

RPS P190 Compression Utility

RPS “Navpact” P190 utility consists of a licensed utility to Compress UKOOA P190 format files and an unlicensed Decompress utility to enable more efficient data transfers over the internet.

By understanding the format of a marine P190 file the software is able to achieve considerably higher compression ratios than using gz, bzip, Unix Compress or PKZIP type programs.

Compression ratios in the order of 40:1 to 55:1 are normal. A 300 megabyte P190 file can be reduced to a 7.5 megabyte file or less enabling it to be attached to an email or FTP'd efficiently. ZIP and GZ programs normally only achieve a 3:1 to 5:1 compression on large p190 files. A typical 370 megabyte file may only compress to 120 megabytes.

The Compression routine is time licensed to the system it is installed on.

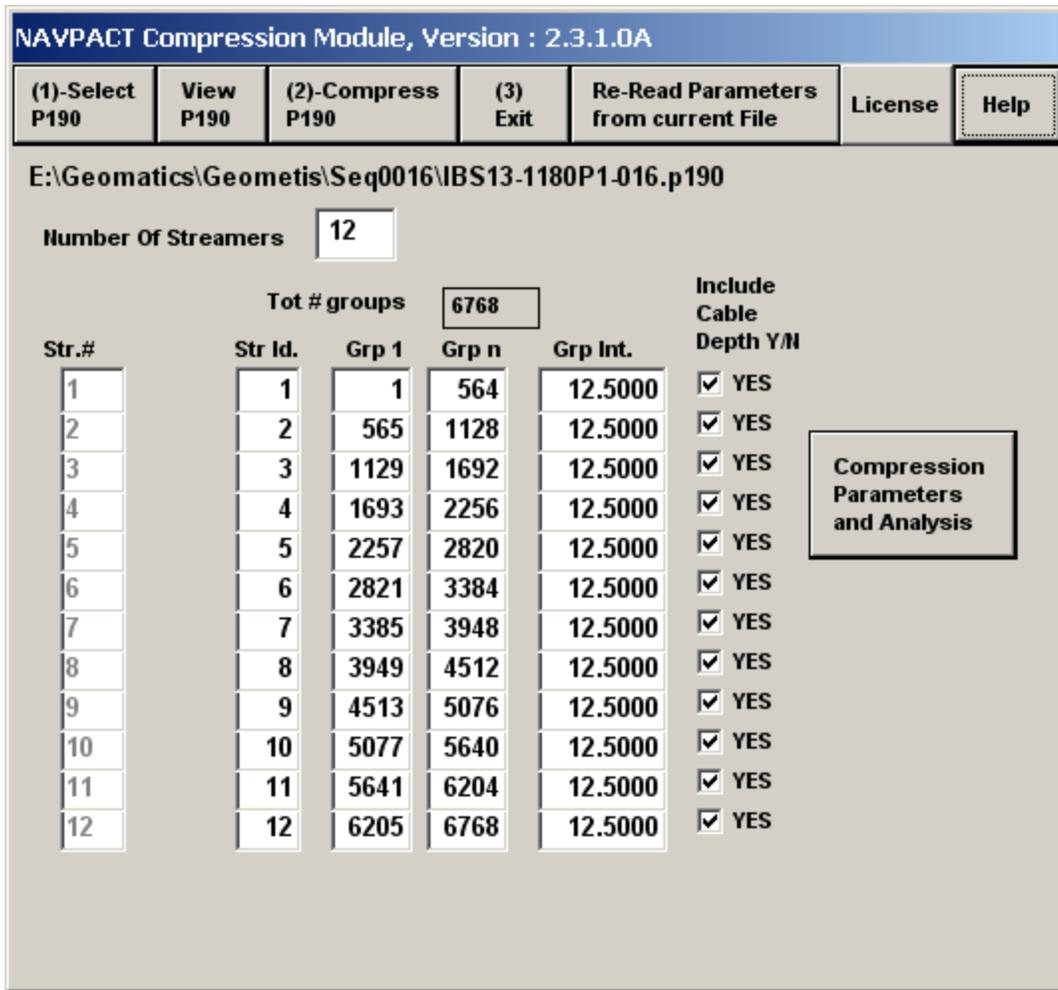
The Decompression utility is not licensed and can be used on any system freely. This allows compressed files to be restored even long after the compression license may have expired. It also allows the decompression installation to be sent to the receiving end user of the compressed file without need to license.

