for Time scaling.



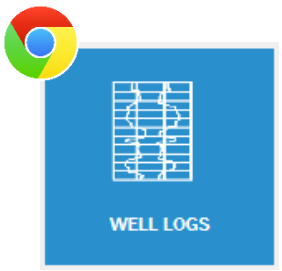
xDirect Logging



Common Task

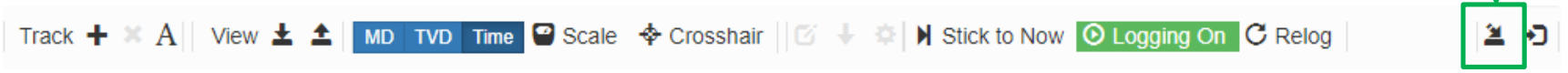
Importing Curves

xDirect Logging



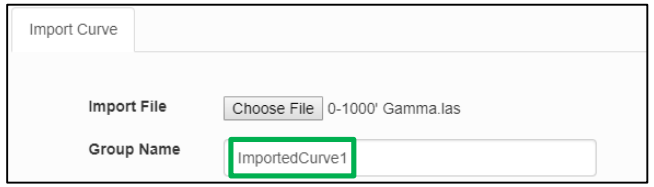
Common Task #10 - **Importing curves** (part 1)

1. Select the **Import** button.



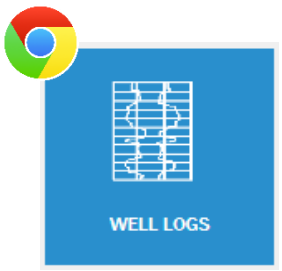
2. Select **Choose File**, select a valid .LAS log file (with DEPTBITM mapping):

3. Give the .LAS file a group name.
   This is how you will find it in the **Add Curve** menu later.



(continued…)

xDirect Logging

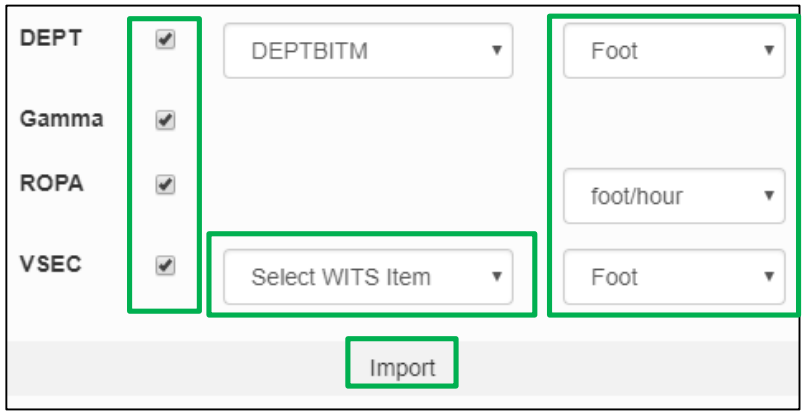


Common Task #10 - **Importing curves** (part 2)

4. Select the desired data points to import from the selected .LAS log file by selecting/deselecting the checkboxes.

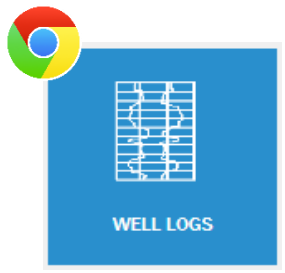
5. If “Select WITS Item” appears, you must use the drop-down menu to select the appropriate datapoint based on the name (ie: VSEC = Vertical Section)

