

S2DPLOT Documentation

Version 4.60

July 30, 2014

Color-Filled-Contour Plots of 2D Resistivity / IP Inversion Results

S2DPLOT reads Zonge TS2DIP inversion-program files (*.s2d, *.ipm and *.ipd) and creates multi-panel plots of inversion-model sections and data pseudosections. Screen plots may be exported to the Windows Print Manager, to Windows metafiles (wmf), to portable network graphics (png) raster image files, to Surfer script and data files or to Oasis montaj control and data files. Output files are given the same filename stem as the source inversion model file, plus a suffix characterizing the plot number, 1, 2, 3 or 4. By default resistivity inversion results are shown on plot 1 and IP results on plot 2, but resistivity and IP plot panels can be combined within a single plot.

Installation

S2DPLOT may be used on any PC running a recent version of Windows and using 16 or 32-bit color graphics.

S2DPLOT program modules

S2DPLOT.EXE	- reads TS2DIP files and creates multi-panel plots
S2DPLOT.CFG	- configuration file
S2DPLOT.GX	- Geosoft Oasis montaj gx to build plots from files exported by S2DPLOT
CFTABLE.CLR	- color-fill spectrum in a Surfer color-table file format

Sample data files

S2DEMO.MDE	- Zonge-format data processing, plot annotation and control file
S2DEMO.S2D	- sample ts2dip survey configuration and inversion control file
S2DEMO.IPD	- sample ts2dip resistivity/IP data file
S2DEMO.IPM	- sample ts2dip model-section file

Documentation and notes

S2DPLOT460.PDF	- s2dplot documentation in Adobe pdf format
S2DPLOT_UPDATE.NTS	- notes on s2dplot updates

S2DPLOT program modules should be unpacked and placed in a directory on the operating system's path. After placing s2dplot files in an appropriate hard-drive directory, edit s2dplot.cfg and select the correct Surfer page units (cm,inch). If you use Geosoft's Oasis Montaj, put S2DPLOT.GX in the <GEOSOFT>\gx directory so that it can be run from within Oasis Montaj.

Settings in the S2DPLOT configuration file, S2DPLOT.CFG, determine the Surfer page units used in s2dplot's output files. S2DPLOT v4.00 dropped backwards compatibility with Surfer v6 and v7 and is only compatible with Surfer v8 or later.

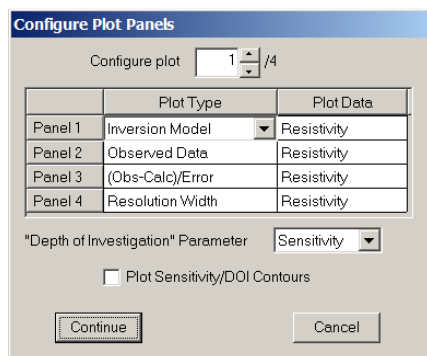
CFTABLE.CLR controls the color spectrum S2DPLOT uses for color files. It is set to a rainbow spectrum with partial color saturation so that posted values can be read more easily on printed s2dplot plots. Color values may be modified by editing the red, green, blue values in cftable.clr to customize the color fill spectrum.

Program Use

Typing "s2dplot s2demo" on the command line runs s2dplot to produce a screen plot from the sample data files s2ddemo.s2d, s2demo.ipm and s2demo.ipd. If you type "s2dplot" without a command-line argument, s2dplot will prompt you to choose from a list of ts2dip model files present in the current working directory. Once s2dplot has the name of a valid model file, it shows a series of interactive dialog boxes to allow plot-parameter editing. (If \$auto=yes in the *.mde file, s2dplot skips interactive verification of plot attributes, exports a plot to the hardcopy format specified in the mde file, and then stops.) If you run s2dplot.gx from within Oasis montaj, it will prompt you for an .s2d file name and then call s2dplot.exe to build the geosoft plot files. When you exit s2dplot.exe, it will write the Oasis montaj plot files and return control to s2dplot.gx. S2dplot.gx will generate the plots as montaj "maps".

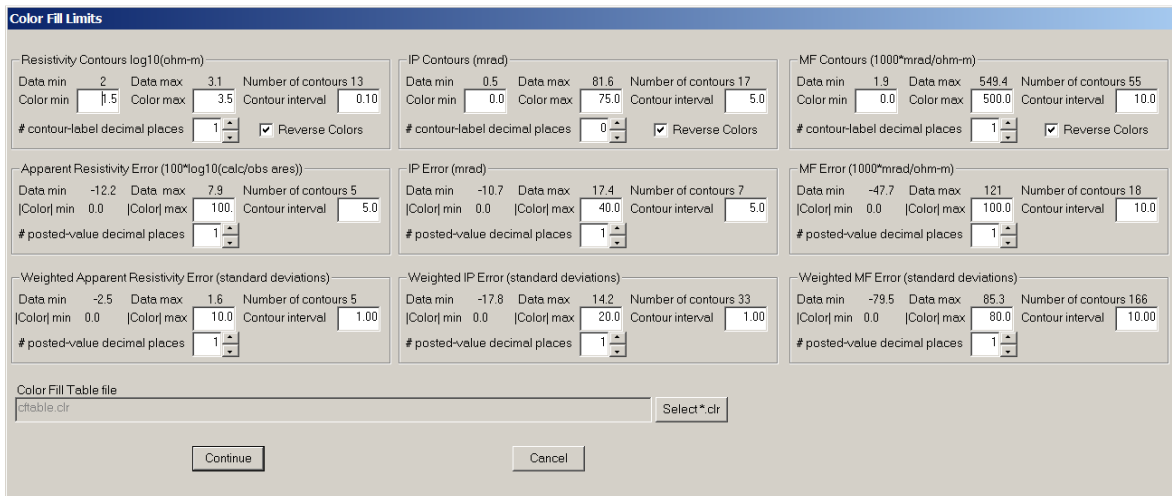
The first s2dplot.exe dialog box allows you to reconfigure plot panel content. S2dplot allows up to four panels per plot and up to four separate plots. Use the Configure plot field at the top of the dialog to select plots 1 through 4. Although s2dplot defaults to plotting resistivity data on plot 1 and IP data on plot 2, resistivity and IP plot panels may be combined in a single plot. Another configuration is to use plots 1 and 2 for the resistivity and IP model sections and plots 3 and 4 for the resistivity and IP data pseudosections. Each plot panel type can be selected as an inversion model section, an observed data pseudosection, a calculated data pseudosection, calculated – observed data, a (calculated – observed data)/(data error) pseudosection, or a resolution width model section. To see the list of options for each panel, click on the arrowhead at the right edge of the panel field. Similarly, click on the right edge of the plot data field to select between resistivity or IP data for each plot panel.

