

# Turning UP the Volume on Vinyl Records

**Company:** SweetVinyl  
**Industry:** Pro/Consumer Audio  
**Product:** UPBoard

## Introduction

Over the last decade, sales of vinyl LP records have grown massively as a new generation of music lovers has discovered the format and the richness of sound it produces. The technology has many advantages, but older records are also characterized by crackles, pops, and hisses that can be heard underneath the music, and even new, high-quality pressings of vinyl LPs can have a few clicks and pops. Understandably, this is a problem for many consumers and would put them off investing in a turntable and building a record collection.

Those all too familiar clicks and pops don't have to be a problem anymore, though, because an American firm called SweetVinyl has developed a sophisticated software-based process that isolates these sounds, and the company's SugarCube devices can remove them completely without affecting the original music in any way.

## Customer Challenges

To develop devices that can apply SweetVinyl's noise removal algorithm in real time, the company needs an advanced computer board with a powerful processor. However, it must balance this requirement with several competing specifications, and, in order to protect its IP, SweetVinyl also needs the board to possess strong security features.

### Space Efficiency

With modern electronics, size matters, and smaller is almost always better. Home users of the SugarCube may have to squeeze their appliance into an already overfilled stereo cabinet, while professional DJs will have to consider how much equipment they're able to carry from show to show. SweetVinyl therefore had to build their systems around a small circuit board.



## Cost Effectiveness

Compared to digital music that you can download or stream on your phone, vinyl LPs are an expensive musical format. Many customers will therefore be reluctant to spend large sums of money on an additional background noise removal machine, regardless of how much it might improve their listening experience. SweetVinyl has to maintain an effective price point, and that starts with sourcing a cost-effective computer board.

## Development Costs

SweetVinyl's noise reduction algorithm is highly innovative and could change the way a lot of people listen to music. As a startup company, however, it only has a limited timeframe in which to deliver reliable products, and anytime software has to be developed in-house rather than sourced from existing libraries, it complicates development schedules.

## Additional Functionality

The noise-isolating algorithm is one of SweetVinyl's unique selling points, but modern consumers expect more from their hardware than a single feature. To increase the SugarCube's marketability, it needs a device display, a connected mobile app, and an ability to go online and download additional programs and updates. Additionally, some users may also want to record their music or see information about the album they're listening to.



**The SweetVinyl SugarCube SC-1 (top)  
and SC-2 (bottom)**

## AAEON's Solution

SweetVinyl's SugarCube SC-1 and SC-2 models are built around the AAEON [UP board](#). The professional maker board's central features, including its powerful Intel® Atom™ x5-z8350 processor and extensive I/O interface, make it an attractive option for any developing technology, and its 85.6mm x 56.5mm dimensions and cost-effective pricing give it an edge over SBCs with similar specifications.

AAEON also offers multiple-year support for the UP board, guaranteeing return on investment, which is vital for a startup company like SweetVinyl.

## Powerful Processing

The quad-core Atom™ x5-z8350 is a low power-consumption, high-performance CPU that can both process the noise-isolating algorithm in real-time and handle the SugarCube's additional functions without dropping a beat.

## Secure Boot Environment

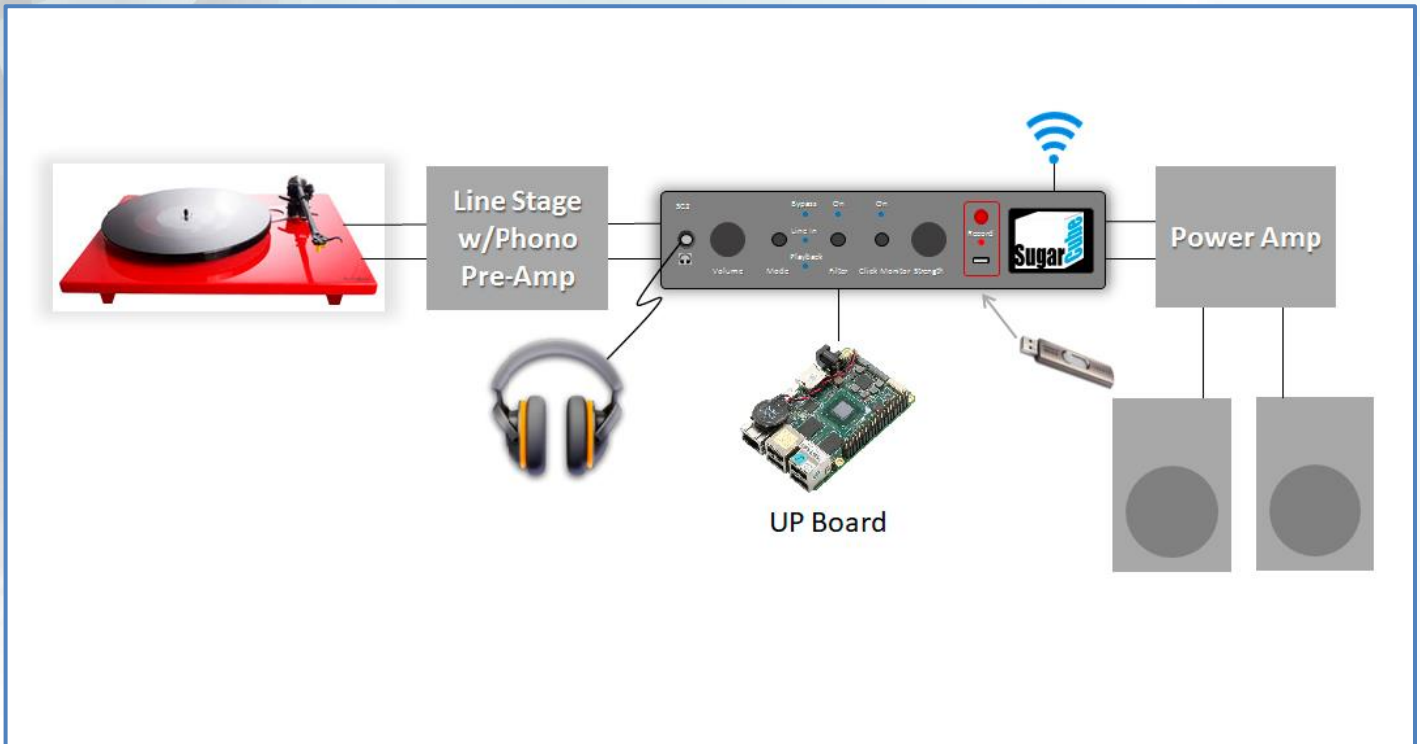
Unlike many competing SBCs, the UP board features a Secure Boot environment, which safeguards SweetVinyl's IP and helps protect the device against malicious attacks.

