Titan

ABRIS, OAE, Impedance

Fast, multi-purpose and portable

Interacoustics®

leading diagnostic solutions

Titan
ABRIS, OAE, Impedance

The Titan concept

Titan Impedance

Titan
Impedance, DPOAE, Automated ABR choose between one, two or all modules

Titan DPOAE

Titan automated ABR (ABRIS)

Titan is a modular platform offering impedance, automated ABR and DPOAE testing. This flexible combination instrument allows you to create the perfect screening instrument or can be configured to perform advanced clinical testing.

With so many combination options, the Titan allows you to meet the needs of your clinic today and with the option to upgrade to other modules later, also meets the needs of your clinic in the future.

Titan

- *Portable and lightweight*
- *Fully customizable*
- *Complete clinical test battery*
- *Flexible printout with .PDF capability*
- *Integrated and customized display and reporting*
- *PC integration and standalone option*

Easy handling

Titan's slim neck and lightweight form allow for easy use in handheld mode. Together with its contemporary design, Titan suggests a professional appearance in the clinic. The high-resolution color display provides an excellent overview of test progress and results.

The various available probe and transducer configurations enable a strong focus on patient-centered testing, toward the aim of achieving consistently reliable measurements - all with little need for user attention to the underlying technology. Test status is viewable by LEDs on the probe and a shoulder-mounted unit allows easy choice of ear and test start/stop. Additionally, calibration values are stored in the probe and ID-transducers, allowing easy changes of transducer or probe configuration.

Titan carrying case

The light indication in the probe is guide for probe status and ear.

Right ear ***Left ear*** ***In ear*** ***Blocked/leaking***

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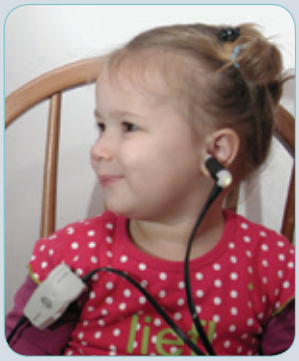
Titan
IMP440 module

The impedance module



The impedance module (IMP440) is available in a screening, diagnostic or clinical version allowing you to configure the Titan for the tests you need. The test battery features standard tympanometry, ipsi- and contralateral acoustic reflexes, reflex decay and reflex latency, as well as three Eustachian tube function tests. Together with optional high frequency probe tones (678, 800 and 1000 Hz), IMP440 is designed to meet and perform the most demanding of clinical testing requirements. Each version comes with preloaded factory protocols as well as the option for creating one's own test protocols and sequences.

Tympanometry
Interacoustics utilizes two beneficial advanced technologies to acquire tympanograms. The first is an "endless airflow" technology which improves the instrument's ability to obtain a tympanogram on difficult-to-test patients or when a slight leak is present. The second is an intelligent pump control system with an adaptive speed control around the tympanic peak. This feature, combined with high-resolution recording of both compliance and pressure level, provides the fastest and most reproducible tympanometry measures available.

Acoustic reflex test
Acoustic reflexes are measured ipsi- and contralaterally (through a headphone or insert phone). Protocols can be set up for quick screenings at a single intensity or for fast reflex threshold searches. Manual testing at individual frequencies and intensities is also available. The optional Automatic Gain Control (AGC) also provides accurate and safe intensity reflex stimulation for small ear canal volumes.

Reflex Decay
Acoustic reflex decay testing is available with ipsilateral as well as contralateral stimulation using a single headphone (TDH39/DD45), the CIR55 or the optional EarTone3A.

Reflex latency
The reflex latency test focuses on the first few hundred milliseconds of the acoustic reflex. It allows a detailed investigation of the onset of the reflex as a function of stimulus type and intensity. As in decay testing, Titan will automatically search for the reflex threshold if that is not yet known, and perform the ipsi- or contralateral stimulus 10 dB above the threshold level.

Three Eustachian tube function tests
Titan performs three different Eustachian Tube Function tests for different conditions of the eardrum and Eustachian tube: ETF for intact eardrum, ETF for perforated eardrum, and ETF for a patulous Eustachian tube. In addition to recording information about Eustachian tube function, the third ETF test is suitable for measuring spontaneous changes in the middle ear system (e.g. due to heart beat pulsation in a glomus tumor). Acoustic reflexes evoked by a cochlear implant can also be easily measured.

