VAGAL SENSE

Complete app manual

Autonomic assessment through heart rate variability (HRV), with the Polar H10 sensor: measurements, reflex tests, receptive fields, RR file import, indices, response profiles, practice plan and reports.

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Audience: health professionals. This manual describes the app; it does not replace clinical training or professional assessment.

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New in this edition (1.6.2). Reflex tests (Deep Breathing and Valsalva, chapter 13); Receptive fields, the ANS sheet and measurements of different lengths in Custom (chapter 11); Import recordings mode (chapter 12); add, move and remove measurements during the session (chapters 11 and 12); 4x6 Breathing in the Library; technical report with blocks from other sessions; clearer Bluetooth messages.

How to read this manual. Chapters 1 to 4 prepare you to use the app. Chapters 5 to 14 follow the order of an assessment. Chapters 15 to 20 explain what the app delivers. Chapters 21 to 26 cover the support features, data and frequent questions.

Paid features are marked: Free Plus Pro. On iOS, every feature is already unlocked.

1. What Vagal Sense is

Vagal Sense is an app for health professionals that assesses autonomic regulation through heart rate variability (HRV). With a Polar H10 strap connected over Bluetooth, it records the intervals between heartbeats at defined moments of a session (rest, task and recovery) and compares those moments with each other.

From these comparisons and a profile questionnaire, the app:

- computes indices of load, flexibility, recovery and autonomic reserve;
- identifies autonomic response profiles (phenotypes F1 to F8);
- suggests a practice plan organised in three tracks: Restoration, Rhythm and Expansion;
- generates PDF reports for the assessed person and technical reports for the professional;
- follows the evolution across sessions.

> **Not a diagnosis.** Vagal Sense is an educational tool for organising practice. The indices, profiles and suggestions are not a medical diagnosis, do not prescribe treatment and do not replace the professional's clinical assessment.

Principles of the app

- **100% local.** No account, login or cloud. All data stays on the device (chapter 23).
- **Comparison, not isolated values.** The app does not classify an isolated RMSSD as high or low. The indices come from comparing moments of the same person.
- **Same window, same position.** The measurements of an assessment use the same duration, and recovery is measured in the same position as the reference baseline, so the comparison is fair.
- **Three languages.** Portuguese, English and Spanish, including the PDFs and the clinical content.

2. Before you start

What you need

- An Android phone or iPhone with Bluetooth.
- A Polar H10 strap. The app recognises the H10 by its name and by the code printed on the strap.
- Water to moisten the strap's electrodes: without moist contact with the skin, the signal fails.

No sensor?

You can explore the whole app with **Demo mode**, which generates simulated data, or type RMSSD, SDNN and HR manually in each measurement. Typed data have no signal quality index (IQS) and appear as "manual entry".

Preparing the measurement

- The person is comfortable and at rest during the baselines. At each step, the app shows the expected position (seated or supine).
- Strap fitted below the chest, with moist electrodes.
- Phone nearby during the recording. If the sensor loses contact or connection, the app warns you.

Platforms and versions

The app is on Google Play and the App Store. On Android there are three levels: Free, Plus and Pro (chapter 24). On iOS, every feature is already unlocked.

3. First launch and Professional Profile

Terms of use

On first launch, the Terms of Use and Privacy appear. The language can be changed at the top (Português / English / Español). Tick the agreement and tap **Accept and Continue**. With the device's large text on, the language buttons move below the title.

Professional profile

Next, fill in your profile. The data go in the header of the reports:

- full name, profession, specialty and professional registration;
- logo or brand: a light, square image that appears in the PDF next to your details Plus.

You can also tap **Fill in later**. The profile can be reached at any time through your initials, at the top right of the home screen.

> **Changed devices?** The same screen has **Import backup**. The assessments come back, and the professional profile in the file is loaded into the fields. Review it and tap **Save** (chapter 23).

What else is in the Profile

Section	What it is for
Appearance	Dark theme (default) or light.
Language	Portuguese, English or Spanish. The app opens in the device language; once chosen manually, it keeps your choice.
Security	PIN lock (4 to 8 digits) and, if the device supports it, biometrics. With the lock on, the app asks to unlock when opened. "Forgot my PIN" resets the PIN after confirming your identity with the device.
Backup & data	Export and import encrypted backups (chapter 23).
Erase data	Removes every assessment, profile and your professional data from this device, with double confirmation. It cannot be undone.
Access code	Activates an access code you received (chapter 24).
Rate Vagal Sense	Opens the app's rating page in the store.

4. The home screen

The home screen gathers everything you use day to day:

Element	Function
Greeting and initials	The initials open the Professional Profile.
Active profiles · Saved assessments	Counters of what is stored on the device.
+ New Assessment	Starts an assessment (chapter 5).
Breathing Practice	Trains the breathing rhythm outside the assessment, without saving anything (chapter 22).
Task Library	Browse the practices and create My tasks (chapter 21).
Demo mode	Turns simulated data on and off. While active, the screen warns that the measurements are not real.
Live reading	Tests the sensor and shows the reading in real time, without saving an assessment (chapter 22).
Help	Usage guide and frequently asked questions, in the three languages.
Subscription	Plus and Pro plans (Android).
Profiles	List of assessed people, with date, number of assessments and the latest response profile. Tap to open the history.