6. Select the appropriate unit of measurement where required.



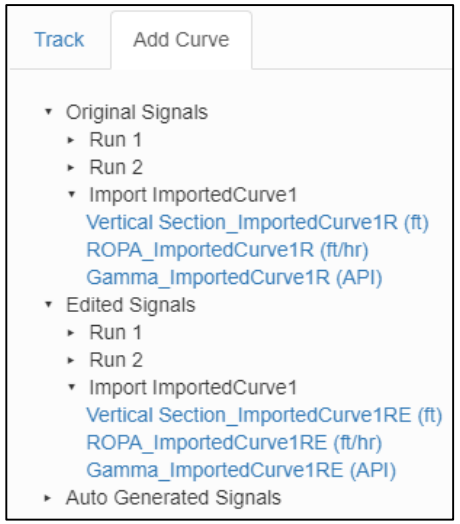
7. Select **Import**.

xDirect Logging

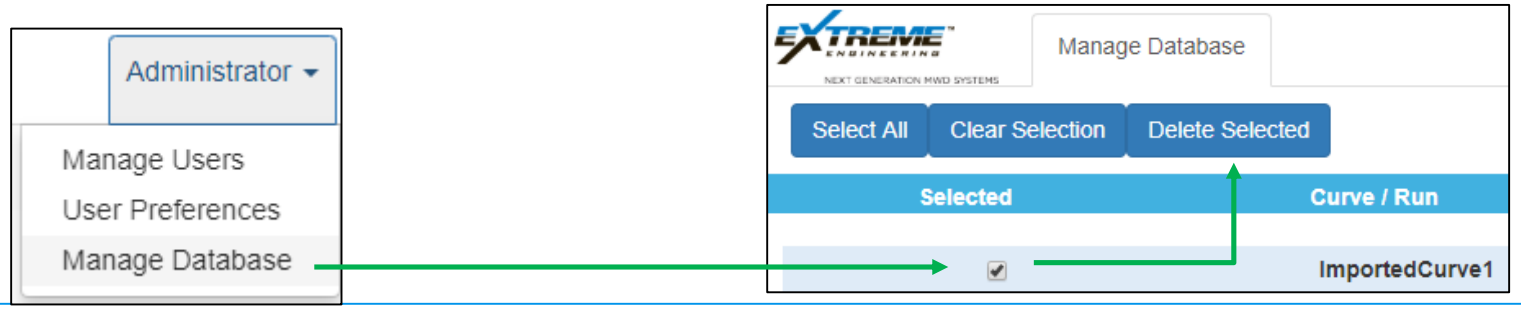


Common Task #10 - **Importing curves** (part 3)

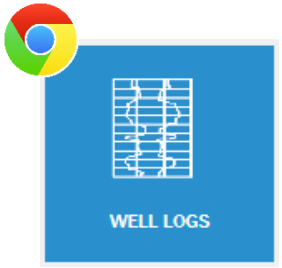
8. The imported curve will now appear in the Add Curve menu under both **Original Signals** and **Edited Signals** as new runs.



NOTE: Imported curves can be removed from the database by using the Manage Database menu from the Administrator tab.



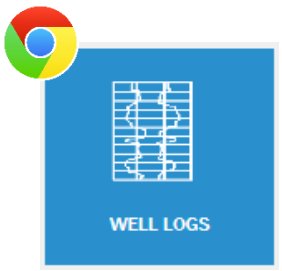
xDirect Logging



Common Task

Save and Load
Well Log Templates

xDirect Logging



Common Task #11 - **Save and Load Well Log Templates**

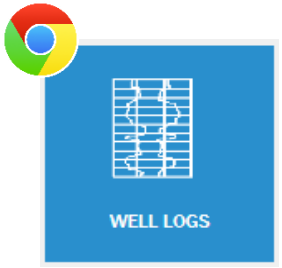
1. Select the View button.

2. Type in a name to save the current Well Log layout as a template.
   Then select the checkmark to save it.

3. Select the Load button to display a list of available templates.
   Select the desired template from the list, and it will automatically load.

