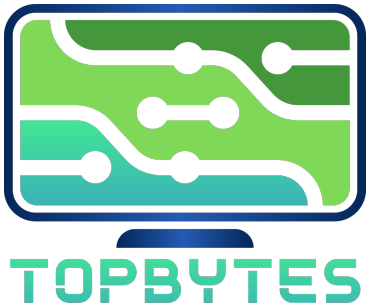

TopBytes OctoIHD https://topbytes.net

Release 0.1.0

User Manual

Nov 26, 2026

OCTOIHD

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Welcome to the OctoIHD user manual.

OctoIHD is an in-home energy display from TopBytes Ltd for Octopus Energy customers. A 7-inch capacitive touchscreen driven by an ESP32-S3 shows what your home is using right now, read from your **Octopus Home Mini**, together with day, week and month charts and a running bill costed against your actual tariff — including Intelligent Octopus Go smart-charge slots, standing charges, VAT, export and Octoplus events such as Power Ups and Happy Hours.

OctoIHD talks to Octopus Energy directly over your home WiFi using your own API key. There is no app, no account with TopBytes and no server in between: plug it in, join it to your WiFi, enter your Octopus account number and API key, and the screens fill in.

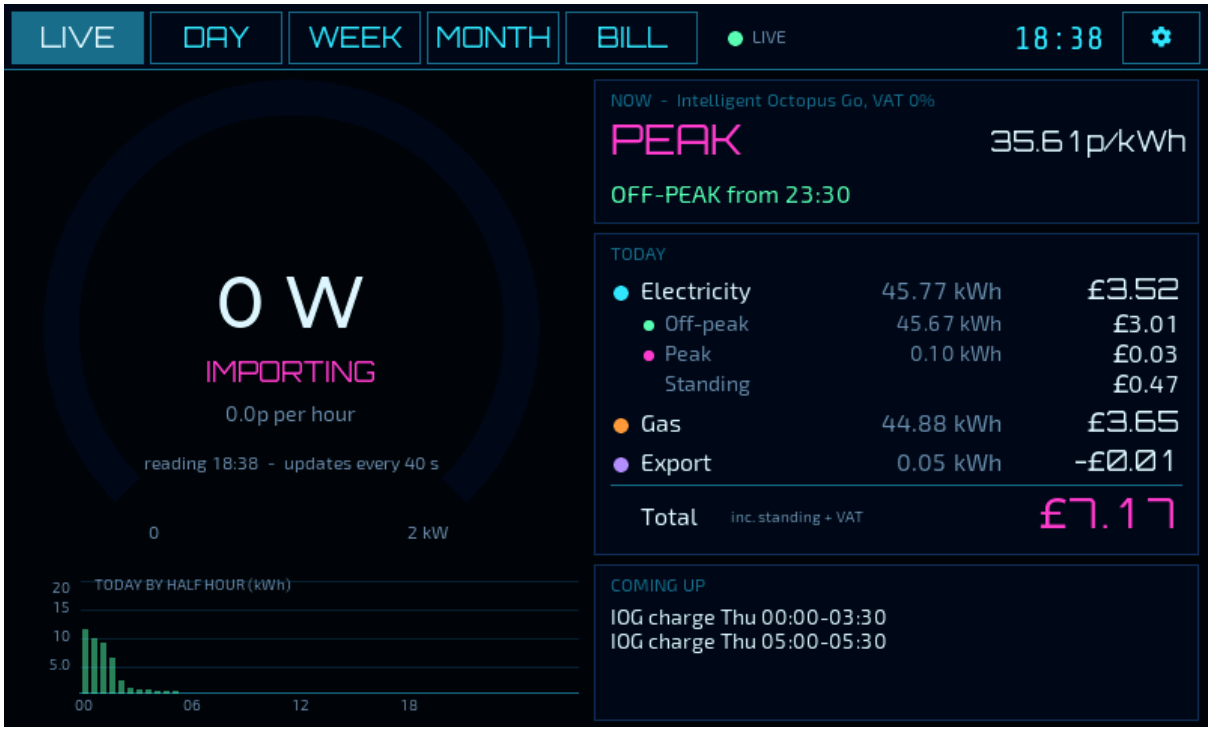

Fig. 1: The **Live** screen (Neon theme).

CHAPTER

ONE

INTRODUCTION

1.1 What is OctoIHD?

OctoIHD is an in-home display (IHD) for households supplied by Octopus Energy. It sits on a desk, shelf or kitchen worktop and answers the questions people actually ask about their energy:

- **What am I using right now, and what is it costing per hour?**
- **Am I on the cheap rate or the peak rate, and when does that change?**
- **What have today, this week and this month cost — including standing charges and VAT?**
- **What will this month's bill come to?**
- **How much did smart charging my car save?**

It reads live demand from your **Octopus Home Mini** and your half-hourly history, tariff, bills and credits from your Octopus account, then costs every half hour itself against your real tariff.

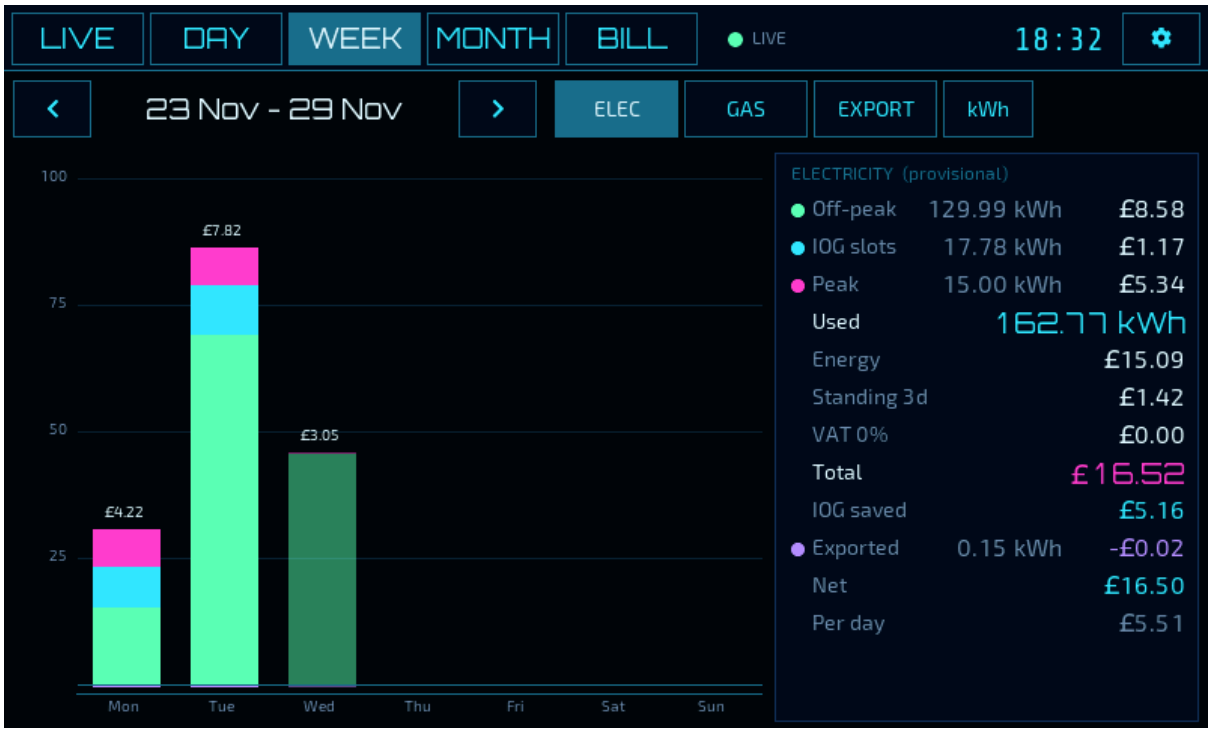

Fig. 1: The **Week** screen: each day split into off-peak, Intelligent Octopus Go slots and peak, with the week's costs on the right.

1.2 Key Features

1.2.1 7-inch Colour Touchscreen

A bright 800 × 480 capacitive touchscreen, readable across the room. Five screens — **LIVE**, **DAY**, **WEEK**, **MONTH** and **BILL** — are one tap away on the tab bar.

1.2.2 Live Power and the Rate Now

A large gauge shows your home's demand in watts, whether you are importing or exporting, and what that costs per hour at the current rate. Next to it: the tariff band you are in now, its price per kWh, and when the next band starts.

1.2.3 Costs That Match Your Bill

Every half hour is costed against the tariff in force at the time, with daily standing charges and VAT worked out per fuel per day (0% is a normal rate and is shown as such). Days that Octopus has already settled use Octopus's own costs; today is worked out on the device and marked *provisional* until it settles.

1.2.4 Intelligent Octopus Go Aware

On Intelligent Octopus Go, smart-charge slots outside the normal 23:30–05:30 off-peak window are shown as **IOG slots** and costed at the off-peak rate, just as Octopus bills them. Upcoming charging slots are listed on the Live screen, and the Bill screen shows how much smart charging saved compared with charging at the peak rate.

1.2.5 Many Octopus Tariffs

As well as Intelligent Octopus Go, OctoIHD understands Octopus Go, Agile, Cosy, Flux, Intelligent Flux, Snug, Tracker, Economy 7 and single-rate tariffs such as Flexible and Fixed. See *Supported Tariffs*.

1.2.6 Electricity, Gas and Export

Gas is shown alongside electricity, with its own standing charge and VAT. If you have an export meter, exported energy and earnings appear too, and totals are shown net of export.

1.2.7 Octoplus Events and Credits

Power Ups are costed at 0p, Weekend Happy Hour credits are matched back to the hour they paid for, joined Power Downs are marked on the Day chart, and goodwill, Octopoints and referral credits are listed separately on the Bill screen.