"Depth of investigation" can be either "sensitivity" or the University of British Columbia, DOI parameters. "Sensitivity" values are generated from diagonal values of the model parameter importance matrix, scaled to percent and ranging from 0 to 100. Sensitivities are near 100 % close to the electrodes and gradually fall to 0 at depth. Sensitivity values fall off gradually with increasing depth and a typical "maximum depth of investigation" value is between 2 and 5 %. "UBC DOI" (Oldenburg and Li, 1999) are calculated by normalizing the difference between two inversions run with different background values by the background value difference. DOI values range from 0 at the surface where the inversion model is primarily controlled by the geophysical data to 1 at depth where the influence of geophysical data is weak and background model constraints dominate the inversion. DOI sections generally have a sharper cutoff than sensitivity contours and the 0.2 to 0.5 contour is a good choice for a "maximum depth of investigation".



Click on the Cancel button or press the ESC key to abort plot production. Click on the Continue button or press the Enter key to save your changes and continue to a second dialog box.

The second dialog box shows color-fill limits, contour intervals and the number of decimal places to use for posted data values and contour labels.



Color Fill Limits

Resistivity Contours log10(ohm-m)
 Data min 2 Data max 3.1 Number of contours 13
 Color min 1.5 Color max 3.5 Contour interval 0.10
 # contour-label decimal places 1 ☒ Reverse Colors

IP Contours (mrad)
 Data min 0.5 Data max 81.6 Number of contours 17
 Color min 0.0 Color max 75.0 Contour interval 5.0
 # contour-label decimal places 0 ☒ Reverse Colors

MF Contours (1000*mrad/ohm-m)
 Data min 1.9 Data max 549.4 Number of contours 55
 Color min 0.0 Color max 500.0 Contour interval 10.0
 # contour-label decimal places 1 ☒ Reverse Colors

Apparent Resistivity Error (100*log10(calc/obs ares))
 Data min -12.2 Data max 7.9 Number of contours 5
 |Color| min 0.0 |Color| max 100.0 Contour interval 5.0
 # posted-value decimal places 1

IP Error (mrad)
 Data min -10.7 Data max 12.4 Number of contours 7
 |Color| min 0.0 |Color| max 40.0 Contour interval 5.0
 # posted-value decimal places 1

MF Error (1000*mrad/ohm-m)
 Data min -47.7 Data max 121 Number of contours 18
 |Color| min 0.0 |Color| max 100.0 Contour interval 10.0
 # posted-value decimal places 1

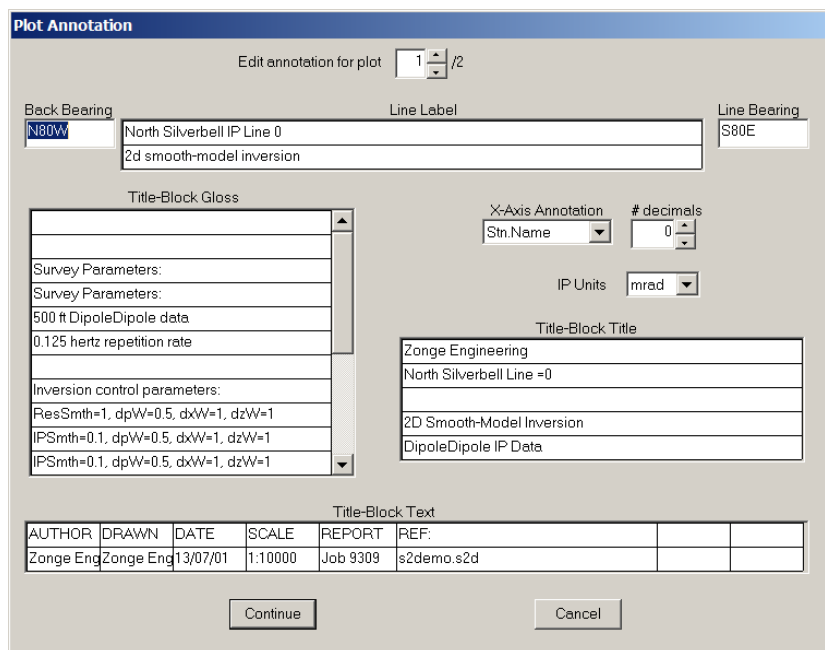
Weighted Apparent Resistivity Error (standard deviations)
 Data min -2.5 Data max 1.6 Number of contours 5
 |Color| min 0.0 |Color| max 10.0 Contour interval 1.00
 # posted-value decimal places 1

Weighted IP Error (standard deviations)
 Data min -17.8 Data max 14.2 Number of contours 33
 |Color| min 0.0 |Color| max 20.0 Contour interval 1.00
 # posted-value decimal places 1

Weighted MF Error (standard deviations)
 Data min -79.5 Data max 85.3 Number of contours 166
 |Color| min 0.0 |Color| max 80.0 Contour interval 10.00
 # posted-value decimal places 1

Color Fill Table file
 ctable.clr

You can move from field to field with the mouse or press tab and shift+tab keys to edit color-fill and contour attributes. Again clicking on the Cancel button will abort plot creation and clicking on the Continue button will move you to the next step. MF fields on the right third of the dialog control metal factor contour display. Selecting Continue or pressing the Enter key brings up a third dialog box with fields for specifying plot annotation.