Extension cord with shoulder unit and probe indicator LED
At times when the clinician cannot step away from the patient, the extension cord with the shoulder box enables full operational control (ear choice, start/stop) and the LED indicates if the probe is sealed correctly or blocked.

Clinical impedance highlights

- *Automatic and manual testing*
- *High frequency probe tones (678, 800 and 1000Hz)*
- *Ipsi and contra acoustic reflexes*
- *3 ETF tests: Intact, perforated and patulous*
- *Reflex decay*
- *Reflex latency*

Titan
DPOAE440 module

The DPOAE module

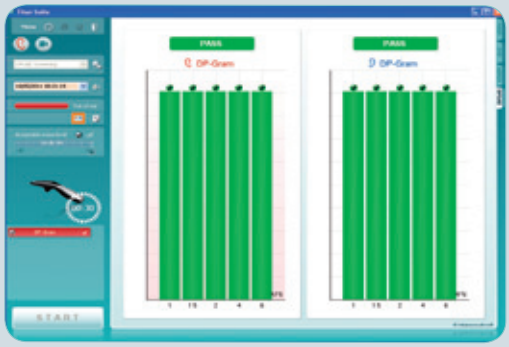
DPOAE440 is a module for the Titan platform allowing you to test Distortion Product OAEs and is available in either a screening or clinical version. The DPOAE440 module will meet the needs of any newborn hearing screening program as well as busy ENT or audiologic clinics.

DP-Gram
DPOAE frequencies can be tested between 500Hz – 10kHz with user definable stop criteria including test time or point time, Signal-to-Noise Ratio (SNR), minimum DP level, residual noise and DP reliability. Titan ensures a precise stimulus intensity using advanced real ear detection methods and can be configured to reject measurements in noisy environments providing more accurate results.

For screening purposes, protocols can be labelled as Pass or Refer giving a simple and easy to understand test result.

For clinical testing, the manual mode enables the user to add extra test frequencies for a more detailed patient examination.

DP/Input-Output
For advanced clinical testing or research purposes, the Titan also offers DP/Input-Output testing across all frequencies. User definable stop criteria can also be applied as in the DP-Gram test.



DPOAE440 DP-Gram - a PASS (Bar view)

DPOAE highlights

- *Noah & HiTrack compatability*
- *Handheld or PC Controlled use*
- *Customisable protocols*
- *500Hz – 10kHz (1kHz – 6kHz Screener)*
- *Customisable PASS/REFER criteria*
- *DP-Gram or DP-I/O tests available*
- *Bar or Graph View*

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Titan
ABRIS440 module

ABRIS440 Automated ABR

The ABRIS440 module for Titan has been designed with the latest technologies available for fast and easy automated ABR testing for infants. The ABRIS440 screening module incorporates the CE-Chirp® stimulus and Bayesian weighting, typically reducing test time by up to 50% compared to traditional click stimuli.
With an easy to understand display (PC or Handheld device), HiTrack compatibility and user customizable protocols, Titan with ABRIS440 is the perfect instrument for any newborn hearing screening program.

ABRIS440 - PASS

Reliable screening
The ABRIS440 default protocol provides a reliable automated ABR test with a sensitivity of 99.9% (ability to correctly identify babies with hearing problems) and a specificity above 96% (ability to correctly exclude babies with normal hearing).

Easy to use
Following patient preparation, electrode impedance information is automatically displayed. Simply press start, and on completion of the test a simple pass/refer result is displayed on screen requiring minimal tester training.

Transducer options
Choose from three transducers (probe, insert earphones, headphones) that are automatically detected when connected to the PreAmplifier. With in-built transducer calibration, transducers can easily be swapped in and out.

CE-Chirp & Bayesian weighting
The default stimulus for automated ABR is the patent pending CE-Chirp® stimulus. Unlike the traditional click, the CE-Chirp provides a better neural stimulation allowing faster detection of a response and in turn, helps reduce the test time by up to 50%. Optionally, the click stimuli or the Hi-Lo frequency specific CE-Chirp stimuli can be selected.
In a nutshell, Bayesian weighting improves the recording conditions for patients that have fluctuating EEG noise (moving patients).