1.2.8 Settings Website

Everything can be set on the touchscreen, and a settings website at `http://octoihd.local` lets you enter your API key and change settings from a phone or computer on your home network, protected by a pairing code shown on the screen.

1.2.9 Three Themes and Night Mode

Choose **Classic**, **Neon** or **Amber**. A night-mode schedule can switch the screen off, dim it, or show a dark night screen with the clock, live power and the current rate.

1.2.10 Over-The-Air Updates

New firmware is delivered over WiFi from the TopBytes update service.

1.3 Requirements

1.3.1 To Run OctoIHD

- An **Octopus Energy** electricity account (gas and export are optional)
- An **Octopus Home Mini** paired to your smart meter, for live power and today's readings
- Your Octopus **account number** (`A-` followed by eight characters) and **API key** (starts `sk_live_`), both from your account on the Octopus Energy website
- A **2.4 GHz WiFi** network with internet access
- A **5 V USB-C** power supply rated 1 A or more

Note: Without a Home Mini, OctoIHD can still show settled history and costs from your account, but not live power or today's half-hourly use.

1.4 How It Works

```
Smart meter -> Octopus Home Mini -> Octopus Energy -(internet)-> your WiFi -> OctoIHD
                                        (your account)                              (7
↪" touchscreen)
```

1. Your Home Mini reads the smart meter and sends readings to Octopus.
2. OctoIHD asks Octopus for the latest reading about every 40 seconds, and for your tariff, half-hourly history, planned smart-charge slots, bills and credits on longer schedules.
3. It costs each half hour against your tariff and stores about 100 days of history on the device, so it survives a power cut without downloading everything again.

1.5 Typical Use Cases

1.5.1 Kitchen or Hallway Display

See at a glance whether the oven, kettle or heater is pushing demand up, and what it is costing per hour.

1.5.2 EV and Battery Owners

Watch the off-peak window and smart-charge slots, and check what charging the car really cost.

1.5.3 Keeping an Eye on the Bill

Follow the bill period as it builds and see a month-end estimate, instead of waiting for the statement.

1.6 Design Philosophy

1.6.1 Standalone

OctoIHD talks to Octopus directly. Your API key is stored on the device and only ever sent to Octopus.

1.6.2 Accurate Before Pretty

Figures are worked out the way Octopus bills them — dated rates, daily standing charges and VAT per fuel — and are labelled *provisional* until Octopus settles them.

1.6.3 Kind to Your Octopus App

Octopus limits how often an account's live readings can be fetched, and the limit is shared with the Octopus app. OctoIHD keeps well inside it so the app keeps working.

CHAPTER

TWO

GETTING STARTED

This section takes you from the box to a working display. Setup has two parts: joining OctoIHD to your WiFi, and connecting your Octopus Energy account. A phone is the easiest way to do the second part.

2.1 Before You Start

Have these ready:

- Your home **WiFi name and password** (2.4 GHz)
- Your Octopus **account number**, shown on your bills and at the top of your account page on the Octopus Energy website. It looks like `A-1234ABCD`.
- Your Octopus **API key**. Sign in at octopus.energy, open **Account**, then **Personal details**, and find the API key in the developer / API access section. It starts with `sk_live_`.

> **Warning:** Your API key can read your whole Octopus account. Treat it like a password: only enter it on OctoIHD's own setup page or settings website.

2.2 Unboxing and First Power-On

1. Connect a USB-C cable to the OctoIHD's USB-C port.
2. Connect the other end to a 5 V USB power supply (wall adapter or a quality power bank).
3. The screen lights up and the tab bar (**LIVE DAY WEEK MONTH BILL**) appears.

Note: Use a quality 5 V USB-C power supply rated at 1 A or more. Insufficient power may cause restarts or display instability.

2.3 Step 1 — Join Your WiFi

With no WiFi saved, OctoIHD starts its own setup hotspot named `OctoIHD-XXXX` (the last four characters are unique to your unit) and shows a **WiFi Setup** panel with two options:

```
WiFi Setup

No WiFi configured.

Option A  -  Join the hotspot "OctoIHD-XXXX" from a phone/laptop,
```

(continues on next page)

(continued from previous page)

```
then open a browser to set up WiFi.

Option B  -  Scan for a network here on the screen:

[ Scan for networks ]
```

2.3.1 Option A — From a Phone (Recommended)

This lets you enter your WiFi *and* your Octopus details in one go.

1. On your phone, open WiFi settings and join the open network `OctoIHD-XXXX`.
2. A setup page should open by itself. If it doesn't, open a browser and go to `http://192.168.4.1`.
3. Fill in **Octopus account** first: your account number and API key, then tap **Save & test connection**. (The test finishes once OctoIHD is on your WiFi.)
4. Then, under **WiFi**, choose your network (or type its name), enter the password and tap **Save & connect**.

OctoIHD leaves hotspot mode and joins your WiFi. Your phone will drop back to its normal network.

Tip: No pairing code is needed on the hotspot page: only someone close enough to join the unit's own hotspot can reach it.

2.3.2 Option B — On the Touchscreen

1. Tap **Scan for networks**. A **Select network** list shows nearby 2.4 GHz networks; a keyboard icon means the network needs a password. Tap **Rescan** to look again, or **Other (enter manually)** for a hidden network.
2. Tap your network, type the password on the on-screen keyboard and tap **Add network**.

Then connect your Octopus account from the settings website (Step 2).

Note: OctoIHD does not support 5 GHz networks. Make sure your router has 2.4 GHz enabled.

2.4 Step 2 — Connect Your Octopus Account

If you entered your Octopus details on the hotspot page, skip to *Step 3 — First Data*.

Otherwise the Live screen shows **Connect your Octopus account** with the address to use. On a phone or computer on the **same home network**:

1. Open `http://octoihd.local` (or the IP address shown on the screen).
2. The page asks you to **Pair this browser**. Tap **Show code on device**.
3. A six-digit code appears on the OctoIHD screen. Type it into the browser and tap **Pair**. The code is valid for two minutes.
4. Under **Octopus account**, enter your account number and API key and tap **Save & test connection**.
5. OctoIHD looks up your meters and tariffs. **Meters found** lists each electricity, export and gas meter, with **Home Mini** marked against the meters your Home Mini reads. If you have more than one gas meter, pick the one your Home Mini reads and tap **Use these meters**.

See *The Settings Website* for everything else on the site.

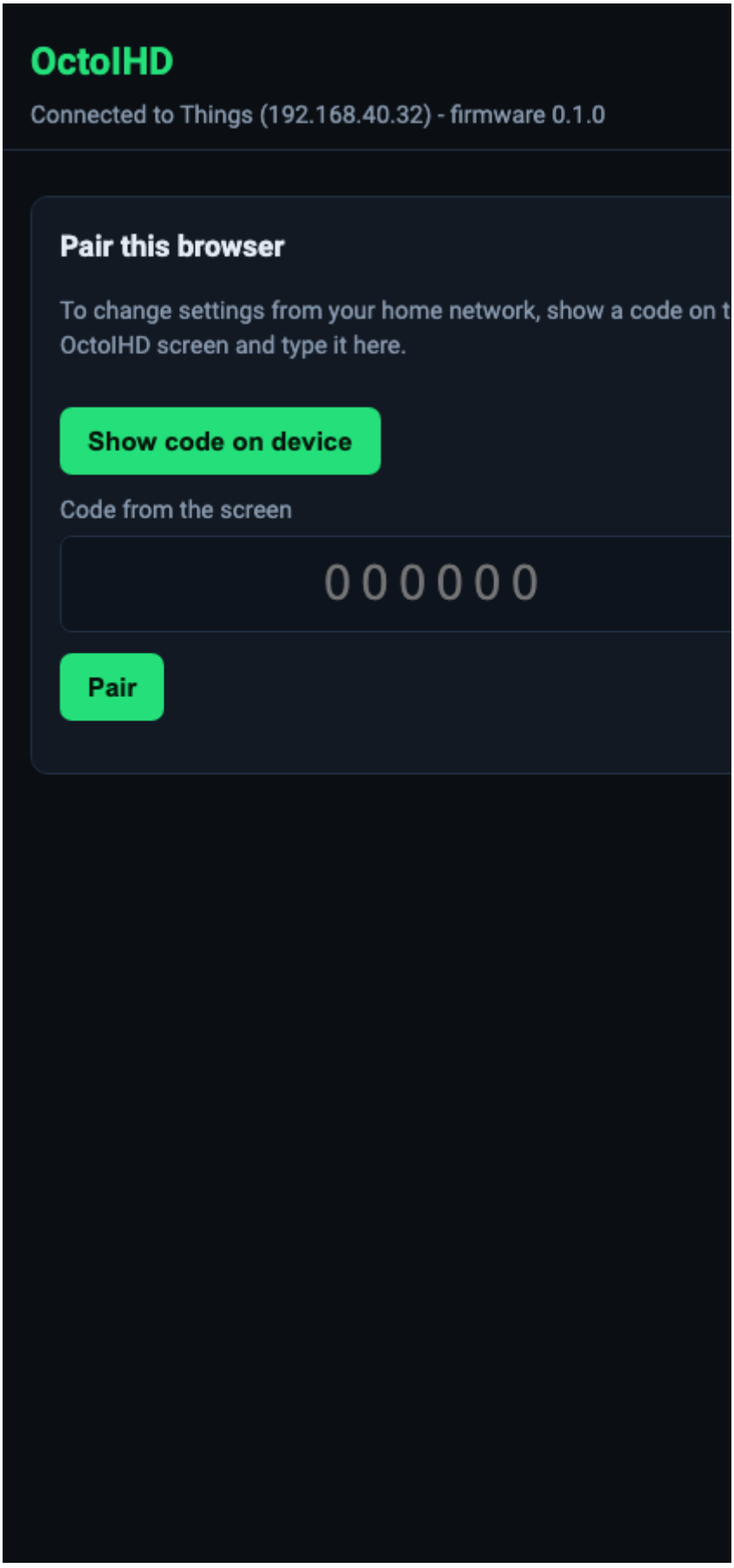

Fig. 1: The settings website before pairing.