Plot Annotation

Edit annotation for plot 1 /2

Back Bearing N80W Line Label North Silverbell IP Line 0
 2d smooth-model inversion Line Bearing S80E

Title-Block Gloss

Survey Parameters:
Survey Parameters:
500 ft DipoleDipole data
0.125 hertz repetition rate
Inversion control parameters:
ResSmth=1, dpW=0.5, dxW=1, dzW=1
IPSmth=0.1, dpW=0.5, dxW=1, dzW=1
IPSmth=0.1, dpW=0.5, dxW=1, dzW=1

X-Axis Annotation Stn.Name # decimals 0
 IP Units mrad

Title-Block Title

Zonge Engineering
North Silverbell Line =0
2D Smooth-Model Inversion
DipoleDipole IP Data

Title-Block Text

AUTHOR	DRAWN	DATE	SCALE	REPORT	REF:
Zonge Eng	Zonge Eng	13/07/01	1:10000	Job 9309	s2demo.s2d

The plot annotation text can be customized for each of separate plot. Default annotation text is generated from system configuration information in s2d files, and is then updated by reading the optional mde file to get possibly more complete information. S2dplot gives you the opportunity to save plot configuration and annotation settings in an updated mde file whenever a plot is exported to a hardcopy format.

The next dialog controls plot limits and scaling.

Plot Limits and Scaling

Left station Strn increment Right station

Model eastings and northings are in ft

Elevation Maximum X scale 1: => plot width 40.91 cm

Elevation Increment Y scale 1: => plot height 36.65 cm

Elevation Minimum Minimum plot height cm

Sensitivity cutoff Interpolate over gaps less than ft = 1.2 a

☒ Plot topographic profile line # grid cells/strn interval

☐ Plot Sensitivity/DOI contours

☒ Post data values

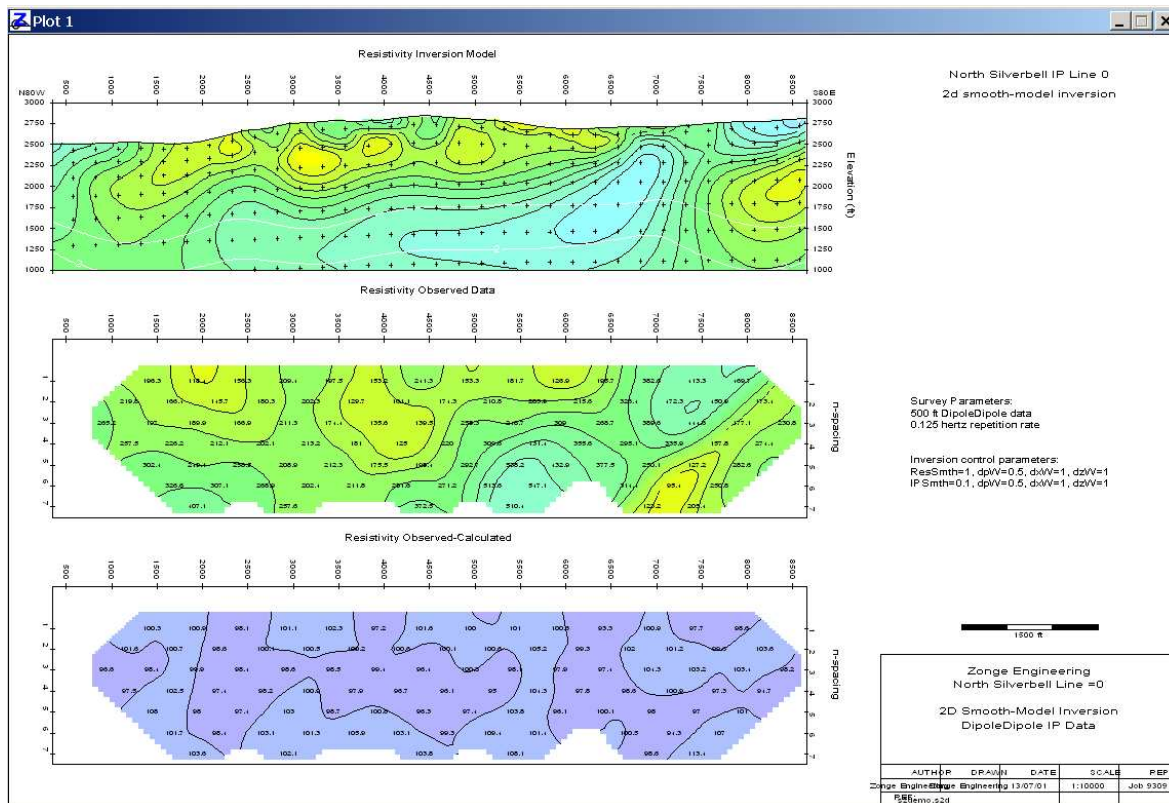
Surfer page units and version to match existing Surfer attributes.

Geosoft resistivity grd data in

The left station and right station fields control the left and right plot limits. By default, the left station is less than the right station and station numbers will increase from left to right across the plot. If the left station is greater than the right station, station numbers will increase from right to left, reversing the plot's direction. X axis and y axis plot scales can be set independently to allow vertical exaggeration in plots of long lines. Plot size is controlled by station and elevation limits and by plot scale. Minimum plot height puts a lower limit on the plot's height to ensure that single-panel plots have enough space for title block annotation.

