

Operating Instructions

_active vibration isolation desktop unit
halcyonics **_i4 series**



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1. Introduction

Thank you for purchasing the halcyonics_i4 system. By selecting this device you have acquired a top-of-the-line active vibration isolation equipment. We feel confident that our system will meet your expectations and provide the best possible performance for your specific application.

Please read the operating instructions carefully to set up the i4 system correctly.

We hope you enjoy working with your halcyonics_i4!

2. Unpacking the i4 System

After unpacking the system, please check whether the package contains all components.

Equipment supplied for the halcyonics_i4 system:

- 1 halcyonics_i4 system
- 1 power cord
- 1 power supply
- 1 instruction manual

3. Symbols used in these instructions



Warning symbol



Important note



Action that the user is required to take

4. Safety Instructions and Warnings

Please read through the following safety instructions and warnings carefully before using this equipment.

General Warnings

Do not operate the system in a potentially explosive or humid environment. Do not switch on the system if there is any visible damage or if you think it might be damaged. In this case, turn off the power immediately and notify our distributor in your area or contact Accurion's headquarters in Germany directly.

Electrical Safety

This system may be operated only on AC grounded power. Do not interrupt the protective grounding conductor under any circumstances. If you plan to use a power cable other than the standard power cord supplied with this equipment, first check that the protective grounding conductor is connected.

Before starting to operate this equipment, check the voltage rating to be sure that it matches your local voltage. For further information, please refer to the specifications on page 10.

Only the certified, external power supply supplied with the system must be used.

Finish the set up and installation before attempting to plug it into an electrical outlet. Never open the equipment housing. Only authorized and qualified personnel may service or repair the equipment. The device must be connected to an easily accessible supply socket so that in the event of a malfunction, the supply plug can be removed quickly.

Mechanical Safety

Ensure that the equipment rests on a stable surface that can safely support the weight of this instrument.



Please note that you need to activate the transport/relocation locking mode before you transport or move the equipment! For further instructions, please refer to the section "Automatic Load Adjustment and Transport Locking Mode" on page 6.

Intended Use

The system is suited to isolate various measurement equipment from building vibration and other disturbing influences. Any other use is not permitted.



Never use the isolation system in mobile environments or outside the specified environmental and operational requirements, see page 10.

DIN and European Standards, European Council Directives

Halcyonics i4 systems conform to the requirements currently valid for electrical safety according to EC Directive 2014/35/EU and for electromagnetic compatibility according to EC Directive 2014/30/EU. This equipment has been tested and found to comply with the following standards EN 61010-1:2010.

5. Getting Started and Operation

Setting Up the System

To obtain best performance from the halcyonics_i4, set it up on a stable, rigid and flat surface. For optimal operating results, the planarity of the support surface should be 0.5 mm.

If you set up the i4 system on a table or bench frame, make sure that the table is distortion-free and stiff. Although most tables and bench frames have sufficient resistance to vertical vibration, they are relatively sensitive with respect to horizontal vibration. This causes amplification of structure and airborne noise.

Therefore, to set up your vibration isolation equipment, select a place with a vibration level that is as low as possible. Vibration generated at this place should not exceed velocities of 500 $\mu\text{m/s}$.