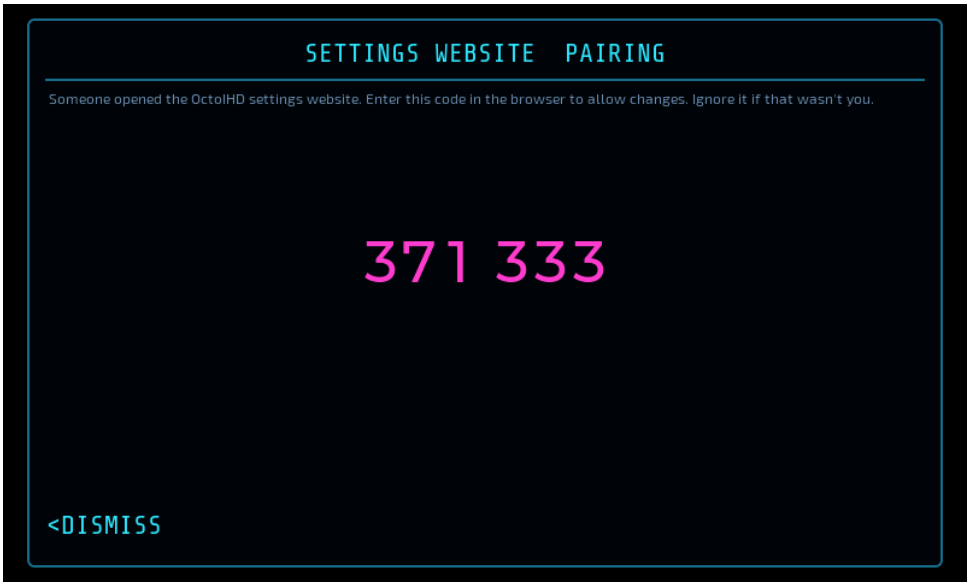

Fig. 2: The pairing code on the display.

2.5 Step 3 — First Data

Once connected, the status beside the tabs changes from **CONNECTING** to **LIVE**:

- The **Live** screen shows your current demand and today's costs within a minute or so.
- The **Day**, **Week** and **Month** charts fill in as history downloads in the background. Until a period has arrived the chart says *No data for this period yet. History downloads in the background.*
- About 100 days of history are kept on the device and survive a restart.

That's it — OctoIHD now runs on its own. It reconnects by itself after power cuts and WiFi drops.

2.6 Placement Tips

- Keep it within good range of your WiFi router.
- Avoid direct sunlight on the screen.
- If you mount it upside down (cable from the top), set **SCREEN** to **180 FLIP** in settings.

2.7 Availability

OctoIHD is not on sale yet. It will be available direct from TopBytes; to ask about availability, contact TopBytes at https://topbytes.net/#contact or support@topbytes.net.

CHAPTER

THREE

OPERATION

This section explains each screen and what every figure means.

3.1 Screen Layout

Across the top of every screen:

- **Tabs** — **LIVE**, **DAY**, **WEEK**, **MONTH** and **BILL**. Tap one to switch screens.
- **Status** — a coloured dot and word beside the tabs:

`LIVE`	Connected; data received in the last two minutes
`STALE`	Connected, but nothing new from Octopus for over two minutes
`CONNECTING`	Looking up your account, meters and tariff
`NO ACCOUNT`	No Octopus account number / API key entered yet
`KEY REJECTED`	Octopus refused the API key or account number
`API ERROR`	Octopus returned an error; OctoIHD keeps retrying
`NO WIFI`	Not connected to WiFi
`SETUP`	Running its setup hotspot

- **Clock** — local time, set automatically over the internet.
- **Settings** — the gear button opens the settings menu (see *Configuration*).

3.2 Rate Bands and Colours

Each half hour of electricity is put in a *band* according to your tariff. Bands are colour-coded the same way on every screen; the names follow your tariff:

Band	Meaning
Off-peak	The cheap rate — named **NIGHT** on Economy 7, **COSY** on Cosy and **CHEAP** on Agile
IOG slot	An Intelligent Octopus Go smart-charge slot *outside* the normal off-peak window, billed at the off-peak rate
Day, Standard	The middle rate on three-rate tariffs (Cosy, Flux, Agile)
Peak	The standard or peak rate (named **DAY** on Economy 7)
Power Up	A free-electricity Power Up event, costed at 0p

Gas and export have one colour each.

3.3 The Live Screen

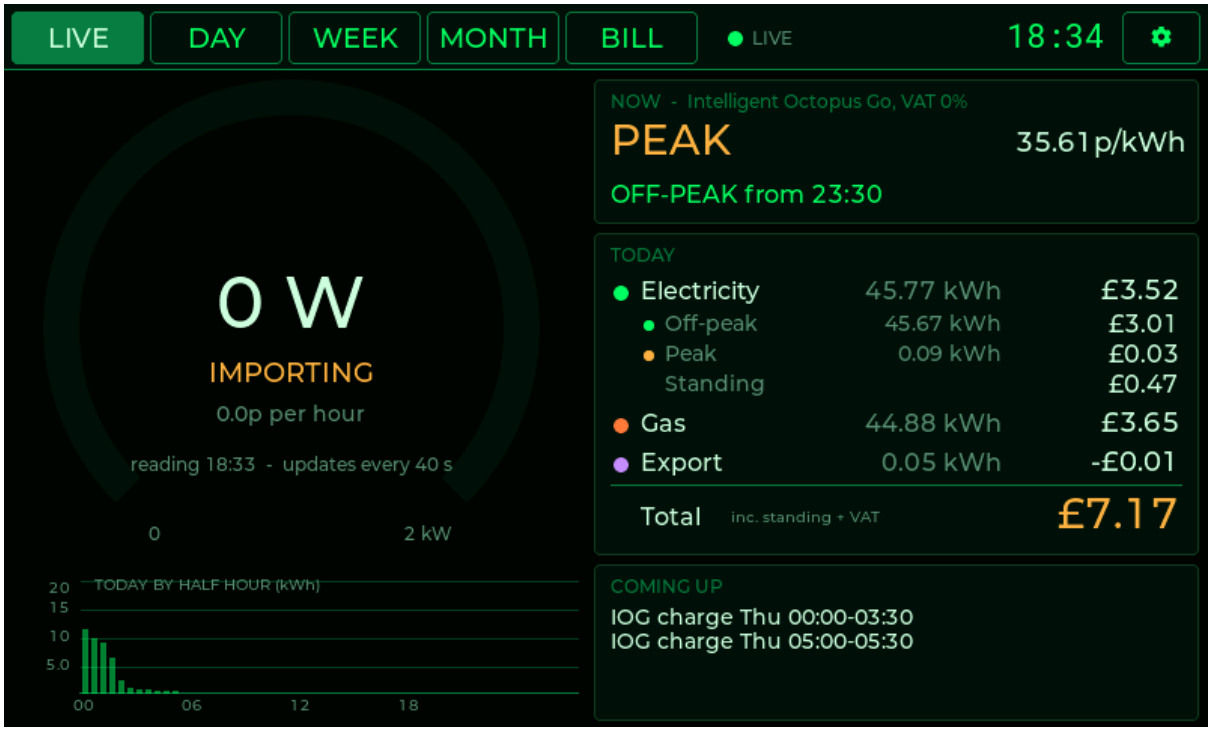

Fig. 1: The Live screen (Classic theme) with two Intelligent Octopus Go charging slots coming up.

3.3.1 Demand Gauge (Left)

- **Watts** — your home's demand from the latest Home Mini reading.
- **IMPORTING / EXPORTING** — whether power is coming from or going to the grid.
- **Cost per hour** — what the current demand costs at the current rate (or *sending power to the grid* while exporting).
- **Reading time** — when the reading was taken and how often it updates, normally *updates every 40 s*.
- The gauge's scale adjusts to your demand.

Tap the gauge to fetch a new reading straight away.

Below the gauge, **TODAY BY HALF HOUR (kWh)** is a small chart of today's electricity use.

During special events the line under the gauge changes, for example **HAPPY HOUR until 16:00 - usage credited** or **POWER DOWN until 18:00 - 0.42 kWh**.

3.3.2 NOW Panel (Top Right)

- Your tariff name, and VAT if it is 0%.
- The **band you are in now** (e.g. **PEAK**) and its price per kWh including VAT.
- When the next band starts (e.g. **OFF-PEAK from 23:30**).

3.3.3 TODAY Panel

- **Electricity** — kWh and cost so far today, broken down by band, plus today's standing charge.
- **Gas** — kWh and cost so far today.
- **Export** — kWh exported and earnings (shown as a minus).
- **Total** — today's cost including standing charges and VAT, less export.

3.3.4 COMING UP Panel

Upcoming events from your account, with day and time:

- **IOG charge / Boost** — planned Intelligent Octopus Go smart-charge slots
- **Power Up** — free-electricity events
- **Power Down / Power Down offer** — joined and offered Power Down sessions
- **Happy Hour** — Weekend Happy Hours you have booked

If nothing is planned it says *No IOG charging or Power Up planned.* (or *Nothing planned.* on other tariffs).

3.4 The Day, Week and Month Screens

These three screens work the same way: a bar chart on the left and a summary on the right.