ABRIS highlights

- *Noah & HiTrack compatability*
- *Handheld or PC Controlled use*
- *Customisable protocols*
- *CE-Chirp, Click or Hi-Lo Chirp stimuli*
- *Results displayed as PASS/REFER*
- *Three transducer options*

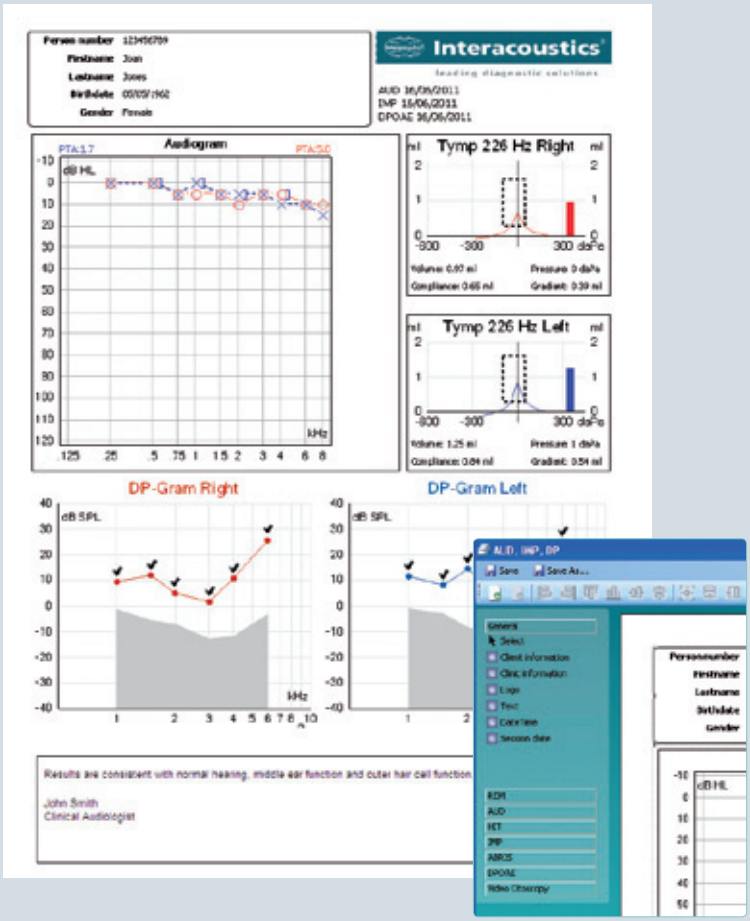
CE-Chirp® *is a stimulus family designed to compensate for the cochlear travel time. The result is a synchronized neural firing of the nerve fibers creating up to twice the response amplitude compared to standard click.*

Design your own reports

Although electronic communication plays an increasing role in audiology, the printed report is still important. The Titan software suite includes an embedded print wizard, a very flexible tool enabling the realization of individual reporting needs, as well as adherence to internal reporting and archiving structures to streamline clinic workflow.

The print wizard can merge data from all three modules and other Interacoustic Suites for full patient reporting. Once completed, test data is automatically routed to predefined templates, eliminating redundancy and the labor intensive tasks routinely involved in getting all information presented on a single page. Reports can either be printed or saved as .PDF's for insertion into EMR systems.

The optional printer



Merge and configure input from different sources in the Print Wizard

Reporting highlights

- *Customizable print-outs*
- *NOAH3 and OtoAccess™ compliant*
- *EMR integration*
- *Portable printer option*

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Titan
Specifications

Specifications Titan Hardware:

Medical CE-mark:	The CE-mark indicates that Interacoustics A/S meets the requirements of Annex II of the Medical Device Directive 93/42/EEC. Approval of the quality system is made by TÜV – identification no. 0123
Standards:	**Safety:** IEC 60601-1, Internally powered, Type B+BF applied parts **EMC:** IEC 60601-1-2 **Impedance:** IEC 60645-5/ANSI S3.39, Type 1 **Test signal:** IEC 60645-1/ANSI S3.6 , IEC 60645-3 **OAE:** IEC 60645-6 2009, Type 2 Otoacoustic emissions **ABR:** IEC 60645-7 2009, Type 2
Probe specifications:	**Titan IOW probe:** IMP, DPOAE and ABRIS capable Replaceable probe tip **Test Pressure:** Ambient pressure.
PC control:	**USB:** Input/output for computer communication. Titan can be fully operated from a PC. The measurements can then be followed on the PC screen. Data can be sent to and saved on the PC and stored in the Interacoustics database OtoAccess™. See separate section in Service Manual for programming details.
	Memory: Theoretically, an infinite amount of test results can be stored on the PC. The Titan hand held unit is delivered with a 1 Gb memory card, enough for storing more than a quarter of a million tests.
Thermal printer (Optional):	**Type:** Thermal (Bluetooth) printer with recording paper in rolls. Print on command through Bluetooth communication and through serial RS-232. **Paper width:** 57.5 ± 0.5 mm on thermal printer **Printing time:** Printing time depends on the size of the used protocol. For 2 tympanograms and 8 reflexes the thermal printer uses approximately 6 s.
Titan Dimensions:	6x6x28cm/2.4x2.4x11inch
Titan Weight:	360g /0.8lbs
ABR/OAE/IMP shoulderbox Weight:	120 g
ABR/OAE/IMP shoulderbox Dimensions:	102, 68, 26 mm.
OAE/IMP shoulderbox Weight:	64 g
OAE/IMP shoulderbox Dimensions:	65, 35, 18 mm.

Read more here:
www.interacoustics.com/com/Titan

Specifications DPOAE440 software:

Stimulus

Frequency range:	500 to 10000 Hz
Frequency step:	25 Hz
Level:	30 to 80 dB SPL (75 dB SPL for 6kHz and 65 dB SPL for 8kHz to 10kHz)
Level Step:	1 dB
Transducer:	IOW Probe auto detection, auto calibrated

Recording

Analysis time:	Minimum 2 seconds to unlimited time
A/D Resolution:	24 bit, 5.38 Hz resolution
Artifact rejection system:	-30 to +30 dB SPL or off
Stimulus tolerance:	Adjustable between 1 and 10 dB
SNR criteria:	Adjustable between 3 and 25 dB
Probe check window:	256 points frequency response of the ear canal due to a click stimulus.
DP-response window:	4096 points frequency response

Display

General display gain:	Applicable during testing
Display:	Stimulus level and type, Bar and Graph view

Probe specifications

Titan IOW probe:	IMP, DPOAE and ABRIS capable Replaceable probe tip

Other

Test types:		**Screener**	**Clinical**
	DP-Gram	500-6000Hz (max. 6 test points)	500-10000Hz
	DP-I/O	n/a	x
	Add test/measurement point	n/a	x
	Enable Pass/Refer	x	x
Test Pressure:	Ambient pressure.		
Included parts DPOAE440 module:		**Screener**	**Clinical**
	Titan handheld unit with basic probe	x	x
	Cradle	x	x
	ASA30M Power supply (with converter)	x	x
	Clinical probe extension	x	x
	BET55 Ear tips and box	x	x
	DG – LiBat – 001 back-up battery	x	x
	4 cavities (0.2, 0.5, 2 and 5cc)	x	x
	Titan PC suite with DPOAE440	x	x
	OtoAccess™ database	x	x
	USB cable, USB adaptor	x	x
	Operation manual	x	x
	Multilingual CE manual	x	x
	TCB Carrying Bag	x	x
Optional parts DPOAE440 module:	Short probe extension	optional	optional
	Thermal printer AB1310/AB1310 Bluetooth	optional	optional

Titan
Specifications

Specifications IMP440 software:

Impedance Measuring System

Probe tone:	Frequency: 226 Hz and optionally 678 Hz, 800 Hz and 1000 Hz Level: 69 dB HL with AGC, assuring constant level at different ear canal volumes.
Air pressure:	Control: Automatic. Indicator: Measured value is displayed on the graphical display. Range: -600 to +300 daPa. Pressure limitation: -750 daPa and +550 daPa. Pressure change rate: Very slow, Slow, Medium, Fast, Automatic with slow speed at compliance peak. Selectable in the set-up.
Compliance:	Range: 0.1 to 8.0 ml at 226 Hz probe tone (Ear volume: 0.1 to 8.0 ml) and 0.1 to 15 mmho at 678, 800 and 1000 Hz probe tone.
Indicators:	Graphical display Compliance is indicated as ml and pressure as daPa. In PC-controlled mode admittance, susceptance and conductance can be printed. Stimulus level is indicated as dB Hearing Level.
Memory:	Tympanometry: 1 curve per ear per tympanometry test. 3 curves per ear per Eustachian tube function test. And theoretically an infinite number of tests per protocol.