## Drivers and Software Library

A comprehensive software library and list of drivers is available for the UP board. This cuts development time and costs, and allows the customer to focus on its core goals and unique technology.

## Extensive I/O Interface

The UP board is fitted with a 1GB LAN port for wired network access. Its four USB 2.0 ports and additional USB 3.0 connector allow it to connect to an industry-leading music-processing interface board. The ports also mean SugarCubes can feature an inbuilt WiFi USB module, and storage devices can be used with the SC-2. As a result, music lovers can connect to the Internet to receive free automatic updates to firmware, enjoy remote operation by syncing their machines with a mobile app, and make copies of their favorite music, capturing the rich, full sound vinyl records are known for. Finally, a DSI connector and an Intel® HD Graphics engine allow the UP board to control the SugarCube's front display.



## Impact

SweetVinyl experimented with a number of SBCs before turning to the UP board, and the AAEON-developed technology has helped the company turn its promising concept into a range of marketable products.

While other boards were stressed handling only the noise-isolating algorithm, the UP board manages the task with ease, allowing SweetVinyl to add a raft of other user-friendly features.

Click [here](#) to see a demonstration of how the UP Board helps power SweetVinyl SugarCubes.



The UP board has helped the company improve both reliability and IP security, and at the same time, speed up technological development, allowing it to make plans for the expansion of its product range.

With AAEON technology on board, SweetVinyl is definitely on the UP!

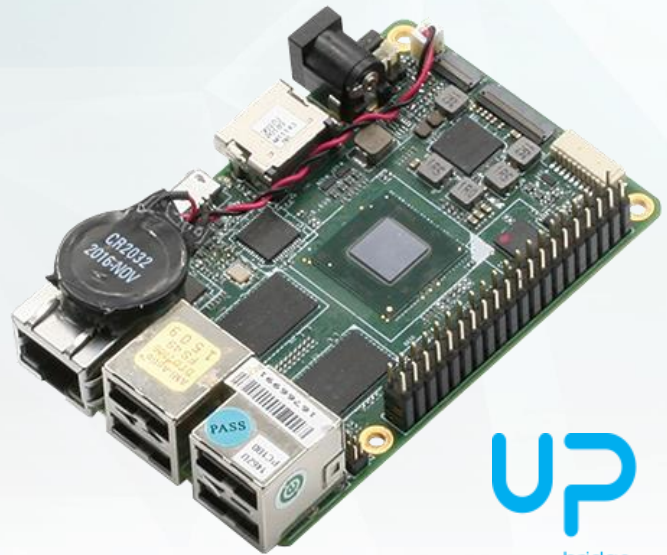
**The UP board has helped the company improve both reliability and IP security, and at the same time, speed up technological development.**

## About the UP Board

UP is a credit-card-size board with the high-performance, low-power-consumption features of the Intel<sup>®</sup> Atom™ x5 Z8350 Processors. It has an Intel Gen 8 HD 400 internal GPU for outstanding 3D graphic performance, and it's equipped with 1GB/2GB/4GB DDR3L RAM and 16GB/32GB/64GB eMMC.

The UP Board features a 40-pin General Purpose bus, two USB2.0 ports, four USB2.0 connectors, one UART on header, one USB 3.0 OTG, one Gbit Ethernet (full speed), one DSI/eDP port, one MIPI-CSI connector, and one HMDI connector.

UP has the Intel security features needed for professional IoT applications such as Intel AES New Instructions and Intel Identity Protection Technology.



## ABOUT AAEON

Established in 1992, AAEON has become one of the leading designers and manufacturers of advanced industrial and embedded computing platforms. Committed to innovative engineering, AAEON provides Industry 4.0 integrated solutions, hardware and intelligent automated services for premier OEM/ODMs and system integrators worldwide, as well as IoT solution platforms that seamlessly consolidate virtual and physical networks. Reliable and high quality computing platforms include industrial motherboards and systems, industrial displays, rugged tablets, PC/104, PICMG and COM modules, embedded SBCs, embedded controllers, network appliances and related accessories. AAEON also offers customized end-to-end services from initial product conceptualization and product development through to volume manufacturing and after-sales service programs. It is also committed to continuously redefining and harmonizing the management and development processes of the industry.

With its constant pursuit of innovation and excellence, AAEON became a member of the ASUS group in 2011, enabling the company to further strengthen its leadership, access advanced technology from ASUS, and leverage resources from within the group. AAEON is poised to offer more diversified embedded products and solutions at higher quality standards to meet world-class design and manufacturing demands in the years to come.

AAEON is an Associate member of the Intel<sup>®</sup> Internet of Things Solutions Alliance.

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