The sensitivity cutoff value is used to trim the depth extent of model-section plots. The bottom of the model section is trimmed when model-pixel sensitivity drops below the sensitivity-cutoff value. Increasing the sensitivity cutoff trims off more of the model section, while reducing the sensitivity cutoff retains more model depth extent. In addition s2dplot v4.00 shows white sensitivity contours at 1, 2 and 4%. The 1% sensitivity contour is a somewhat optimistic estimate of the maximum depth of investigation, while the 4% contour is a more conservative estimate. As with previous dialogs, click on the Continue button to move to the next dialog panel or click on Cancel to abort the plotting.

After you select the Continue button, s2dplot generates the two multi-panel plots in separate display screen windows, and then displays its main option menu in the main display screen window.



Menu options **Open**, **View**, **Edit**, **Hardcopy Plot** and **Exit** are displayed across the main menu. Selecting **Open** sends you back to the beginning of the plot creation procedure by showing an open-file dialog box listing all s2d files in the current working directory. Selecting **View** brings up two choices, **Plot 1**, **Plot 2**, **Plot 3** or **Plot 4**, which will restore either of the plot windows for visual review. The display screen plot windows may also be restored by clicking on the plot icons showing on the status bar along the bottom of the display screen.

Skipped data. Observed-data apparent resistivity or IP values in .ipd files are skipped when their corresponding error levels are greater than 5000. Skipped values are not contoured, but are posted on observed data pseudosections as a bracketed value (i.e. [326.2]).

You can make changes to the current inversion plots with the **Edit|Panel Configuration**, **Edit|Color Fill**, **Edit|Plot Scale and Limits** or **Edit|Annotation** menu choices which bring up individual dialog boxes for editing plot attributes. Each of the individual dialog boxes will look familiar, they are all presented in sequence when a new TS2DIP file set is plotted starting with the Open menu option.

Hardcopy Plot has several suboptions, **Model to *ipm.csv**, **Printer**, **WMF**, **PNG**, **Surfer Script** or **Geosoft Script**. Selecting Model to *ipm.csv writes pixel-centered model section values to a csv file with columns of east, north, elevation, xpixel, station, line, inversion_resistivity, log10(ResInv), inversion_IP, sensitivity, Oldenburg/UBC depth_of_investigation and resolution_width. Selecting Printer sends the current screen plots directly to the Windows Print Manager to produce hardcopy plot copies on your printer. The **Printer** option allows you to select a paper size, margin sizes and paper orientation. If the plot is too big to fit on the paper, it is scaled down until it does fit. Selecting **WMF** produces a windows metafile, which is suitable for pasting into MS-Word documents for report writing. The **PNG** option produces a raster image of the resistivity and IP plots in a portable network graphics file. **PNG** files are a compact raster image format useful for shipping plots over the Internet.

Surfer Script produces Surfer v8 script (bas) and data files (csv, txt, lvl, bln) suitable for plot production with Surfer's scripting program. Exporting s2demo plots with **Surfer Script** will produce script file s2demo1.bas and s2demo2.bas for each of the two plots.

Selecting **Geosoft Script** produces Oasis montaj files (con, xyz, grd, zon) which s2dplot.gx can turn into a montaj plot. Once you have copied s2dplot.gx into the <GEOSOFT>\gx directory, you can open a workspace and run s2dplot.gx from the montaj GX|Run GX menu. After exporting s2demo plots to Geosoft Script, run s2dplot.gx and select s2demo1.con from the s2dplot.gx dialog to create a resistivity plot in s2demo1.map or select s2demo2.con to generate an IP plot in s2demo2.map. S2dplot also creates a number of contour control files, which it prefixes with an underscore so that they can be easily distinguished from the user selectable mapplot control files.

Every time you export a plot to a hardcopy format; plot annotation, plot scale, color fill and contour parameters may be optionally saved as a block of mde file keywords. S2dplot gives you the option of archiving current plot attributes in a mde file with the same filename stem as the input ts2dip model files. If the mde file already exists, it is updated, otherwise a new one is created. On subsequent runs, s2dplot will read plot scale, axis limit and annotation information from mde file keywords. Saving plot-attribute keywords in mde files is recommended, as it provides an archival record of plot parameters and allows automated plot production from batch files.

Main menu option **Exit** ends s2dplot execution.

S2dplot may be run from batch files for more automated plot production. If "\$auto=yes" in the mde file, s2dplot skips interactive verification of plot parameters and stops after exporting a hardcopy plot. If "auto=no" or is missing from the mde file, s2dplot shows its interactive dialogs to allow interactive plot parameter verification and editing. A dictionary of s2dplot mde file keywords is described in the following section.

To further facilitate batch-file operation, s2dplot scans its command line for file names. S2dplot uses the model-file name as a template to search for a matching mde file name. If a matching mde file is present, s2dplot opens it to scan for plot-attribute specifications.

MDE File Format (Zonge data-processing-control file)

mde files contain one or more “mode” lines. Program-control mode lines start with a \$, optionally followed by a program name and a “:”. Next is a keyword followed by an = and then a keyword value. Spaces may be included between elements of the mode line. Putting a ! or ” character before the \$, inactivates a mode line, turning it into an inert comment line which is ignored by s2dplot. S2dplot will read all mode lines that have either no program name or “\$ s2dplot:”. It will ignore mode lines which contain other program names.

mde file variables used by S2DPLOT:

AUTO	- yes = batch file mode, no = interactive mode in Zonge data processing programs.
CLIENT	- company for which survey was run (text).
PROJECT	- project name (text).
JOBNUMB	- job number.
JOBDATE	- date when survey was conducted.
JOBLINE	- line number.
BRGLINE	- forward line bearing (in direction of increasing station numbers).
BRGBACK	- line back bearing (in direction of decreasing station numbers).

