Air-conditioning Adapter

CET-HD-AC2-IRB-1 ("Basic")
CET-HD-AC2-IR3-1 ("3-in-1")

Product User Manual

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Safety Notices

1. Please read and follow the warning and instructions contained in this document carefully.

2. This product is approved for indoor use only and must not be used near water.

3. Do not block any ventilation openings on the product enclosure.

4. This product must not be operated outside of the specified Operating Temperature Range.

5. Do not install this product near any heat sources such as radiators, stoves, or other apparatus that produce heat.

6. Only use the supplied power supply with this product.

7. Do not connect this product to a power supply outside of the range specified in the Technical Specifications.

8. Repair and maintenance of this product can be performed by qualified service personnel only. Do not attempt to repair the product if damaged. If the product is damaged or inoperable please contact Combined Energy.

9. This product is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience or knowledge, unless they have been given supervision or instruction concerning use of the product by a person responsible for their safety.

10. This product should be unplugged during lightning storms.

Introduction

The CET-HD-AC2-IRB-1 & CET-HD-AC2-IR3-1 Air-conditioning Adapters are air-conditioner controllers for Combined Energy home energy management systems.
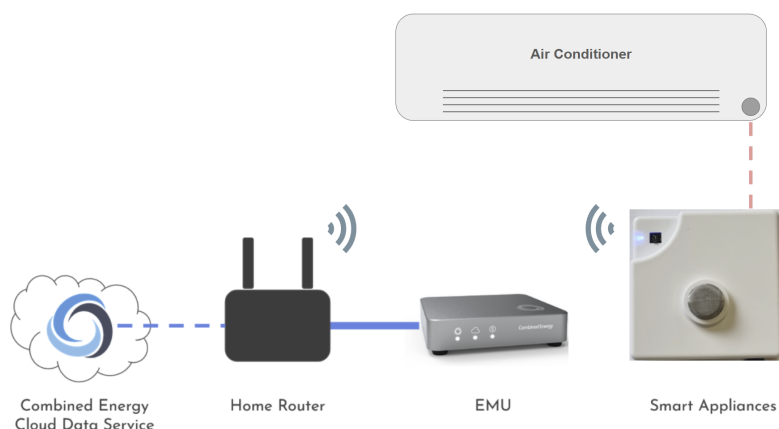
Combined Energy Air-conditioning Adapters communicate over Wi-Fi and output infrared (IR) signals to control split-unit air-conditioning systems. The products enable both automatic and manual control of the air-conditioner via the home energy management system, and keep track of settings that are manually entered using the appliance's remote controller.

Connection to a wireless local network is required, and **the Air-conditioning Adapters will only operate on the 2.4GHz Wi-Fi band**. 5GHz wireless networks can not be seen by the Adapters and can not be used.

Initial configuration of an Air-conditioning Adapter is achieved using a smartphone running the ESP Touch App. Once configured, Air-conditioning Adapters will remain connected to the local network and home energy management system until manually reset (or if the local network Wi-Fi password is changed).

Technical Specifications ("Basic" version)

Type: Air-conditioning Adapter (Basic)

Model: CET-HD-AC2-IRB-1

Power Supply:
Air-conditioning Adapter: 5VDC (USB Micro-B). 150mA Max
AC power supply: 100-240VAC 1W+N 50/60Hz 20-10mA

Average power consumption: <1W

Dimensions: 30 x 30 x 8mm

Mass: 0.01kg

Operating Temperature Range: 0C to +46C

Standards:
- AS/NZS CISPR 32
- AS/NZS 4268:2017 Amd 1:2021
- AS/NZS 60950-1

Supplied with:
- 5V AC Power Supply
- 2.5m USB cable

Technical Specifications ("3-in-1" version)

