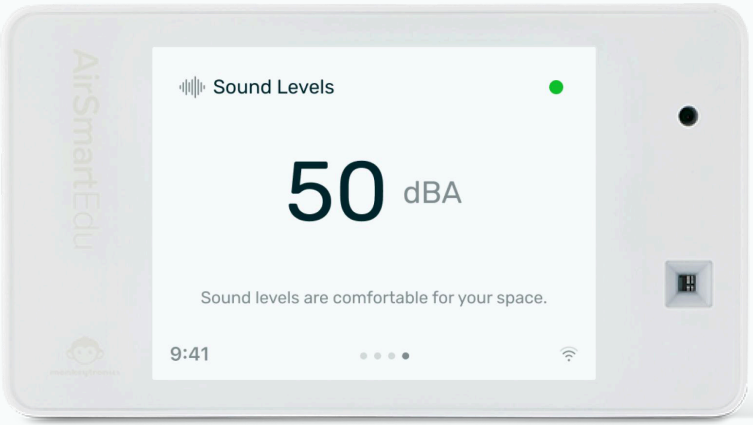
monkeytronics

AirSmart EcoConnect

Smart air quality monitor that runs your ventilation, so the people in the room get fresh air when they need it.

Temperature | Humidity | CO_2 | Lighting | Sound Level



Scan QR or visit **docs.monkeytronics.co.nz** to access more information about our products.

contact@monkeytronics.co.nz monkeytronics.co.nz

Overview

Everyone in a room shares its air: tamariki and kaiako in a classroom, staff in an office, whānau in a community hall. In a New Zealand winter an open window means a cold room. In a 2015 study of 40 Auckland schools, 40 % of teachers opened windows, and from April to October classroom windows tended to stay shut.[1]

AirSmart EcoConnect is AirSmart Edu with a control board. It measures the air and runs your fan, heat recovery unit or damper to match through two 0 to 10 V outputs and a relay, so fresh air comes in when the room needs it. A building system can read it over RS-485 using Modbus or BACnet. Every reading reaches the AirSmart app and web portal, so you can check it worked.

Installation

EcoConnect needs 24 V AC or 6 to 36 V DC and 2.4 GHz Wi-Fi with a plain name and password. Not sure about your unit? Email its make and model, or a photo of its label, to **contact@monkeytronics.co.nz** and Al will get back to you.

1. Wire the plug, push it into the back, then hang EcoConnect on the wall
2. Scan the QR code in the AirSmart Installer app and connect Wi-Fi
3. Set each output, the relay and the set points in the AirSmart app

A 3D printed installation guide sets the wall screws so EcoConnect sits flush on the wall. Turn on Bluetooth and camera before you start. A qualified installer should do the wiring; we help commission every project.

Accuracy

Temperature[2]	Humidity	CO_2
± 0.4 °C	± 3 %	± 30 ppm ± 3 %
Lighting[3]	**Sound Level**	**0 to 10 V outputs[4]**
± 20 %	± 1 dBA	± 300 mV

Specs

Dimensions	11.1 cm × 6.2 cm × 2.7 cm
Power	24 V AC or 6 to 36 V DC
Connection	8-way plug-in screw terminal, 26 to 16 AWG
Wiring Protection	Designed to survive 24 V AC on any terminal
Control Outputs	Two 0 to 10 V DC, set independently
Relay	One volt-free contact, up to 30 V, 1 A
Building Systems	Modbus RTU and BACnet MS/TP over RS-485. Roadmap: BACnet/IP, Modbus TCP
Heat Pump Control	Roadmap: by infrared, not in the first release
Control Input	Temperature, humidity or CO_2
Output Update	Every 20 seconds
Connectivity	Wi-Fi 2.4 GHz (802.11 b/g/n), WPA2
Sampling, Reporting	Every few seconds; to the cloud every 15 minutes

[1] Massey University, Healthier classrooms for Kiwi kids (2016): a 2015 study of 40 Auckland schools, run with a window systems company as industry partner.
[2] Sensirion SCD30 figures at 25 °C; temperature ± (0.4 °C + 0.023 × (T − 25 °C)), 0 to 50 °C.
[3] ams TSL2572 datasheet, page 8: output under a fixed white light 4,000 to 6,000 counts (typical 5,000), a spread of ±20 %. The datasheet states no lux accuracy.
[4] 0 to 10 V outputs into 10 kilohm or more. Design figure; bench test on the first board to follow.

Benefits

- Fresh air for the people in the room when they need it, without anyone having to remember
- Output follows the room: more fresh air as it fills, less as it empties, never below the minimum you set
- EcoConnect does not make fresh air free. It stops a fan running flat out when the room does not need it, which in our modelled Wellington classroom avoids about 30 % of the heat used to warm the fresh air (modelled, not measured; about $32 a classroom per winter)[5]
- Works with or without a building management system: 0 to 10 V, Modbus or BACnet

Control

Off Output at the bottom of its range.

On A fixed level you choose, 0 to 100 %, for manual override from the app.

Auto Scales in a straight line between two set points on temperature, humidity or CO_2, rising as the reading climbs or as it falls.