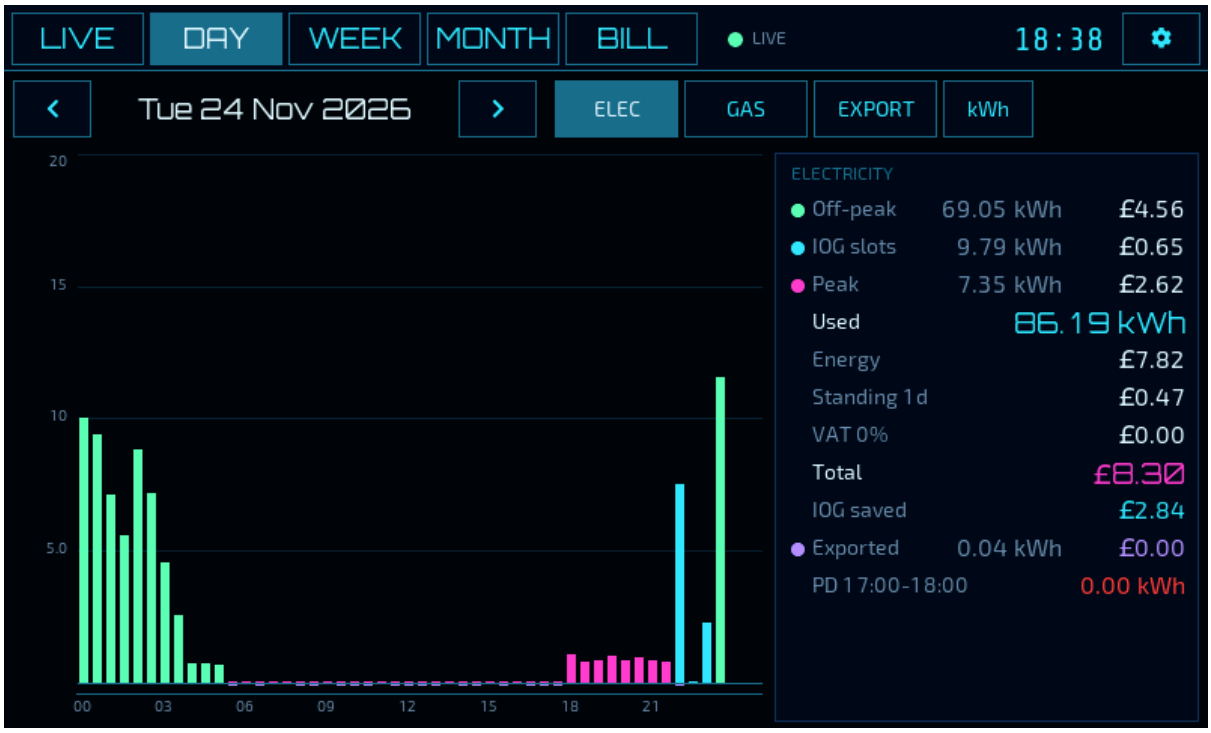

Fig. 2: A day with an Intelligent Octopus Go evening: peak use from 18:00 and smart-charge **IOG slots** before the 23:30 off-peak window.

3.4.1 Controls

- **◄ / ►** — previous or next day, week or month. The title shows the period.
- **ELEC / GAS / EXPORT** — which fuel to chart.
- **kWh / £** — chart energy or cost.
- **Tap a bar** to see that half hour or day on its own; the summary title changes to **SELECTED** with its time. Tap it again to go back to the whole period.

3.4.2 The Charts

- **Day** — 48 half-hour bars.
- **Week** — seven daily bars, Monday to Sunday, with each day's cost above the bar.
- **Month** — one bar per day.

Electricity bars are stacked by band (off-peak, IOG slot or middle rate, peak). If you have an export meter and **Show export** is on, export is drawn below the axis on the electricity chart. Days or slots that Octopus has not settled yet are drawn **dimmer**.

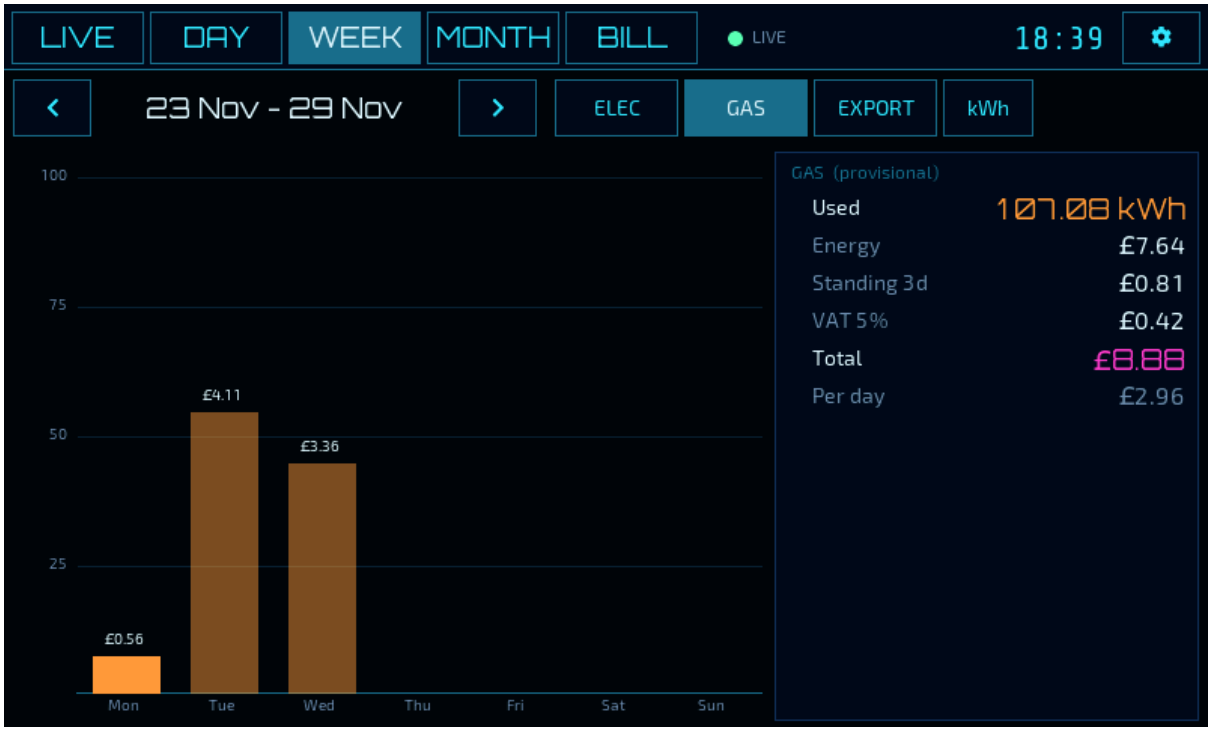

Fig. 3: Gas for the week. Monday is settled; Tuesday and Wednesday are still provisional (dimmer bars).

3.4.3 The Summary

From top to bottom (rows only appear when they apply):

Row	Meaning
Band rows	kWh and energy cost for each band (electricity)
Used / Exported	Total kWh for the period
Energy	Cost of the energy, before VAT
Standing Nd	Standing charge for N days
VAT x%	VAT on energy and standing charge, at the rate Octopus charged (0% is normal for some periods)
Total	Energy + standing + VAT
IOG saved	What smart-charge slots saved compared with paying the peak rate for that energy
Exported / Net	Export earnings, and electricity cost less export
Month est. (all)	Estimated total for the month, all fuels, net of export and Happy Hour credits (Month screen, current month only)
Per day	Average cost per day (Week and Month)
Happy Hour	Happy Hour credits matched to this period
Happy Hr due	Hours you have marked as Happy Hour that Octopus has not credited yet (an estimate)
After credits	Electricity total less Happy Hour credits
PD hh:mm-hh:mm	A Power Down you joined, with the kWh you used during it (Day screen)

(provisional) after the fuel name means part of the period is still today's readings rather than Octopus's settled figures.

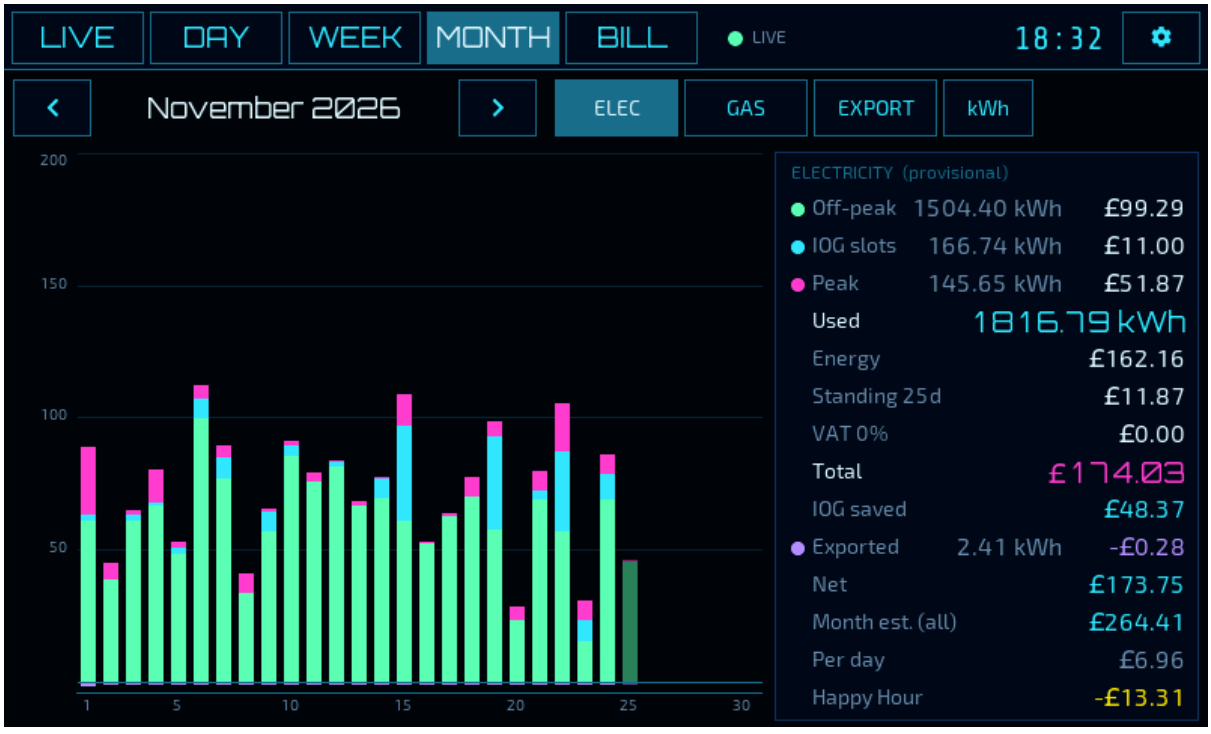

Fig. 4: The Month screen, with the month-end estimate and Happy Hour credits.

