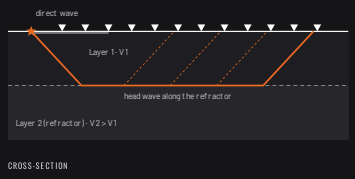
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FEATURE OVERVIEW

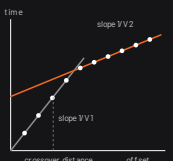
Refraction Studio

SEISMIC REFRACTION SOFTWARE · P AND SH WAVES

From field records to a finished report: first-arrival picking, layered models, tomography, Vs30 and quality control.



CROSS-SECTION



FIRST-ARRIVAL TIMES

Seismic refraction analysis, step by step

Refraction Studio takes P- and SH-wave shot records from import to a technical PDF report on a Windows computer. Every step is recorded and reversible, raw data are never modified, and quality control explains what to check before results are reported.

DATA AND QUALITY

Import with inspection
SEG-2 and SEG-Y records are inspected before import; findings come with proposed corrections and nothing is repaired silently.

Geometry
Positions from the file headers, channel roles with a reference geophone, reusable spread profiles and a surveyed ground profile.

Non-destructive processing
Filters, AGC, trace balance and more run on copies; advice flags filters that shift first breaks.

Shot-time correction
Trigger delays corrected from a reference geophone or entered per shot; raw and corrected times are kept.

PICKING AND MODELS

Automatic picking
AIC, STA/LTA, modified energy ratio and an SH polarity-divergence picker, each pick with a confidence and its reasons.

Manual review
Click, drag and nudge picks; propagate a reviewed pick along the line. Manual picks are never overwritten.

Layered interpretation
Automatic layer assignment with draggable crossovers; intercept-time, plus-minus, GRM and delay-time methods.

Tomography
Regularised, robust travel-time inversion with ray coverage, convergence and the depth of investigation.

RESULTS AND REPORTING

Engineering parameters
Vs30 or any averaging depth, with labelled extrapolation; Poisson's ratio and the G, E and K moduli.

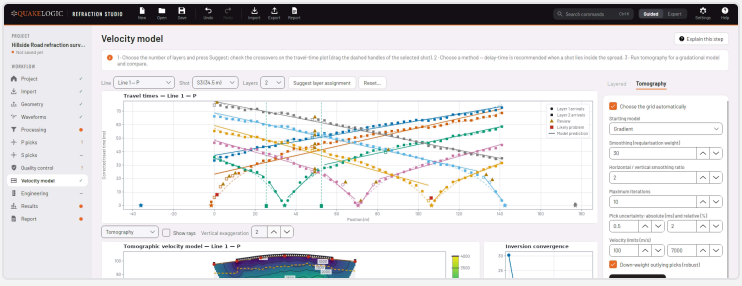
Quality control
Findings on picks, timing, geometry and models, each with what to check and a link to the trace.

Exports
XLSX and CSV tables, PNG, SVG and PDF figures, and an audit record of methods, settings and history.

PDF report
A complete technical report with your branding, in A4 or Letter and SI or US customary units.

REPRODUCIBLE BY DESIGN

A project file holds the raw records, every processing step and pick, and the complete history with the user and software version. Undo any change, keep snapshots, and compare alternative interpretations of the same data as scenarios. The report states the methods, settings, warnings and limitations.

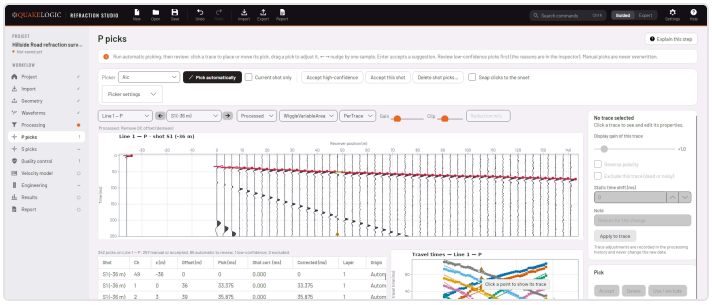


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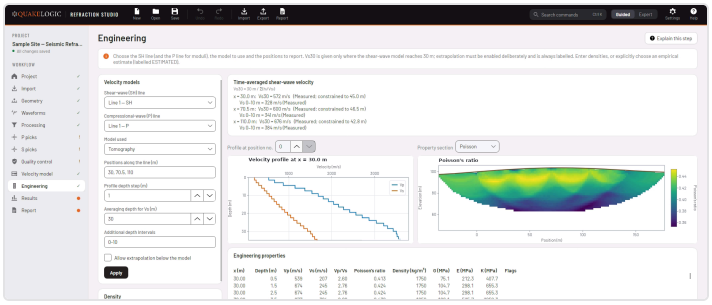
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Workflow

Project → Import → Geometry → Waveforms → Processing → P and SH picks → Quality control → Velocity model → Engineering → Results → Report. Each step shows its status; Guided mode explains it, Expert mode keeps the screen compact.



P picks: automatic picks with confidence, pick table and travel times



Engineering: Vs30, velocity profiles and the Poisson's ratio section

Technical specifications

Item	Specification
Input formats	SEG-2 (.sg2, .seg2, .dat), SEG-Y (.sgy, .segy; also recognised by content); recording delays and header positions applied
Wave types	P (compressional) and SH (horizontal shear) lines in one project; opposite SH impacts combined as (left – right)/2
Processing	Demean, detrend, taper, Butterworth high/low/band-pass (causal or zero-phase), notch, normalisation, trace balance, AGC, polarity, time shift, resampling; amplitude spectrum
Pickers	AIC, STA/LTA, modified energy ratio, SH polarity-divergence; confidence High / Medium / Low; neighbour guidance; cross-correlation propagation
Layered methods	Intercept-time, plus–minus, generalised reciprocal method (with XY analysis), delay-time least squares; forward-model check
Tomography	Shortest-path ray tracing; regularised, robust inversion; gradient starting model; ray coverage; depth of investigation
Engineering	Vs30 and averages over chosen intervals; ν, G, E, K; measured or estimated density (Gardner, Brocher), estimates labelled
Quality control	Signal-to-noise, onset sharpness, reciprocal times, trigger problems, dead, noisy or clipped traces, model residuals
Outputs	PDF report (A4 or Letter; SI or US customary), XLSX, CSV, PNG, SVG and PDF figures, audit record (JSON)
Projects	One .rfsx file with the raw data; full history with undo and redo; autosave and crash recovery; snapshots; analysis scenarios
Validation	37 of 37 validation cases pass against hand calculations, closed-form solutions and synthetic models (version 1.0.0)
System requirements	Windows 10 (version 1809 or later) or Windows 11, 64-bit; about 250 MB of disk space; screen 1024 × 660 or larger
Licence	Full version on every installation: no trial, no activation and no internet connection needed

Version 1.0.0. Results support engineering interpretation; they do not replace site investigation or professional judgement.

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