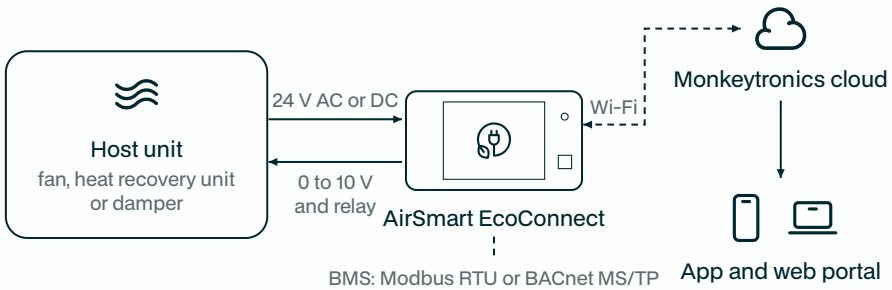
Each output either runs a unit, with a minimum it never drops below, or sends a reading to a building controller, for example 0 V at 400 ppm and 10 V at 1,000 ppm. The relay switches at set points you choose. Settings are stored on the device. Lighting and sound are monitored, not used for control.

Features in the first release

- Two 0 to 10 V outputs and a relay
- Modbus RTU and BACnet MS/TP over RS-485
- Off, On and Auto modes, set in the AirSmart app
- Real-time CO_2, temperature, humidity, light & sound
- App and web portal with reports and notifications
- Wi-Fi connectivity, no ongoing costs[6]
- Powered by the unit or a 24 V AC building supply

On the roadmap, not yet available: heat pump control by infrared, and BACnet/IP and Modbus TCP over Wi-Fi.

How it connects



Works with fans, heat recovery units and dampers that take a 0 to 10 V signal. Its relay switches units with an on and off input. Heat pump control by infrared is on the roadmap, not in the first release. Send us the model and we'll check.

[5] Monkeytronics energy model, October 2026: one Wellington classroom, 32 people at 10 l/s each, 55 winter school days, against a fan on a timer. Modelled, not measured. Reviews of demand-controlled ventilation in homes report ventilation energy savings of up to 60 % without worse air quality, but some systems used 26 % more energy (Guyot, Sherman and Walker 2018). EcoConnect's savings are not yet measured.
[6] Cloud, app and web portal free for the life of the product, within fair-use limits. Custom add-ons are quoted separately.

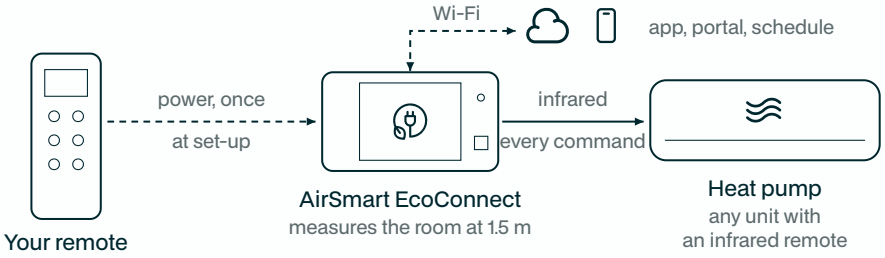
On the roadmap: heat pump control by infrared

A heat pump knows the temperature at its own sensor, up by the ceiling, and nothing about who is in the room. On the roadmap, EcoConnect will talk to it by infrared, the way its remote does, and bring what it measures at 1.5 m: how many people are breathing (CO_2), how warm it is where they sit, and how damp the room is. Not in the first release.

Set-up in three steps, as planned

1. Point your remote at EcoConnect and press power once, or pick the brand and model in the app
2. EcoConnect will send a test command and ask: did the heat pump respond?
3. Run it from the app, on a schedule, or let the room decide

How it will work



What it will do

- On when people arrive and off when they leave, from the CO_2 in the room
- Set point corrected from the temperature where people sit, not at the ceiling
- Dry mode when the room gets damp
- On and off, mode, temperature, fan and a 7-day schedule from the app and web portal
- Keeps working with the Wi-Fi off, and picks up the commands you give with the handheld remote
- No subscription, ever

Planned for any heat pump that has an infrared remote: Mitsubishi Electric, Daikin, Fujitsu, Panasonic, Gree, Haier, LG, Samsung, Toshiba, Hitachi, Mitsubishi Heavy Industries and others. A remote we do not know yet will be taught in a few minutes. Line of sight to the indoor unit, up to 6 m.

First release Two 0 to 10 V outputs and a relay; Modbus RTU and BACnet MS/TP over RS-485 (the firmware may follow the first units by update); CO_2, temperature, humidity, light and sound; Wi-Fi, the AirSmart app and web portal; 24 V AC or 6 to 36 V DC supply; an 8-way plug-in screw terminal, designed to survive 24 V AC on any terminal.

Roadmap, not yet available Heat pump control by infrared: EcoConnect will send the heat pump the commands its remote sends, and pick up the commands you give with the handheld remote. BACnet/IP and Modbus TCP over Wi-Fi.