3.4.4 Marking a Happy Hour

Octopus only posts a Weekend Happy Hour credit days later. To keep the day's figures honest in the meantime, select a half hour on the **Day** screen and tap **HAPPY HR** to mark that hour; it is then counted as *Happy Hr due*. The button shows **BOOKED** for hours booked through Octopus and **CREDITED** once Octopus's credit has been matched. Tap **UNMARK HH** to remove a mark.

3.5 The Bill Screen



Fig. 5: The Bill screen (credits list blurred).

BILL SO FAR covers the current bill period — from the day after your latest Octopus bill up to today — and builds up like a statement:

- **ELECTRICITY** — kWh × rate for each band, standing charge (days × daily charge), VAT and total.
- **GAS** — energy, standing charge, VAT and total.
- **EXPORT** — kWh × export rate, shown as a minus.
- **HAPPY HOUR** — credits matched to your usage, and any booked hours whose credit is still due.
- **NET** — what the period has cost so far. *today is provisional* means today's figures will be replaced by Octopus's when they settle.
- **IOG SAVED** — what smart charging saved compared with the peak rate.

OTHER CREDITS (not in the total) on the right lists goodwill, Octopoints and referral credits with their date and amount. They are kept out of the energy costs and totals, because they don't pay for specific usage. You can hide the list from the settings website.

A note at the bottom shows whether you are enrolled for Power Ups, how many Power Downs you have joined this bill and your Octopoints balance.

3.6 The Night Screen

If night mode is set to **Night screen**, the display shows a dark, low-glare screen during the night window: the clock, live power and the current band and rate. Touch it to bring back the normal screens for five minutes. See *Night Mode*.

3.7 Normal Operation

3.7.1 Power-On

1. The screen and tabs appear.
2. OctoIHD joins your WiFi, sets its clock and checks for a firmware update.
3. It looks up your Octopus account, meters and tariff (**CONNECTING**).
4. The Live screen fills in, then history loads in the background.

3.7.2 Update Schedule

What	How often
Live demand (Home Mini)	About every 40 seconds (2 minutes while the screen is off at night)
Today's half-hourly electricity	Every 15 minutes
Today's gas	Every 30 minutes
Planned smart-charge slots	Every 5 minutes
Octoplus sessions (Power Downs, Happy Hours)	Every 30 minutes
Credits, bills and Power Ups	Every 6 hours
Account, meters and tariff	Once a day

Octopus limits live Home Mini readings to 125 per hour per account, shared with the Octopus app. OctoIHD keeps to about 100 per hour. If the limit is reached the gauge says **PAUSED UNTIL hh:mm** and *Octopus limit, shared with other apps*, and carries on by itself afterwards.

3.7.3 Auto-Recovery

- WiFi drops are retried automatically with increasing back-off.
- If Octopus is unreachable, the last figures stay on screen and updates resume when it answers again.
- History is stored on the device, so a restart only fetches what's new.

CHAPTER

FOUR

CONFIGURATION

4.1 Where Settings Live

OctoIHD's settings can be changed in two places, and both save to the same place on the device:

- **On the touchscreen** — tap the gear button at the top right.
- **On the settings website** — `http://octoihd.local` from a phone or computer on your home network (see *The Settings Website*). The Octopus API key can only be entered here or on the setup hotspot page.

Settings are kept through restarts and power cuts.

4.2 The Settings Menu

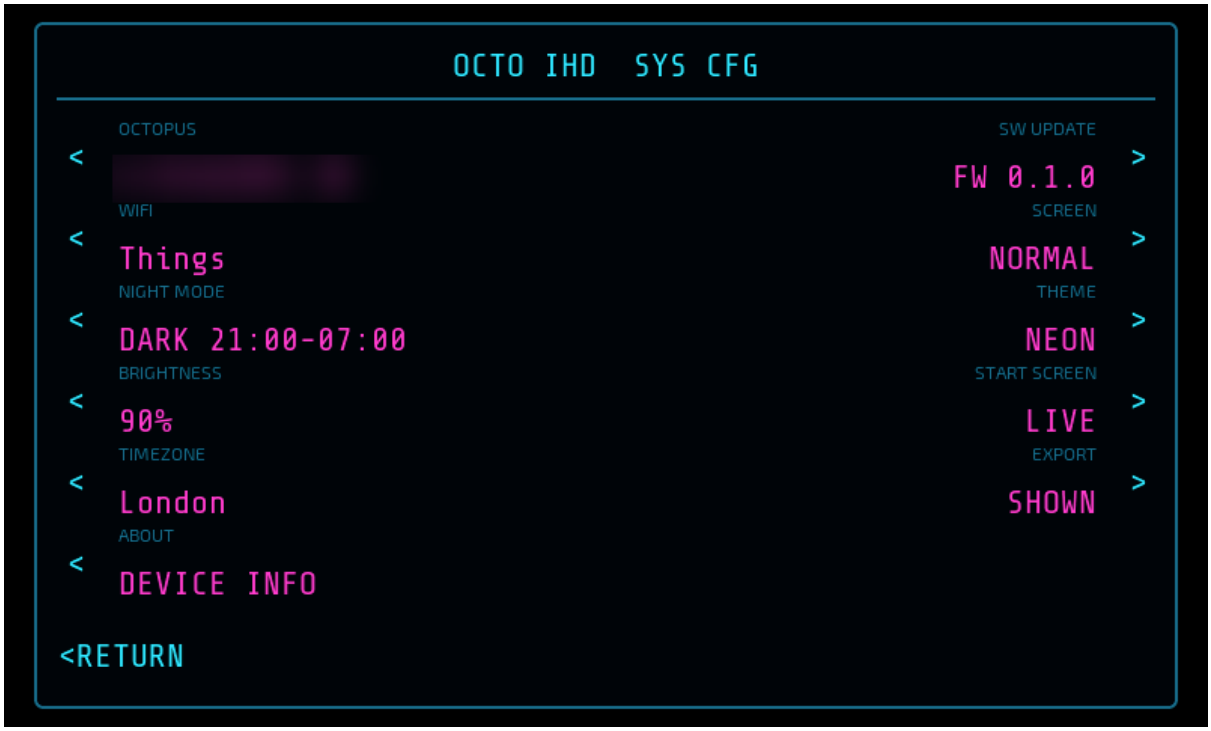

Fig. 1: The settings menu (account number blurred).

Tap a row to change it. Tap **<RETURN** to go back.

Row	What it does
OCTOPUS	Account status. Tap for the account number, masked API key, connection status, tariff and meters. Shows **SETUP ON WEB** until an account is entered.
WIFI	The connected network. Tap to manage saved networks.
NIGHT MODE	The night schedule, e.g. `DARK 21:00-07:00`. Tap to change.
BRIGHTNESS	Backlight level. Tap for a slider (**FIXED** on hardware whose backlight can't be dimmed).
TIMEZONE	The local time zone. Tap to choose.
ABOUT	Device information.
SW UPDATE	The firmware version. Tap to check for an update now.
SCREEN	**NORMAL** or **180 FLIP**. Tap to toggle.
THEME	The display theme. Tap to choose.
START SCREEN	The screen shown at power-on and after night mode. Tap to cycle LIVE, DAY, WEEK, MONTH, BILL.
EXPORT	**SHOWN** or **HIDDEN**: whether export appears on the screens.

4.3 Octopus Account

The account number and API key are entered on the settings website (or the setup hotspot page):

- **Account number** — looks like `A-1234ABCD`.
- **API key** — starts with `sk_live_`. Once saved, the key is never shown again: the website shows only its last four characters (`sk_live_...ab12`). Leave the box blank to keep the saved key.

Tap **Save & test connection**. OctoIHD looks up your account and lists the meters it found under **Meters found**, marking those read by your Home Mini. If you have more than one gas (or electricity) meter, choose the right one and tap **Use these meters**.

Changing to a different account number clears the stored meters and history, and downloads them again for the new account.

4.3.1 Supported Tariffs

OctoIHD recognises your tariff automatically and names the bands to match:

Tariff	How it is costed
Flexible, Fixed	One unit rate
Intelligent Octopus Go	Off-peak 23:30–05:30, plus smart-charge slots at the off-peak rate (**IOG slots**)
Octopus Go	Off-peak 00:30–05:30
Snug	Off-peak 00:30–06:30
Cosy	Cosy, day and peak rates through the day
Flux / Intelligent Flux	Off-peak, day and peak rates (import and export)
Agile	A new price every half hour
Tracker	One rate that changes daily
Economy 7	Night rate 00:30–07:30 GMT (see note)
Other time-of-use tariffs	The rates Octopus publishes for the tariff

Where Octopus publishes a tariff's rates, OctoIHD uses them directly; for private variants (for example loyalty fixes) it applies your account's rates to the tariff's standard pattern.

