1. System requirements

winMASW® and *HoliSurface®* run under Windows operating system but, through appropriate emulators, even on a Mac.

winMASW® and *HoliSurface®* work by means of a hardware key (USB dongle) and can be installed on an indefinite number of computers (for using the software it is clearly necessary to insert the key).

RAM: to work with a certain easiness we recommend 8M at least.

CPU (the processor): as regards lower profile versions (based only on modal curves dispersion) a simple *dual core* may be enough, while to minimize the computation time of the *Academy* version and *HoliSurface®* is preferable to use a *6-core* (physical) CPU at least (better more) in order to take full advantage of joint automatic inversion modules.

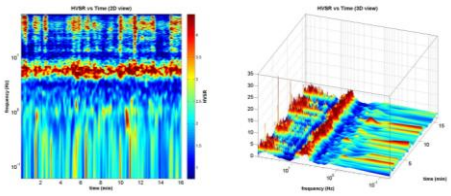
In order to let *winMASW®* properly use updated functionalities we suggest to frequently update the operating system (click on "windows update" from the menu Start).

For further technical details please contact us: winmasw@winmasw.com

2. Operating systems and compatibility

The compatibility with different operating systems depends on the version (*HVSR*, *Lite*, *Standard*, *3C*, *Professional*, *Academy*) and the release you have.

winMASW® *Academy* and *HoliSurface®* work only on 64-bit operating systems while the other versions can operate on both 32 and 64-bit OS but all the releases from the 7.0 (available starting from November 2014) are compatible only with 64-bit operating systems.



Anyway, the suggested OS is *win7* or, even better, *win8* (64bit).

The release 7.0 and higher of *winMASW®* and the 4.0 (and higher) of *HoliSurface®* are characterized by a faster startup and a lightness of required resources. Furthermore, with regard to the *Academy* version, has been optimized a substantial series of tools for automatic joint inversion of different data combinations than previous versions.

Old releases of the software also work on windows XP.

Any information on the current versions and releases: http://www.winmasw.com/winmaswstatus.htm

3. *Educational* License

The Educational License is reserved to universities and scientific institutions interested in our software only for educational work/purposes and is granted sending two USB dongles (instead of one). Institutions who choose for a such License are required to use the software exclusively for educational research/purposes.

Institutions carrying out contract work for third parties may opt for the normal License (one USB dongle) or, alternatively, for a mixed License (two USB dongles) whose cost is given by the price of the normal License increased by 20%.

Please, do not confuse *Educational* License and *Academy* version. For example, a university can purchase an Educational License of *winMASW®* *Professional* and, on the other hand, the *Academy* version is available (and recommended) to anyone.

Software *winMASW*®: available versions and tools

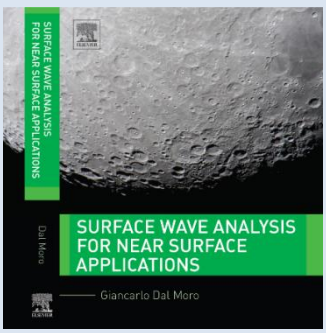
	HVSR	Lite	STD	PRO	3C	ACD
MASW **analyses jointly considering both Rayleigh and Love waves**		Rayleigh waves	Rayleigh waves	✓	✓	✓
Analysis of Rayleigh-wave attenuation to determine Q_S quality factors				✓		✓
ReMi **analyses (passive seismics)**			✓	✓		✓
Group-velocity Analyses (*Multiple Filter Analysis*) for group-velocity determination (both for Rayleigh & Love)						✓
Joint analysis of phase & group velocities						✓
Computation and modelling of the H/V spectral ratio (Nakamura's method) to estimate the resonance frequency	✓			✓	✓	✓
Band- Low- High-pass filters		✓	✓	✓	✓	✓
Vs30 calculation	✓	✓	✓	✓	✓	✓
Spectral analyses: computation of amplitude and phase spectra and spectrograms (frequency content over time)		✓	✓	✓		✓
1D modelling of *refractions* (also considering low-velocity layers)				✓	Only for P waves	✓
1D modelling of *reflections* (also considering low-velocity layers)						✓
Tool to combine two shots and simulate a dataset with a double number of channels (or three times, etc)		✓	✓	✓		✓
Elastic moduli calculation tool			✓	✓	✓	✓
Synthetic seismograms (*modal summation*) both for Rayleigh & Love waves						✓
Computation of the *apparent* (or *effective*) dispersion curves (recommended for passive datasets e.g. from ESAC analyses)						✓
Velocity-spectra inversion via synthetic seismogram computation: no need of dispersion-curve picking but longer computational times						✓
Tool for the *vertical stacking*						✓
Tool for creating 2D sections						✓
Tool for putting in evidence specific (even "hidden") modes						✓
ESAC and FK analyses (bidimensional arrays)				Only linear *arrays*		✓
Tool for combining several traces acquired by a single 3-component geophone (using different offsets) and obtaining datasets useful for MASW analysis considering both Rayleigh (radial and vertical component) + Love waves.				✓	✓	✓
Tool TCEMCD (*Three-Component Extraction from Multi-Channel Data*) for efficient passive joint ESAC + HVSR acquisitions: connect your vertical geophones and our HOLI3C (3-component geophone) to your seismic cable and with this tool you'll then be able to extract the data for the joint analysis of dispersion (via ESAC) and HVSR.						✓