5. Overview of an assessment

An assessment is a sequence of steps, shown in a fixed bar at the top of the screen ("Step 3 of 10 — …"). The steps depend on the chosen mode. In Complete mode, the order is:

Step	Name	What happens
1	Mode	Person's details, assessment mode and duration.
2	Profile Questionnaire	Sleep, stress, pain, gastrointestinal, history, events, physical activity and circadian rhythm. It feeds the ICA.
3	Check-in (IEA)	Context of the day. Optional; not part of the calculations.
4	T1S — Seated	Resting baseline, seated.
5	T1D — Supine	Resting baseline, lying down.
6	Selection	Choose up to 3 tasks, at most 1 per family.
7	T2	Measurement during each task.
8	T3	A single recovery, after all the tasks.
9	ITT	Tolerance to each task. Optional, but used in the plan.
10	Result	Indices, response profiles, practice plan and reports.

The ← **Back** and **Next** → buttons are at the bottom of each step. When something required is missing, the button says what is missing (for example, the patient's name).

> **Reassessment.** When you start a new assessment from the screen of a person already assessed, the name is linked and cannot be edited, and the app offers to reuse the previous Profile Questionnaire.

6. Setup: person, mode and duration

Person's details

Field	Note
Name	Required. In a reassessment, it is pre-filled and locked.
Date of birth	Optional, but needed to interpret the results by age (for example, the IRO threshold).
Biological sex	Optional. Reserved for reports and research; it does not change this version of the interpretation.
Baseline breathing	Paced (guided) or free (spontaneous). "Free" only flags in the report that resting HRV may be influenced; it does not change the indices.

Acquisition duration

Choose 2, 3, 5 or 10 minutes, or **Free**. The same duration applies to every measurement in the assessment (T1, T2 and T3), so the windows are comparable.

- **SDNN** is only valid with recordings of 5 min or more. With less time, the app warns you to disregard it.
- With short recordings (under about 4 min), the LF band is not fully resolved: total power, LF and LF/HF become fragile and should not be compared with longer recordings.

Free time

With the Free duration, the first measurement has no fixed time: you tap **End measurement** whenever you want, from 1:00 on. That exact time then applies to every other measurement in the assessment, which end by themselves.

Reference baseline

In modes with a single baseline, you choose whether it is seated (T1S) or supine (T1D). T3 is measured in the same position as the baseline: this is what allows recovery to be read without the effect of a change in posture.

7. Assessment modes

Mode	Sequence	What it is for	Plan
Single Measurement	`one moment`	Check one moment between sessions without repeating the whole battery. No phenotype, response indices or plan.	Free
By Task	`Baseline → T2 → T3`	Quick. A single baseline (seated or supine). Does not include the IRVP.	Free
Complete gold standard	`T1S → T1D → T2 → T3`	Initial assessment and detailed follow-up. Includes the postural vagal reserve (IRVP) and can end with the Orthostatic test.	Plus
Multi-Task	`Baseline → T2A → T2B → T2C → T3`	Several tasks in sequence. Each T2 is compared with the same baseline, so the effect of one task does not contaminate the next.	Pro
Custom	`T1 · T2 · T3 · RF, as many as you like`	You build the sequence: how many measurements, in what order, with which position and time. Includes the Receptive fields block and can be adjusted during the session (chapter 11).	Pro
Orthostatic	`Supine → 3 min standing`	Immediate cardiovagal response to standing up, by the 30:15 ratio (chapter 14).	Pro
Resting Breath Pause	`2 min normal → pause`	Pause time after exhaling, comparable only with the same person (chapter 14).	Plus
Deep Breathing	`2 min · 4 s in / 6 s out`	Cardiovagal reflex test: E-I difference per cycle (chapter 13).	Pro
Valsalva	`15 s rest → 15 s strain → 30 s recovery`	Reflex test: Valsalva ratio, with optional repeats (chapter 13).	Pro
Import recordings	`RR files → T1 · T2 · T3 · RF`	Measurements recorded in another program, from RR interval files (chapter 12).	Pro

Which ones produce the practice plan? By Task, Complete and Multi-Task produce indices, phenotypes and a plan. Custom and Import recordings do too, when the sequence follows the recipe in chapter 11. Single Measurement, Orthostatic, Breath Pause, Deep Breathing and Valsalva are stand-alone measurements, with their own result and PDF.

8. Profile Questionnaire and check-in

Profile Questionnaire

The questionnaire describes the person's health profile across domains: sleep, stress, pain, gastrointestinal, history, events, physical activity and circadian rhythm. It feeds the **ICA** (symptom and lifestyle load) and contributes to the symptom-related phenotypes.

- It is required before the first assessment with phenotypes. The more complete it is, the more individual the reading.
- It can be saved as a **draft** and completed later. If much is missing, the app warns you and suggests filling in at least Sleep, Stress and Pain.
- In a reassessment, the app finds the previous form and offers **Use previously filled form** or **Fill in a new form**, with the option to review it before moving on.

Today's check-in

Records the context of the session:

- last night's sleep: hours slept, whether the person woke up rested, and awakenings;
- current state: stress, pain and energy, from 0 to 10.

The check-in **is not part of the calculation** of indices or phenotypes. It is stored and appears in the report. It can be skipped or partly filled in; anything left blank does not appear.

9. The sensor and the recording

Connecting the Polar H10

1. Moisten the electrodes and put on the strap.
2. In the measurement step, tap **Connect sensor**.
3. With several straps switched on nearby, the app does not choose for you: it shows the list with the code printed on each strap, the nearest and the last used. Check the code on the strap.
4. If you like, give each strap a **nickname** ("Strap 3"). The nickname stays on this device only.