Type: Smart Appliance Adapter
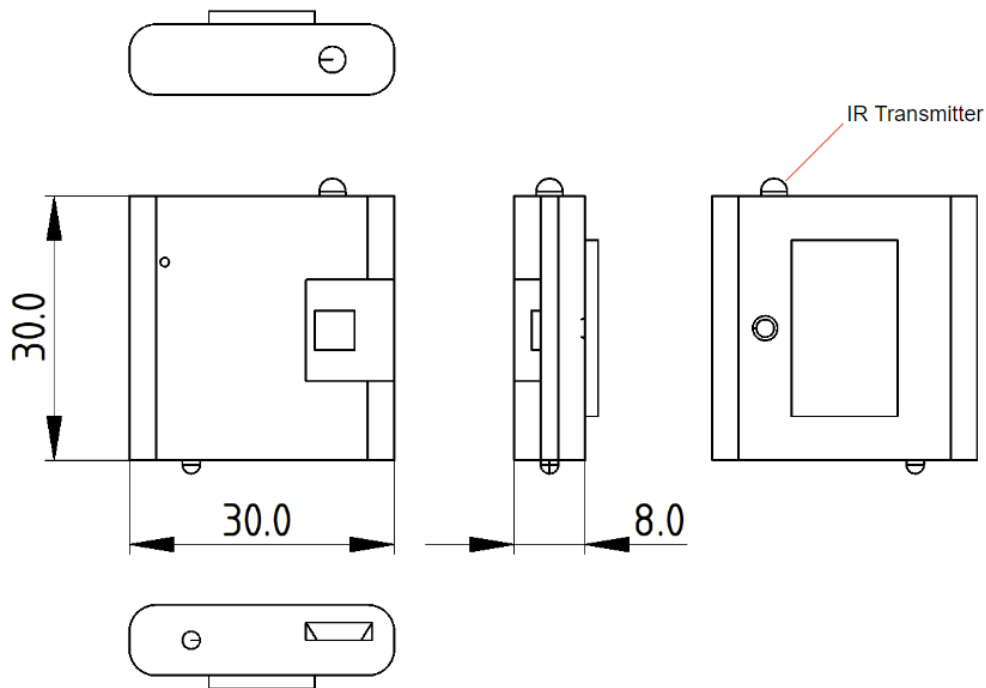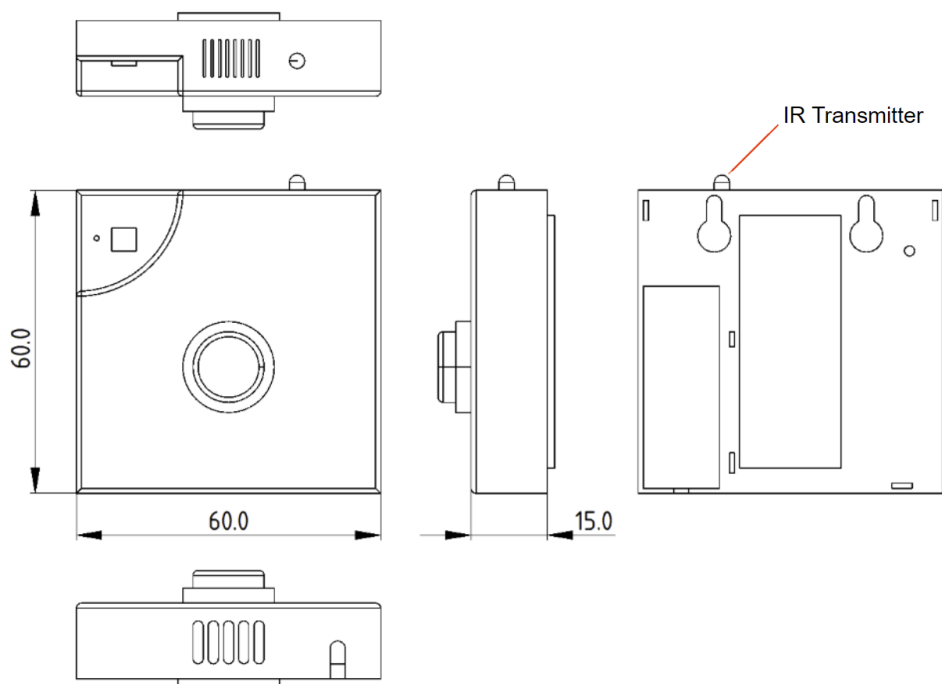
Model: CET-HD-AC2-IR3-1

Power Supply:
Air-conditioning Adapter: 5VDC (USB Micro-B). 220mA Max
AC power supply: 100-240VAC 1W+N 50/60Hz 20-10mA