For more info download the *winMASW*® manual

(available on our website, see "products" or "publications" area)

and/or

get a copy of "*Surface Wave Analysis for Near Surface Applications*"
(Dal Moro G., 2014, ISBN 978-012-800770-9, Elsevier)



Version	Main facts
winHVSR	Computation and modelling of the H/V spectral ratio (Nakamura's method) to estimate the resonance frequency; Vs30 calculation.
***winMASW*® Lite**	*MASW* analyses (Rayleigh waves only); Band- Low- High-pass filters; Vs30 calculation; spectral analyses: computation of amplitude and phase spectra and spectrograms (frequency content over time); tool to combine two shots and simulate a dataset with a double number of channels (or three times, etc).
***winMASW*® Standard**	*MASW* analyses (Rayleigh waves only); *ReMi* analyses (passive seismics); Vs30 calculation; Band- Low- High-pass filters; spectral analyses: computation of amplitude and phase spectra and spectrograms (frequency content over time); *tool* to combine two shots and simulate a dataset with a double number of channels (or three times, etc); elastic moduli calculation *tool*.
***winMASW*® 3C**	*MASW* analyses considering both Rayleigh and Love waves (and their joint inversion); computation and modelling of the H/V spectral ratio (Nakamura's method) to estimate the resonance frequency; Vs30 calculation; Band- Low- High-pass filters; 1D modelling of *refractions,* also considering low-velocity layers, only for the P waves; elastic moduli calculation tool. *Tool* for combining several traces acquired by a single 3-component geophone (using different offsets) and obtaining datasets useful for MASW analysis considering both Rayleigh (radial and vertical component) + Love waves.
***winMASW*® Professional**	*MASW* analyses considering both Rayleigh and Love waves (and their joint inversion); analysis of Rayleigh-wave attenuation to determine Q_S quality factors; *ReMi* analyses (passive seismics); computation and modelling of the H/V spectral ratio (Nakamura's method) to estimate the resonance frequency; Vs30 calculation; Band- Low- High-pass filters; spectral analyses: computation of amplitude and phase spectra and spectrograms (frequency content over time); 1D modelling of *refractions* (also considering low-velocity layers); tool to combine two shots and simulate a dataset with a double number of channels (or three times, etc); elastic moduli calculation *tool*; ESAC and FK analyses only for linear *arrays*. *Tool* for combining several traces acquired by a single 3-component geophone (using different offsets) and obtaining datasets useful for MASW analysis considering both Rayleigh (radial and vertical component) + Love waves.
***winMASW*® Academy**	*MASW* analyses considering both Rayleigh and Love waves (and their joint inversion); analysis of Rayleigh-wave attenuation to determine Q_S quality factors; *ReMi* analyses (passive seismics); Group-velocity Analyses (*Multiple Filter Analysis*) for group-velocity determination (both for Rayleigh & Love); Joint analysis of phase & group velocities; computation and modelling of the H/V spectral ratio (Nakamura's method) to estimate the resonance frequency; Vs30 calculation; Band- Low- High-pass filters; spectral analyses: computation of amplitude and phase spectra and spectrograms (frequency content over time); 1D modelling of *refractions/reflections* (also considering low-velocity layers); tool to combine two shots and simulate a dataset with a double number of channels (or three times, etc); elastic moduli calculation tool; synthetic seismograms (*modal summation*) both for Rayleigh & Love waves; Velocity-spectra inversion via synthetic seismogram computation: no need of dispersion-curve picking but longer computational times; *tool* for the *vertical stacking; tool* for creating 2D sections; *tool* for putting in evidence specific (even "hidden") modes; ESAC and FK analyses (bidimensional arrays); *tool* for combining several traces acquired by a single 3-component geophone (using different offsets) and obtaining datasets useful for MASW analysis considering both Rayleigh (radial and vertical component) + Love waves. NEW From *release* 7.0: 1) Tool TCEMCD (*Three-Component Extraction from Multi-Channel Data*) for efficient passive joint ESAC + HVSR acquisitions: connect your vertical geophones and our HOLI3C (3-component geophone) to your seismic cable and with this tool you'll then be able to extract the data for the joint analysis of dispersion (via ESAC) and HVSR 2) Computation of the *apparent* (or *effective*) dispersion curves (recommended for passive datasets e.g. ESAC analyses)
***HoliSurface*®**	*HoliSurface*®: a new software for surface wave analysis characterized by an acquisition procedure particularly easy and fast: just one 3-component geophone and one source (a patent-pending methodology). Computation of the H/V spectral ratio (Nakamura's method) to estimate the resonance frequency; Vs30 calculation; spectral analyses: computation of amplitude and phase spectra and spectrograms (frequency content over time); 1D modelling of *refractions* (also considering low-velocity layers); elastic moduli calculation *tool*; joint inversion HVSR + group-velocity spectra (radial or vertical component of Rayleigh and/or Love waves); *tool* for creating 2D sections; vibration analysis (DIN 4150 and UNI9614). NEW From *release* 5.0: 1) *Miniature Array Analysis of Microtremors* (MAAM) 2) Tool TCEMCD (*Three-Component Extraction from Multi-Channel Data*) for efficiently handling joint acquisition of MAAM+HVSR data (please see "*Surface Wave Analysis for Near Surface Applications*" - case study#8) 3) analysis of building vibration Because of the novelty of the adopted procedures, the *HoliSurface*® application is offered only during one of our workshops or by getting the compulsory *training* day.