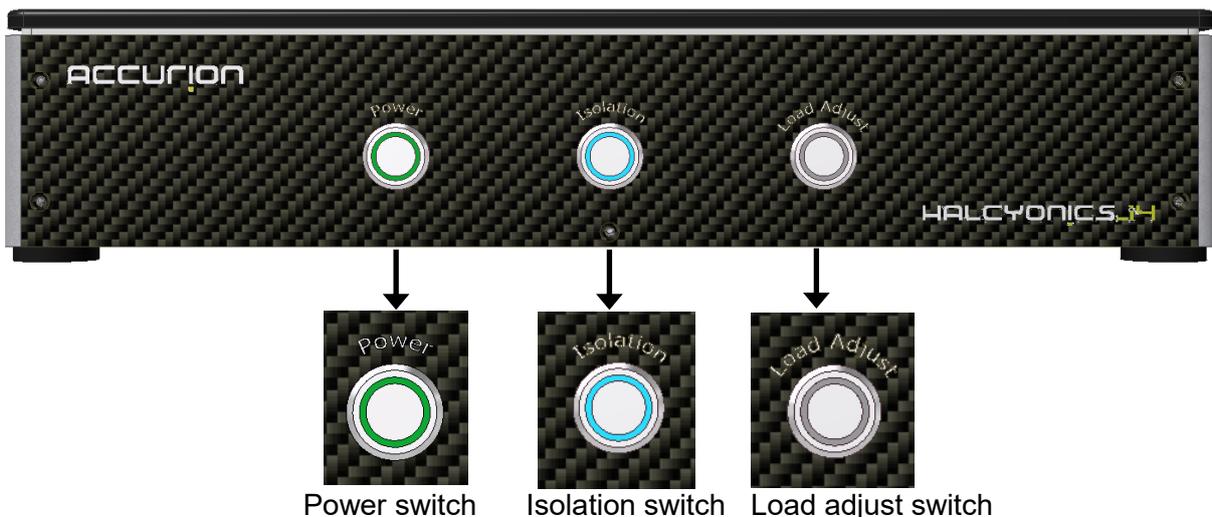


Operating the system at low temperatures may cause malfunctioning. If the equipment is brought from a cold environment into a relatively warmer one, we recommend that you wait approx. 2 – 3 hours before plugging it into AC power and switching on the power.



Start-up

- Set up the system on a flat, stable surface at your work area.
- Connect the external power supply to AC power (main supply) and to the i4.
- Center your application on the top plate of the i4 system.
- Turn on the power switch on the front panel of the system.
- Press the Load Adjust button for automatic load adjustment (see page 6)
- Set the switch for active isolation to on, blue LED is on (see page 7)



Automatic Load Adjustment and Transport Locking Mode

The top plate of the system is supported by four steel springs. These springs carry the load placed on top. For the initial installation or after load changes these springs have to be pre-stressed according to the weight of the setup. This is done by electric motors via an electronic circuit. This procedure is called „automatic load adjustment“. The objective of the load adjustment is to elastically support the top plate by the springs.

The halcyonics_i4 systems have a combined automatic load adjustment and transport locking mode feature. Both functions are controlled using the "Load Adjust" button. The following modes can be selected depending on the number of times you press the button. The LEDs show the selected mode as follows:

- Green – load adjustment
- LED off – neutral
- Red – transport locking mode



The "load adjustment" mode (green LED) is used for automatic, load-dependent adjustment of the system. When you set up the system and press this button, the system will start the load adjustment. For initial adjustment and for changing the loading conditions, the green mode has to be selected. During the activation of the green LED, the system will check at intervals whether the load on the system has changed and will automatically move the top plate into the optimal position when necessary. If this automatic adjustment is not desired, please turn the LA-Automatic off by pressing the load adjust button once so that the LED is off. During the load adjustment of the i4 system, the active isolation is interrupted.



The "neutral" mode (LED off) is selected to deactivate the automatic load adjustment and to avoid the self-adjustment of the system. This way the motors of the load adjustment do not start to run at an unwanted time. Once you switch on the system power for the first time, the i4 system will be in the "neutral" mode. At this point, select the "load adjustment" mode. As soon as the stepper motors stop you can switch to "neutral" and the system is ready to operate.



Press and hold the button for 4 seconds!

During transportation the halcyonics_i4 system always has to be locked! In the lock mode a rigid mechanical contact between the top and the bottom of the system prevents the sensitive components from damage. To lock the system, change the load adjustment setting to the "transport locking mode" (red LED), and the four steel springs will be automatically pre-stressed up to the maximum.



The system may only be transported or moved in the transport-locked condition!



