

Demonstration Video

Didger 4 - Part 5

Well Logs and LAS Export

PART 5

1. Introduction
2. Georeferencing Well Logs from an Imported Image
3. Digitizing Well Logs
4. Exporting to an LAS File

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1. Welcome to Golden Software's demonstration video for Didger 4 – Part 5. In this demonstration I'll be covering the topic of using Didger to calibrate and digitize well logs and export the information to an LAS file.

In this example, I'll be digitizing and exporting two logs that use the same scale.

2. The first step is to calibrate and import your log. You can use a digitizing tablet to calibrate the log, but in this example I will be working with an image file.
 - a. The first step is to go to **File | Import**, select the image file and click *Open*.
 - b. In the **Image Registration and Warping** dialog box, enter the coordinates of three (or more) points on the log in the *Reference X* and *Reference Y* columns. I will type in the coordinates for the four corners of the log.
 - c. The next step is to calibrate these points on the image in the *Source Image* window. You can use these tools in the upper left to zoom in and zoom out of your image to make sure that you are calibrating the points precisely. I'll first click on the *Zoom In* tool and then click at the top of the log to zoom in. Then, I'll click on the *Select a calibration point* tool and I'll start calibrating my points. My first point has an X of 20 and a Y value of 0. That is going to be right here on the log so I will just click on the log right here. The second point has a *Reference X* value of 2200 and a Y value of 0. That's going to be over here on the image so I'll click here. The third calibration point is going to be at the bottom of my log. I'll just scroll down to the bottom of the log and click on the corresponding point on the image.
 - d. If your log is a simple linear-linear scaled log, then you can simply click *OK* and you are done with the calibration process. However, if your log has a logarithmic axis, you will need to click the *Options* tab, select the *Specify* radio button, and click on the *Coordinate System* button. You can then choose *Logarithmic* as either the X or Y Axis Type. Since my log does not have a logarithmic axis, I'll click *Cancel*.
 - e. When you have finished setting up the calibration, click *OK* and the log image is imported.
3. Once the image is calibrated and imported, the next step is to digitize the log.

- a. I'll go to **Digitize | Polyline** and digitize the gamma ray log line as a polyline. For the sake of time, I'm not going to take great care to digitize the log very accurately. If you were truly digitizing the log, you would most likely want to zoom in and trace the line more precisely.
- b. Since the DT log (in orange) uses the same scale as the gamma ray log, I could digitize that log also and export it to the same LAS file. I will also digitize it quickly for the sake of time.
- c. I'm digitizing these logs manually, by tracing them with the mouse. If the log line is a different color than the background grid lines (as in this example), or if there aren't any background grid lines, using the **Image | Vectorize Image** command may be very useful to automatically and precisely digitize the log. This method would not work well if you have a black line over black gridlines.

If you do use the **Vectorize Image** command, you may also need to use the **Tools | Edit Boundaries | Connect Polylines** command on the vectorized objects so that you have just a single polyline, and you may also need to use **Tools | Reshape** to edit the shape of the polyline slightly. This may or may not be faster than digitizing the log by hand, depending on how many edits you will need to make and how long it takes you to do them. I will demonstrate on this example.

- i. First, I'll select and delete the polyline I digitized for the gamma ray log.
 - ii. Next, I'll select the image and go to **Image | Vectorize Image**.
 - iii. Since I only want to digitize the gamma ray log at this time, I'll choose *Selected Colors* and then move the cursor over the image and click on the gamma ray log. This enters the color of the log under the Color column and tells Didger to only automatically vectorize that color. This is an easy way to isolate the gamma ray log during the vectorization process so you don't end up with many extraneous polylines from the grid lines, tick marks or other logs.
 - iv. Click *OK* and the log is vectorized. The polylines are created on a new layer called *Vector Results*.
 - v. I can see that it did a pretty good job. I'll zoom in so I can look at it more closely. However I can also see that Didger digitized it in a whole bunch of small single segments. I really want this to be a single polyline so what I'll do is right click over the layer and go to *Select All Items on Layer*. That will select all the small polyline segments.
 - vi. Next, I'll go to **Tools | Edit Boundaries | Connect Polylines**. That will connect all those small polylines into one single larger polyline.
 - vii. In this particular case, using Didger to automatically vectorize the log was much faster and much more accurate than manually digitizing it. This will not always be the case, especially if your logs have intersecting lines that are all a single color, such as black.
- d. Once the lines are digitized, you can enter the Curve Type, Curve Units, and/or Curve Description as the polyline IDs. It is easiest to do that by simply typing them directly in the Data Manager. I'll enter the Curve Type as the Primary ID, the Curve Units as the

Secondary ID, and a Description as the Third ID. I'll also do that for the second log I digitized.

4. The last step is to export it to an LAS file.
 - a. Go to **File | Export**, choose to export as an LAS file, give the file a name, and click *Save*.
 - b. In the **LAS Export** dialog box, on the *Curve Info* tab, you can set the *Start Depth*, *Ending Depth*, and *Step* values. I'll change the *Ending Depth* to 0 and the *Step* to 0.5.
 - c. Check to be sure the *Use X Axis for Depth* check box is appropriately set. We did not use the X axis as the depth axis, so it should not be checked.
 - d. If you entered some curve settings as IDs for the polyline (which we did), be sure to specify the correct ID fields in the *Curve Settings* section.
 - e. Add any additional information to the *Well Info* tab that you like, such as the well name, company name, locations, etc.
 - f. When all the information is entered, click *OK*. The single LAS file has been exported with all the digitized data, which in this case is both the GR and DT data.
 - g. This concludes my demonstration of digitizing a well log and exporting to an LAS file.