Note: Templates will store layout and settings for all tracks, curves, scales, and log type

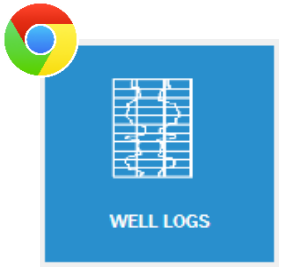
xDirect Logging



Common Task

Hole Depth Resets

xDirect Logging

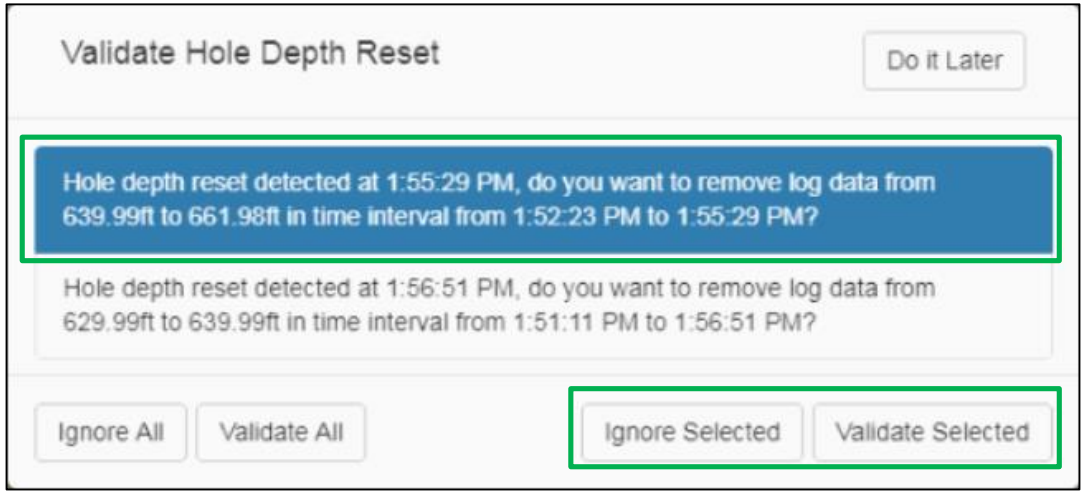


Common Task #12 - **Validate/Ignore Hole Depth Resets**

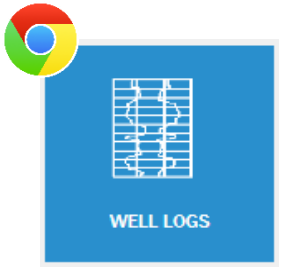
A “Validate Hole Depth Reset” dialog will appear any time a negative depth change is detected (ie: depth goes from 500ft to 450ft)

1. Confirm that the new depth is expected and accurate. This may require discussion with the rig crew. Check for multiple resets: In some cases, the depth reset may have been done in error.

2. Select the reset message, then select **Ignore** or **Validate**. You can also ignore/validate every reset by selecting **Ignore All** or **Validate All** respectively.



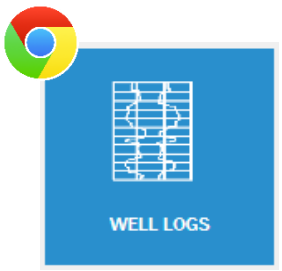
xDirect Logging



Common Task

Curve Splicing

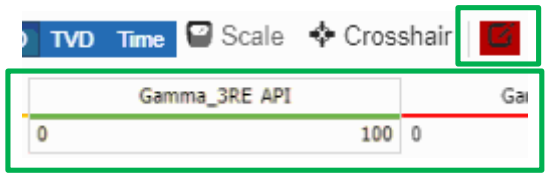
xDirect Logging



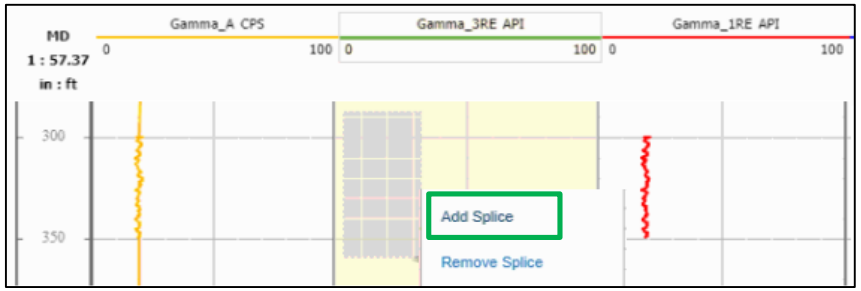
Common Task #13 – **Splicing into Edited Curves** - Part 1

