RadExPro Ver. 2024.1 — Technical Specification

	Start	Professional	Real-Time
I/O			
Input data from SEG-Y, SEG-2, SEG-B, SEG-1, SCS-3 files, with optional header remapping	X	X	X
Input data from SEG-D, SEG-D (rev.3) and FairFieldNodal Receiver Gather files, with optional header remapping		X	X
Input GPR data from LOGIS, Zond, RAMAC/GPR, GSSI, Pulse EKKO formats	X	X	X
Input trace from ASCII file	X	X	X
Input DAS data from Terra15, Fotech, PRODML (Sintela) HDF5, ASN and Silixa files		X	X
Reading data from tapes	X	X	X
Data output to SEG-Y files	X	X	X
Data input/output via replicas system		X	X
Integration Python project into RadExPro processing flows		X	X
Continuous recording data slicing		X	X
Geometry assignment			
Import from SPS and UKOOA P1-90 files	X	X	X
Import from ASCII		X	X
Import from OGP P1/11		X	X
Calculation using built-in equation calculator	X	X	X
Display and editing using built-in spreadsheet editor	X	X	X
Dedicated module for near-surface geometry assignment	X	X	X
Dedicated module for marine geometry assignment		X	X
Dedicated module for VSP geometry assignment		X	X
Crooked line 2D/3D binning		X	X
Trace editing			
Resample	X	X	X
Kill trace	X	X	X
Zero-padding	X	X	X
Inverse	X	X	X
Muting (top, bottom, surgical)	X	X	X
Trace length change	X	X	X
Header fields manipulations			
Mathematical operations	X	X	X
Spreadsheet editor	X	X	X
Import from ASCII files, export to ASCII	X	X	X
Smoothing average	X	X	X
Shift of header values to specified number of traces	X	X	X
Header Enumerator	X	X	X
Header NMO/NMI	X	X	X
Graphs	X	X	X
Cross-plots and histograms		X	X
Header 2D spatial interpolation		X	X
Dataset combining			
Trace-by-trace subtraction/addition of 2 datasets	X	X	X
Vertical merge of 2 datasets along a horizon		X	X
Adaptive Wavefield Subtraction		X	X
Amplitudes			
Amplitude corrections: time raised to power, exponential, automatic gain control (AGC), trace equalization, time-variant gain	X	X	X
Spherical Divergence Correction	X	X	X
Time Variant Amplitude Gain	X	X	X
AGC removal	X	X	X
Ensemble Equalization	X	X	X
DC removal	X	X	X

Feature			
Surface-consistent amplitude corrections for source and receiver		X	X
Statics			
Refraction statics calculation		X	X
Interactive refraction statics calculation (trial 100 launches)		X	X
Elevation statics calculation	X	X	X
Residual statics calculation		X	X
Maximum Power Autostatics		X	X
Correlation Stack Enhancement		X	X
Trim statics		X	X
Apply Statics	X	X	X
Denoising			
Burst Noise Removal	X	X	X
Frequency filtering (common and time-variant): - simple bandpass - Ormsby bandpass - Butterworth high-pass/low-pass/bandpass - notch	X	X	X
2D average/median/alpha-trimmed filtering	X	X	X
F-K filtering	X	X	X
Time frequency domain (TFD) noise attenuation (auto/manual)		X	X
2D F-X predictive filtering		X	X
3D F-X-Y predictive filtering		X	X
Sparse F-K Filtering		X	X
Sparse Radon Filtering		X	X
F-K Amplitude Power		X	X
Structural Smoothing		X	X
Deblending		X	X
Deconvolutions and Wavelet Shaping			
Signature/Phase/Predictive/Spiking Deconvolution	X	X	X
Surface-consistent Deconvolution		X	X
Nonstationary predictive Deconvolution		X	X
Automatic Wavelet Extraction		X	X
Kolmogoroff Spectral Factorization		X	X
Derive Match Filter		X	X
Filter application	X	X	X
Spectral Whitening	X	X	X
Spectral Shaping		X	X
Wavelet Processor		X	X
Geophone -> DAS Conversion		X	X
Q Filtering		X	X
Multicomponent processing			
Hodogram analysis		X	X
2C/3C Rotation		X	X
Rotation of FairFieldNodal multicomponent data		X	X
Interpolation			
Trace interpolation along the line	X	X	X
Interpolation of set of 2D lines into a 3D volume		X	X
3D linear interpolation		X	X
3D F-Kx-Ky Regularization		X	X
Sparse F-K Interpolation		X	X
Trace transforms and trace math			
Linear and Parabolic Radon transforms		X	X
Amplitude spectrum calculation	X	X	X
Phase spectrum calculation	X	X	X
Autocorrelation and crosscorrelation functions	X	X	X
Logarithm and exponent of trace	X	X	X