There must not be any load on top of the isolation system during transport!



To change the different modes, it is necessary to press and hold the button for some seconds.

Using Active Vibration Isolation

Once you have started up the system, press the “isolation” button on the front panel to enable the active vibration isolation. Now the system initializes, which is shown by a flashing blue LED. When the system initializes for the first time or after a long interval, this process can take up to 30 seconds. When the blue LED remains lit, the active vibration isolation is activated.



Overmodulation of the System

The i4 has been designed to compensate vibration amplitudes up to 500 $\mu\text{m/s}$. If vibrations significantly exceed this level the system changes to the stand-by mode, indicated by a flashing blue "Isolation" LED. After the overload excitation is stopped, the isolation mode will automatically be turned on again. After a severe overload the system may take up to 30 seconds to reach full active isolation performance, but normally only a few seconds are required.



The active vibration isolation will be automatically switched off during overmodulation of the system. Once this interference has subsided, the system will re-initialize and, after a few seconds, automatically resume to the active isolation mode. This procedure does not require any action from the user.

6. Appendix

Care and Maintenance

The i4 system has been carefully designed and manufactured by Accurion. To maintain this equipment and the validity of your warranty, you should observe the following recommendations:

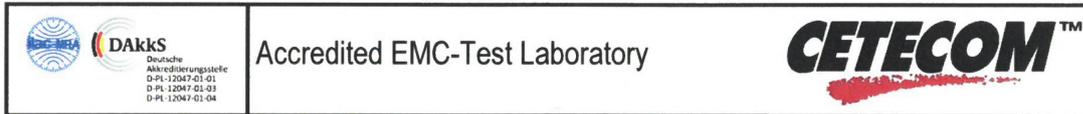
- Store the system in a dry place. Never expose it to rain, liquids or dampness. The minerals contained in these liquids may lead to short-circuits or corrosion of the electronic circuits.
- Where possible, avoid operating and storing the system in dirty or dusty environments as this may otherwise damage the electronic or mechanical components.
- Do not store the system in hot environments. Operating the system at high temperatures may compromise its performance and reduce its lifetime.
- Do not store the system in cold environments. When the temperature rises to normal room temperature, moisture condenses inside the system and causes a circuit failure. If you need to transport the system from a cold environment to a warmer one, wait approx. 2 – 3 hours before plugging it into AC power and switching on the power.
- Do not drop the system or shake it, and never expose it to impact or blows. Improper handling can damage the integrated electronics and mechanical components in the system.
- To clean, wipe off dust from the exterior surfaces of the system using a lint-free cloth. For cleaning, do not use any aggressive cleaning agents.

EMC Test Report

Lab.No. 19-1-0151201T01

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Test schedule and results – EMC - Immunity and Emission



Type of device	Active Vibration Isolation Desktop Unit
Type name	halcyonics i4 series
Serial number	i4 – TI – 5928
Variant type name	i4medium, i4large, workstation i4
Manufacturer	Accurion GmbH Stresemannstr. 30, 37079 Göttingen (Germany)
Applicant	Accurion GmbH Stresemannstr. 30, 37079 Göttingen (Germany)

Test Standards	Immunity: EN 61326-1:2013 include tests according to : EN 61000-4-2:2009 EN 61000-4-3:2006 + A1:2008 + A2:2010 EN 61000-4-4:2012 EN 61000-4-5:2006 EN 61000-4-6:2009 EN 61000-4-11:2004
	Emission : EN 55011:2009 + A1:2010 EN 61000-3-2:2014 EN 61000-3-3:2013

Configuration and operation mode	See Test reports
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Performance Criteria (Immunity)	General criteria according to EN 61326-1
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Performance criterion A