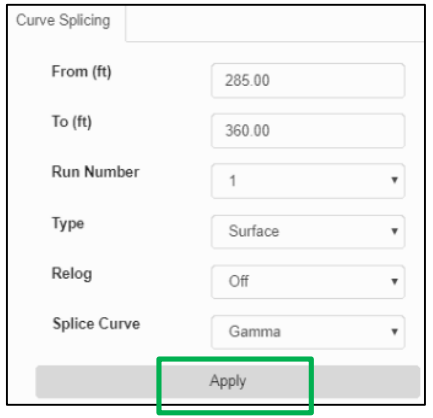
Edited curves – identified by "E" in the curve name – can be spliced, or combined, to add data into a single curve. In this example, we will splice data from RUN 1 into RUN 3, so RUN 3 contains the spliced data.

1. Select the RUN 3 Gamma Edited curve, then select **Edit**.



2. Use the left-mouse button to select an area of the RUN 3 curve in which to splice data in from another curve, then select Add Splice.





3. Confirm the details then select **Apply**.

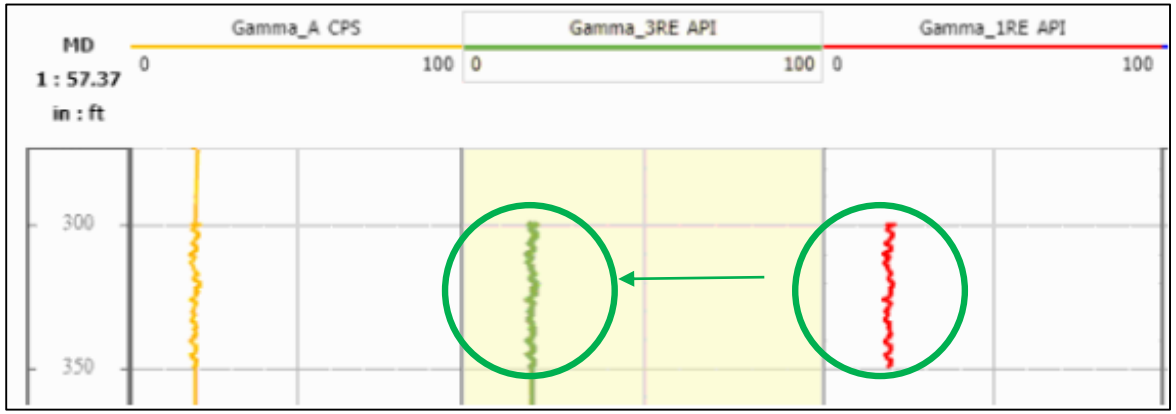
Note: Selected Run Number is the run to import FROM.

In this case, we are importing 285' to 360' from Run 1 to Run 3.

xDirect Logging

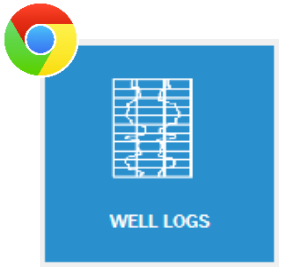
Common Task #13 – **Splicing into Edited Curves** - Part 2