When the connection fails, the app says why: **no Bluetooth permission** (with the **Open Settings** → shortcut), **Bluetooth off**, **sensor not found**, **the connection dropped** or **failed to connect**.

During the recording

- Live **HR curve** and timer. At the end, the curve shows the last minute of the measurement.
- On iPhone, the screen can lock during the recording: the app keeps receiving the beats.
- Warning when the **sensor is not in contact** with the skin: moisten and adjust.
- If the sensor drops during the recording, the timer keeps running, but the beats of that interval are lost; the app shows the coverage and suggests redoing it.
- **Stop and use what I collected** ends early and uses the stretch already recorded. **Redo** repeats the measurement.

Signal quality (IQS)

Before computing RMSSD and SDNN, the app detects and corrects artifacts beat by beat and gives the recording a score from 0 to 100:

Band	Meaning
Optimal · Good · Acceptable	Usable recording. The app also shows the percentage of corrected beats.
Rejected	Signal too noisy. Redo the measurement. If the baseline is rejected, the Result shows "insufficient measurement" and the phenotypes may not be reliable.

Without a sensor

In each measurement you can type RMSSD, SDNN and HR. The assessment works normally, without IQS. With Demo mode on, the measurement screen shows the **Turn off demo** link, to go back to real measurements without returning to the home screen.

Missing beats

If the recording has gaps (the sensor dropped, the imported file is shorter than the measurement), the result and the PDF warn about **missing beats**, with the share covered. If much is missing, redo it.

10. Baselines, tasks, recovery and ITT

Baselines (T1S and T1D)

T1S is seated rest; T1D, supine rest. In Complete mode, the transition from T1S to T1D measures the resting vagal gain (IRVP).

Task selection

- Up to 3 tasks, at most 1 per family.
- The app suggests families from the baseline RMSSD. The question "Does the person report fatigue?" changes the suggestion for the activation families (F and G).
- **Use suggestion** pre-selects the indicated task; you can also choose freely or browse the Library.
- Each task shows the expected type: relaxation (sympathetic decrease), activation (sympathetic increase) or mixed.

> **Contraindications.** When a practice has contraindications, the app lists them and asks you to confirm you reviewed them with the person before moving on.

T2 — during the task

The recording takes place while the person performs the task. In breathing tasks the **rhythm guide** appears: a circle that expands on the inhale, holds during pauses and contracts on the exhale, with a sound at each phase change and optional vibration. The guide starts together with the recording and can be switched off (ON/OFF) or adjusted (visual, sound, vibration). It does not change the calculations, but makes the IRVR reliable, since the IRVR assumes the person breathed at the task's rhythm.

T3 — recovery

A single recovery recording after **all** the tasks, in the same position as the reference baseline, breathing freely. It has no rhythm guide, because it measures spontaneous recovery. The SRA is computed from this T3.

ITT — Task Tolerance Index

Six questions per task, in three blocks:

Block	Questions
Positive (50 pts)	Task tolerance (0 to 10) · Post-task sensation (up to 5)
Negative (30 pts)	Perceived fatigue · Dyspnea · General discomfort (0 to 8)
Adherence (20 pts)	Perceived adherence (0 to 10)

- It is optional per task, but **all or nothing**: the score only appears with all 6 answers. The card warns in orange how many are missing.
- Without the ITT, the app cannot confirm the load was well tolerated, and the practice enters the plan as **Regulation** (chapter 18).
- There is a notes field for incidents and session notes.

11. Custom Assessment and Receptive fields Pro

In Custom, you decide how many measurements to take, in what order and with what time each. The order of the steps differs from the other modes:

`Mode → Sequence → Profile Questionnaire → Check-in → Measurements → Result`

Build the sequence

- **Saved customizations** stay at the top, collapsed. Tap one to use it; tap **Edit** to change it. When saving an edit, choose to replace the existing one or save it as new.
- To build a new one, use the **+ T1** (rest), **+ T2** (task), **+ T3** (recovery) and **+ RF** (receptive fields) buttons. Each item has a position (seated or supine), a time (2, 3, 5, 10 min or Free) and an optional short name, and can be moved (↑ ↓) or removed (✕).
- For each T2, choose the task from the Library or My tasks.
- The **RF** block is always free-time. The sheet's fields are already listed; add others with **+ Field** (for example, "Diaphragm").
- **Save customization** asks for the name in a window in the middle of the screen. The customization then appears in the list.
- **Note** (optional): goes into the technical report and can be edited later, even in the saved assessment.
- Up to 20 measurements per sequence. You can start with a single item and add the rest during the session.

> **The full-analysis recipe.** With a T1 (seated or supine), then at least one task (T2) and a T3 after the tasks, the green notice appears: the result is read as a standard assessment, with indices, phenotypes, tracks and the patient PDF. Ideally **all with the same length**. T2 and T3 may also have another length, **from 2 min** (for example, a 5-min T1 and a 2-min T2): the full analysis comes out the same, with a **different lengths** warning in the builder, in the result and in the technical PDFs (not in the patient PDF). In that case, indices and phenotypes compare RMSSD and HR; SDNN is only valid in measurements of 5 min or more, and the final interpretation is yours. The two T1s (seated and supine) must have the same length. With free time, what counts is how long each measurement lasted. The RF block is not part of the recipe.
>
> Without the recipe, the app shows all the measurements and the comparisons between them, without a phenotype, and warns when windows or positions differ.