Convolution	X	X	X
Trace/trace and trace/scalar arithmetic	X	X	X
Power of trace		X	X
Radial trace transform (direct and inverse)	X	X	X
Stockwell transform		X	X
Time-depth conversion			
Conversion between time and depth domain using different types of velocity functions	X	X	X
Migrations and DMO			
Pre-/Post-stack 2D/3D Kirchhoff time migration (on CPU and GPU)		X	X
2D/3D F-K Stolt migration		X	X
3D F-K Stolt migration with variable velocity		X	X
T-K migration	X	X	X
2D F-K DMO		X	X
Velocities and CDP stacking			
3D CDP binning		X	X
Crooked line 2D CDP binning		X	X
CDP gathers	X	X	X
Super gathers	X	X	X
Velocity manipulation		X	X
Trace<->Velocity Table Transfer		X	X
Interactive analysis of stacking velocities	X	X	X
Horizon-based velocity analysis		X	X
Automatic horizon-based velocity analysis		X	X
NMO/NMI-correction	X	X	X
LMO/LMI-correction	X	X	X
Stacking	X	X	X
Angle Stack		X	X
Angle Muting		X	X
Offshore data processing			
Marine geometry assignment		X	X
Import geometry from UKOOA P1-90 files		X	X
Dropped/missed shots correction		X	X
Import tidal statics		X	X
2D/3D HiRes marine statics calculation		X	X
De-bubbling		X	X
Radon demultiple		X	X
2D SRME		X	X
Zero-offset demultiple (for near-offset data)		X	X
SharpSeis™ adaptive deghosting/broadband processing		X	X
Adaptive wavefield subtraction		X	X
PZ Calibration		X	X
QC and attribute analysis			
Pre-stack shot/receiver gather QC: estimation of mean, 2D RMS and mean 1D RMS amplitude, signal-to-noise ratio, resolution and apparent frequency pre-stack within an arbitrary polygon or a rectangular window		X	X
Fold and offset sampling calculation		X	X
Survey, fold and offset sampling maps		X	X
Analysis of attribute dependency on linked cross-plots and histograms		X	X
Mapping attributes on top of topography background		X	X
Estimate of average, RMS, minimum, maximum, absolute maximum amplitude post-stack within a window along a horizon		X	X
Determination of time of maximum, minimum, and absolute maximum amplitude post-stack within a window along a horizon		X	X
Estimate of peak frequency, apparent frequency, visible frequency, centroid frequency, and frequency		X	X

