AirSmart EcoConnect installer data sheet

For electricians and ventilation installers: what you need to quote, wire and commission one EcoConnect. Figures are the production design; bench results on the first board follow.

Before you quote

- ☐ **Control input** on the unit: 0 to 10 V, or a range inside it such as 2 to 10 V (each output is set to match).
- ☐ **Or an on/off input** (maker's contact adaptor, fan controller): use the relay, volt-free, 1 A at up to 30 V AC or DC, low voltage, not mains.
- ☐ **Supply:** 24 V AC or 6 to 36 V DC, from the unit or a building transformer; full 10 V output across the range. 1 W typical, 2 W maximum; allow 3 VA per unit at 24 V AC.
- ☐ **One 0 V** for the supply, both outputs and RS-485.
- ☐ **Minimum airflow:** set each output's minimum to the unit's design minimum (10 l/s per person on DQLS mechanical systems).
- ☐ **Wall:** interior, in the room served, 1.2 m to 1.8 m up, clear of windows, doors, heaters and the unit's airflow.
- ☐ **Wi-Fi:** 2.4 GHz, WPA2 with a plain name and password; no login-page or enterprise networks. Schools: ask IT.
- ☐ **Building system:** Modbus RTU or BACnet MS/TP over RS-485, read access, no writes; firmware may follow the first units by update.
- ☐ **Warranty:** the unit's maker allows an outside control signal on this input.

Tell your customer

- **First release:** 0 to 10 V outputs, relay, and RS-485 for building systems. **Roadmap, not yet available:** heat pump control by infrared, BACnet/IP and Modbus TCP over Wi-Fi.
- Every reading reaches the AirSmart app and web portal every 15 minutes, with each output's level and mode.
- Settings are stored on the device, so it keeps running through Wi-Fi drops and power cuts.

Not sure about a unit? Email its make and model, or a photo of its label, to **contact@monkeytronics.co.nz** and AI will get back to you. Guides: **docs.monkeytronics.co.nz**

Connections

Pin	Terminal	Signal	Connect to
1	+V	Supply in	24 V AC (G), or DC +, 6 to 36 V
2	0 V	0 V	G0, or DC 0 V; common to all
3	D1 (B, +)	RS-485	Bus +
4	D0 (A, -)	RS-485	Bus -
5	OUT1	Output 1	Unit's 0 to 10 V input
6	OUT2	Output 2	Second 0 to 10 V input
7, 8	RLY, RLY	Relay	Unit's on/off contact input

Plug: one 8-way screw plug, wired in the hand, then pushed into the back of the unit. 26 to 16 AWG. Steps and pin drawing: page 2.

RS-485: terminator on at the last unit; bias off unless the bus has none. On 24 V AC, one transformer pole for every device on the bus.

> **Designed to survive 24 V AC on any terminal** (bench test to follow). Seal the cable entry against wall-cavity air. Never mains.

Commissioning

1. Power off. Wire the plug (page 2); check every pin.
2. Power on. In the AirSmart Installer app, scan the label's QR code, hold the red button on the back and join 2.4 GHz Wi-Fi.
3. In the AirSmart app, set each output's role, input, set points, voltage range and minimum, and the relay.
4. Set On at 0, 50 and 100 % and measure each output to 0 V: your start voltage, the midpoint and your end voltage, within 300 mV. Allow 20 s per change.
5. Set Auto. Turn Wi-Fi off and cycle the power: the outputs return to their settings within 10 s. Note the settings for the handover.

Output behaviour

- **Off** bottom of the range. **On** a fixed level, 0 to 100 %. **Auto** a straight line between two set points on temperature, humidity or CO_2, either way round. Updates every 20 s. Lighting and sound are monitored, not used for control.
- **Control role:** runs a unit and never drops below the minimum you set. **Transmit role:** sends the reading to a building controller over the voltage range you set (for example 0 V at 400 ppm, 10 V at 1,000 ppm).
- **Faults** (sensor missing, settings that do not match the sensors): transmit outputs go to 0 V so a building controller sees the fault; control outputs hold their minimum.
- **Wi-Fi drops, power cuts, restarts:** runs on its stored settings, back within 10 s of power-up. During a firmware update the outputs hold their last value.
- **Relay:** switches on above one level and off below a lower one, on temperature, humidity or CO_2.
- **Schools:** Ministry guidance (2023) asks CO_2-driven systems to aim for sustained levels under 800 ppm, so choose set points to suit.[1]

Heat pumps, by type

- **0 to 10 V:** commercial packaged units with a capacity or fan-speed input; EC fan coils, on fan speed (most stop below about 1 V, so set a minimum).
- **Relay, on and off:** units with a maker contact adaptor or thermostat input.
- **Infrared, on the roadmap:** not in the first release. EcoConnect will send any split, floor console, ducted or cassette unit the commands its remote sends, and pick up the commands given with the handheld remote. Line of sight to the indoor unit, up to 6 m; mount on a facing or side wall. Sending by infrared needs 5 V USB power at the unit.
- **Not driven:** units with a wired controller and no infrared remote.

