

SEG-D, Rev 3.1 - October 2015

Release letter

Changes October 2015 version

- Various places – Updated version number to 3.1
- Section 2.0 – Added description of changes for Rev 3.1.
- Section 2.1 – Small change in point 7 to clarify.
- Section 2.4 – Point 11 fix typo compliment -> complement
- Section 3.1 – Updated leap-seconds to June 2015, note that a leap second will be added in June 2015.
- Section 3.6 – Add support for new CRS de
- Section 4.1 – Field 2 changed to SD3.1
- Section 4.2 – Fix typo 64 -> 128 byte entry for each SEG-D record...
- Section 4.2.1 – Field 2 changed to SD3.1
- Section 5.6.2 – Change to position backup to reflect the extended usage of the P#/11 formats. Also added P6/11 bin grid example.
- Section 6.1, 8.1 – Added support for little-endian sample formats 9036, 9038, 9058, 9080. Other little endian sample formats are currently not supported as they do not match internal computer data formats, and are not much used in modern recording systems.
- Section 8.2 – Byte 12, minor version set to 0x01 (for revision 3.1)
- Section 8.12 and 8.13 – Add support for new P1/11 CRS format
- Section 8.26.1 – Change to position data to reflect the extended usage of the P#/11 formats.
- Appendix A – Added OCTIO (code 58) and inApril AS (code 59).
- Added support for new P1/11 CRS definition format, and deprecating the old format.
- Created appendix D1 (P1/11 CRS identification format), and renamed old stanza based CRS format appendix D2 (deprecated).
- D2.1.1 – Removed sentence referring to 3200 byte limitation (this is a SEG-Y issue).
- D2.1.3 – Removed sentence referring to 3200 byte limitation (this is a SEG-Y issue).
- Appendix E9 – Updated code to include June 2015 leapsecond. Also added a disclaimer reminding users of responsibility to add entries to tables when new leapseconds are added.
- Appendix F – Updated to reflect that version 1.0 of UoM has now been published, and changed URL for Energistics link.

SEG-D Rev 3.0 changes

The following are the changes of Rev 3.0 versions November 2009 - September 2014.

Changes September 2014 version

- Section 2.0 – Add description of the new Appendix F to the list of changes in revision 3.0.

- Section 3.1 – Update leap-second table to June 2014.
- Section 5.3, page 43 – Some clarification for bytes 13-15 Time break window.
- Section 5.3, page 43 – Change text for Trace Header Extension #1 to "must be added". THE1 is required in rev 3.0.
- Section 6.2 – Clarification of sensor sensitivity and physical unit conversion. SS=1/STY used in Sensor Info Header Extension.
- Section 8.9 – Add comment stating 0x0 is often used to indicate "not set" for indexes (source line/point/point index, depth, group and re-shoot).
- Section 8.16 – Channel type, byte 4, adding codes 0x9A Source excitation, 0x9B Source valve and 0x9C Source overload.
- Section 8.16 – Add two new physical units (byte 62): 0x14 Millimeter and 0x15 Meter.
- Section 8.18 – Add comment stating 0x0 is often used to indicate "not set" for indexes (receiver line/point, depth, group and re-shoot).
- Section 8.19 – Clarification of sensor sensitivity bytes 9-12 (ref. section 6.2)
- Appendix A – Added Seismic Instruments, Inc (code 54), TGS (code 55), Hewlett Packard (code 56) and Modern Seismic Technology, LLC (code 57).
- Appendix F – Updated to Energetics Unit of Measure Integer Codes v1.0. Some units have been deprecated, and some have been added. Deprecated units/codes are listed like ~~this~~. Most notable "%" has been removed and replaced with "Euc" (Euc = 100*%). Please do not use deprecated units in new measurements.

Changes June 2012 version

- Section 8.1 – Added comment for Base Scan Interval (byte 23) when using 1/16 msec sample rate as it is not a multiple of 1 micro second.
- Section 3.1 – Added leap seconds until Jun 2012.
- Section 4.1 – Updated Energetics address
- Section 4.2.2 – Fixed typo in field 5 (Record ID) 50 -> 60
- Section 5.3 – Change description of timing word to support negative values.
- Section 7.23 and 8.24 – Measurement block enabled
- Section 8.13 - Added clarification of how the location of Position blocks is used to determine what the position refers to.
- Section 8.16 – Channel Set Descriptor byte 62 – Added two new supported physical units, Pascal (12₁₆) and Micropascal (13₁₆)
- Section 8.17 – Fix typo, max number of channel sets is 99, not 9999.
- Appendix A – Added Verif-i (code 51), Troika International (code 52) and MagSeis (code 53).
- Appendix C – Updated the Energetics address and the Producer Organization Code table
- Appendix D.1.2 – Fix typo page 145, example e) – add missing = in first line
- Appendix D.1.2 – Fix typo page 149, example j) – remove ((SEG:EndText)) as it is inconsistent with the rest of examples.
- Appendix E.9 – Add support for leap seconds until Jun 2012 + some minor fixes.
- Appendix F – Create new appendix with snapshot of Energetics Unit of Measure integer codes.