Keywords specific to s2dplot.

\$ S2DPLOT: - identifies keywords intended specifically for s2dplot.

PlotExport	- hardcopy export format (printer, wmf, png, surfer, geosoft)
LNUnits	- length units (m, ft)

Plot annotation.

BRGLEFT	- line bearing annotation for left end of line.
BRGRIGHT	- line bearing annotation for right end of line.
LNTITLE?	- line title text centered at top of text block (up to two lines).
TBTITLE?	- title-block title information (up to five lines)
TBLABEL?	- title-block text labels along bottom of text block (up to six labels)
TBTEXT?	- title-block text placed along bottom of text block (up to six text strings)
TBGLOSS?	- title-block glossary text placed in the center of text block (up to twenty lines)
FOOTER?	- right footer text (up to three lines).

Plot configuration, limits and scale.

PANELij	- panel configuration (i=plot 1 or 2, j = panels 1 to 4), (Inversion Model, Observed Data, Calculated Data, Calculated-Observed, (Calc-Obs)/Error, no plot), (resistivity or IP data)
DoiType	- “depth of investigation” contour parameter (Sensitivity or UBC DOI).
XSCALE	- horizontal scale of model-section plot (ground m per plot m).
YSCALE	- vertical scale of model-section plot (ground m per plot m).
YSIZE	- minimum plot height (cm).
StnLeft	- first station on left edge of plot (stations numbers increase from left to right if StnLeft<StnRight and from right to left if StnLeft>StnRight).
StnRight	- last station on right edge of plot.
StnInc	- posted station interval (stn #).
StnDec	- number of decimal places on posted station numbers (0 to 3).
ElvMax	- maximum elevation on model section (length units).
ElvMin	- minimum elevation on model section (length units).
ElvInc	- tick mark increment on model section elevation axis (length units).
SNScutoff	- sensitivity cutoff threshold (0.01 to 50 percent)
Topo	- yes => draw line along topographic profile, no => no line
DataGap	- maximum pseudosection data gridding interpolation distance (LNUnits)

Resistivity color-fill limits and contour attributes.

CRMIN - minimum resistivity color-fill level ($\log_{10}(\text{ohm-m})$).
CRMAX - maximum resistivity color-fill level ($\log_{10}(\text{ohm-m})$).
CRINC - resistivity contour interval ($\log_{10}(\text{ohm-m})$).
CRDEC - number of decimal places on resistivity contour label and posted data (0 to 3).

Resistivity error color-fill limits and contour attributes.

CREMAX - maximum resistivity error |color-fill| level ($100 \cdot \log_{10}(\text{calc/obs})$).
CREINC - resistivity error contour interval ($\log_{10}(\text{ohm-m})$).
CREDEC - number of decimal places on posted resistivity error data (0 to 3).

Weighted resistivity error color-fill limits and contour attributes.

CRWEMAX - maximum weighted resistivity error |color-fill| level (standard deviations).
CRWEINC - resistivity error contour interval (standard deviations).
CRWEDEC - number of decimal places on posted weighted resistivity error data (0 to 3).

IP color-fill limits and contour attributes.

CPMIN - minimum IP color-fill level (mrad, msec or PFE).
CPMAX - maximum IP color-fill level (mrad, msec or PFE).
CPINC - IP contour interval (mrad, msec or PFE).
CPDEC - number of decimal places on IP contour label (0 to 3).

IP error color-fill limits and contour attributes.

CPEMAX - maximum IP error |color-fill| level (mrad, msec or PFE).
CPEINC - IP error contour interval (mrad, msec or PFE).
CPEDEC - number of decimal places on posted IP error data (0 to 3).

Weighted IP error color-fill limits and contour attributes.

CPWEMAX - maximum weighted IP error |color-fill| level (standard deviations).
CPWEINC - IP error contour interval (standard deviations).
CPWEDEC - number of decimal places on posted weighted IP error data (0 to 3).