The equipment shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

Performance criterion B

The equipment shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

Performance criterion C

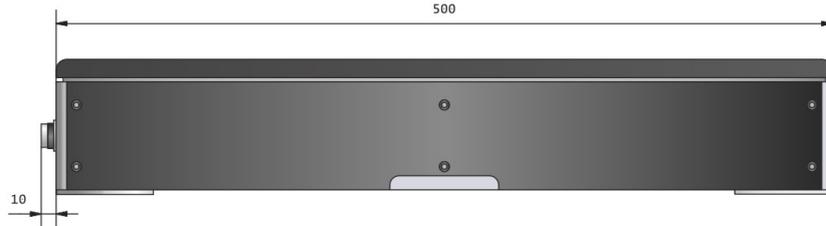
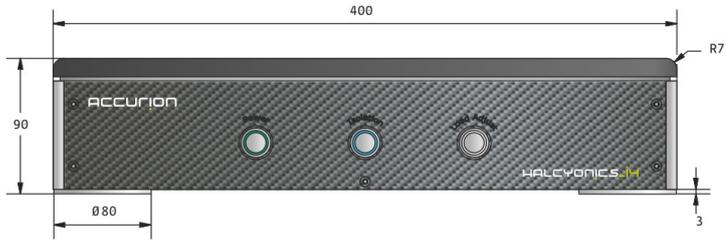
Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.


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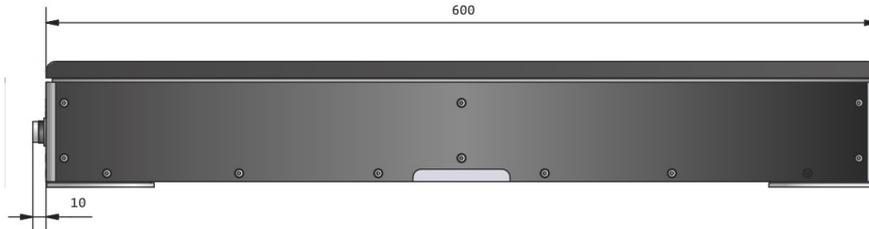
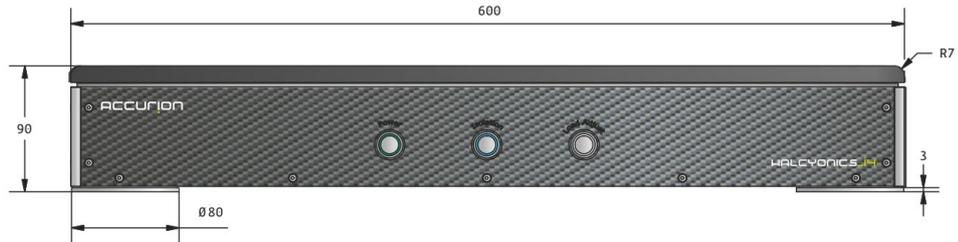
Specifications