Average power consumption: <1.5W

Dimensions: 60 x 60 x 15mm

Mass: 0.03kg

Operating Temperature Range: 0C to +46C

Standards:
- AS/NZS CISPR 32
- AS/NZS 4268:2017 Amd 1:2021
- AS/NZS 60950-1

Product Features

Communications Interfaces:
- 1 x 2.4GHz Wi-Fi Transceiver
- 1 x IR Signal Receiver
- 1 x IR Signal Transmitter

Sensors ("Basic" model):
- Temperature sensor

Sensors ("3-in-1" model):
- Temperature sensor
- Gas sensor (CO2 ppm)
- Motion sensor

Human Interfaces:
- Tactile switch for manual reset (rear panel)
- LED to indicate device state, network status and input/output signal indications (front panel)

Included Accessories:
- 5V USB AC Power Supply
- 2.5m USB Micro-B Cable

Installation Guide

Requirements

Before setting up your Air-conditioning Adapter, please consider the following system requirements:

1. **The Air-conditioning Adapter requires a reliable connection to the Internet to function properly.**
   Internet connectivity can be provided to the Air-conditioning Adapter through the following methods:

   ➢ **OPTION 1:** Direct Wireless connection to your home Internet router (using the 2.4GHz Wi-Fi band)

   Combined Energy   Home Router   Air-conditioner Adapter
   Cloud Data Service
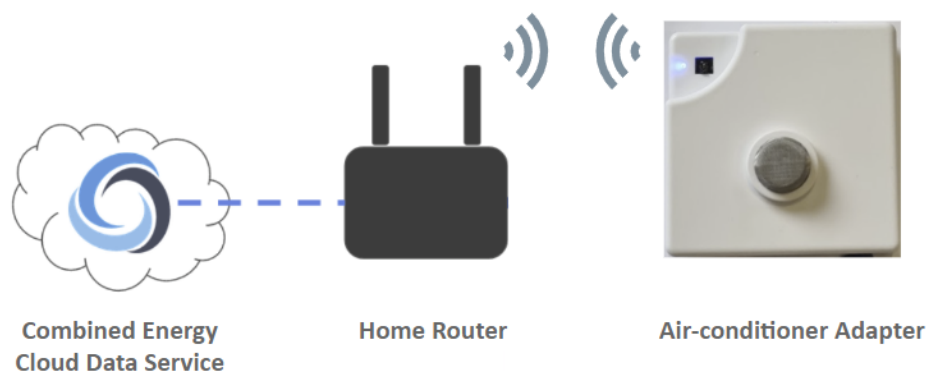
   ➢ **OPTION 2:** Connection to a third-party Wi-Fi extender (extender joined to home Wi-Fi network)

   Combined Energy   Home Router   WiFi Extender   Air-conditioner Adapter
   Cloud Data Service

2. **You must have a user account set up with Combined Energy to use the Air-conditioning Adapter.**
   This account should have been created for you by the company that installed your energy management system. Your account login will be either your email address or mobile phone number.

3. **A Combined Energy Gateway (GW1) or Energy Management Unit (EMU) must be installed to use the Air-conditioning Adapter.**
The EMU / Gateway coordinates energy devices in the home and runs the Home Energy Management System (HEMS).

Setup and Installation

Setup and Installation of an Air-conditioning Adapter involves the following steps:

1. **Joining the Adapter to the home Wi-Fi network** so it can communicate with the Energy Management Unit (EMU) / Gateway
2. **Configuring the Adapter with the correct air-conditioner model** so it knows how to talk to your particular brand of air-conditioner
3. **Mounting the Air-conditioning Adapter on the wall** in a position with line of sight to the air-conditioner head unit
4. **Adding the air-conditioner to your Home Energy Management System** so that it can be monitored and controlled via the *atHome* web app

Joining the Adapter to the home Wi-Fi network

1. Before attaching the Air-conditioning Adapter to a surface with the adhesive tape, it is recommended to first check the device functionality:
   a. Plug in the USB Micro-B cable to the USB Power Adapter and Air-conditioning Adapter

   b. Observe that the Blue LED on the front of the Air-conditioning Adapter lights up. It will remain on for about 10 seconds and then start blinking every second.

   c. If the device does not show a blue LED light or the expected light blinking pattern when powered on, the device can be reset by following the steps in the **Resetting the Device** section of this manual.