Measure

1. In the Measurements step, the list at the top shows the sequence (✓ on items already measured). The current item appears in a card with the code, name and time.
2. Connect the sensor and measure as in the other modes (chapter 9). Breathing tasks show the rhythm guide; tasks with contraindications ask for confirmation before the recording.
3. When done, tap **Next measurement** →, or tap an item in the list to go to it or redo it.
4. With all items measured, tap **View Result** →.

Adjust the sequence during the session

- **+ Add** (at the end of the list): choose the type (T1, T2, T3 or RF), the position or task and the time, and tap **Add**. The new item goes **right after the current item**.

- ↑ ↓ on the current item's card: moves the item. Moving an item already measured does not lose the measurement.
- ✕ **Remove this item**: asks for confirmation. If the item was already measured, the app warns that its measurement will be deleted.
- These buttons disappear during the recording, so nothing changes in the middle of a measurement.

Receptive fields (RF block)

Measures the autonomic response to the stimulation of each receptive field, within one continuous recording. Fields on the sheet: Suboccipitals; Eye, Ear and Trigeminal V1, V2, V3 and V2 intraoral (each right and left); Esophagus / trachea; Interoception / sternum; Breathing; Peritoneum.

1. Start the RF block measurement. Fields can only be marked while the recording is running.
2. Before each field, allow **at least 15 s of rest**.
3. Tap **Start** on the field when the stimulation begins, and **Stop** when it ends (between 15 and 60 s). The curve shows each field's band.
4. The app compares the 15 s before with the time during and shows the HR and RMSSD change, with a **suggestion**: Responds (HR goes down and HRV goes up), No response or Inversion (opposite direction).
5. You confirm or change the answer. You are the one who classifies: when HR and RMSSD disagree, or the 15 s before were missing, the app does not suggest and says "you decide".
6. **Redo** repeats a field. Each field has a note box. End the measurement when you finish the fields.

> **Why HR decides.** In 15 to 60 s windows, HR is the most stable measure. Short-window RMSSD oscillates with the breathing phase, so it only confirms the direction.

ANS sheet: time and vital signs

- Each measurement records its start time, shown in the summary.
- In the Result, **Vital signs (optional)**: systolic and diastolic BP, SpO_2 and RR (respiratory rate). They stay editable, like the note, even after saving.

Result and PDF

The Result shows each measurement (each T2 with the task name), the comparisons and the receptive fields with the chosen answer. The **technical report of the sequence** button sits next to the save actions. The PDF has the summary in the sheet's format (time, duration, artifacts, RMSSD, SDNN, minimum, maximum and mean HR, IQS), the vital signs, the receptive fields and the note.

12. Import recordings Pro

For measurements already recorded in another program. You build the sequence as in Custom and say where each measurement comes from. The calculation is the same as for measurements taken with the strap.

`Mode → Sequence → Profile Questionnaire → Import → Result`

There is no check-in: the recording is from another day, and "how the person arrived today" does not describe that recording.

The file

- Plain text (`.txt`), with **one RR interval per line, in milliseconds**. Values in seconds and decimal commas are accepted and converted; lines that are not numbers are ignored, and the app says how many.
- At least 1 minute of beats.
- If the file name has a date and time, the app fills them in. Otherwise, you type them.

Step by step

1. In Mode, choose **Import recordings** (last in the list).
2. Build the sequence (T1, T2, T3, RF) with the recordings' times.
3. In the **Where the recordings come from** step, choose:
   - **Separate files**: one file per measurement (for example, three 5-min files);
   - **Single file**: one long recording. Choose the file in the first measurement and mark each one's segment. The next one starts where the previous one ended, and the segments used appear on the curve with their code (T1S, T2...).
4. On each card, tap **Choose file** (or **Mark segment**). The phone's file picker opens. On Android, to leave without choosing, tap Back until it closes, one tap per open folder.
5. In the file window, check the beats and the duration. If the file is longer than the measurement, choose the segment's **Start** (the grey band on the curve). If it is shorter, it goes in with the missing-beats notice.
6. Enter the recording's **real date and time** (dd/mm/yyyy hh:mm). It is required: without the real date, the history and the evolution get out of order.
7. Tap **Use this segment**. The card shows ✓ with the file, RMSSD, HR and time. **Change** redoes it.
8. With all imported, tap **View Result** →.

Adjust the sequence

Each card has ↑ ↓ (move), **+** (a new measurement right after that card) and ✕ (remove, with confirmation; the imported measurement goes too). This way you can add a measurement in the middle of the sequence without starting over.

> **Imported receptive fields.** The RF block goes in as a regular measurement: there is no need to mark the fields, because the original recording did not have that feature.
>
> **Result.** The assessment is saved with the recording's real date. If the sequence forms the recipe (chapter 11), you get the full result, with indices, phenotypes and plan. The result header and the PDF say **Import recordings**, and each moment's annex shows "Imported from file" with the file name.

13. Reflex tests: Deep Breathing and Valsalva Pro

Two classic cardiovagal tests, each as a separate mode. The test itself sets the time: there is no duration to choose. The recording is also a normal measurement (RMSSD, SDNN, HR, IQS and curve). The result shows the test's numbers with the reference range from the literature. **A reference range is not a diagnosis**, and there is no phenotype or plan.