4. Confirm that the splice has taken effect.
The user may need to refresh the screen for the changes to take effect.



5. The splice can be removed by highlighting the same area on the curve, then selecting **Remove Splice**.

xDirect Logging

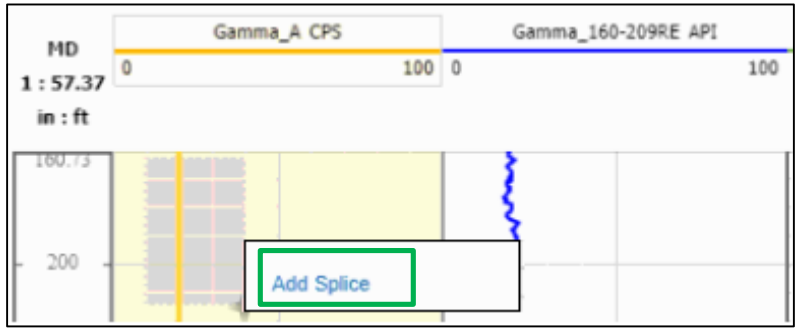


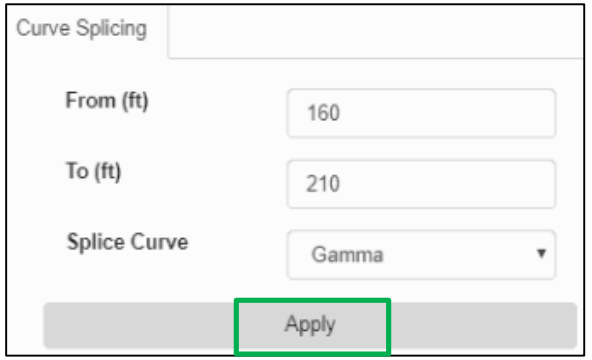
Common Task #14 – **Splicing into Auto Curves** - Part 1

Auto curves – identified by "A" in the curve name – already contain data from existing curves *except* for Imported Curves. Therefore, **ONLY** Imported Curves can be spliced into Auto curves.

1. Select the Auto Gamma curve, then select **Edit**.

2. Use the left-mouse button to select an area of the Auto curve in which to splice data in from another curve, then select Add Splice.





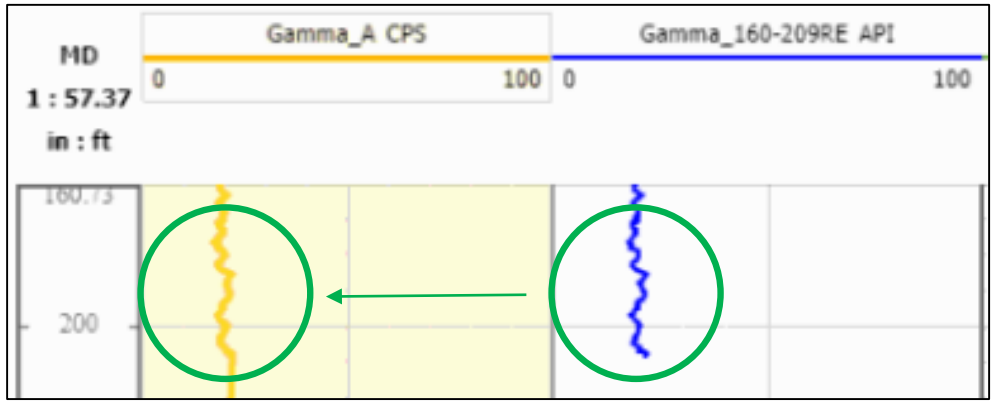
3. Confirm the details then select **Apply**.

Note: When splicing into an Auto curve, XDirect does not allow the user to choose which curve to splice from, as it can only be the Imported curve.

xDirect Logging

Common Task #14 – **Splicing into Auto Curves** - Part 2

4. Confirm that the splice has taken effect.
The user may need to refresh the screen for the changes to take effect.



5. The splice can be removed by highlighting the same area on the Auto curve, then selecting **Remove Splice**.

Summary

- Validate good SHT
- Use xBolt downlinking features
- Learn receiver options within Xdirect
- xBolt Basic troubleshooting
- Learn logging functions within XDirect