Estimation of signal-to-noise ratio post-stack along a horizon		X	X
Computation of auto-correlation and cross-correlation functions	X	X	X
Interactive estimate of velocities of all types of waves	X	X	X
Reflection strength, instantaneous frequency, instantaneous phase		X	X
Interactive QC maps and cross plots		X	X
Interactive data display from QC maps (shot/receiver/CMP gather)		X	X
Ensemble header statistics (min, max, average, number of values above threshold – total of max consecutive)		X	X
QC stats: total shot count, bad shot count, CMP coverage		X	X
Real-time QC			
Real-time SEG-D/SEG-D rev.3/SEG-Y input			X
Real-time DAS data input: Terra15/Fotech/PRODML (Sintela)/Silixa			X
Real-time on-land QC (all attribute calculation, interactive maps and stats)			X
Real-time offshore QC:			X
Parallel execution of QC flows			X
Shot QC			X
Automated first-break picking			X
Near-trace gather QC			X
Real-time 2D CDP stack			X
RMS amplitude map			X
Frequency map			X
SNR map			X
Attribute and header plots			X
Source QC: NFH records/stacks, bubble peak time/amplitude and bubble period maps, pressure and towing depth plots			X
Towing depths control based on spectrum notches			X
Saving all QC results to project DB			X
Export and import of QC polygons		X	X
Refraction			
Processing time-curves of refracted waves (plus-minus and GRM)	X	X	X
First-break travel-time tomography	X	X	X
Vibroseis			
Correlation	X	X	X
Synthetic vibroseis sweep generation		X	X
Harmonic distortion analysis (time-frequency plots)		X	X
Surface Wave Analysis			
Multichannel Analysis of Surface Wave (MASW)	X	X	X
VSP			
VSP geometry assignment for vertical or inclined wells		X	X
Hodogram analysis, 2C and 3C rotation		X	X
Generation of synthetic seismograms for different wave types		X	X
Separation of wavefields of different wave types		X	X
Calculation of arrival time of direct wave or reflected wave from a specified reflector for horizontal layered model		X	X
Layer velocity modeling		X	X
Estimation of Q		X	X
Far-offset VSP NMO-correction		X	X
Import of well-log data, import and export of velocity models		X	X
Joint interpretation of VSP, logging, and seismic data		X	X
VSP Kirchhoff migration		X	X
2D VSP/Crosswell Kirchhoff Depth Migration		X	X
VSP-CDP transformation		X	X
Display and printing			
Various modes of data display	X	X	X
Display of WT/VA traces on top of color-coded velocity or seismic data	X	X	X
Support of several data displays at a time, several datasets in one display	X	X	X

Synchronized scale, scroll and gain in several display windows for data comparison	X	X	X
Interactive calculation of frequency spectrum and F-K spectrum of arbitrary data fragment	X	X	X
Display of several spectrum graphs in one window	X	X	X
Display of trace header fields	X	X	X
Display of profile crossing point marks		X	X
Display of lines, attributes, horizons, on the interactive map	X	X	X
Interactive display of data along an arbitrary line selected on the Map	X	X	X
Display of attributes on linked cross-plots and histograms		X	X
Printing and export of cross-plots and histograms to a bitmap		X	X
Printing of processing results with print preview	X	X	X
3D Volume Display / Time Slice generation			
3D volume display		X	X
3D Time slice generation		X	X
Data and processing management			
Processing within projects. A project can be easily moved to a new location together with all associated data and processing parameters	X	X	X
Work with several projects at a time	X	X	X
Processing flows can be combined into several queues and run in parallel	X	X	X
Processing flows can be copied with all procedures and parameters	X	X	X
Project and flows can be protected by password in admin mode		X	X
Export/import of processing flows	X	X	X
Export/import of datasets in RadExPro data exchange format	X	X	X
Processing history	X	X	X
Data run-time resorting on input into the flow	X	X	X
Fast resorting of big data volumes		X	X
Flow Replication	X	X	X
Combining several flows into processing queue, parallel execution of several queues		X	X
Batch processing of several files with the same flow		X	X
Horizon interpolation/extrapolation, transfer from pick to trace headers and back		X	X
Interpretation			
Horizon picking, manual and automatic	X	X	X
Gridding of horizons and attributes	X	X	X
Attribute calculation along horizons		X	X
3D Autopicker		X	X
Acoustic inversion (genetic algorithm)		X	X

*Technical specification is for information only and is subject to change without prior notice.

Recommended Minimal System Requirements: Intel Core i-5 CPU, 8 Gb RAM, OS Windows 7/8/10 64-bit