Available Standard Versions		
halcyonics_i4	halcyonics_i4medium	halcyonics_i4large
halcyonics_i4 M6/25	halcyonics_i4medium M6/25	halcyonics_i4large M6/25
	halcyonics_i4medium 150 kg	halcyonics_i4large 150 kg
	halcyonics_i4medium 150 kg M6/25	Halcyonics_i4large 150 kg M6/25
Performance Specifications		
Isolation Technology:	Accurion control technology based on piezoelectric type acceleration pickup, fast signal processing and electro-dynamic type force transducers	
Force directions:	Active compensation in all six degrees of freedom	
Isolation performance:	> 5 Hz = 25 dB (94.4%); >10 Hz = 40 dB (99.0%)	
Active bandwidth:	0.6 – 200 Hz*	
Settling time:	300 ms**	
Response time:	0.5 ms***	
Max. correction forces:	Vertical ± 8 N; horizontal ± 4 N	
Load capacity:	i4: 0 – 120 kg (0 - 265 lbs) / i4medium + i4 large: 0 - 105 kg (231 lbs) or 40 - 150 kg (88 - 330 lbs)	
Other Specifications		
Dimensions:	i4: 400 x 500 x 90 mm (15.7" x 19.7" x 3.5") / i4medium: 600 x 600 x 90 mm (23.6" x 23.6" x 3.5") / i4large: 550 x 700 x 92 mm (21.7" x 27.6" x 3.6")	
Weight:	i4: 20 kg (44 lbs) / i4medium: 37 kg (81 lbs) / i4large: 40 kg (88 lbs)	
Table top material:	Powder coated aluminium	
Top plate surface flatness:	± 0.10 mm over complete surface	
Max. compensation level:	500 μ m/s at 6 Hz and with a load of 60 kg (132 lbs)**	
Repeatability of load adjustment:	120 μ m	
Environmental and Operational Requirements		
Electrical voltage:	100 - 240 V AC/47 – 63 Hz	
Fuse (inside i4):	250V / F3,15A (Fuse may be changed by authorized service staff only!)	
Power consumption:	Typically 40 - 45 W	
Operating temperature:	15 – 40°C (59 – 104 F)	
Operating humidity:	0 – 60%	
Operating altitude:	< 2500 m (8100 ft)	
Operating condition:	Use in non-mobile laboratories only	
Pollution degree:	2 (according to DIN EN 61010-1)	
<p>* Floating table top is supported by steel springs; low-pass characteristics of spring-mass combination dominates the dynamic behaviour above 200 Hz.</p> <p>** The settling time and maximum compensation level depend on several conditions, such as payload, frequency, load distribution and height of the payload. For that reason this value should be considered as an estimation.</p> <p>*** The response time determines when the system starts to actively isolate an incoming vibration after detection by the sensors.</p>		

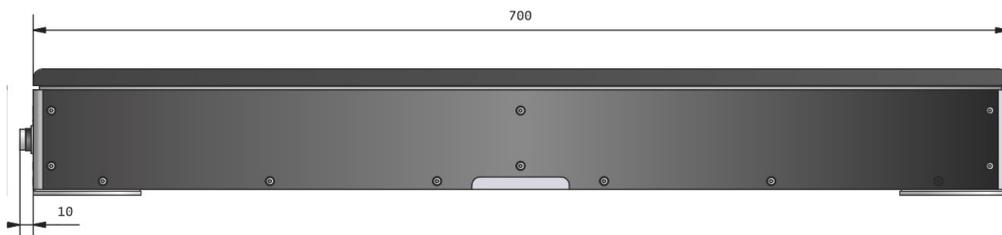
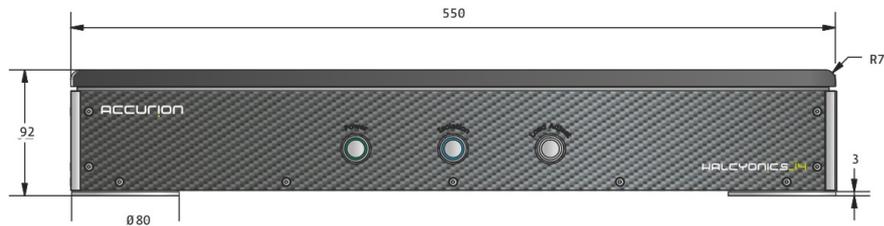
Dimensions of the Isolator