[1] Ministry of Education, Ventilation Guidance for New Zealand Schools (March 2023), pages 11, 12, 18, 23 and 29.

Wire the plug, then mount the unit

Wire the plug in the hand, away from the unit, then push it into the back of EcoConnect. There is no back plate: the unit hangs on two screws and nothing else stays on the wall.

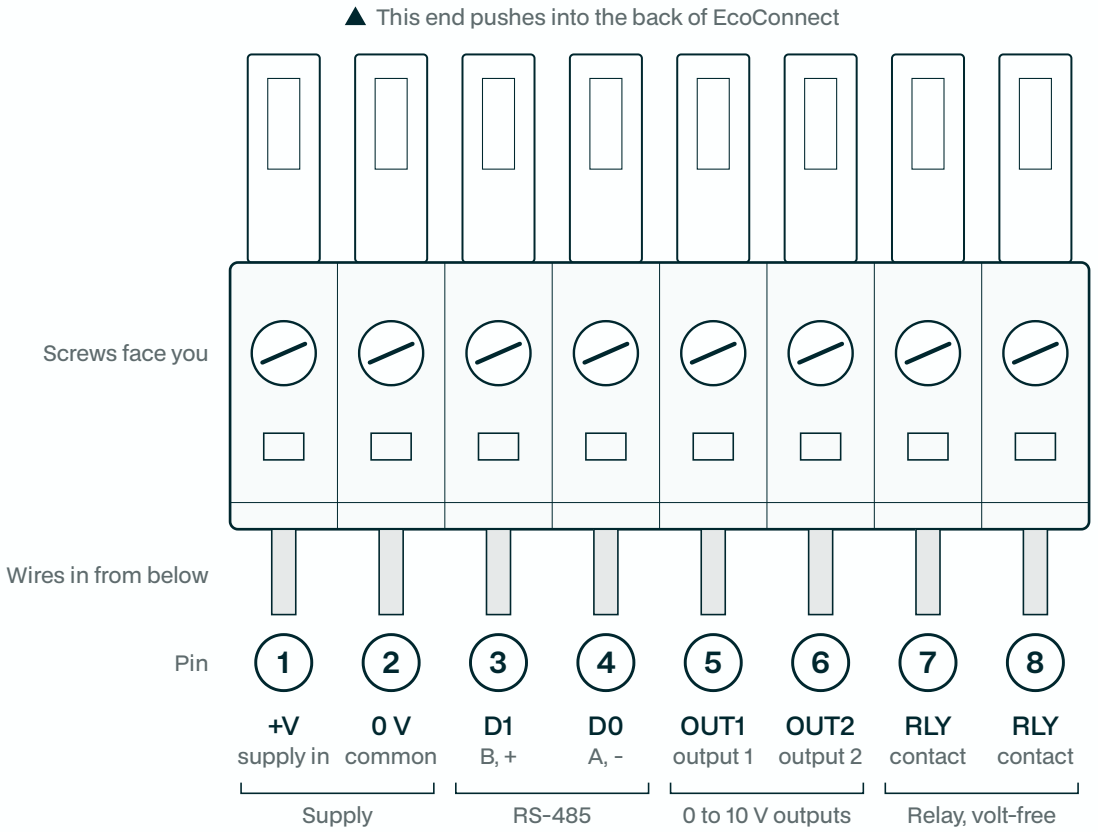
Wire the plug

1. Power off the supply. Leave about 100 mm of each wire out of the wall.
2. Strip each wire 6 to 7 mm. The plug takes 26 to 16 AWG (0.13 to 1.3 mm²), solid or stranded.
3. Hold the plug with the screws facing you and the wire openings down, as drawn. **Pin 1 is on the left.**
4. Put each wire into its terminal by pin number and tighten the screw to 0.25 Nm. Pull each wire to check that it holds.
5. RS-485: makers label A and B both ways round, so match + to + and - to -.
6. To daisy-chain the supply or the RS-485 bus, put both wires into the one terminal. Together they must fit the terminal, which takes up to 16 AWG (1.3 mm²).
7. Check every wire against the drawing before the power goes on.

Mount the unit

1. Choose the spot (page 1, **Wall**). The cable comes out of the wall behind the unit.
2. Hold the 3D printed installation guide on the wall. It marks where the two screws go and sets how far in they go.
3. Drive both screws to the depth the guide sets, then take the guide away. Nothing else stays on the wall.
4. Push the wired plug into the socket in the back of EcoConnect.
5. Let the spare wire go back into the wall and hang EcoConnect on the screws. It sits flush on the wall.
6. Seal the cable entry against wall-cavity air.

The plug, pin by pin



Wire	26 to 16 AWG (0.13 to 1.3 mm²), solid or stranded
Strip length	6 to 7 mm
Screw torque	0.25 Nm
Plug	8-way screw plug, 3.5 mm pitch

Designed to survive 24 V AC on any terminal: each terminal is designed to take 24 V AC from any other terminal without damage. Bench test to follow. Low voltage, never mains.