`Mode → Check-in → Test → Result`

Deep Breathing (E-I)

1. Person **seated or lying down**, at rest, with the strap connected. Date of birth filled in: the reference range depends on age.
2. Start the measurement and follow the guide: **4 s breathing in, 6 s breathing out, for 2 minutes**. Deep breathing, without forcing.
3. The measurement ends on its own at 2 min.

How to read it. Breathing in, HR rises; breathing out, it falls. In each cycle, the difference between maximum and minimum HR is the **E-I** (expiration − inspiration), which measures the vagal response (respiratory sinus arrhythmia). The app shows:

- **E-I median** and **E-I mean**, in bpm, each with its range;
- HR max − HR min over the 2 min, without a reference range;
- valid cycles (out of 12).

Age	Within range	Borderline	Below range
10 to 29 years	≥ 20	15 to 19	< 15
30 to 49 years	≥ 15	11 to 14	< 11
50 years or older	≥ 12	9 to 11	< 9
No date of birth	≥ 15	11 to 14	≤ 10

E-I in bpm. Ranges by age: Wieling et al., 1982; without age: Ewing et al., 1985.

Valsalva

> **Contraindications.** Before the test, the app lists the contraindications and asks you to confirm they were reviewed with the person: retinopathy (especially proliferative) or recent eye surgery; recent heart attack, unstable angina or arrhythmia; uncontrolled high blood pressure; known aneurysm; recent stroke or brain bleeding; recent abdominal, chest or hernia surgery; pregnancy. Stop if there is dizziness, chest pain or discomfort.

1. Person at rest, with the strap connected. Start the measurement.
2. **Rest — 15 s**, breathing normally.
3. When the screen asks **"STRAIN — hand on mouth"**, with a beep and vibration, the person strains to breathe out with the hand closing the mouth, for **15 s**.
4. **Release and breathe normally — 30 s** of recovery.

5. **Rest**: the screen shows current HR against the baseline. When it returns to baseline, there is a beep and vibration and the notice "HR back to baseline — you can repeat". The suggested rest is 60 s.
6. **Repeat** is optional (maneuver 2, 3...). To finish, tap **Stop** on the measurement.

How to read it. Valsalva ratio = longest RR after release ÷ shortest RR during the strain. The app shows the mean ratio of the maneuvers (with the range), the highest one and each maneuver with its maximum and minimum HR.

Within range	Borderline	Below range
≥ 1.21	1.11 to 1.20	≤ 1.10

> **Without a manometer.** The references assume a 40 mmHg strain. Done without a manometer, the maneuver should be interpreted with caution, and the result says so.

Signal quality and PDF

- If the signal quality is rejected, the result warns in red: **repeat the test before interpreting**.
- **Generate test report (PDF)** has the test's numbers with the range and the recording data. The test can also go in as a block in the general technical report (chapter 19).

14. Orthostatic, Breath Pause and Single Measurement

Orthostatic Test — 30:15 ratio Pro

Measures the immediate cardiovagal response to standing up. It can be done on its own (focused mode) or at the end of Complete mode, by ticking "Include Orthostatic Test".

1. Connect the sensor. The live reading appears by itself.
2. 5 min of rest lying down (or "Already resting", which counts 5 s and asks the person to stand).
3. Countdown and **"NOW — Stand up!"**: the person stands up quickly and remains standing, relaxed, for 3 min. The capture starts by itself.
4. Record blood pressure lying down and standing (1 and 3 min).

The **IRO** is the ratio between the longest and shortest RR interval of the response to standing. The normality threshold falls with age (about 1.20 at age 20 and 1.01 at 75); the app shows the expected limit next to the value. Bands: **vigorous** (≥ 1.35), **normal**, **reduced** and **insufficient** (signal too poor to conclude). Blood pressure is labelled as stable, borderline or significant drop (a drop ≥ 20 systolic or ≥ 10 diastolic). The IRO and blood pressure are context: they do not change phenotypes or practices.

Resting Breath Pause Plus

After 2 min of normal breathing, the person breathes out without forcing and holds. You tap **Hold now** and, at the first clear urge to breathe, **STOP**. It is not about holding on: the first breath afterwards should be calm.

- The result is a **time**, comparable only with that person's other pauses, in the same position (supine or seated).
- It works without the sensor; with it, the starting HR and the minimum HR during the pause are added.
- If there was a hyperventilation practice beforehand, the measurement enters the comparison flagged, because the drop in CO_2 may have lengthened the pause.

> **Contraindications:** history of fainting, panic disorder or intense anxiety, pregnancy.

Single Measurement Free

Measures a single moment: T1 supine or seated, T3 supine or seated, guided T2 (with a prescribed rhythm) or free T2 (a task outside the library, with the name you write). With no second moment, there is no phenotype, response index or plan, and the value is not classified as high or low. T1 enters the evolution bands, alongside measurements in the same posture; T3 stays out of them. It produces its own PDF.

15. The Result

The Result screen brings together, from top to bottom:

Block	Content
Indices	ICA, IFA, SRA, IRA, IRVP and IRVR, depending on the mode and plan (chapter 16).
Response profiles	Predominant phenotypes, split into Autonomic Response (HRV) and Symptom Context (chapter 17).
Response to the tested practices	For each task: T2 RMSSD, change from baseline, HR and the direction of the response (vagal, sympathetic, neutral or paradoxical).
HRV transitions	Comparison between moments: during the session and the final state (start × end, same position).
Comparison across moments	Table with the values of each moment. The arrows only indicate the direction of change, not a normal range.
Measurement data	Raw values per moment, for checking. Tap a moment to see all the data: time domain, Poincaré geometry, frequency domain (total power, LF, HF, LF/HF and dominant oscillation), the HR curve and **Export RR**.
Today's check-in	The recorded context, outside the calculations.
Practice plan	Suggested practices in the tracks, with classification, dose and explanation (chapter 18).
Sleep and rhythm plan	Routine guidance linked to circadian rhythm, complementary to the practices.
Session notes	Free field that goes into the report.