Test types:

	Screening	Diagnostic	Clinical
• Tympanometry Automatic (fixed start and stop pressure)	x	x	x
• Tympanometry Manual	-	-	x
• ETF1 – Non perforated eardrum (Williams test)	n/a	x	x
• ETF2 – Perforated eardrum (Toynbee test)	n/a	n/a	x
• ETF3 – Patulous Eustachian tube (Sensitive baseline tympanometry for 10 up to 60 seconds)	n/a	n/a	x

Reflex Functions

Signal sources:	Tone - Contra, Reflex: 250, 500, 1000, 2000, 3000, 4000, 6000, 8000 Hz. Tone - Ipsi, Reflex: 500, 1000, 2000, 3000, 4000 Hz. NB noise - Contra, Reflex: 250, 500, 1000, 2000, 3000, 4000, 6000, 8000 Hz. NB noise - Ipsi, Reflex: 1000, 2000, 3000, 4000 Hz. Noise - Contra, Reflex: Wide Band, High Pass, Low Pass. Noise - Ipsi, Reflex: Wide Band, High Pass, Low Pass.
Outputs:	Contra Earphone: TDH39 earphone, DD45 earphone, EARtone 3A and/or CIR55 insert for Reflex measurements. Ipsi Earphone: Probe earphone incorporated in the probe system for Reflex.

Test types:

	Screening	Diagnostic	Clinical
• Automated Reflex with single intensities or reflex growth			
- Ipsilateral	x	x	x
- Contralateral	n/a	x	x
• Manual control of all reflex functions	x	x	x
• Reflex decay, automatic 10 dB above threshold or manually controlled with stimulus duration of 10 up to 30 s	n/a	x	x
• Reflex latency, automatic 10 dB above threshold or manually controlled, first 300 ms from stimulus start	n/a	n/a	x

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		Screening	Diagnostic	Clinical
Included parts IMP440 module:	Titan handheld unit with basic probe	x	x	x
	Cradle	optional	x	x
	ASA30M Power supply (with converter)	x	x	x
	Clinical probe extension	optional	x	x
	CIR55 contra insert headset	n/a	x	x
	BET55 Ear tips and box	x	x	x
	DG – LiBat – 001 back-up battery	x	x	x
	4 cavities (0.2, 0.5, 2 and 5cc)	x	x	x
	Titan PC suite with IMP440	x	x	x
	OtoAccess™ database	optional	x	x
	Operation manual & Multilingual CE manual	x	x	x
	TCB Carrying Bag	x	x	x
Optional parts IMP440 module:	Short probe extension	optional	optional	optional
	Thermal printer AB1310/AB1310 Bluetooth	optional	optional	optional
	DD45C contra cup headset	n/a	optional	optional
	EARtone 3A insert headset for contra	n/a	optional	optional

Specifications ABRIS440 software (ABR Infant Screening):

EPA Preamplifier:	One Channel EPA3 Cable Collector (3 electrodes). 50 cm. **Gain:** 64 dB. **Frequency response:** 0.5 - 5000 Hz. **Noise:** <25nV/√Hz. **CMR Ratio:** > 90 dB. **Max input offset voltage:** 2.5 V. **Input impedance:**10 MΩ/ 170 pF. **Power from main unit:** Isolated power supply
Electrical Impedance measurement:	**Measurement frequency:** 33 Hz. **Waveform:** Rectangular **Measurement current:** 11.25µA. **Range:** 0.5 kΩ – 25 kΩ ± 10 %
Stimulus:	Click range (177-11313 Hz). CE-Chirp® range (177 – 11313 Hz) HiLo CE-Chirp® range (Lo 177- 1414 Hz) (Hi 1414 – 11313 Hz) **Stimulus rate:** 90 Hz **Transducers:** EarTone ABR insert phone. TDH 39/DD45 head phone. IOW probe **Channels:** 1. **Level:** 30 dB nHL, 35 dB nHL, 40 dB nHL **Analysis time:** 1-10 min or Residual noise 5-80 nV. **Bandwidth:** 22.05 kHz. **A/D resolution:** 24 bit **Weighting:** Bayesian weighting **Artifact reject system:** Rejection level (Peak, Min RMS, Max RMS) Clipping (Saturation) Display Stimulus level and type, bar and graph view
Algorithmic Sensitivity:	Click 99.9%. CE-Chirp® 99.9%. HiLo CE-Chirp® 99.9%

