



HYPACK
a xylem brand

Sounding Better!

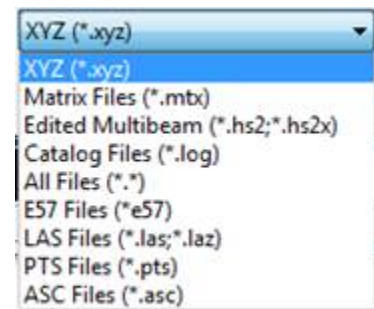
HYPACK Point CLOUD

By Ken Aiken

It's been a long time since much has been written about CLOUD so I thought I'd take the chance to go over a lot of it touching on many of its aspects.

FILE TYPES

CLOUD supports several different file types—several internal to HYPACK® and some external. Saving out it is a bit more restrictive. For saving, you are limited to XYZ, LAS, LAZ and, if it is HYPACK® format, the original type. It can be useful to load files from other programs and convert them to XYZ. Also, to a lesser extent, you can do the reverse: take a HYPACK® format file and convert it to XYZ or LAS, which many programs can read.



CONTROLS

Of course, one of the most important things to get the most out of a program is to know its controls so you can view and edit the data quickly and easily.

The **click-and-drag** with the left mouse button controls the rotation and with the right mouse button pans the view.

The **mouse wheel** has 2 functions in CLOUD: scrolling controls the zoom, and clicking with it defines the center point of your display affecting the center of the display rotation. If you are using a laptop track pad, it can be difficult without a mouse wheel.

If you've used CLOUD before, you probably know the mouse controls, but the keyboard commands are probably less known. With these you can control zoom (+/- keys); reset the view (Home key); change the Z scaling (Page Up/Down Keys) and affect the point size (period and comma keys). The arrow keys can have a few functions: normally they rotate the display; with the Shift pressed, they control the Pan; and with the Ctrl key, they change the current cell when using the Grid Control which I'll mention later.

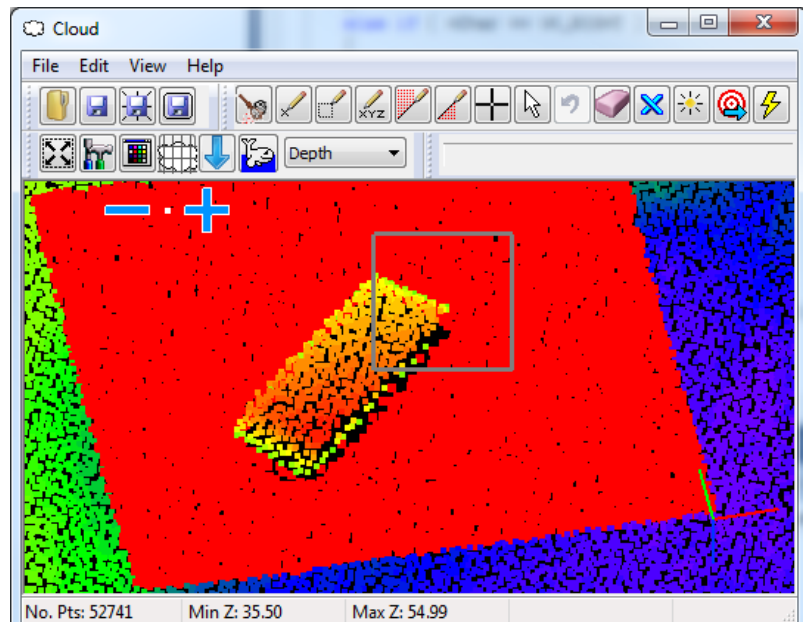
Tip: It can be useful to use the arrow keys, when you are using the cursor for editing.

EDITING

The first and main purpose of CLOUD is manual editing of point data. Since CLOUD has fewer calculations to handle in the background than MBMAX as you edit, CLOUD editing is sometimes faster and easier.

Removing Outliers

Often one of the first steps after loading data is removing outlying points, especially if you are editing laser data. These can make it hard to get good extents on your data. The best way to remove outliers is with the delete above and below tools: drag a line between the garbage points and your good data. Then working on your good data is easier.



Editing Soundings

During manual editing, you have 2 ways to select points: a rectangular block selection or individual point selection.

The easiest way to remove an area is often to select a lot of points then switch tools to carefully deselect the points you want to keep, rotating the display to move the points around as necessary. Once selected, you can delete the points.