At the bottom of the screen: ← **Fix** (back to the steps), **Save Assessment**, **Generate Report** and **Technical Report**. Once saved, the assessment can be reopened from the history, and changes to the plan are stored with **Save changes**.

16. Indices

Index	Name	What it measures	Plan
ICA	Symptom & Lifestyle Load	Load from the Profile Questionnaire, 0 to 100, with each domain's contribution. Bands: ≤ 20 low · 21–40 mild · 41–60 moderate · 61–80 high · 81–100 very high.	Free
IFA	Response flexibility	0 to 100, from the direction, amplitude and recovery of the response to tasks. Bands: good, moderate, low.	Free
SRA	Recovery capacity	T3 compared with T1D (whole session). Bands: excellent, good, moderate, low, very low.	Free
IRA	Acute Response	Response to the task (T1D → T2): direction, amplitude and tolerance; with recovery kinetics.	Free
IRVP	Resting Vagal Gain	Ability to increase vagal modulation and lower HR when moving from seated to supine (vagal RMSSD and postural HR). Complete mode only.	Plus
IRVR	Respiratory Vagal Reserve	Ability to modulate the vagus during guided breathing (functional reserve). Bands: optimal, good, acceptable, low, insufficient. It may indicate that low resting HRV does not reflect true rigidity.	Pro
IRO	Orthostatic Response	30:15 ratio on standing up, with an age-adjusted threshold (chapter 14).	Pro
IQS	Signal quality	Reliability of each recording, 0 to 100 (chapter 9).	Free

Basic HRV measures

- **RMSSD** (ms): variation between consecutive beats; a marker of vagal modulation.
- **SDNN** (ms): overall variability of the period; valid only with 5 min or more.
- **HR** (bpm): mean heart rate of the interval.

17. Response profiles (phenotypes)

Phenotypes are autonomic response profiles that guide the suggested practices. **They are not diagnoses.** The app shows the predominant patterns of the assessment.

Code	Name in the app	What the profile indicates
F1	Alert State	Autonomic nervous system in persistent alert, with difficulty slowing down: insomnia, chronic tension and paradoxical parasympathetic response.
F2	Recovery Needs Attention	Reduced autonomic recovery capacity, with non-restorative sleep as the central marker.
F3	Reduced Responses	Low autonomic reactivity, with consistently reduced amplitudes across several tasks.
F4	Sensitive Response	Exaggerated autonomic oscillations; an unstable pattern between tasks and between sessions.
F5	Stress-Sensitive Digestion	Gut–brain axis: digestive symptoms linked to stress, sleep, pain or overload.
F6	Low Energy Activation	Resting vagal predominance with low energy activation; low HR without an athletic context. In trained people, it may reflect good adaptation.
F7	Good Adaptation	Good autonomic modulation, high adaptive reserve and good response to interventions.
F8	Heightened Body Sensitivity	Chronic inflammatory load associated with autonomic dysfunction: chronic pain, hyperalgesia and autoimmunity.

> **Autonomic Response × Symptom Context.** F5 and F8 appear under "Symptom Context", because they depend on reported symptoms (digestive, pain, inflammation), not only on HRV. It is a contextual reading, not a direct measurement.

> **Insufficient measurement.** When the baseline signal quality is rejected, the app warns that the phenotypes may not be reliable and recommends redoing the recording before building the plan.

18. Practice plan and tracks

The plan is based on the responses observed during the assessment. Practices are organised in three tracks:

Track	Goal
Restoration	Vagal support and recovery.
Rhythm	Training of autonomic oscillation, mainly with paced breathing.
Expansion / Activation	Progressive activation.

Classification of each tested practice

Classification	When
Support Practice	Response in the expected direction, adequate amplitude (15% to 50%), good flexibility (IFA ≥ 70) and good tolerance (ITT ≥ 60). Keep or progress.
Regulation Practice	All other cases: neutral direction, insufficient or exaggerated amplitude, moderate or low flexibility, intermediate tolerance, or ITT not filled in.
Progression Practice	Paradoxical response (in the direction opposite to the expected one) or low tolerance (ITT < 40). Calls for graded exposure.

Each practice card shows the reason for the classification, what the practice is, how to do it, the goal and the dose (duration, sets and frequency). Suggested practices not yet tested appear with the mark **N1 · gentle start**.

Adjusting the plan

- **+ Add task** adds practices to a track.
- The dose of each practice can be adjusted; the changes are saved in the assessment.
- A valid clinical suggestion that belongs to Pro stays in the plan, flagged, ready for when the plan is unlocked.

19. PDF reports

Assessment report

In **Generate Report**, you choose what goes into the PDF:

- reading notes (how to read, variability, method);
- comparison across moments Plus;
- annex with data and charts per moment Pro;
- evolution across sessions, choosing which sessions to compare (2 sessions on Free, up to 8 on Plus and Pro);
- latest Orthostatic tests and Breath Pauses.

Back to default restores the initial selection. The header with your name, registration and logo is part of Plus and Pro. The PDF opens in the device's share sheet, so you can save or send it.

