

SAFETY SWIM TIME



SST SWIM WITH PEACE

USER MANUAL

The poolside alarm that sounds when a swimmer's tag stays under water for more than 3 seconds.

3 s

under water
and the alarm sounds

3 h

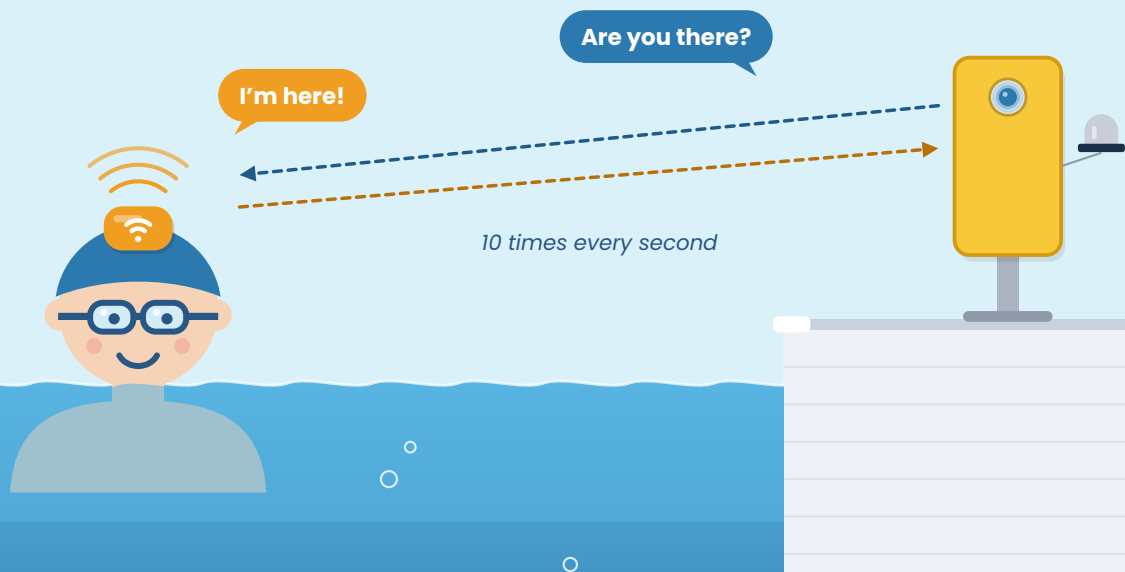
of swimming
on one charge

10×

checks every
second

0

Wi-Fi, apps or
internet needed



Please read this manual before first use.

SST helps you watch swimmers – it never replaces watching them.

Edition 1

September 2026

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Charge the tag

about 3 h per charge

2



Base Station on

alarm sounds at first

3



Swim Tag on

alarm stops, blue light on

4



Dunk test

alarm after 3 s



Safety first – please read

SST is an **extra pair of ears, not a lifeguard**. Always keep swimmers – especially children – in sight and within reach.

SST only knows whether the Swim Tag is **above or below the water**. It cannot tell if a swimmer is in trouble while the tag stays above the surface.

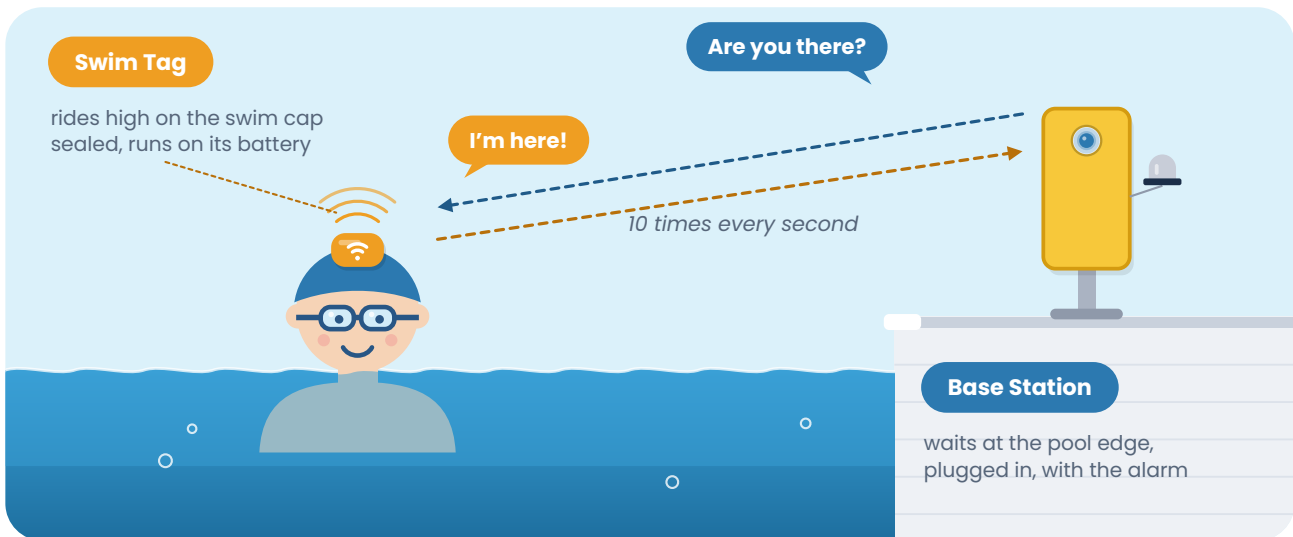
Do the dunk test before every swim (chapter 3). If the alarm does not sound, do not rely on SST.