NOTE: Selected points may also be saved as golden soundings or targets.

Sometimes it easier to pick out the points you want than what you want to remove. A recent addition to the menu, EDIT- INVERT SELECTION, enables you to work, in a way, backwards.

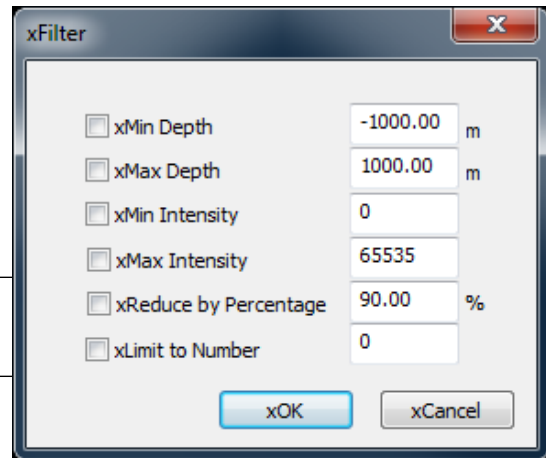
FILTERS

Filters are also useful for reducing your data to be more easily viewed on less robust computers. These are very basic and you can do a better job in other programs, but they can be an effective quick and dirty tool. You should never use filters as a sort. When they delete data it is at random, but it is very quick.

IMPORTANT: Filtered data can not be used to calculate accurate volumes.

The **Min/Max Depth** and **Intensity** filters are fairly self-explanatory, but useful for removing data that is clearly bad.

The **Reduce by Percentage** and **Limit to Number** are just simple ways to limit the number of points.



POINT COLORING

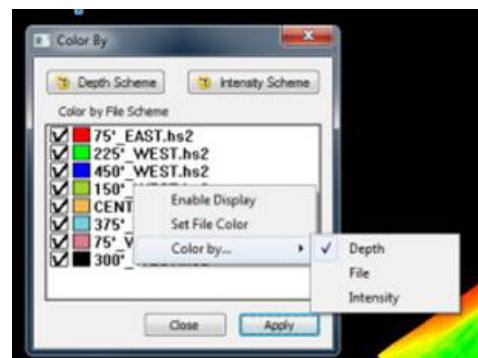
CLOUD has several display options that are useful, not just for making it look nice, but that are helpful for editing and understanding your data.

Probably the one most obvious is the point coloring. The standard, as in every other HYPACK® program, is coloring by depth; however, there are several other useful ways to color the points: You can color by intensity; color by file, or by RGB coloring if the file has such data embedded (ex. HS2X, LAS, LAZ, E57).

You can also combine the depth with intensity. In this case, CLOUD uses your depth color scheme, then uses the intensity color scheme range to adjust the brightness of the points making reflective things “light up.” You can select the color options from the VIEW-COLOR BY menu, or the drop-down list on the toolbar, or click the Set Colors icon to access the Color by dialog.

The Color By dialog shows you all the files you have loaded. You can do a few different things here: individually turn them on and off, set the color of the file for the Color by File option, and set the color schemes for coloring by depth and intensity. If you right-click on a file, you can set its individual color method.

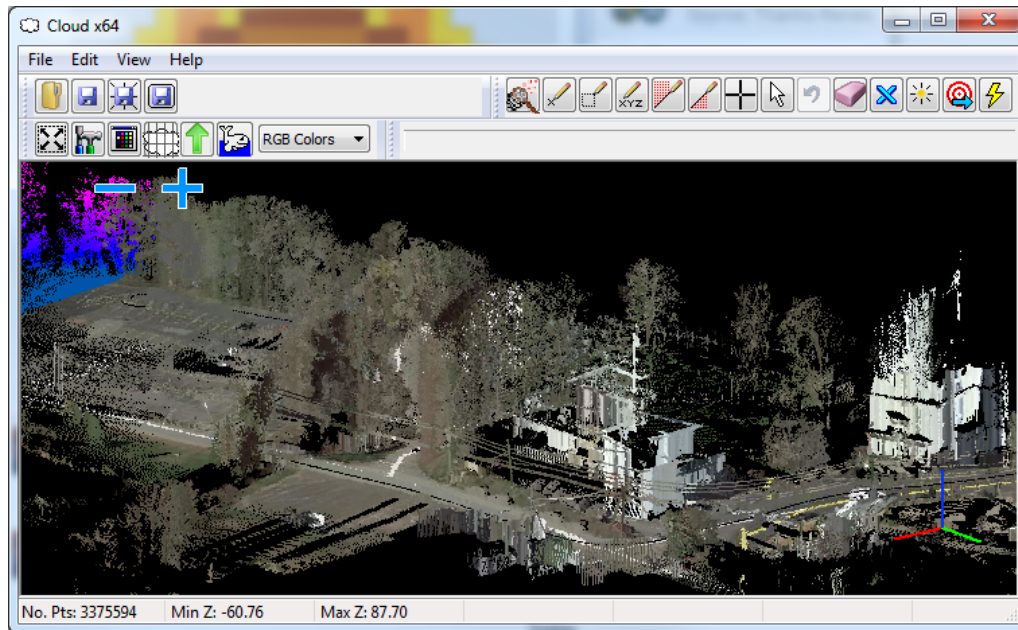
Coloring individual files using different coloring methods is useful if you have hydro and topo data together, where depth is better for hydro but intensity is more useful for topo data.