Listing of s2dplot mde-file keywords from s2ddemo.mde:

```
$ COMPANY=Zonge Engineering
$ CLIENT=Zonge Engineering
$ PROJECT=North Silverbell
$ JOBNUMB=9309
$ JOBDATE=March 1993
$ JOBLINE=0
$ BRGLINE=S80E
$ BRGBACK=N80W
$ STNLO= -3.0
$ STNHI= 17.0
$ STNDELTA= 1.0
$ LBLFRST= -300
$ LBLDELTA= 500
$ UNITS= feet
$ ZPLOT: AXSTN= vertical
$ ZPLOT: SIZEX= 1.5
$ ZPLOT: SIZEY= 0.75
!$ AUTO= YES
$ AVG-GDAT: sone=-3
$ AVG-GDAT: stwo=-2
$ AVG-GDAT: xone=-300
$ AVG-GDAT: xtwo= 200
$ S2DPLOT: PlotExport = PNG
$ S2DPLOT: LNUnits = ft
$ S2DPLOT: LNTITLE1 = North Silverbell IP Line 0
$ S2DPLOT: LNTITLE2 = 2d smooth-model inversion
$ S2DPLOT: BRGLEFT= N80W
$ S2DPLOT: BRGRIGHT= S80E
$ S2DPLOT: TBTITLE1 = Zonge Engineering
$ S2DPLOT: TBTITLE2 = North Silverbell Line =0
$ S2DPLOT: TBTITLE3 =
```



```

$ S2DPLOT: TBTITLE4 = 2D Smooth-Model Inversion
$ S2DPLOT: TBTITLE5 = DipoleDipole IP Data
$ S2DPLOT: TBLABEL1 = AUTHOR
$ S2DPLOT: TBLABEL2 = DRAWN
$ S2DPLOT: TBLABEL3 = DATE
$ S2DPLOT: TBLABEL4 = SCALE
$ S2DPLOT: TBLABEL5 = REPORT
$ S2DPLOT: TBLABEL6 = REF:
$ S2DPLOT: TBTEXT1 = Zonge Engine
$ S2DPLOT: TBTEXT2 = Zonge Engine
$ S2DPLOT: TBTEXT3 = 13/07/01
$ S2DPLOT: TBTEXT4 = 1:10000
$ S2DPLOT: TBTEXT5 = Job 9309
$ S2DPLOT: TBTEXT6 = s2demo.s2d
$ S2DPLOT: TBGLOSS01 =
$ S2DPLOT: TBGLOSS02 =
$ S2DPLOT: TBGLOSS03 =
$ S2DPLOT: TBGLOSS04 = Survey Parameters:
$ S2DPLOT: TBGLOSS05 = 500 ft DipoleDipole data
$ S2DPLOT: TBGLOSS06 = 0.125 hertz repetition rate
$ S2DPLOT: TBGLOSS07 =
$ S2DPLOT: TBGLOSS08 =
$ S2DPLOT: TBGLOSS09 = Inversion control parameters:
$ S2DPLOT: TBGLOSS10 = ResSmth=1, dpW=0.5, dxW=1, dzW=1
$ S2DPLOT: TBGLOSS11 = IPSmth=0.1, dpW=0.5, dxW=1, dzW=1
$ S2DPLOT: TBGLOSS12 =
.
$ S2DPLOT: TBGLOSS20 =
$ S2DPLOT: PANEL11 = Inversion Model, Resistivity
$ S2DPLOT: PANEL12 = Observed Data, Resistivity
$ S2DPLOT: PANEL13 = Observed-Calculated, Resistivity
$ S2DPLOT: PANEL14 = no plot, Resistivity
$ S2DPLOT: PANEL21 = Inversion Model, IP
$ S2DPLOT: PANEL22 = Observed Data, IP
$ S2DPLOT: PANEL23 = Observed-Calculated, IP
$ S2DPLOT: PANEL24 = no plot, IP
$ S2DPLOT: DoiType = Sensitivity
$ S2DPLOT: XSCALE = 1.0000E+4 Horizontal scale (plot X-axis)
$ S2DPLOT: YSCALE = 1.0000E+4 Vertical scale (plot Y-axis)
$ S2DPLOT: YSIZE = 15.00 Minimum plot height (cm)
$ S2DPLOT: StnLeft = 350. First station on left edge of plot
$ S2DPLOT: StnRight = 8650. Last station on right edge of plot
$ S2DPLOT: StnDec = 0 # station-number decimals (0 to 3)
$ S2DPLOT: StnInc = 500.00 Station interval (stn #)
$ S2DPLOT: ElvMin = 1000.00 Minimum elevation (plot Y-axis)
$ S2DPLOT: ElvMax = 3000.00 Maximum elevation (plot Y-axis)
$ S2DPLOT: ElvInc = 250.00 Elevation tick interval
$ S2DPLOT: SNScutoff = 1.00 Sensitivity cutoff threshold (percent)
$ S2DPLOT: TOPO = yes Draw line along topographic profile.
$ S2DPLOT: DataGap = 600.00 Maximum data gridding interpolation length (ft)
$ S2DPLOT: CRMIN = 1.50 Res contour color minimum (log10(ohm-m))
$ S2DPLOT: CRMAX = 3.50 Res contour color maximum (log10(ohm-m))
$ S2DPLOT: CRINC = 0.10 Res contour interval (log10(ohm-m))
$ S2DPLOT: CRDEC = 1 # res-contour-label decimals (0 to 3)
$ S2DPLOT: CREMAX = 100.00 |Res error| contour color maximum (100*log(calc/obs))
$ S2DPLOT: CREINC = 5.00 Res error contour interval (100*log(calc/obs))
$ S2DPLOT: CREDEC = 1 # res-error contour label decimals (0 to 3)
$ S2DPLOT: CRWEMAX = 10.00 |weighted res error| contour color maximum (std deviations)
$ S2DPLOT: CRWEINC = 1.00 Weighted res error contour interval (standard deviations)
$ S2DPLOT: CRWEDEC = 1 # res-error contour label decimals (0 to 3)
$ S2DPLOT: CPMIN = 0.00 IP contour color minimum (IPUnits)
$ S2DPLOT: CPMAX = 75.00 IP contour color maximum (IPUnits)
$ S2DPLOT: CPINC = 5.00 IP contour interval (IPUnits)
$ S2DPLOT: CPDEC = 0 # IP-contour-label decimals (0 to 3)
$ S2DPLOT: CPEMAX = 40.00 |IP error| contour color maximum (IPUnits)
$ S2DPLOT: CPEINC = 5.00 IP error contour interval (IPUnits)
$ S2DPLOT: CPEDEC = 1 # IP-error contour label decimals (0 to 3)
$ S2DPLOT: CPWEMAX = 20.00 |weighted res error| contour color maximum (std deviations)
$ S2DPLOT: CPWEINC = 1.00 Weighted res error contour interval (standard deviations)
$ S2DPLOT: CPWEDEC = 1 # res-error contour label decimals (0 to 3)

```

S2dplot configuration file (s2dplot.cfg)

S2dplot.cfg is an ASCII file holding modes to parameters used to configure program s2dplot. When s2dplot is run, it looks for s2dplot.cfg in the current working directory, then in the directory holding s2dplot.exe and finally in MS-DOS path directories.