		Screener
Included parts ABRIS440 module:	Titan handheld unit with basic probe	x
	Cradle	x
	ASA30M Power supply (with converter)	x
	PreAmplifier w/clothing clip & neckstrap	x
	Short extension cable	x
	ETSE tab surface electrode cables	x
	Sanibel tab surface electrodes (36 pcs.)	x
	SPG15 preparation gel	x
	Alcohol pads, Gauze swabs	x
	USB cable, USB adaptor	x
	BET55 Ear tips and box	x
	DG – LiBat – 001 back-up battery	x
	4 cavities (0.2, 0.5, 2 and 5cc)	x
	Titan PC suite with ABRIS440	x
	OtoAccess™ database	x
	Operation manual & multilingual CE manual	x
	TCB Carrying Bag	x
Optional parts ABRIS440 module:	EarTone ABR earphones	optional
	Thermal printer AB1310/AB1310 Bluetooth	optional
	TDH39 Stereo ID headset	optional
	DD45 stereo ID headset	optional

Interacoustics – the wise choice

With over 40 years of experience, Interacoustics is dedicated to supplying its customers with the best possible solutions for their audiologic needs. This is accomplished by maintaining a continuous dialogue with healthcare professionals working in all sectors of audiology. Our equipment meets the highest possible engineering standards and we provide design expertise that can only come from close contact with clinical practice.

Solutions on every scale

Designing equipment for every size of clinic in so many countries puts us in the unique position of being able to offer solutions that fit your requirements exactly. Audiometry, tympanometry, electrophysiology, hearing aid testing, balance investigation are all within our scope and can be integrated to suit your needs.

Designed for diagnostics efficiency

We design equipment to make testing and interpretation easier. This means better interfaces, well designed screen layouts, printed reports and interaction over networks with databases and electronic records systems. In most cases, you can configure the settings and layout yourself.

Support worldwide

The Interacoustics name is not only your guarantee of quality and functionality, but also for support. We operate in over 100 countries worldwide through a well coordinated network of distributors and service centres to ensure that you receive total support and service.

Related products:

Eclipse™:

- EP25 Advanced ABR
- EP15 Clinical ABR
- Interacoustics® ASSR
- ABRIS Newborn Screening
- VEMP
- TEOAE25 Sreening and Clinical TEOAE
- DPOAE20 Screening and Clinical DPOAE

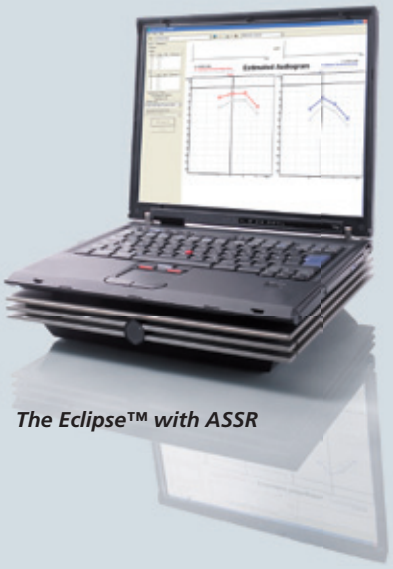
OtoRead™ Handheld OAE

Middle ear analyzers:

- AT235 Middle Ear Analyzer
- AT235h Middle Ear Analyzer
- MT10 Handheld Tympanometer

Audiometry and Middle Ear Analyzer in one:

- AA222 Audio Traveller



The Eclipse™ with ASSR

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Sales and service in your area:

Read more here:
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