Changes May 2011 version

Note: Though there are many changes, the format itself is unchanged. The changes are only related to clarification of various issues, and fixing of typos and other minor typographic issues.

- Version number changed to SEG-D Rev 3.0 - May 2011
- Section 2.0, point 1 – Properly refer to Storage Unit Label, field 2
- Section 2.0, point 2 – Change General Header #0 to General Header #1
- Section 2.0, point 7 – Clarify usage of position coordinate systems
- Section 2.0, point 34 – Change wording to reflect that the device information not yet exists on seg.org.
- Section 3.0, page 18 – Minor correction to max header size calculations (typo fix)
- Section 3.1, page 26-27 – Add leap-second information for 2009 and 2010
- Section 3.2, page 28 – Change Trace Header Extension to Trace Header Extension #1
- Section 3.3 – Clarify some issues regarding holes and continuity of traces in Extended Recording Mode. Also clarify that Extended Recording Mode supports max 4294967295 samples per channel set, not 4294967295 microseconds as stated earlier.
- Section 3.4 – Some clarification regarding the max amount of time available for recording in Extended Recording Mode. (Similar to section 3.3 corrections above).
- Section 4.1, field 4 – Clarification: Binding edition for SEG-D rev 3.0 should be set to ‘B2 ‘. This is most compatible with RP66 v2.
- Section 4.1, field 6 – Add reference to Appendix C.
- Section 4.2.1, field 11 – License id of ‘survey area’. Typo in initial version.
- Section 5.1 – Clarify usage of table, and remove duplicate definition for General Trailer Description block. Add clarification of block ordering in General Header. Add description of how to order different type of source information to properly refer to the correct Source Description.
- Section 5.5 – Correct wrong byte reference (typo fix)
- Section 5.6 – Correct first numbered list, align with information below.
- Section 5.6.5 – Clarify the range of block type values for User defined block
- Section 6.0 – Clarify that the Trace Header Extension #1 block is required as part of a trace.
- Section 6.2 – Clarify issue of “sample value is measured value in millivolt” Describe how to handle situations where “millivolts at system inputs” are not relevant (e.g. for aux channels).
- Section 7.6 – Use correct label for CI in table.
- Section 7.17, 8.18 – Use correct label for Trace Header Extension #1
- Section 7.18, 8.19 and other places – Changed name of Sensor Info Trace Header Extension to Sensor Info Header Extension as it is allowed to use it as part of general Header
- Section 7.23 – Measurement block is updated according to discussions with Energetics, however agreement with Energetics has still not been reached, so do not use until further notice. Added minimum and maximum allowed value for the measurement.
- Section 8.0 – Added clarification of the usage of extended fields
- Section 8.0 – Added clarification unset value for location indexes.

