This Raster Log Digitizer program is used for scanning raster log images and extracting the depth and value information for a selected, colored curve. Please note that each curve, including "overruns" (curves that change scale and "wrap" when they extend beyond the data column) must have unique colors. In addition, the program will accommodate logs that aren't perfectly vertical as well as logs in which the vertical scale is not constant.

To use the program;

- Select the name of the raster image that contains the scanned log. This can be a PNG, BMP, JPG, etc. It cannot be a PDF, in which case, the PDF must be converted to a raster image. RockWare recommends PaintShop Pro because it's inexpensive (~$80) and provides control over the output resolution (RockWare recommends 200 DPI).

- Use the *Size* option to enlarge an area of interest.

- Click the *Color* button and then click on the colored track to be digitized. The Color button should now correspond to the color of the track that was just selected.

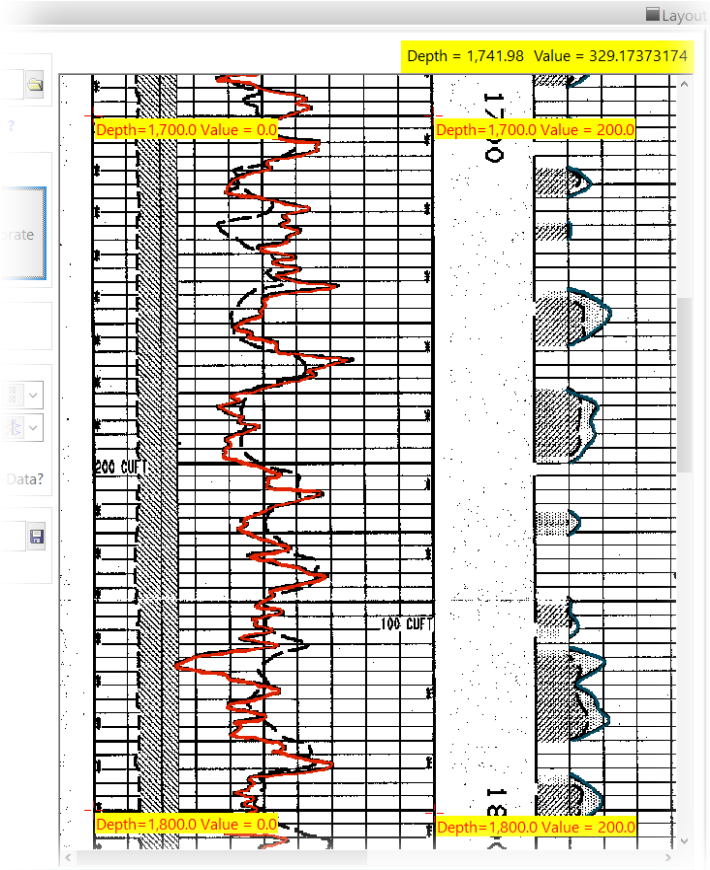
- Check the *Logarithmic* option if the horizontal axis for the curve that is to be digitized is logarithmic.

- **Calibration**

    - If the log is short and it can be assumed that the vertical scale does not vary, the calibration can be made with just four points. Clicking on the *Calibrate* button will prompt the user to digitize the following points;

