

# reTerminal E1004

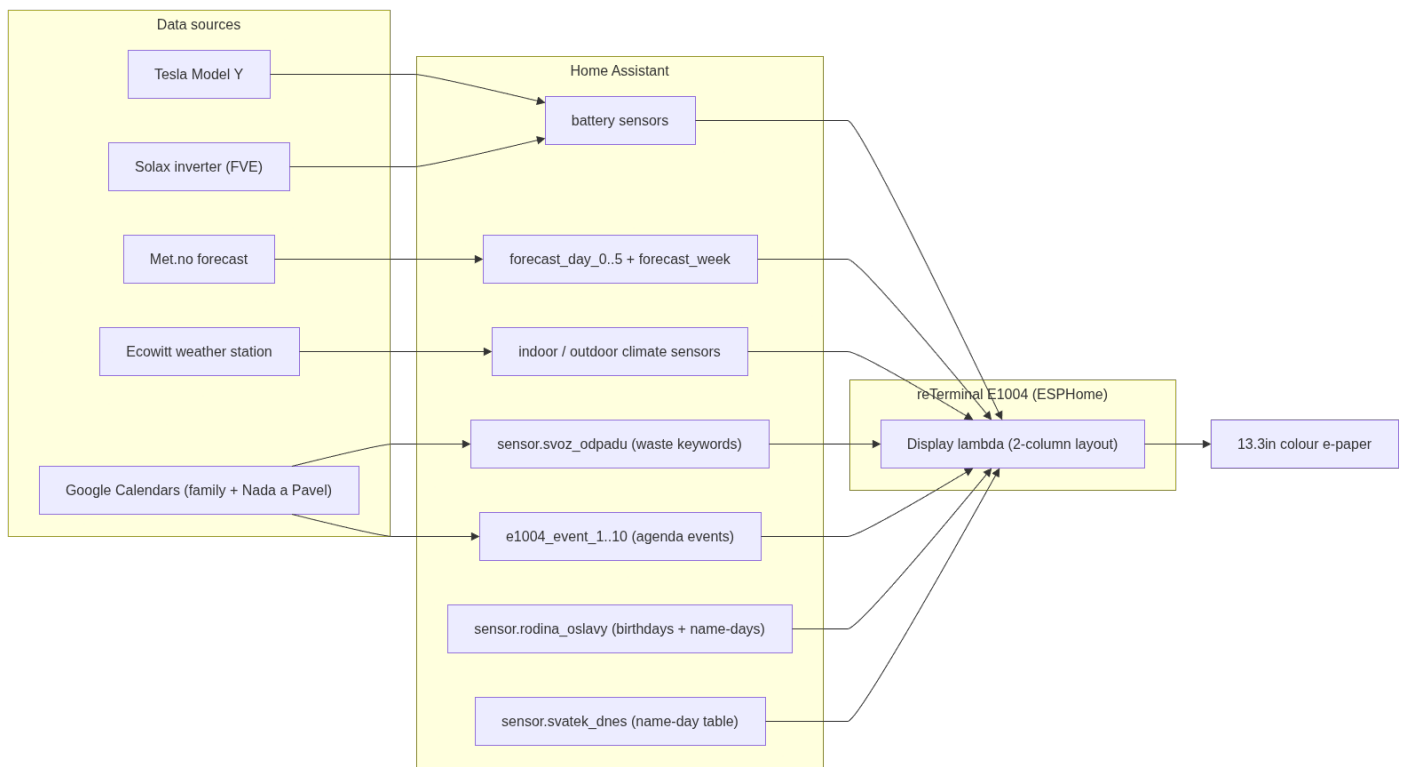
## Overview

The reTerminal E1004 is a 13.3" **6-colour (Spectra 6)** e-paper display mounted in the **kuchyň (kitchen)**. It is the household's central family dashboard: a colour calendar/agenda on the left, and a stacked column of live information on the right (weather, home & outdoor climate, upcoming family celebrations, waste-collection schedule, solar/car batteries, and a weekly temperature chart).

It is the colour companion to the **E1001** (mono weather display in the living room) and shares the same icon language, footer style, and refresh philosophy.

| Property              | Value                                                     |
|-----------------------|-----------------------------------------------------------|
| Model                 | Seed reTerminal E1004 (13.3" Spectra 6 colour e-paper)    |
| Resolution            | 1200 × 1600, portrait                                     |
| Colours               | Black, white, red, green, blue, yellow (6-colour palette) |
| Panel model (ESPHome) | Seed-reTerminal-E1004                                     |
| MCU                   | ESP32-S3 with 8 MB PSRAM (octal, 80 MHz)                  |
| Power                 | Permanently powered (deep sleep disabled)                 |
| Location              | Kuchyň (kitchen)                                          |
| Firmware              | ESPHome                                                   |
| Flashing              | Wireless (OTA)                                            |

## Data flow



# What it displays

## Header

- Full Czech day name + date (e.g. "*Pondělí 17.08.2026*")
- Today's Czech name-day (*svátek*) on the right

## Left column – Agenda

- Upcoming calendar events grouped by day (Czech day labels: Po, Út, St...)
- Event titles **colour-coded by calendar**: green = Family, red = Nada a Pavel
- Time or "Celý den" (all-day) below each event
- Multi-day events show "· do DD.MM"
- **Long titles are truncated with "..."** so they don't overflow into the right column

## Right column (top to bottom)

1. **Blíží se** – next 3 upcoming family celebrations (birthdays with age, and name-days). Red = birthday, green = name-day. Twins Daniel & Dominik are combined onto one birthday line.