Technical report

Made for the professional. On Plus, an essential version (comparison table and evolution); on Pro, the full version, with charts per moment. Under **Other sessions (reflex tests and custom)**, choose which ones go in as blocks: those from the same day come ticked, those from other days appear unticked, with the date. The blocks have no charts and point to the detailed PDF of each session.

The Custom mode has its own technical report of the sequence (chapter 11), with the note you wrote. When it came from files, the PDF is called **Import recordings**.

Other documents

Single Measurement, Breath Pause, Orthostatic, Deep Breathing and Valsalva produce their own PDFs from their result screens.

Export RR

In the detail of a moment, **Export RR** produces a file with the series of intervals between beats, for external analysis. Only assessments made since the version that started storing this series have the data.

20. Follow-up and evolution

Each assessment is stored in the person's profile. On the profile screen:

- **Assessment History**: date, response profile, ICA and mode of each session. **View** reopens the result; ✕ deletes the assessment (with confirmation).
- **+ New Assessment**: starts a reassessment already linked to the person.
- **Export this profile's backup**: backup of that person only.
- **Delete this profile and all assessments**: removes the person from the device.

With two or more sessions, the report can include the **evolution** chart. Measurements are only compared when they are in the same posture and the same time window.

21. Task Library and My tasks

The Library groups the practices by family. Each task has a description, how to do it, duration and frequency, goals, when it usually helps, when to avoid it, priority profiles and technical notes. You can search by name or description. On Free and Plus the basic tasks are unlocked (one per family, marked with *); on Pro, the full library.

Family	Tasks	Type
A — Paced Breathing	A.1 Breathing 4x4* · A.2 Breathing 5x5 · A.3 Breathing 6x6 · A.4 Breathing 4x6 (4 s in, 6 s out; 6 cycles/min)	Relaxation
A2 — Ultra-Slow Breathing	A2.1 Gentle Breathing for Sleep* · A2.2 Breathing 3x3	Relaxation
B — Special Breathing Techniques	B.1 Humming — Breathing with Sound* · B.2 Box Breathing 4x4x4x4 · B.3 Breathing 4-7-8 · B.4 Alternate Nostril Breathing · B.5 Box Breathing 5x5x5x5 · B.6 Cyclic Sighing	Relaxation
C — Visceral Regulation	C.1 Abdominal Compression · C.2 Supported Squat* · C.3 Tired Person's Walk	Relaxation
D — Mindfulness / Grounding	D.1 Grounding — Body Anchoring* · D.2 Body Scan · D.3 Body Meditation	Relaxation
E — Mobility	E.1 Neck Mobility* · E.2 Jaw Relaxation	Mixed
F — Sympathetic Activation	F.1 Morning Sun Exposure* · F.2 Hand Grip · F.3 Squats · F.4 Breath of Fire · F.5 Conscious Hyperventilation Breathing	Activation
G — Modulatory Challenge	G.1 Cold Water on the Face* · G.2 Cold Shower	Activation
H — Orofacial Touch	H.1 Calming Touch · H.2 Facial Massage · H.3 Jaw Massage · H.4 Face and Jaw Relaxation (family on Pro only)	Relaxation

My tasks Plus Pro

- **+ New task**: name, description, track and type (relaxation, activation or mixed). The type is what the app uses to read the response when the task is the T2; if unsure, leave it as Mixed.
- **+ New guided rhythm**: set the times for inhale, pauses and exhale. The T2 guide follows that rhythm. The same rhythm is the same task; changing the rhythm later saves another task, so sessions do not get mixed.
- The text appears exactly as you wrote it, in any app language and in the PDFs.
- Deleting a task removes it from the library, but the assessments that used it keep showing the task as it was.

22. Breathing Practice and Live reading

Breathing Practice

A separate module, outside the assessment. Choose a breathing practice and the duration (or free time) and train the rhythm with the person, with the same visual, sound and vibration guide used in the tasks.

- **Custom breathing**: set the times for inhale, hold full, exhale and hold empty, in steps of 0.5 s. Available only in the practice module.
- **Optional sensor**: with the Polar connected, HR and RMSSD appear live, next to the rhythm and heart response chart.
- The HR curve follows the breath with a delay of about 3 s (respiratory sinus arrhythmia). This is expected, not an execution error; that is why the chart shows shape and synchrony, without a numeric scale.
- **Nothing is saved**: the practice produces no assessment, phenotype, history or report.

Live reading

Connects the sensor and shows the reading in real time, without saving an assessment. Use it to test the strap and the contact before a session.

23. Data, backup and privacy

> **The data stay on this device only.** The app uses no cloud, creates no account and sends nothing to servers. If you uninstall the app, change phones or clear the data, everything is lost. Make backups.

Export

1. Profile → **Backup & data** → **Export full backup**.
2. Set a password of at least 4 characters. Keep it: without it, nobody can open the file, not even you.
3. Android asks where to save the file. Pick a place you trust: Google Drive, e-mail or a computer. From then on, keeping the file safe is your responsibility.
4. The app confirms how many assessments and how many of My tasks went into the file.

The full backup carries every person, the assessments, your professional profile, My tasks and the custom setups. The file is an encrypted `.json` (AES-256). From each person's screen, **Export this profile's backup** produces a backup of that person only.

Import

1. Profile → **Import backup** (or, on a new device, the same option in the initial setup).
2. Choose the file and enter the same password.
3. The summary shows how many assessments are new, updated or already present.