Note: Economy 7: Octopus publishes the day and night prices but not the times your meter switches. OctoIHD assumes the common smart-meter window of 00:30–07:30 GMT all year. Settled days use Octopus's own costs either way.

4.4 Night Mode

During a nightly window the screen can do one of three things:

- **SCREEN OFF** — the backlight turns off.
- **DIM** — the screen dims to a set level (5–50% on the touchscreen, in steps of 5%).
- **NIGHT SCREEN** — a dark screen with the clock, live power and the current rate (see *The Night Screen*).

Touching the screen during the window wakes the normal screens for **5 minutes**; the wake-up tap doesn't press anything underneath. After night mode the **start screen** is shown.

To set it on the touchscreen: **NIGHT MODE** row → set **Start** and **End** (hours and 5-minute steps) → **ENABLED/DISABLED**, mode, and dim level → save.

START 23:30 (OFF-PEAK) starts night mode at the Intelligent Octopus Go off-peak start instead of the start time.

While the screen is off, live readings are fetched every 2 minutes instead of every 40 seconds.

4.5 Brightness

10–100%, set with a slider on the touchscreen or on the website. On boards whose backlight can't be dimmed the row shows **FIXED** and the dim option is hidden.

4.6 Theme

CLASSIC	Phosphor green on black, amber values
NEON	Holographic HUD: cyan and magenta neon
AMBER	Vintage meter: amber dial, blue-green display

Tap a theme to use it. **The display restarts** to apply it and reloads its data, which takes about half a minute.

4.7 Screen Rotation

SCREEN switches between **NORMAL** and **180 FLIP**, for mounting the unit upside down. It applies immediately.

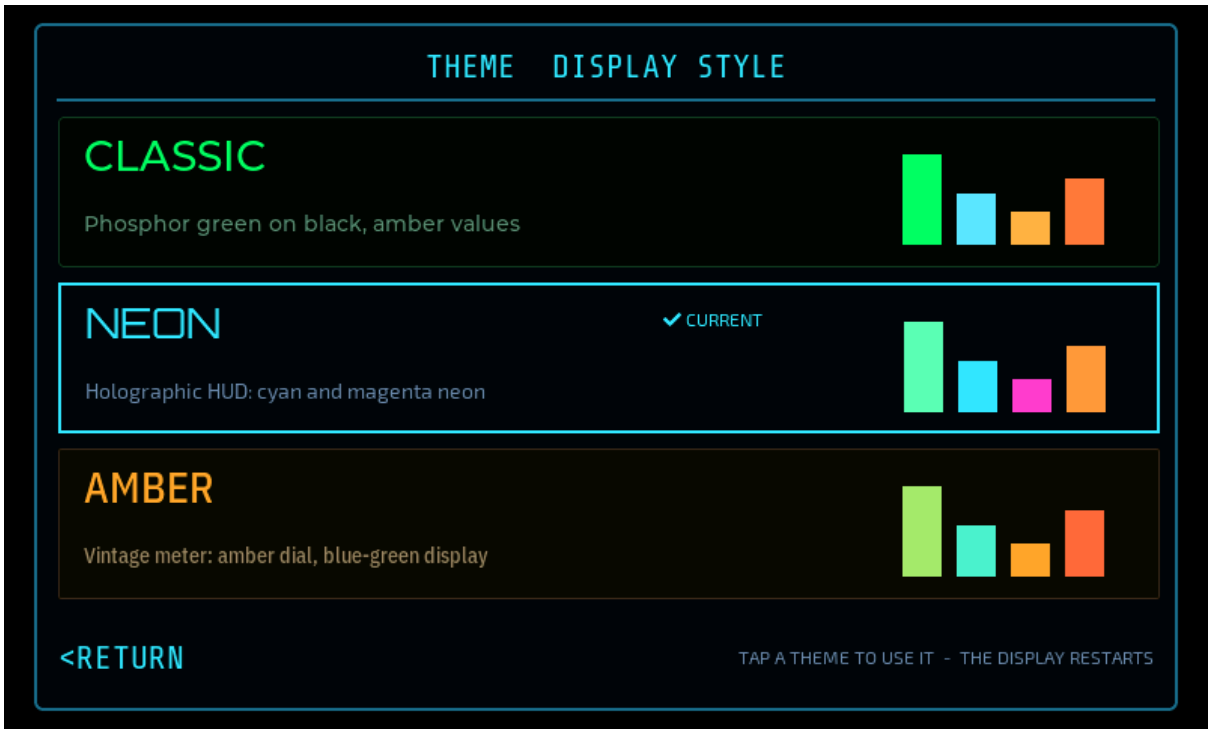

Fig. 2: The theme picker.

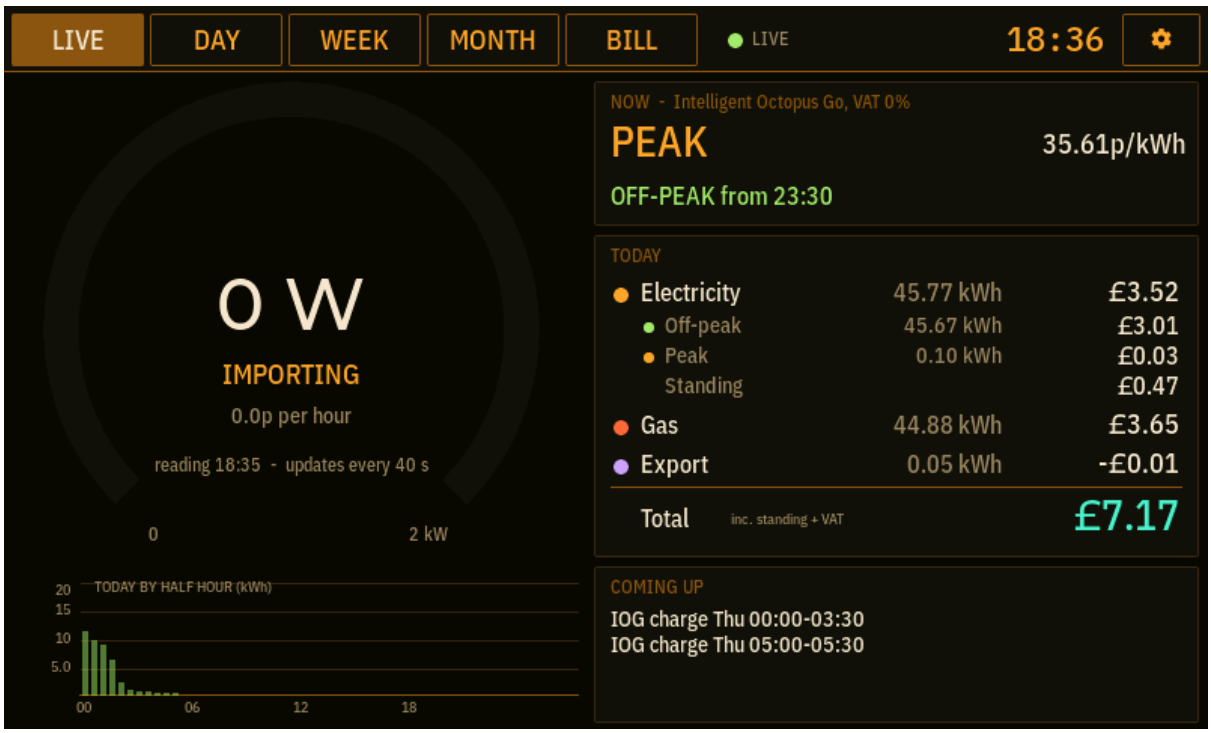

Fig. 3: The Live screen in the Amber theme.

4.8 Timezone

The default is **London**, with automatic British Summer Time. Other zones (European, American, Asian and Australasian cities) are available. Times and day boundaries on every screen use the zone you choose; UK households should leave it on **London**.

4.9 WiFi Networks

Up to **three** networks are remembered; OctoIHD joins whichever saved network is in range. Adding a fourth drops the oldest. Manage them from the **WIFI** row (add, or delete with the bin icon) or from the website's **WiFi** section.

4.10 Export and Other Credits

- **Show export** (website) / **EXPORT** (touchscreen) — show or hide export on the Live, Day, Week, Month and Bill screens.
- **List other credits** (website) — show or hide the **OTHER CREDITS** list on the Bill screen. Hiding it doesn't change any totals.

4.11 Device Information



Fig. 4: **ABOUT** (device ID blurred).

Shows the firmware version, **Device ID** (the unit's MAC address, quoted for support), WiFi network and signal, IP address, the settings website address, how much of the history store is used, registration status and the support email.

4.12 The Settings Website

Open `http://octoihd.local` in a browser on the same network as OctoIHD. If your device doesn't support `.local` names, use the IP address shown under **ABOUT**.

4.12.1 Pairing

To stop anyone else on your network changing settings, each browser must be paired once:

1. Tap **Show code on device**. A six-digit code appears on the OctoIHD screen (tap **<DISMISS** on the screen if you didn't ask for it).
2. Type the code and tap **Pair**.

The code is valid for two minutes, and five wrong attempts cancel it. Up to four browsers can be paired at a time. Pairings are forgotten when OctoIHD restarts, so you may be asked to pair again.

The setup hotspot page (used before WiFi is set up) doesn't need a code.

4.12.2 Sections

Octopus account
: Account number, API key, **Save & test connection**, the meters found and meter choice.