Compression Modes

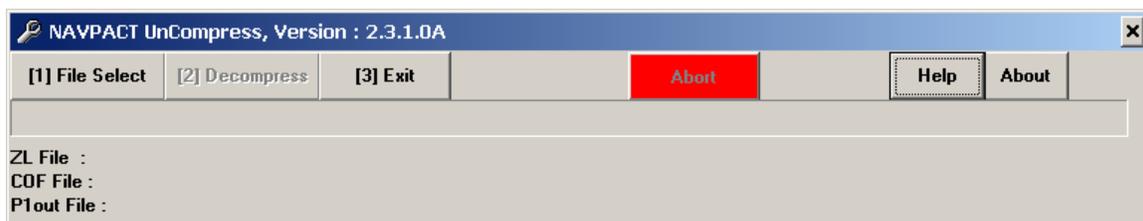
Three compression modes are available:

1. **NO Loss mode:** Least compression, most accurate, fastest compression.
2. **Fixed Compression mode:** Fixed Nth Order data fit. Variable speed.
3. **Fixed error mode:** Variable Nth order data fit. Most Compression. Slowest.

In all modes the Vessel, Source, Echo sounder and Tailbuoy and other position records will be fully preserved with no error along with full header information.



Main Screen – Values are automatically populated from the P190



Main Screen for Decompression Utility

NO LOSS Mode (Recommended mode)

Full accuracy is kept and the decompressed P190 file is identical to the original. Typical compression ratios are in the order of 40:1 to 55:1.

A 180 Megabyte file can typically be reduced to 3.6 Megabytes in about 3 minutes on a laptop, possibly faster on a PC. This mode is used when the full accuracy is required. This method uses a unique proprietary algorithm.

Fixed Compression mode.

This mode uses a fixed Nth order least squares data fit algorithm to create a set of coefficients for each streamer for each shot. The user specifies the Nth fit order between 2 and 14 depending on end users accuracy requirements or intended use. Depending on the streamer dynamics this method has a variable accuracy/error value, but has a fixed compression ratio dependent on N.

The compression speed also varies with the size of N. The error statistics are stored in the compressed file header and can be viewed when decompressing.

Fixed error mode

This mode provides the highest compression while allowing user control over the maximum allowable error in decompressed positions. Typical error constraints used will be +/- 1 or 2 meters. The program automatically adjusts the Nth order least squares fit until the error is within the specified constraints.

This mode can give very high compression rates in the 80:1 to 100:1 for clean data sets.

If the data is noisy or highly dynamic and the error limit cannot be met an error is generated advising the operator. The maximum error value is stored in the compressed file header and can be viewed when decompressing.

This mode is good for generating binning coverage plots, feather plots etc with a known accuracy. The higher compression ratio makes a good choice for vessels with slow data links.

No streamer Depth Mode

The streamer depth in the receiver records can be optionally omitted in any of the 3 compression modes. This can provide a slight improvement on the compression.

Note: Not recommended for final P190 or if streamer depths are needed for QC.

Analysis/Test Mode

For initial setup purposes an analysis and test mode is provided that allows the operator to test the compression over a limited number of shots and establish the normal operating mode and limits.

Analysis / Operations Parameters

File Format
 P1/84 P1/90

Calculation Method
 Fixed Error
(most compression)
 Fixed N'th Order
(Fixed compression)
 No Loss
(least compression)

Number of Shots for Analysis
50

Comment
[FILENAME.EXT]

Analyze Change Values Exit

Analyze mode screen

This mode has a password protection feature to prevent accidental parameter changes during normal use. The password to access the edit mode is 'goodday'.

Note: Changes should only be made by experienced users.