- Importing **deletes nothing**: it adds what is missing and updates what changed. Importing on the same device does not duplicate anything.
- An assessment deleted after the backup **does not come back**; the summary says how many.
- If the file carries a professional profile different from the one on screen, it is loaded into the fields. It is only saved when you tap **Save**.

Changing phones

On the old one: export the full backup and keep the file outside the device. On the new one: install the app, accept the terms, tap **Import backup** in the setup, review the profile and tap Save. If you use an access code, enter it again.

Protection

Turn on the PIN or biometric lock in the Profile (chapter 3). The user is responsible for protecting the device and for obtaining the assessed people's permission to record their data.

24. Plans and access code

Plan	What it includes
Free	Single Measurement and By Task · ICA, IFA, SRA and IRA indices · basic tasks · 2-session evolution in the PDF.
Plus	Complete mode · IRVP · PDF with your identity (logo, name, credentials) · essential technical report · Breath Pause · evolution of up to 8 sessions · My tasks, with your own guided rhythm.
Pro	Everything in Plus · Multi-Task · Custom with Receptive fields · Import recordings · Deep Breathing and Valsalva · Orthostatic · full library · IRVR and IRO · full technical report, with charts per moment.

- On **Android**, subscriptions are monthly or yearly, with a 14-day free trial and automatic renewal; cancel in the Play Store. **Restore purchases** recovers an existing subscription.
- On **iOS**, every feature is already unlocked.
- When a feature belongs to Plus or Pro, the app shows a lock and the plan required.

Access code

Profile → end of the screen → **Access code** → **I have an access code**. Type the code and tap **Activate**: every feature is unlocked on this device. When you change phones or reinstall the app, enter the same code again. **Leave founder access** returns to the Free plan without deleting data.

25. Troubleshooting

Situation	What to do
"No Bluetooth permission" or "Bluetooth off"	Tap Open Settings → and allow Bluetooth for Vagal Sense, or turn on the device's Bluetooth.
"No Polar H10 found"	Moisten the strap, put it on (it only switches on in contact with the skin) and bring the phone closer. Tap Search again.
The chosen strap does not appear	Check that it is on and nearby; choose it from the list. With several straps, check the printed code.
"Sensor not in contact with skin"	Moisten the electrodes and adjust the strap.
The sensor dropped during the recording	Check the coverage shown and, if there is a large gap, redo the measurement.
Signal quality "Rejected"	Redo the recording with the person at rest and the strap moist.
SDNN marked as invalid	The recording is shorter than 5 min. Use RMSSD and HR, or choose 5 min or more.
The ITT gave no score	Answers are missing: the score only appears with all 6.
A practice came out as Regulation	See the reason on the card (for example, ITT not filled in or amplitude out of range).
Custom produced no phenotype	The sequence needs T1, at least one task and T3. T2 and T3 of at least 2 min; the two T1s, if any, with the same length.
Import: "No RR intervals found"	The file must be text with one RR interval per line. Export it again from the other program in that format.
Import: the file picker does not close	On Android, tap Back until it closes: one tap per open folder.
Reflex test with "low signal quality"	Moisten the strap, ask the person to stay still and repeat the test before interpreting.
A receptive field got no suggestion	HR and RMSSD disagreed, or the 15 s of rest before were missing. Classify it yourself.
I forgot the backup password	There is no way to open the file. Export a new backup with another password and keep it.
I forgot the app PIN	"Forgot my PIN" on the lock screen, with confirmation by the device.
Error generating the PDF	Try again. The message shows a technical detail that can be sent to support.

26. Glossary

Term	Definition
HRV	Heart rate variability: the variation in time between heartbeats.
RR interval	Time between two consecutive beats, in milliseconds.
RMSSD	Root mean square of successive differences between RR intervals; a vagal marker.
SDNN	Standard deviation of the RR intervals of the period; valid with 5 min or more.
HR	Mean heart rate, in beats per minute.
T1S / T1D	Seated baseline / supine baseline.
T2	Measurement during the task.
T3	Recovery measurement, after all the tasks.
IQS	Signal quality index of the recording (0–100).
ICA	Symptom and lifestyle load (questionnaire).
IFA	Autonomic response flexibility.
SRA	Recovery capacity (T3 × T1D).
IRA	Acute response to the task.
IRVP	Resting vagal gain, seated → supine.
IRVR	Vagal reserve during guided breathing.
IRO / 30:15 ratio	Cardiovagal response to standing up.
ITT	Task Tolerance Index (6 questions).
IEA	Today's check-in (session context).
LF / HF	Low- and high-frequency bands of the HRV spectrum.
Poincaré	Plot of each RR interval against the next; summarises short- and long-term variability.
Respiratory sinus arrhythmia	Natural oscillation of HR with breathing.
E-I	Difference between the maximum and minimum HR of each breathing cycle, in Deep Breathing.
Valsalva ratio	Longest RR after the strain ÷ shortest RR during the strain.
Receptive field (RF)	Area stimulated to observe the autonomic response, comparing the 15 s before with the time during.
RR file	Text with one RR interval per line, in milliseconds, used in Import recordings.
Phenotype	Autonomic response profile (F1 to F8); not a diagnosis.
Track	Group of practices by goal: Restoration, Rhythm or Expansion.

> Vagal Sense is an educational tool for autonomic well-being. It is not a diagnosis and does not replace evaluation by a health professional.

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