2. Using a **Smartphone** navigate to either the Google Play Store (Android) or Apple App Store (iOS) and search for "ESPTouch"

From the Google Play Store install and run this application developed by 'KhoaZero123'
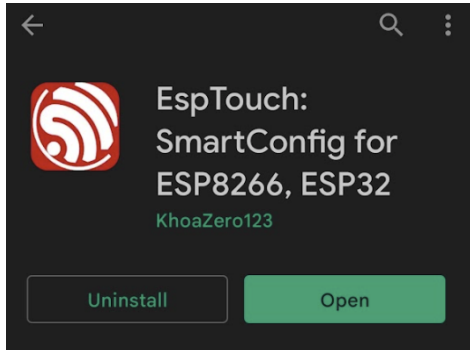
From the Apple App Store install and run this application developed by "Espressif Systems (Shanghai) Co., Ltd."


3. Ensure that your **Smartphone** is currently joined to the same **2.4GHz Wi-Fi connection** that the Air-conditioning Adapter will be connected to.

The Air-conditioning Adapter device is unable to communicate with 5GHz Wi-Fi networks, so this frequency can not be used to set up the Air-conditioning Adapter.

4. Follow the onscreen prompts in the ESP Touch App to grant the app the requested permissions. As this is a one-time process, permissions can be granted temporarily.
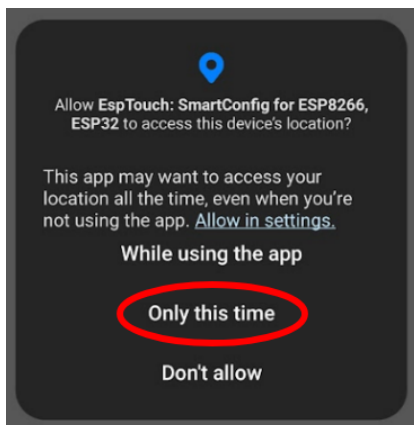
5. Once you have granted permission to the ESP Touch App it will automatically fill in the following fields detailing the 2.4GHz network. Enter the Wi-Fi **Password** and tap on 'confirm':
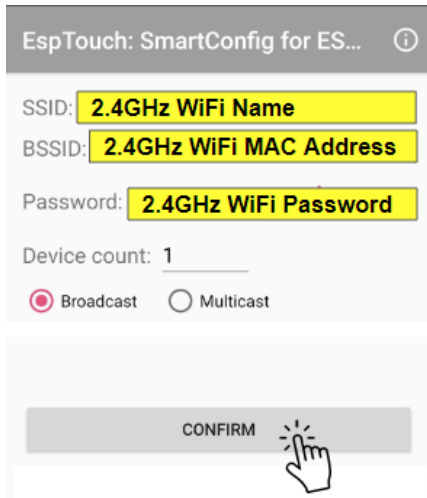
6. The ESP Touch App will now scan the Wi-Fi network for the new Air-conditioning Adapter:
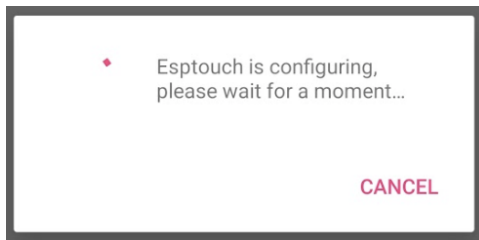
7. When the Air-conditioning Adapter is found, the ESP Touch App will report a successful connection and give details for the Air-conditioning Adapter's unique MAC address as well as it's local IP address:
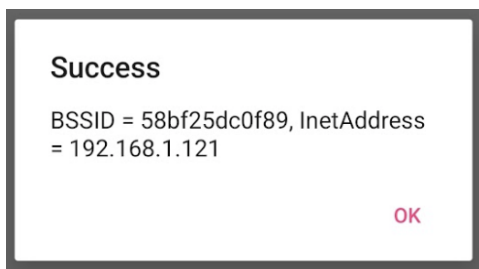
8. If the device is not found, reset the Air-conditioning Adapter using the Device Resetting Guide on page 17 and try again.
    a. If the process fails multiple times, try moving the Air-conditioning Adapter closer to the Wi-Fi router. If the connection then succeeds, it may be necessary to add a Wi-Fi Extender to ensure a reliable connection.

9. Once the Air-conditioning Adapter has successfully connected via the ESP Touch App, the Air-conditioning Adapter will retain the Wi-Fi credentials and automatically connect to the network once powered on.