WiFi
: Saved networks (with **remove**), choose a scanned network or type a name, password, **Save & connect**, **Rescan**.

Display
: Brightness, start screen, theme (restarts the display), time zone, rotation, **Show export**, **List other credits**, and night mode: enabled, mode, dim level (5–60%), start, end and *Start at the off-peak start (23:30) instead*. Tap **Save display settings**.

Device
: Device ID, history store use and Octopus status, with **Check for update**, **Restart** and **Factory reset**.

4.13 Factory Reset

Factory reset on the settings website erases the Octopus account number and API key, all saved WiFi networks, the stored history and all other settings, then restarts OctoIHD into setup mode. Use it before passing the unit on to someone else.

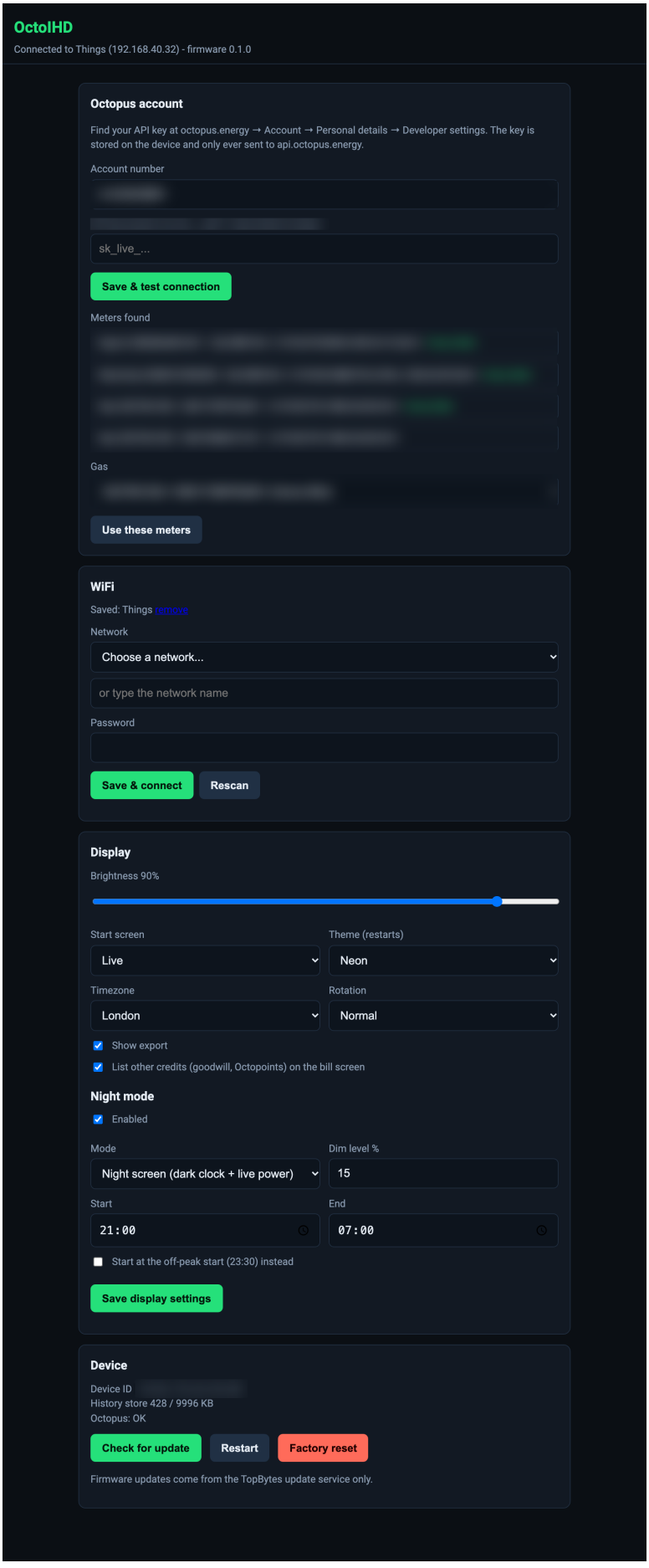

Fig. 5: The settings website (account number, meter details and device ID blurred).

CHAPTER

FIVE

TROUBLESHOOTING

5.1 Quick Diagnostic Checklist

1. Is the status beside the tabs **LIVE**? If not, see the table in *Operation*.
2. Is the unit on a **2.4 GHz** WiFi network with internet access?
3. Open settings → **OCTOPUS**: is the status **OK**?
4. Open settings → **ABOUT**: note the firmware version and Device ID for support.

5.2 WiFi and Setup Issues

5.2.1 The WiFi Scan Shows No Networks

- Make sure your router broadcasts on **2.4 GHz**; 5 GHz-only networks are not supported.
- Move the unit closer to the router and tap **Rescan**.
- For a hidden network, use **Other (enter manually)**.

5.2.2 Can't Connect to the WiFi Network

- Check the password (it is case-sensitive).
- If a network that worked before can't be reached, OctoIHD keeps retrying for some time before falling back to its setup hotspot, in case the router is just restarting.
- If setup fails three times in a row on first setup, it starts the hotspot `OctoIHD-XXXX` again so you can correct the details.

5.2.3 Can't Reach the Setup Page (Hotspot)

- Make sure your phone has joined `OctoIHD-XXXX` (some phones switch back to a network with internet; tell it to stay connected).
- Browse to `http://192.168.4.1`.

5.2.4 Can't Open `http://octoihd.local`

- Your phone or computer must be on the **same network** as OctoIHD.
- Some devices and networks don't resolve `.local` names: use the **IP address** shown under settings → **ABOUT** instead.

5.2.5 Pairing Says "Code expired" or "Wrong code"

The code lasts two minutes and is cancelled after five wrong attempts. Tap **Show code on device** again for a new one. After OctoIHD restarts, browsers need to pair again.

5.3 Octopus Account Issues

5.3.1 Status Says KEY REJECTED

Octopus refused the API key or account number.

- Check the account number is in the form `A-1234ABCD`.
- Copy the API key again from your Octopus account and re-enter it on the settings website. If you regenerated the key on the Octopus website, the old one stops working.

5.3.2 Status Says NO ACCOUNT

No account has been entered yet. Follow *Getting Started*, Step 2.

5.3.3 The Live Gauge Says WAITING FOR HOME MINI or NO RECENT READING

- Check your Home Mini is plugged in and online (the Octopus app should show live readings too).
- On the settings website, check **Meters found** shows **Home Mini** against your electricity meter, and that the right meter is selected.

5.3.4 The Gauge Says PAUSED UNTIL ...

Octopus limits live readings per account, and the limit is shared with the Octopus app and any other app using your Home Mini. OctoIHD has paused live readings until the time shown; everything else keeps updating. If this happens often, check whether another app or service is also reading your Home Mini.

5.3.5 Charts Say "No data for this period yet"

History downloads in the background after setup and can take a while. Octopus normally settles each day's data the following day, so yesterday may still show as provisional.

5.3.6 Today's Figures Change Later

Today is costed on the device from Home Mini readings and marked *provisional*. When Octopus settles the day, its own figures replace OctoIHD's, so small changes are normal.

5.3.7 Costs Look Different from the Octopus App

- OctoIHD totals include **standing charges** and **VAT**; some views in the app show energy only.
- **Other credits** (goodwill, Octopoints, referrals) are deliberately left out of the totals.
- A Weekend Happy Hour isn't credited by Octopus until days later. Mark the hour on the Day screen (**HAPPY HR**) to allow for it.
- On **Economy 7**, today's split between day and night assumes a 00:30–07:30 GMT night window.

5.4 Display Issues

5.4.1 Screen Is Blank or Dark

- Check whether night mode is active — touch the screen to wake it for 5 minutes.
- Check the power supply (5 V, 1 A or more) and the cable.
- Check brightness in settings.

5.4.2 Everything Is Upside Down

Settings → **SCREEN** → **NORMAL** (or **180 FLIP** if you mounted it inverted).

5.4.3 The Screen Went Blank After Changing Theme

Changing theme restarts the display; it comes back in a few seconds and reloads its data.

5.4.4 Clock Is Wrong

The clock is set over the internet once WiFi connects. Check the **TIMEZONE** setting.

5.5 Firmware Update Issues

- Updates need a working internet connection. Tap **SW UPDATE** to check again.
- **CHECK FAILED** means the update service couldn't be reached; try later.
- Don't unplug the unit while **Installing update** is shown.

5.6 Device Not Registered

If a **Device Not Registered** screen appears, contact support@topbytes.net quoting the Device ID shown and your proof of purchase.

5.7 Getting Help

5.7.1 Gathering Information for Support

Please include:

- Firmware version and Device ID (settings → **ABOUT**)
- The status word beside the tabs and the **OCTOPUS** status
- Your tariff name (settings → **OCTOPUS**)
- What you expected to see and what you saw

Please **never send your API key** to anyone, including TopBytes support.

5.7.2 Contact Support

- Email: support@topbytes.net
- Website: https://www.topbytes.net

5.8 Starting Again

As a last resort, **Factory reset** on the settings website clears all settings and history and restarts OctoIHD in setup mode. You will need your WiFi details, account number and API key again.

CHAPTER

SIX

ADVANCED FEATURES

6.1 Over-The-Air (OTA) Firmware Updates

6.1.1 How OTA Works

OctoIHD gets new firmware only from the TopBytes update service (`u.topbytes.net`):

- It checks a few seconds after connecting to WiFi — before it starts talking to Octopus — and then **every hour**.
- When a newer release is available it downloads and installs it automatically.
- The settings website has **no firmware upload**: nobody on your network can install firmware on the unit.

6.1.2 Manual Update Check

Tap **SW UPDATE** in the settings menu (it shows **CHECKING...**, then **UP TO DATE** or **CHECK FAILED**), or **Check for update** on the settings website.