Execution Summary

Input P1 File:	IBS13-1180P1-016.p190		
Nav Line	Comment Box	[FILENAME.EXT]	
	3-1180P1-016		
Date	02/02/2013	Total Bytes In P1	9284220
File Type	P1/90	Total Bytes Out COF	617090
Prc Method	No Loss	Comp Ratio P1/COF	15. > 1
Max,Min N'Order East		Total Bytes Out ZL	000000000
Max,Min N'Order North		Comp Ratio P1/ZL	000.0 > 1
Max,Min N'Order Depth		Max Abs Err East	.
First SP	1034	Max Abs Err North	.
Last SP	1083	Max Abs Err Depth	.
Total SP	50	Time(Start)	18:21:23
Total Grps	338400	Time(End)	18:21:25
		Time(Elap)	00:00:02
		Grps per Sec.	169115.4
OutPut Compressed File:	IBS13-1180P1-016.COF.ZL		

Exit

Analysis statistics output screen

Command Line Mode

To compress or decompress multiple files each module supports operation from the command line allowing a simple batch file (or CMD) script to be created or to be added to a process flow.

Calling Parameters are:

C:\RPSQCX\P190_Utility\comp190.exe [Full Pathname to P190 file]

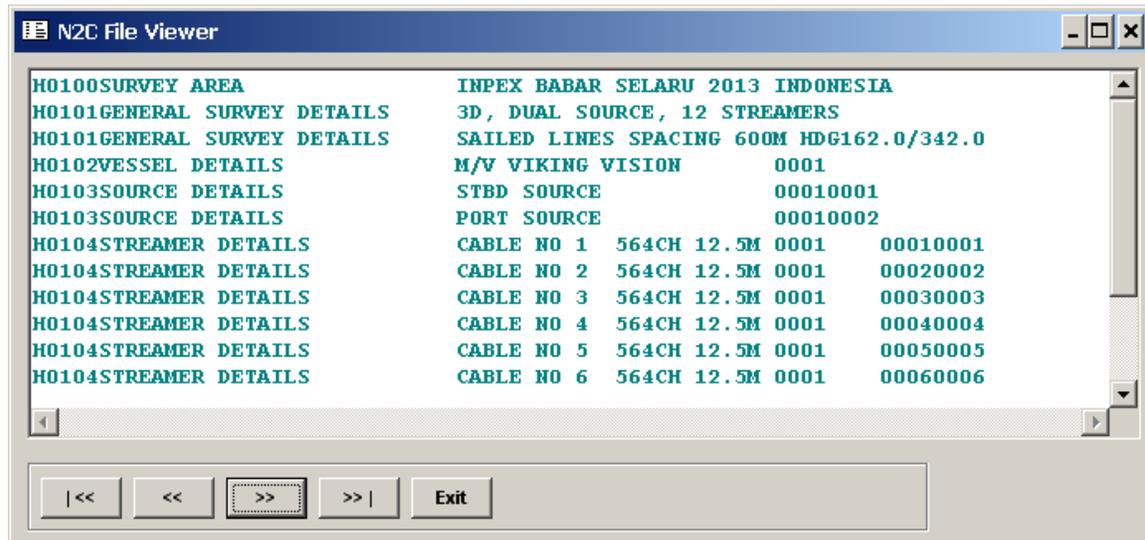
Or

C:\RPSQCX\P190_Utility\Decom190.exe [Full Pathname to compressed .COF.LZ]

Note that if pathnames contain spaces then they should be enclosed in Quotes on the command line.

View P190

A P190 view option is provided to examine the input file prior to compression.



Simple P190 Viewer

Compression utility

The Compression utility, "**Comp190.exe**", creates a file of a size suitable for emailing or FTP'ing to another party.

The compression routine accepts a P190 formatted file as input and then in a two step process first creates a much smaller coefficient file ("*.COF") and in the second automatic step compresses the intermediate "*.COF" to form a "*.COF.LZ" file using LZW compression. The intermediate "*.COF" file will be removed automatically on completion of the compression.

The *.COF.LZ file is generally about 1/3 to 1/5 the size of the intermediate .COF files. Typical total compression ratios of 40 to 50 to 1 are achieved using the NO Loss option. Higher compression ratios can be achieved using one of the other two available modes.

All compressed files are automatically stored in a /CMP_DATA directory under the original P190 files directory.

Note: This requires the program to have write permissions in this directory. The original files are opened in Read Only mode.