Configuring the Adapter with the correct air-conditioner model

To be able to transmit the correct Infrared (IR) signals to the air-conditioner, the Air-conditioning Adapter needs to be configured. This is accomplished by sending some command to the Air-conditioning Adapter using the remote control supplied with the air-conditioner appliance. These steps only need to be completed once, unless the Air-conditioning Adapter is manually reset.

1. Power the Air-conditioning Adapter off and back on by unplugging and replugging the USB Micro-B power cable from the USB Power Adapter.

2. When the Air-conditioning Adapter first powers on, the blue LED should turn on and remain on for about 30 seconds. While the LED is in this state, aim the air-conditioner's remote controller at the Air-conditioning Adapter and press any button to 'teach' the Air-conditioner what model of air-conditioner it will be talking to.

3. When the Air-conditioning Adapter is configured correctly the blue LED will blink with every button press of the remote controller (providing the remote controller is pointed at the Air-conditioning Adapter's IR receiver). If the blue LED does not light up after every button press, go back to step 1 and try again.

4. To verify that the Air-conditioning Adapter configuration was successful, power the Air-conditioning Adapter off and on, and check that it connects to the Wi-Fi network successfully and receives input from the air-conditioner remote.
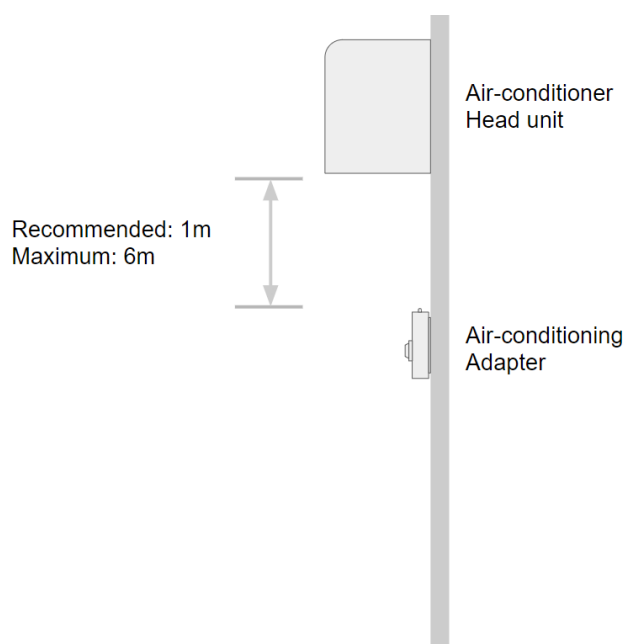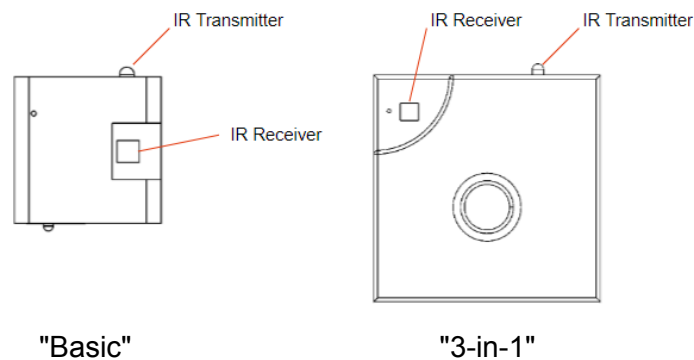
Mounting the Air-conditioning Adapter on the wall

For best results the Air-conditioning Adapter should be positioned so that it receives IR signals from the air-conditioner remote when the remote is being pointed at the air-conditioner head unit.

For typical split system air-conditioners it is recommended to place the Air-conditioning Adapter below the head unit with approximately 1m spacing, ensuring that the IR transmitter has direct line-of-sight with the IR receiver found on the air-conditioner head unit.

For non-typical systems or alternative arrangements, the Air-conditioning Adapter has a maximum IR signal range of 6m. At or beyond this range it is unlikely that the Air-conditioning Adapter will be able to control the air-conditioner.

Different lighting conditions can impact the ability for the adapter to communicate with the head unit, so it is recommended to test functionality at different times to ensure the decided installation location is suitable and will work continuously.