S2dplot.cfg may contain any number of blank or comment lines, and they may be located anywhere in the file. Comment lines begin with a !, /, \ or " character. S2dplot ignores all blank and comment lines.

S2dplot.cfg contains one or more active "mode" lines with the same structure used in mde files. Mode lines begin with a \$ character, followed by a keyword, an = and then a mode value. Spaces may be included between elements of the mode line. Putting a ! character before the \$ inactivates a mode line by creating a comment line, which s2dplot will ignore.

s2dplot.cfg file variables:

SurferVersion - Surfer version number (8), only Surfer v8 script is implemented in s2dplot v4.00
PageUnits - Surfer page units (inches, cm)

Listing of s2dplot.cfg:

```
! Program s2dplot configuration file, updated 12/Dec/05 by SCM
! Blank lines are ignored.
! Comment lines start with ! and are ignored.
! Active mode lines start with $ and are used.

! Surfer version number, only Surfer v8 is implemented in s2dplot v4.00
$ SurferVersion=8

! Surfer page units, select one of two.
$ PageUnits=inch
!$ PageUnits=cm
```

S2dplot color-fill table file (cftable.clr)

CfTable.clr is an ASCII file specifying the color spectrum to use for color fills. The installation version has a blue-to-red rainbow spectrum, but cftable.clr can be customized to suit individual tastes. CfTable.clr uses a Golden Software's Surfer format, so sample Surfer clr files with different color spectrums can be copied from the Surfer\Samples subdirectory.

Listing of cftable.clr:

```
ColorMap 1 1
    0      178      178      255
   25      153      255      255
   50      128      255      128
   75      255      255       0
  100      255       0       0
```

cftable.clr file variables:

S2dplot ignores the header line "ColorMap 1 1", but it should be included for compatibility with Surfer.

The remaining numerical records specify range, red, green and blue values for a variable number of anchor points, where

Range = percent between minimum and maximum contoured data (0 to 100),

Red = amount of red color from 0=none to 255=maximum,

Green = amount of green color from 0=none to 255=maximum,

Blue = amount of blue color from 0=none to 255=maximum.

Colors are interpolated between anchor points to get continuous gradation of the color-fill spectrum. Range values should be ordered from low to high with no duplicate values.

***ipm.csv format (S2DPLOT => Model to *ipm.csv)**

*ipm.csv files hold pixel-centered model-section values in a tabular comma-separated-value format

Partial *ipm.csv file listing:

```
East,North,Elevation,XPixel,Station,Line,ResInv,log10(ResInv),IPInv,Sensitivity,DOI,RMW
1472514.38,11773339,2406.581,1472514.38,-175,1,933.1,2.9699,28.31, . . .
1472514.38,11773339,2252.761,1472514.38,-175,1,690.6,2.8392,29.63, . . .
1472514.38,11773339,2075.868,1472514.38,-175,1,533.6,2.7272,28.87, . . .
. . . . .
. . . . .
```

*ipm.csv file variables:

Line one holds column labels.

East	- pixel center easting (length units).
North	- pixel center northin (length units).
Elevation	- pixel center elevation (length units).
Ypixel	- pixel center distance along line (length units).
Station	- pixel center station number
Line	- line number
ResInv	- inversion model resistivity (ohm-m).
log10(ResInv)	- log10 of inversion model resistivity (log10(ohm-m)).
IPInv	- inversion model IP (mrad or msec).
Sensitivity	- inversion model sensitivity (percent).
DOI	- inversion model Oldenburg/UBC "depth of investigation (ratio, 0 to 1).
RMW	- inversion model resolution width (length units).

S2DPlot => SURFER format files

- *.bas = Surfer v8 basic script (see Surfer v8 documentation).
- *.bln = Surfer blanking file, masks plot above topography and below sensitivity cutoff contour.
- *.grd = Surfer v6 format grid file.
- *.lvl = Surfer color-filled contour level file (see Surfer v8 documentation).

*S.CSV File Format (S2DPLOT => SURFER data file)

*.csv files hold model values, observed and calculated data in a tabular format suitable for use by Golden Software's Windows SURFER v8 program.

Partial *s.csv file listing:

```
"Xpixel", "Ypixel", "Res_mod", "log10(Res_mod)", "IP_mod", "Res_sns", "Res_doi", "Res_RMW", "IP_doi", "Xdata", "Ydata", "ARes_obs", "ARes_calc", "log10(ARes_obs)", "log10(ARes_calc)" "100*log(obs/calc)", "weighted log(ARes_obs/calc)", "IP_obs", "IP_calc", "IP_obs-calc_error", "weighted_IP_obs-calc_error"
1175.431,2433.959,5.38690E+02,2.731,33.42,45.3,0,492.81,0,1550.18,-1000,265.2, 275.7, 2.424,.
1175.431,2278.534,4.57710E+02,2.661,31.11,21.24,0,920.3,0,1800.645,-750,219.8,217.4,2.342,..
1175.431,2099.795,3.77600E+02,2.577,29.11,11.75,0,659.88,0,1800.645,-
. . . . .
. . . . .
```

*S.CSV file variables:

Line one holds column labels.