N2C Processing E:\GEOMATICS\GEOMETIS\SEQ0016\IBS13-1180P1-016.P190

Execution Status		Performance		Compression Errors
LineName	3-1180P1-016	Start Time	18:26:42	
Shot Point	1239	Current Time	18:26:51	
Shots (line)	205	Elapsed Time	00:00:08	
Shots (file)	205	Est Time to End	00:01:12	
Grps /Block	6768	Est End Time	18:28:03	
Grps / Sec. Avg.	1127295	Est total time	00:01:20	

No Error Mode

Compression Status (no LZW)	
File Average	15.5 to 1
Lowest Ratio	49.1 to 1
Highest Ratio	114.9 to 1

ABORT

Compression Status Window while compressing

Execution Summary

Input P1 File: IBS13-1180P1-016.p190

Nav Line Comment Box [IBS13-1180P1-016.p190]
3-1180P1-016

Date	02/02/2013	Total Bytes In P1	377564490
File Type	P1/90	Total Bytes Out COF	24158894
Prc Method	No Loss	Comp Ratio P1/COF	15.6 > 1
Max,Min N'Order East		Total Bytes Out ZL	0008326279)
Max,Min N'Order North		Comp Ratio P1/ZL	45.3 > 1
Max,Min N'Order Depth		Max Abs Err East	.
First SP	1034	Max Abs Err North	.
Last SP	3071	Max Abs Err Depth	.
Total SP	2038	Time(Start)	18:26:43
Total Grps	13793184	Time(End)	18:28:07
		Time(Elap)	00:01:24
		Grps per Sec.	164204.6

OutPut Compressed File: IBS13-1180P1-016.COF.ZL

Exit

Final Compression status after Compression showing 45.3:1 Ratio

Using File Associations with the Compression Utility

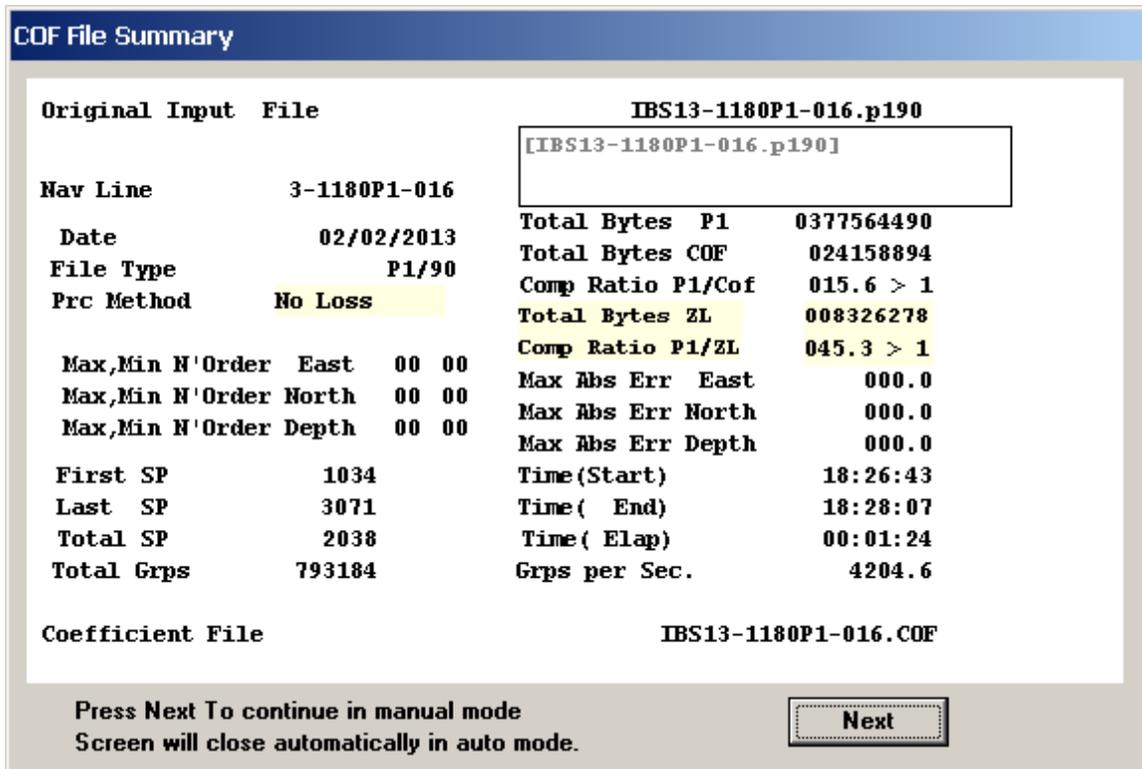
Once installed on a PC the compression utility can be manually associated with *.P190, *.P1, *.190 etc files to allow the compression process to be started by double clicking on the file to be compressed.