"Basic"   "3-in-1"

Air-conditioner Head unit

Recommended: 1m
Maximum: 6m

Air-conditioning Adapter

The photo below shows an example of correct placement of the Air-conditioning Adapter relative to the air-conditioner head unit:

Adding the air-conditioner to your Home Energy Management System

Once your Air-conditioning Adapter has been joined to your Wi-Fi network and configured using the air-conditioner remote, it needs to be added to your Home Energy Management System (HEMS).

To have a new air-conditioner device added to your HEMS, please contact Combined Energy by emailing **support@combined.energy**

The Air-conditioning Adapter lets you control your air-conditioner via the *atHome* web app and can report data from its sensors (e.g. room temperature), however it can not monitor the power consumption of the air-conditioner by itself. Monitoring the power consumption of the air-conditioner requires a Combined Energy Power Meter with a current sensor (CT) be installed in the electrical switchboard. For more information on power metering, please contact Combined Energy.

Resetting the Device

If the Air-conditioning Adapter

- does not show the expected LED light status after powering up or during operation

- is having problems sending or receiving signals or commands

- is needing to be used with a new network or site

Then it is recommended to reset the Air-conditioning Adapter. Resetting the Air-conditioning Adapter will revert it back to the factory default configuration, allowing for reconfiguration by following the 'Setup Steps' on Page 9 of this manual.

To Reset the Air-conditioning Adapter:

1. Press and hold the reset button found on the rear of the device for 5 seconds:
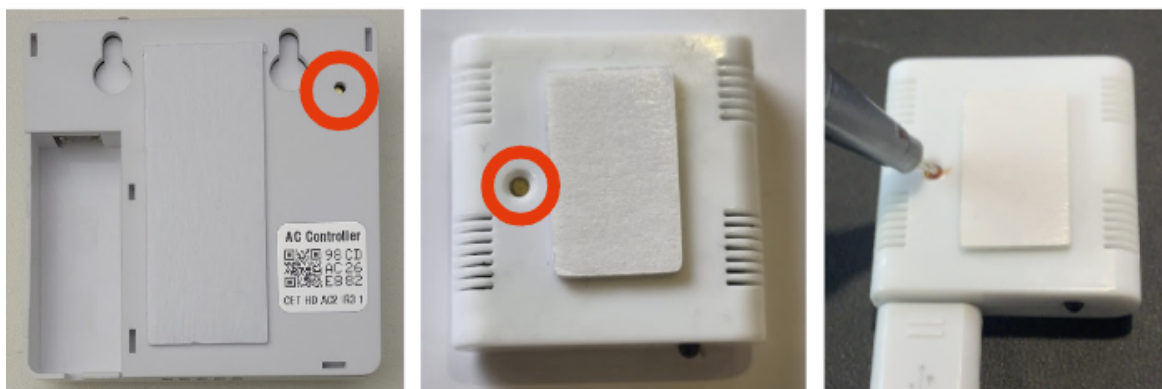
2. After 5 seconds the blue LED will begin to flash indicating a successful reset. Release the button.

3. Wait for 10 seconds before then powering the Air-conditioning Adapter off.

4. If successfully reset, once it is powered back on the Air-conditioning Adapter will show a solid blue LED light before displaying a blinking blue light indicating it is ready for setup.

User Interface

Standard Light Indications

All models – Blue LED Network Indicator:

Solid Blue – Power On / Waiting for IR Signal

Flashing Blue (1s on, 1s off) – Waiting for network

Flashing Blue (rapid) – Firmware update (automatic)

Short Blue flash– IR Signal Received

CET-HD-AC2-IR3-1 model – Red LED Sensor Indicator:

Red (two blinks) – Motion Sensor Indicator

Red+Blue (Purple) – Device is starting up

Buttons

All models – Reset switch found on rear panel.

CET-HD-AC2-IR3-1 model – "manual switch control" button on side panel (currently performs no function)

Remote Control via the *atHome* web app

Once your Air-conditioning Adapter has been added to your Home Energy Management System you can control your air-conditioner remotely via the *atHome* web app.

Log in to https://athome.combined.energy/, navigate to your air-conditioner using the side menu, then open the **Settings** tab at the top-right of the screen to access the air-conditioning controls.

If you have a Combined Energy Power Meter installed and monitoring the air-conditioner's power circuit, live power consumption and energy usage history will be available through the *atHome* web app.