APPLYING GEOTIFFS

If your data doesn't have RGB coloring, you can add it using georeferenced images like Geotiffs, PNGs, and JPEGs. Edit-Import Geotiff...applies the colors from the image to corresponding soundings. This allows you to take an image from web maps, Google Earth or photogrammetric software and apply it to your data.

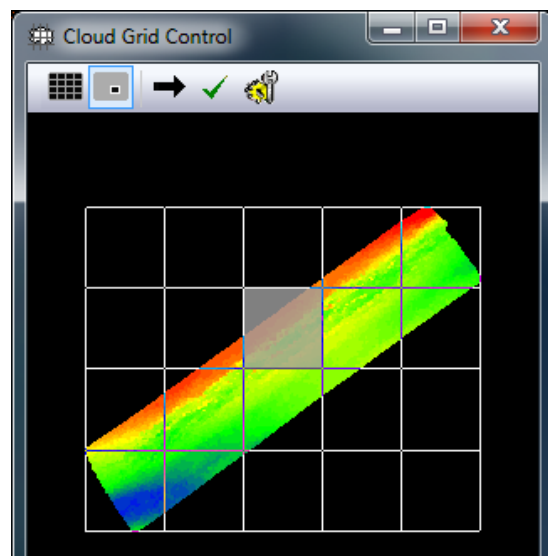
FIGURE 1. Coloring Different Files Using Different Coloring Methods



GRID CONTROL

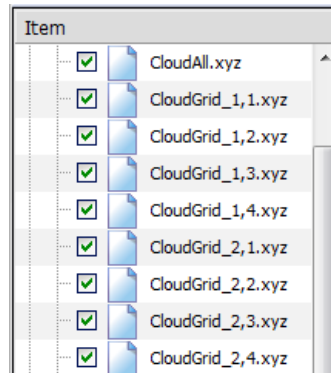
Working with large datasets can be difficult with things on top of each other, so we created the Grid Control. This allows you to break your data up by cells in a grid, then only view and edit what you can see in each cell.

1. **Find a good cell size**, increasing or decreasing the number of rows and columns by which the dataset is divided.
2. **Switch to single section mode** so the main window only shows the currently selected cell.
3. Now you can **select the cell you want to work on**: In the Cloud Grid Control, click in the cell then click the arrow button to apply your selection.
4. **Edit your soundings**.



5. **When you are finished editing the cell in the CLOUD window, you can mark that cell as complete** (click the Mark Cell icon) and you can move on to the next cell.
6. **Repeat the process for each cell** in the grid.
7. **Save the edited dataset.** Using the Grid Control window allows you to save each cell, or the entire grid to one file. Click the “Save as XYZ” icon in the menu or toolbar.

FIGURE 2. XYZ Files Saved from CLOUD—All points to one file (CloudAll.xyz) or separately by CLOUD grid cell.



At any time, you can switch modes back so the entire cloud is drawn.

SETTINGS DIALOG

In the Settings dialog, there are many things to note. This displays the extents of your data and your current rotation.

Here you can change many of your settings including exaggerating your depth values (**z-axis ratio**), setting the **point size** and choosing the **background color**. You can also enable the grid and change its cell sizes; 0 makes it automatic based on zoom.

Continuous Pan and Rotate which continuously repeats your last pan or rotate animating your data.

Hide Near Points is somewhat recent addition to CLOUD to make it easier to view large datasets by clipping out points close to the screen.