2. **Svoz odpadu** – next collection date per waste type: BIO (leaf), Papír (newspaper), Plast (bottle), Směsný (bin) — each with a coloured icon.
3. **Baterie** – FVE (home solar) % with a house icon, Tesla % with a car icon.
4. **Doma / Venku** – indoor and outdoor temperature + humidity, with thermometer and droplet icons.
5. **Počasí** – 6-day forecast with colour weather icons (red sun, blue rain, clouds) and high/low temps.
6. **Týden** – a 6-day high-temperature bar chart, bars colour-coded (red  $\geq 28^\circ$ , blue  $\leq 18^\circ$ , black otherwise).

## Footer

- **Aktualizováno HH:MM** – last refresh time
- **WiFi** signal strength bars

# Home Assistant sensors that power it

These are custom template sensors built in `configuration.yaml`:

| Sensor                                       | Purpose                                                                                                                                                                           |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>sensor.svatek_dnes</code>              | Today's Czech name-day, from an embedded 366-day table                                                                                                                            |
| <code>sensor.rodina_oslavy</code>            | Family birthdays + name-days; <code>state</code> = today's celebrations, <code>upcoming</code> attribute = next celebrations (JSON)                                               |
| <code>sensor.svoz_odpadu</code>              | Scans both calendars for BIO/PAPÍR/PLAST/SMĚSNÝ keywords; attributes <code>bio</code> , <code>papir</code> , <code>plast</code> , <code>smesny</code> hold the next date per type |
| <code>sensor.forecast_day_0..5_*</code>      | Per-day condition / temp / tempnow                                                                                                                                                |
| <code>sensor.forecast_week</code>            | Weekly highs as a pipe-separated string ( <code>`Po:26</code>                                                                                                                     |
| <code>sensor.e1004_event_1..10</code>        | Per-event agenda data (title, day label, time, colour)                                                                                                                            |
| Ecowitt climate sensors                      | Indoor/outdoor temperature & humidity                                                                                                                                             |
| <code>sensor.solax_battery_capacity_2</code> | FVE battery %                                                                                                                                                                     |
| <code>sensor.tesla_model_y_battery</code>    | Tesla battery %                                                                                                                                                                   |

# Refresh behaviour

flowchart TD

```
A["Calendar event changes"] -->|instant, debounced 8s| R["request_redraw script"]
B["5-minute interval"] --> D["Display refresh"]
C["Manual button in HA"] --> D
R --> D
D --> S["Redraw e-paper"]
```

- **Every 5 minutes** – scheduled refresh (keeps weather, climate, batteries current)
- **Calendar event change** – triggers the debounced redraw (new events appear promptly)
- **Manual button** – `button.reterminal_e1004_e1004_refresh_display`
- Temperature/weather changes do **not** trigger refreshes directly (they ride the 5-minute interval), to avoid constant flashing.

## Key lessons learned (build history)

- **String vs float sensors:** several HA-attribute sensors return **strings** (e.g. "17.8.", family lines). These must be defined as `text_sensor` in ESPHome, not numeric `sensor`. Mixing them up caused compile errors (`.c_str()` on a float) and a firmware that never built — so the device kept running old firmware.
- **to\_json spacing:** an early approach passed data as JSON attributes and parsed it on-device; HA's `to_json` adds spaces after colons (`"d": 17`), which broke a strict parser. Solved by switching to simple pre-formatted string attributes (`bio`, `papir`, ...) instead of JSON.
- **Entity name typos:** `forecast_dayN` vs `forecast_day_N` (missing underscore) and `run__state` (double underscore, unrelated washer bug) both caused silent failures. Lesson: verify entity IDs against **Developer Tools → States**.
- **MDI codepoints:** several icon glyphs were initially wrong (cake, party-popper, night) and rendered as empty boxes — codepoints must be verified against the actual font.
- **Yellow on white is unreadable** on e-paper: the "sunny" icon was switched from yellow to **red** for contrast.
- **Refresh discipline:** the display only redraws on meaningful changes + a 5-minute interval, because colour e-paper refresh is slow and visually distracting.

## Configuration reference

**Sanitised.** The real config contains an API encryption key, an OTA password, and WiFi credentials. **These secrets are NOT included here** — see the password manager. Full config stored at [link to your config location].

```
# — reTerminal E1004 (excerpt, secrets removed) —
esphome:
  name: reterminal-e1004

esp32:
  board: esp32-s3-devkitc-1
  framework:
    type: esp-idf

psram:
  mode: octal
  speed: 80MHz

spi:
  clk_pin: GPIO7
  mosi_pin: GPIO9

# Secrets removed – see password manager:
#   api / ota / wifi

display:
  - platform: epaper_spi
    model: Seeed-reTerminal-E1004
    update_interval: never          # driven by interval + triggers instead
    rotation: 0
    # lambda: two-column layout (agenda left, info column right)

interval:
  - interval: 5min
    then:
      - component.update: epaper_display

button:
  - platform: template
    name: "E1004 Refresh Display"
    on_press:
```

then:

- `component.update: epaper_display`

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Revision #3

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