DOWN SAMPLING DATA IN EXCEL

Excel has a limit of 32000 elements in a series to be plotted in a graph, and plots of this size can swell the size of output files. To reduce the file size and still maintain the original data trend, down sample the data in a 1-for-2, 1-for-3, 1-for-4 etc manner. This can be done easily using the index function and the drag-and-fill operation. The index function in excel allows elements in a block of data to be referenced by their position in the block, versus an absolute reference.

Generic form	=INDEX(array,row_num,column_num)
For this example	=INDEX($B$6:$B$65536,(ROW(C6)-6)*2+1,1)

$B$6:$B$65536   This defines the array from which the down sampling draws. $B$6 is now index (1,1) of the array. The use of the *"$B$6"* form versus *"B6"* prevents excel from incrementing the numbers when the function is copied.
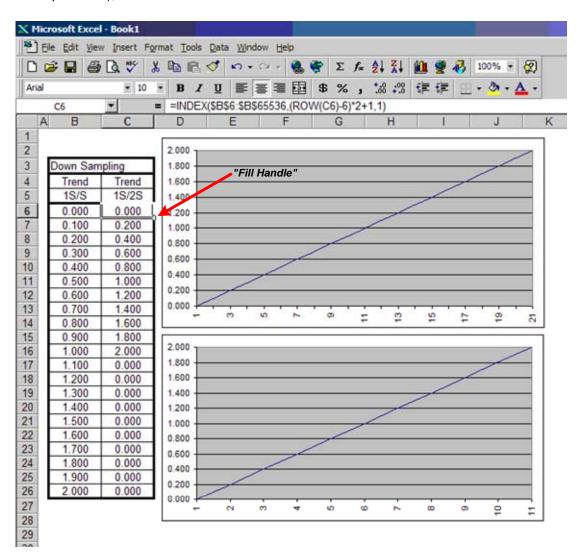
(ROW(C6)-6)*2+1

	Row(C6)	This uses the current row position as the step index, it returns the value "6" for the first element defined in this example.
	-6	This subtracts out the starting offset of the index function to return "0" for this row, "1" for the next row and so on.
	*2	This defines the step function to return every second sample. The functions return *(6-6)*2 = 0*, *(7-6)*2 = 2* and so on. Use 3 for a 1-for-3 down sample etc.
	+1	The first element of the array defined in the function (Top left corner) has an index of (1,1) so the +1 adjusts for this for the previous part of the equation which returns 0 for the first row.

1   The simply means use column number 1 of the defined array.

Once the function is typed in, simply select the cell and drag the fill-handle to select at least N/2 cells below it (N is the number of original samples) to copy the formula. As can be seen from the graphs below of column B (The original data) and column C (The down sampled data), the curve of the source data is maintained with 1/2 of the information.