i4 system

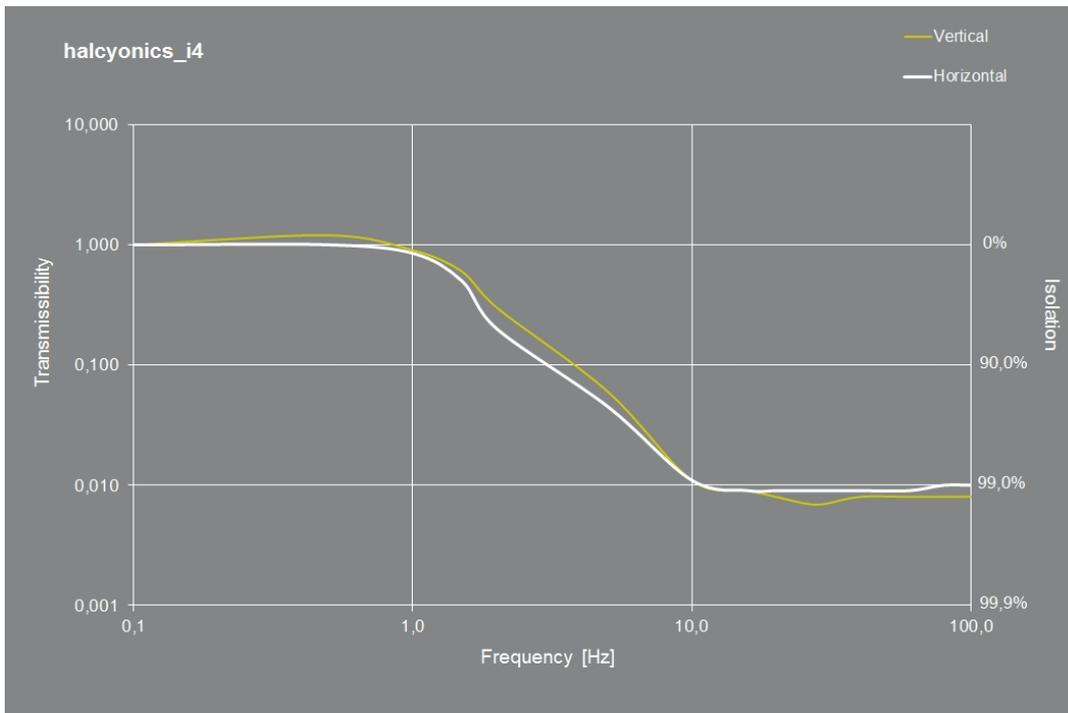


i4medium system



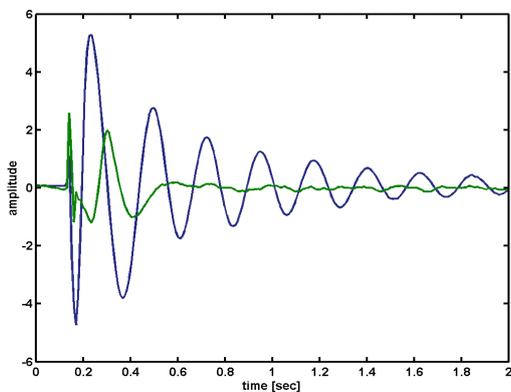
i4large system

Transmissibility



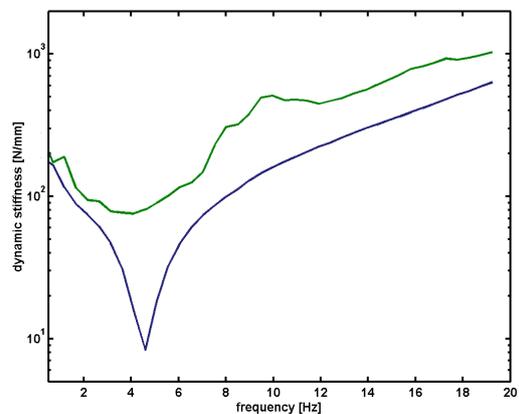
Transmission graph i4, measured at a velocity of 100 $\mu\text{m/s}$ with a payload of 20 kg (44 lbs)

Settling Time



Settling time of a Halcyonics_i4 system (green) compared to a conventional air-damped vibration isolation system (blue), made by one of the major manufacturers of optical tables and vibration isolated laboratory desks.

Dynamic Stiffness



Dynamic isolator stiffness (green) of Accurion's i4 system compared to a commercially available passive air-damped isolation system (blue). Due to their higher dynamic stiffness, Accurion's systems are less sensitive to direct forces affecting the isolation system.

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Installation Video