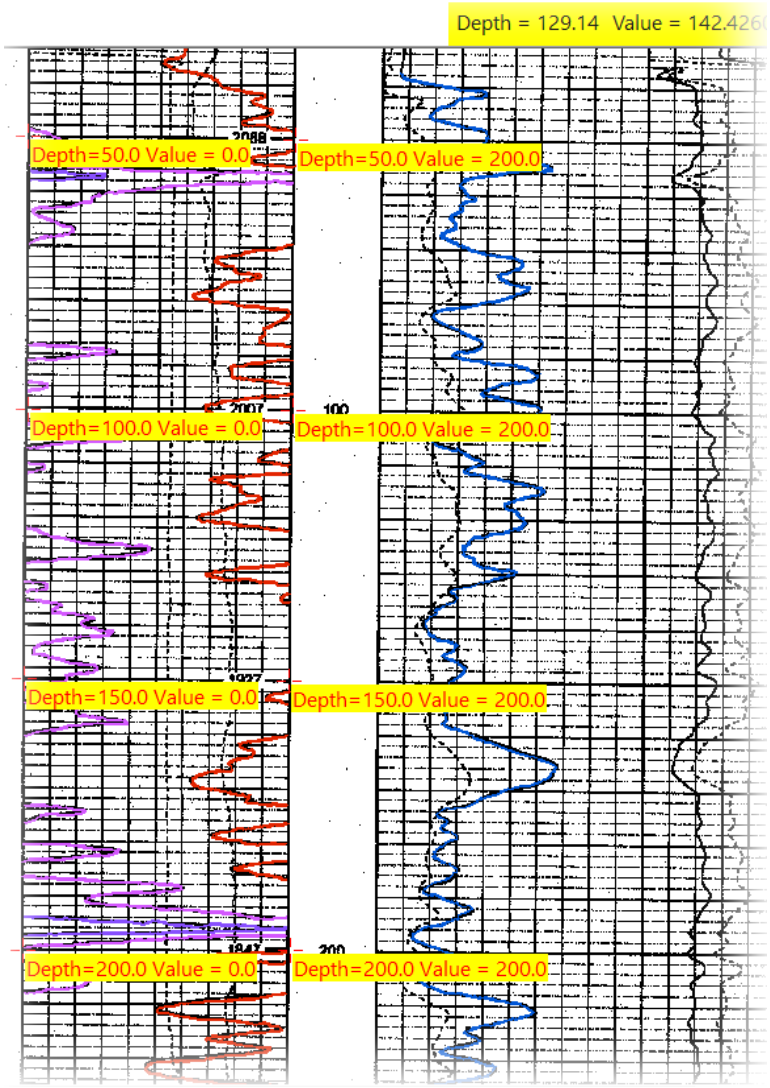
        - The upper-left point that corresponds to the specified *Minimum Depth* and *Minimum Value*.
        - The upper-right point that corresponds to the specified *Minimum Depth* and *Maximum Value*.
        - The lower-left point that corresponds to the specified *Maximum Depth* and *Minimum Value*.
        - The lower-right point that corresponds to the specified *Maximum Depth* and *Maximum Value*.

      As these points are digitized, a red cross-hair symbol and a red-on-yellow label will be superimposed on the display showing the depths and values as shown by the following example.



Immediately after digitizing the four calibration points, it's a good idea to move the cursor around the log and compare the cursor location within the Depth and Value listing within the upper-right corner of the dialog box to make sure that the log was correctly calibrated.

- If the log is long and/or distorted and/or the vertical scale varies, the log should be calibrated using more than four points in which case the **Interval** option should be checked. The value specified for the calibration interval will determine the number of calibration points that the program will prompt for as shown by the following example.



As with the four-point calibration, it is a good idea to move the cursor around the log and compare the cursor location within the Depth and Value listing within the upper-right corner of the dialog box to make sure that the log was correctly calibrated.

- The *Clip Output* option provides a way to only extract points that are within a user-defined depth range.

- The *Save as P-Data* option will convert the pixel locations that correspond to the selected *Color* to their respective depths and values (based upon the calibration) and save these points to the designated *P-Data Track* for the designated *Borehole ID* within the RockWorks borehole database. The option to *Backup* the database is there to serve as insurance just in case one of the following mistakes were made;

    - The wrong *Color* was selected.
    - The *Logarithmic* option was selected even though the horizontal scale was linear or vice-versa.
    - The log was improperly calibrated.
    - The wrong *Borehole ID* was selected.
    - The wrong *P-Data Track* was selected.

    In a similar vein, the Display Confirmation option will summarize the settings and provide a last-chance to cancel the export and correct the settings. There are a lot of "moving parts" involved with the conversion of raster logs to P-Data and the potential to make mistakes is high. Pausing and thinking before proceeding will eliminate the tedium of restoring the database from a backup copy.

- The *Save as CSV* option will output the depth and value data into an Excel-compatible file for subsequent import into other programs (e.g., LogPlot).

Caveats

- Each curve **must** have a unique color.

- **Most raster logs have non-linear vertical scales**. This is caused by a variety of factors including;

    1. Differential stretching and contraction of the original paper log that was scanned due to humidity and dryness.
    2. Changes in the speed of the rollers on the sheet feeder.
    3. Scanner operator mistakes (e.g., trying to adjust the feeding angle by tugging on a corner of the log).

    As a consequence, it is rarely the case that an entire log can be scanned based on just four calibration points. The solution is to use the Interval-based calibration.

- **REMEMBER!** Test the calibration by moving the cursor and make note of the blue *Cursor Coordinates* located within the upper-right corner of the menu. If they're not correct, then something is wrong and merits investigation.

Colorizing Curves

There are many programs that can be used to colorize curves within raster images by essentially tracing the curves with a virtual colored pen. Examples include the Microsoft Paint program (included with Windows), PaintShop Pro, Corel Canvas, PhotoShop, etc.

Shameless Plug for RockWare Consulting

If you have a lot of raster logs that need to be digitized, please consider using RockWare Consulting Services. We have a lot of experience with scanning, colorizing, and digitizing raster logs meaning that we can do it for a reasonable price. Just send us some sample logs and we'll quote you a price.