Decompression

The Decompression utility, "Decomp190.exe" , is used to restore the file back to its original size. This is also a two part process (automatic) with the "*.cof.lz" file first being expanded to create the intermediate "*.cof" file and then the "*.cof" being expanded to recreate the original P190 file.

As the compression mode is stored within the *.cof file the decompression algorithm to be used is automatically detected.

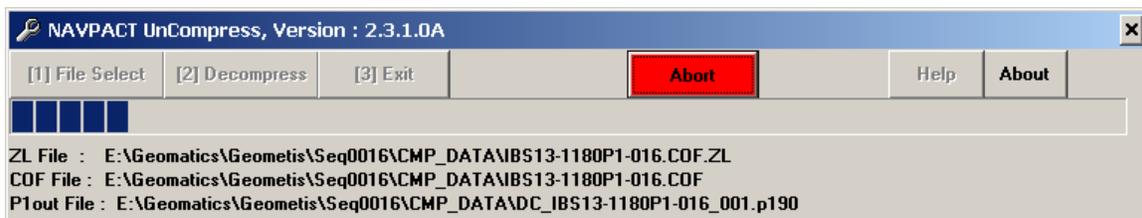
The Output P190 file will be placed in the same directory as the *.cof.lz file. The file will be given the same base name as the original filename with a "DE_" prefix to indicate it is the decompressed version. This is to prevent overwriting the original file if being decompressed on the same system. If a previous version exists in the same folder a 4 digit version number will be automatically appended to the name. This is also useful when testing for the best compression method.



Decompression COF file information after selecting file to decompress



Decompress Screen after selecting file and reviewing the file information.



Decompress screen after select (2) Decompress button.

Using File Associations with the Decompression Utility

The decompression routine should be associated with ".cof" and ".cof.lz" files to allow the decompression to be started by double clicking on either.

Data Limits

The Maximum P190 input file size is currently limited to 2GB

The number of streamers is currently limited to 32

Streamer numbers supported are 1-9 and A-Z where A=10

The number of groups per streamer is currently limited to 2000

The Compressed file header has fixed string lengths for file and pathnames.

The Maximum allowable pathname length is 260 characters.

The maximum base filename length is 60 characters.

Corrupted input file

If the input P190 file is corrupted in any way or the Compression utility may abort as it relies on the file structure and numbering to be consistent. Typical issues will be if the file has been manually edited or an invalid receiver number is encountered that causes an incorrect index into the internal storage arrays or the line length is not 80 characters. The compression algorithm is more sensitive to invalid values (non numeric or non standard alphanumeric characters) in the data records than many standard P190 readers that can ignore an invalid value typically by returning a zero value. It can be used as a tool for detecting corruptions in the file.

If you are unable to locate the corruption then the file may have to be sent using normal zip or gz compression methods.

Licensing

The Compression Program is run under a node locked license to the system it is installed on.



Compression Utility License Screen

The Decompression Module does not require a license to run so may be sent to the end user(s) of the P190 file to allow the file to be decompressed.

Licenses may be acquired from RPS energy by contacting Greg Glanville at glanvilleg@rpsgroup.com or via software_license@rpsgroup.com

A popup window is presented at the program start if a valid license is not present.

A PC/Laptop specific reference number will be displayed at the top of the window.

This reference number will need to be supplied along with the license request. Licenses can be issued as permanent or for a fixed time limit. The license reference number is based on the serial number of the primary disk drive installed on the PC/Laptop. If the disk is changed a new license will be required.