6.1.3 The Update Progress Screen

While an update installs, **SOFTWARE UPDATE INSTALLING** shows the progress. *Do not power off — the device restarts when done.* If the download fails the screen says so and OctoIHD carries on with its current firmware.

6.1.4 Beta / Pre-Release Builds

Units enrolled for testing by TopBytes are offered beta builds. A confirmation screen appears before a beta is installed, and a **SELECT** screen lets a beta unit choose between the latest **RELEASE** and the **BETA**.

6.2 How OctoIHD Gets Its Data

All data comes from your own Octopus Energy account, using your API key:

- **Account discovery** — your meters, Home Mini, tariff agreements, unit rates and standing charges.
- **Live readings** — demand from your Home Mini.
- **Half-hourly history** — settled consumption and Octopus's own costs, for electricity import, export and gas.
- **Smart charging** — planned Intelligent Octopus Go dispatches.
- **Octoplus** — Power Ups, Power Downs, Weekend Happy Hours and Octopoints.
- **Account** — bills (to find the current bill period) and credits.

6.2.1 How Costs Are Worked Out

- **Settled days** use Octopus's own cost for each half hour.
- **Today** (and any gap) is costed on the device: each half hour is priced at the rate in force at that time. On Intelligent Octopus Go, a half hour that overlaps a smart-charge slot is priced at the off-peak rate. Power Up half hours are 0p.
- **Standing charges** are added once per day per fuel.
- **VAT** is applied per fuel per day at the rate Octopus actually charged (worked out from Octopus's own figures, so a change such as 5% to 0% is picked up automatically). Export has no VAT.
- **Happy Hour** credits are matched to the hour of usage they paid for and come off the totals. Goodwill, Octopoints and referral credits are listed but not deducted.
- The **month estimate** scales month-to-date energy by the time elapsed and adds standing charges for every day of the month.

6.2.2 History Storage

About 100 days of half-hourly history are stored on the device's flash memory and survive restarts. Settings → **ABOUT** shows how much of the store is in use.

6.3 Network Administration

6.3.1 Ports Used

Connection	Details
Octopus Energy API	HTTPS (TCP 443) to `api.octopus.energy`
Firmware updates	HTTPS (TCP 443) to `u.topbytes.net`
Time	NTP (UDP 123) to `pool.ntp.org` / `time.google.com`
DNS	UDP 53
Settings website (inbound)	HTTP (TCP 80) on your local network
`octoihd.local`	mDNS (UDP 5353) on your local network
Setup hotspot	Open WiFi network `OctoIHD-XXXX`, 192.168.4.1

6.3.2 Firewall Considerations

OctoIHD only needs outbound HTTPS, NTP and DNS. Nothing needs to be opened inbound from the internet. Networks with client isolation may stop phones reaching the settings website; use the setup hotspot or a network without isolation.

6.4 Security Notes

- **Your API key stays on the device.** It is only ever sent to `api.octopus.energy`, over HTTPS. The settings website never sends it back to a browser; only the last four characters are shown.
- **Pairing code.** Changes from your home network need a browser paired with a six-digit code shown on the OctoIHD screen. The website itself uses plain HTTP on your local network, so pair only on networks you trust.
- **No firmware upload.** Firmware comes only from the TopBytes update service.
- **Factory reset** erases the key, account, WiFi details and history.

- OctoIHD reads your account; it does not change anything on your Octopus account.

6.5 Time Synchronisation

The clock is set from internet time servers when WiFi connects and is kept in UTC internally, with the selected time zone (and British Summer Time) applied for display.

CHAPTER

SEVEN

TECHNICAL SPECIFICATIONS

7.1 Hardware Specifications

7.1.1 Processor and Memory

Processor
ESP32-S3 dual-core

Flash
16 MB (includes about 10 MB for stored history)

PSRAM
8 MB

7.1.2 Wireless Connectivity

WiFi Standard
IEEE 802.11 b/g/n

Frequency Band
2.4 GHz only (5 GHz not supported)

WiFi Modes
Station (STA), Access Point (AP, for setup)

Antenna
On-board PCB antenna

Note: OctoIHD does **not** support 5 GHz WiFi networks. Ensure your router has 2.4 GHz enabled.

7.1.3 Display

Type
7-inch IPS colour LCD

Resolution
800 x 480 pixels

Backlight
White LED (dimmable on supported hardware)

Touch Panel
Capacitive

Surface
Glass

7.1.4 Power Requirements

Input Voltage
5 V DC (via USB-C)

Connector
USB-C

Supply
5 V USB-C, rated 1 A or more

7.1.5 Physical and Environment

Form factor
7-inch landscape enclosure, the same as other TopBytes 7-inch products

Mounting
Desk or shelf; 180° screen rotation for inverted mounting

Environment
Indoor use only

7.2 Software Specifications

Firmware
OctoIHD 0.1.0

Screens
Live, Day, Week, Month, Bill, plus night screen

Themes
Classic, Neon, Amber

Fuels
Electricity import, electricity export, gas

Tariffs
See *Supported Tariffs*

History stored
About 100 days, half-hourly

Settings
Touchscreen and settings website (`http://octoihd.local`)

Updates
Over the air from the TopBytes update service

7.3 Data and Update Intervals

Live demand
About every 40 s (2 minutes while the screen is off)

Today's electricity
Every 15 minutes

Today's gas
Every 30 minutes

Planned smart-charge slots
Every 5 minutes

Octoplus sessions
Every 30 minutes

Credits, bills, Power Ups
Every 6 hours

Account, meters and tariffs
Daily

Live-reading budget
About 100 per hour (Octopus allows 125 per hour per account, shared with other apps)

7.4 Configuration Limits

Saved WiFi networks
3

Paired browsers
4 (until restart)

Pairing code
6 digits, valid 2 minutes, 5 attempts

Brightness
10–100%

Night dim level
5–60% (website), 5–50% (touchscreen)

Night mode wake
5 minutes per touch

7.5 Requirements

- Octopus Energy electricity account; gas and export optional
- Octopus Home Mini for live power and today's readings
- Octopus account number and API key
- 2.4 GHz WiFi with internet access

7.6 Support and Documentation

- Website: https://www.topbytes.net
- Support email: support@topbytes.net
- OctoIHD will be available direct from TopBytes.

CHAPTER

EIGHT

COMPLIANCE

OctoIHD is not on sale yet. Its regulatory compliance documentation, including the declarations of conformity, will be published here when the product is released.

8.1 Radio Equipment Information

Technology	IEEE 802.11 b/g/n (WiFi)
Operating frequency band	2.4 GHz
Antenna	Internal (PCB, non-removable)

8.2 Safety and Use

- Indoor use only. Keep away from water, moisture and direct sunlight.
- Power only from a 5 V USB-C supply rated 1 A or more.
- Do not open the enclosure; there are no user-serviceable parts inside.

8.3 Disposal

Do not dispose of this product with household waste. Take it to a collection point for the recycling of electrical and electronic equipment (WEEE).

8.4 Trademarks

Octopus Energy, Intelligent Octopus Go, Octopus Home Mini and Octoplus are trademarks of Octopus Energy. OctoIHD is an independent product from TopBytes Ltd and is not affiliated with, endorsed by or supported by Octopus Energy.

CHAPTER

NINE

CHANGELOG

This page documents the changes in each OctoIHD firmware release.

9.1 Version 0.1.0

First version.

- **Live screen:** demand from the Octopus Home Mini, cost per hour, the rate now and the next band, today's electricity, gas and export costs, and upcoming smart-charge slots, Power Ups, Power Downs and Happy Hours.
- **Day, Week and Month screens:** charts by half hour or day, stacked by rate band, for electricity, gas and export, in kWh or pounds, with a cost summary and a month-end estimate.
- **Bill screen:** the current bill period so far, per fuel, with standing charges, VAT, export, Happy Hour credits, net total and Intelligent Octopus Go savings, plus other credits listed separately.
- **Tariffs:** Intelligent Octopus Go (including smart-charge slots), Octopus Go, Agile, Cosy, Flux, Intelligent Flux, Snug, Tracker, Economy 7, Flexible and Fixed.
- **Settings website** at `http://octoihd.local` with browser pairing, and a setup hotspot for first-time setup from a phone.
- **Night mode** (screen off, dim or night screen), three themes (Classic, Neon, Amber), brightness, rotation, start screen and time zone.
- **About 100 days of history** stored on the device.
- **Over-the-air updates** from the TopBytes update service.

CHAPTER

TEN

QUICK LINKS

- genindex
- search

CHAPTER

ELEVEN

ABOUT THIS MANUAL

This manual covers:

- Powering on, joining WiFi and connecting your Octopus account
- Reading the Live, Day, Week, Month and Bill screens
- How costs are worked out: rate bands, Intelligent Octopus Go slots, standing charges, VAT, export and credits
- Settings on the touchscreen and on the settings website (`http://octoihd.local`)
- Night mode, themes, brightness and screen rotation
- Troubleshooting, firmware updates (OTA) and technical specifications

CHAPTER

TWELVE

TRADEMARKS AND DATA

Energy data, tariffs and account information are read from your own Octopus Energy account through the Octopus Energy API, using the API key you provide.

Octopus Energy, Intelligent Octopus Go, Octopus Home Mini and Octoplus are trademarks of Octopus Energy. **OctoIHD is an independent product from TopBytes Ltd. It is not affiliated with, endorsed by or supported by Octopus Energy.** Please contact TopBytes, not Octopus Energy, about OctoIHD.

CHAPTER

THIRTEEN

SUPPORT

For additional support, please visit:

- Website: https://www.topbytes.net
- Support email: support@topbytes.net

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