Inversion-model section	
Xpixel	- pixel center location along line (length units).
Ypixel	- pixel center elevation (length units).
Res_mod	- model resistivity (ohm-m).
log10(Res_mod)	- log ₁₀ of model resistivity (log ₁₀ (ohm-m)).
IP_mod	- model IP (mrad, msec or PFE).
Res_Sns	- resistivity model sensitivity (percent).
Res_doi	- resistivity model “depth of investigation (ratio, 0 to 1).
Res_RMW	- resolution width (length units)
IP_doi	- IP model “depth of investigation (ratio, 0 to 1).
Pseudosection data	
Xdata	- pseudosection plot point location along line (length units).
Ydata	- pseudosection plot point vertical plot position (length units).
Ares_obs	- observed apparent resistivity (ohm-m).
Ares_calc	- calculated apparent resistivity (ohm-m).
log10(Ares_obs)	- observed apparent resistivity (log ₁₀ (ohm-m)).
log10(Ares_calc)	- calculated apparent resistivity (log ₁₀ (ohm-m)).
100*log(obs/calc)	- relative apparent resistivity error (%)
weighted_log(Ares_obs/calc)	- apparent resistivity error/Ares_obs_error (standard deviations)
IP_obs	- observed apparent IP (mrad, msec or PFE).
IP_calc	- calculated apparent IP (mrad, msec or PFE).
IP_obs-calc_error	- observed – calculated IP error (mrad, msec or PFE)
weighted_IP_obs-calc_error	- IP – IP error/IP_obs_error (standard deviations)

***S.TXT File Format (S2DPLOT => SURFER text file)**

*S.TXT files hold plot scale and annotation information in a spreadsheet format suitable for use by Golden Software's Windows Surfer v8 Scripter program (and for manual Surfer plot creation).

***S.TXT file listing:**

```
"XStn","YMSmax","YPSmax","Stn","Xmin","Xmax","Yplt","n-sp","Xmin","Xmax","Yplt","elev"
1300.54,3000,0,700,1050.32,9549.63,-500,1,1050.32,9549.63,1000,1000
1800.64,3000,0,1200,1050.32,9549.63,-750,2,1050.32,9549.63,1250,1250
2300.26,3000,0,1700,1050.32,9549.63,-1000,3,1050.32,9549.63,1500,1500
2800.85,3000,0,2200,1050.32,9549.63,-1250,4,1050.32,9549.63,1750,1750
3300.46,3000,0,2700,1050.32,9549.63,-1500,5,1050.32,9549.63,2000,2000
3799.91,3000,0,3200,1050.32,9549.63,-1750,6,1050.32,9549.63,2250,2250
4300.02,3000,0,3700,1050.32,9549.63,-2000,7,1050.32,9549.63,2500,2500
4800.12,3000,0,4200,,,,,1050.32,9549.63,2750,2750
5300.22,3000,0,4700,,,,,1050.32,9549.63,3000,3000
5800.17,3000,0,5200
6300.27,3000,0,5700
6800.38,3000,0,6200
7299.99,3000,0,6700
7799.6,3000,0,7200
8299.66,3000,0,7700
8799.64,3000,0,8200
9299.25,3000,0,8700
9549.63,1000,-2125,
```

***S.TXT file variables:**

Line one holds column labels.

Station number posting

XStn - x-coordinate of station number (length units)
YMSmax - maximum model-section y-coordinate (length units)
YPSmax - maximum pseudosection y-coordinate (length units)
Stn - station number

Pseudosection

Xmin - x-coordinate of left pseudosection y-axis (length units).
Xmax - x-coordinate of right pseudosection y-axis (length units).
Yplt - y-coordinate of y-axis pseudosection annotation (length units).
n-sp - y-axis pseudosection annotation values (n-spacing).

Model section

Xmin - x-coordinate of left model section y-axis (length units).
Xmax - x-coordinate of right model section y-axis (length units).
Yplt - y-coordinate of y-axis annotation (length units).
elev - y-axis model section annotation values (length units).

S2DPLOT => Geosoft Oasis montaj format files

Filename.con = s2dplot.gx control file
filename1.con & filename2.con = Geosoft mapplot control files
_filename*.con = contour control files
_filename*s.con = sensitivity contour control files
*.mdf = Geosoft map definition files
*.grd = Geosoft short integer, uncompressed grid files
*.zon = Geosoft contour color-fill files

*m.xyz = model section values in a csv format

HPlt = pixel center horizontal distance along line (length units)
Elevation = pixel center elevation (length units*vertical exaggeration)
Station = station number
Res_Model = inversion model pixel resistivity (ohm-m)
IP_Model = inversion model pixel IP (mrad or msec)
Sensitivity = model pixel sensitivity (%)
DOI = model UBC "depth of investigation"
Resolution_Width = model resolution width (length units)
East = pixel center easting (length units)
North = pixel center northing (length units)

*d.xyz = resistivity and IP pseudosection data

HPlt = pseudosection plot point horizontal distance along line (length units)
ZPlt = pseudosection plot point depth (length units)
ARes_Obs = observed apparent resistivity (ohm-m)
ARes_Calc = calculated apparent resistivity (ohm-m)
ARes_Residual = 100*observed/calculated apparent resistivity (%)
ARes_StdDev_Residual = (100* observed/calculated ARes)/(ARes error)
IP_Obs = observed IP (mrad,msec)
IP_Calc = calculated IP (mrad,msec)
IP_Residual = 100*observed - calculated IP (mrad,msec)
IP_StdDev_Residual = (100* observed - calculated IP)/(IP error)
East = pseudosection plot point easting (length units)
North = pseudosection plot point northing (length units)
Elevation = pseudosection plot point elevation (length units)
T1S = transmitter electrode station number
T2S = transmitter electrode station number
R1S = receiver electrode station number
R2S = receiver electrode station number

*s.xyz = station and elevation annotation posting

x = x plot coordinate (length units)
y = y plot coordinate (length units)
z1 = post value:
Line 1 = left y-axis elevation posting
Line 2 = right y-axis elevation posting
Line 3 = model section station number posting
Line 4 = left pseudosection y-axis n-spacing posting
Line 5 = right pseudosection y-axis n-spacing posting
Line 6 = pseudosection station number posting
Line 7 = topographic profile