- Section 8.1, byte 27 – Clarify usage of record length in relationship to Extended Recording Mode. Allow a value of 0.0 for indetermined record length.
- Section 8.1, byte 28 – Allow 0 as number of scan sets (to support meta data only records). Typo in initial version,
- Section 8.1, byte 29 - Allow 0 as number of channel sets (to support meta data only records). Typo in initial version, Correct byte reference and remove reference to outdated example.
- Section 8.2, bytes 6,7,8 – Minor correction of max Extended header size
- Section 8.2, bytes 13-16 – Minor correction of max trailer size
- Section 8.2, bytes 17-20 – Clarify usage of record length in relationship to Extended Recording Mode. Allow a value of 0.0 for indetermined record length.
- Section 8.2, bytes 25-27 – Clarify description of Dominant sampling rate. Allow a value of 0.0 if indeterminate (e.g. in case of meta data only records).
- Section 8.2, bytes 28-30 – Minor correction to max External Header size.
- Section 8.3, bytes 1-8 – Clarify definition of Time zero. Also clarify relationship to Extended Recording mode and absolute timing recording (usage of Timestamp header blocks).
- Section 8.3, bytes 9-16 – Fix typo in undefined value for General trailer size.
- Section 8.9 – Clarify usage of Expanded File Number in Source description Blocks.
- Section 8.9 –Section 8.9 – Refer to correct example.
- The following applies to all Source Description blocks (section 8.9.x):
 - a. Bytes 4-6 – Clarify description of Source Description block.
 - b. Byte 22 – Add 0 as undefined value for group index.
 - c. Byte 24-25, 26-27 and 30-31 – Add -32768 (0x8000) as undefined value for offset.
 - d. Add definitions of 0 value for various fields in the source blocks (source size, source depth, etc.)
- Section 8.9.3 and 8.9.4 – Clarify definition of air pressure unit.
- Section 8.10, byte 32 – Fix typo – use correct block number.
- Section 8.11 – Clarify undefined value for aux channel reference
- Section 8.12 – Clarify how multiple stanzas are written into the header.
- Section 8.13, bytes 57-58 and 89-90 – Allow 0 as value of Location Stanza ID (in case it is unknown/the position tuple is not filled in.
- Section 8.13, bytes 60 and 92 – Fix typo, tables were not ordered the same way.
- Section 8.14 – Add description is left justified and space padded.
- Section 8.15 – Fix typo, max number of channel sets is 65535, not 99.
- Section 8-15 – Add two channel types to list in byte 4.
- Section 8.16, byte 1 – Clarify the value is BCD
- Section 8.16, byte 2-3 – Refer to Extended number of channel sets.
- Section 8.16, byte 4 – Add two angular measurement types (tilt and angle)
- Section 8.16, bytes 5-8 and 9-12 – Clarify usage of Channel set start and end time in cases of Extended recording mode, and usage of Timestamp header in traces (absolute timing recording).
- Section 8.16, byte 28 – Clarify usage of Number of trace header extensions.
- Section 8.16, byte 62 – Add radians to physical unit.
- Section 8.16, bytes 69-95 – Fix typo for size of field

- Section 8.17 – Add some more clarification regarding numbering of scantypes/channelsets/traces.
- Section 8.17, bytes 7-9 – Add description of data type and remove incorrect reference to base scan interval
- Section 8.17, bytes 10 – Clarify usage of Trace Header Extensions,. At least one is required (has been true since SEG-D Rev 1)
- Section 8.17, bytes 11 - Remove incorrect reference to base scan interval.
- Section 8.18, bytes 25-28 – Clarification regarding number of samples in trace.
- Section 8.18, byte 31 – Fix byte reference typo
- Section 8.19 – Remove superfluous text.
- Section 8.19 bytes 1-8 and 13 – Rename Instrument to Equipment.
- Section 8.20, bytes 1-8 – Clarify calculation of time of first sample of trace.
- Section 8.21 – Fix type in byte index 25.
- Section 8.22 – Correct datatype for Offset Deployment and Retrieval values.
- Section 8.23 – Updated the figure and improved the text to clarify definition of orientation coordinate systems and rotation angles.
- Section 8.24 - Measurement block is updated according to discussions with Energistics, however agreement with Energistics has still not been reached, so do not use until further notice. Added minimum and maximum allowed value for the measurement.
- Section 8.25 – Correct datatype for offset values.
- Section 8.26.1, field 5 – Correct header block number typo
- Section 8.26.1, byte 1 – Align table with information in section 5.6.
- Section 8.26.1, byte 9-24 – Clarify user defined values.
- Appendix A – Add codes for AutoSeis (49) and INOVA Geophysical Inc (50)
- Appendix B – Minor typographic fix, change - to –.
- Appendix C – Change reference to RP66 document.
- Appendix C – Update the Organization code table from the latest Energistics version.
- Appendix D.1.4 – Minor layout changes to tables to make them look nicer.
- Appendix E.1 – Add comment to clarify this has no longer little relevance, but mainly kept to be able to copy older SEG-D formats into Rev 3.0.
- Appendix E.1 – Modified example to reflect removal of base scan interval in SEG-D rev 3.0.
- Appendix E.2 – Add comment to clarify this has no longer little relevance, but mainly kept to be able to copy older SEG-D formats into Rev 3.0.
- Appendix E.2 – Modified example to reflect removal of base scan interval in SEG-D rev 3.0.
- Appendix E.7 – Extended example to include information about how to organize source information in General Header.
- Appendix E.8 – Corrected example to reflect the length of a trace in Extended recording Mode is 4294967295 samples, not 4294967295 microseconds
- Appendix E.9 – Corrected a couple of typos in the code example. Added timestamp for 1 Jan 2011.
- Appendix E.11 – Added a new more advanced Extended Recording Mode example dealing with recording creating traces with holes etc. Also contains some more detailed info regarding handling of independent source and receiver acquisition.
- In addition a few other minor typos and typographic issues has been fixed

Changes November 2009 version

- Initial publication of SEG-D Rev 3.0