1

Welcome to SST

CHAPTER 1

SST – **Safety Swim Time** – keeps an extra ear on the water. A small **Swim Tag** rides on the swimmer's cap and a **Base Station** waits at the pool edge. If the tag stays under water for more than **3 seconds**, the alarm sounds.



The Base Station keeps asking, the Swim Tag keeps answering – as long as it is above water.

The two parts



Swim Tag

- Sealed, waterproof capsule worn high on the swim cap.
- Answers the Base Station 10 times a second.
- Runs about **3 hours**, then recharges on its magnetic charger.



Base Station

- Stands at the pool edge, plugged in.
- **Blue light on** = the tag is answering.
- Sounds the alarm when the answers stop for **3 seconds**.

One Base Station watches **one** Swim Tag. For two swimmers, use two complete SST sets.

At a glance

3 s

under water before the alarm sounds

3 h

of swimming on one full charge

10×

the Base Station checks every second

1–2 s

for the alarm to stop once the tag is back up

0

Wi-Fi, router, app or internet needed

2

How SST works

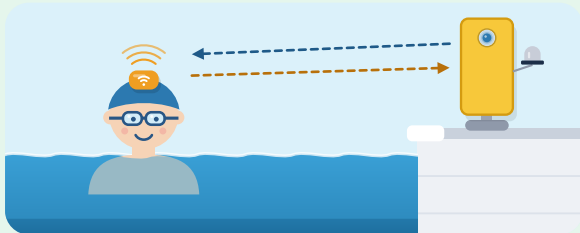
CHAPTER 2

SST is built on one simple fact: **radio travels easily through air, but not through water**. When the tag goes under, its answers stop – and that is exactly what the Base Station listens for.

The idea in four pictures

1 Head above water

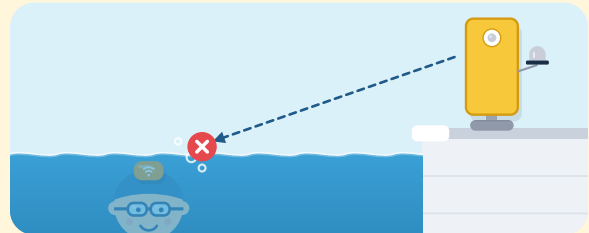
quiet



The Base Station asks “Are you there?” and the tag answers “I’m here!” – **10 times every second**. All quiet, blue light on.

2 Head goes under

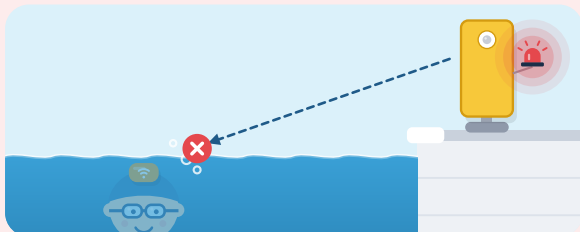
1 2 3



Water blocks the radio. The answers stop and the Base Station starts counting: **1... 2... 3...**

3 3 seconds: ALARM

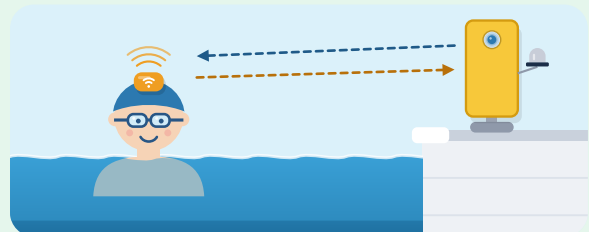
ALARM



No answer for **3 seconds** – the siren sounds and the blue light goes out. Look at the swimmer right away.

4 Head back up

1–2 s



The tag answers again. Within **1–2 seconds** the alarm stops by itself and the blue light returns.

Why water?

SST talks on 2.4 GHz – the same kind of radio as Wi-Fi. Water soaks this radio up almost completely: a few centimetres of pool water are enough to silence the tag, and salt water blocks it even faster. In the air above the pool, the signal travels easily.



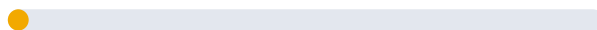
Air



easily across the pool



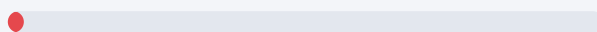
Pool water



a few centimetres



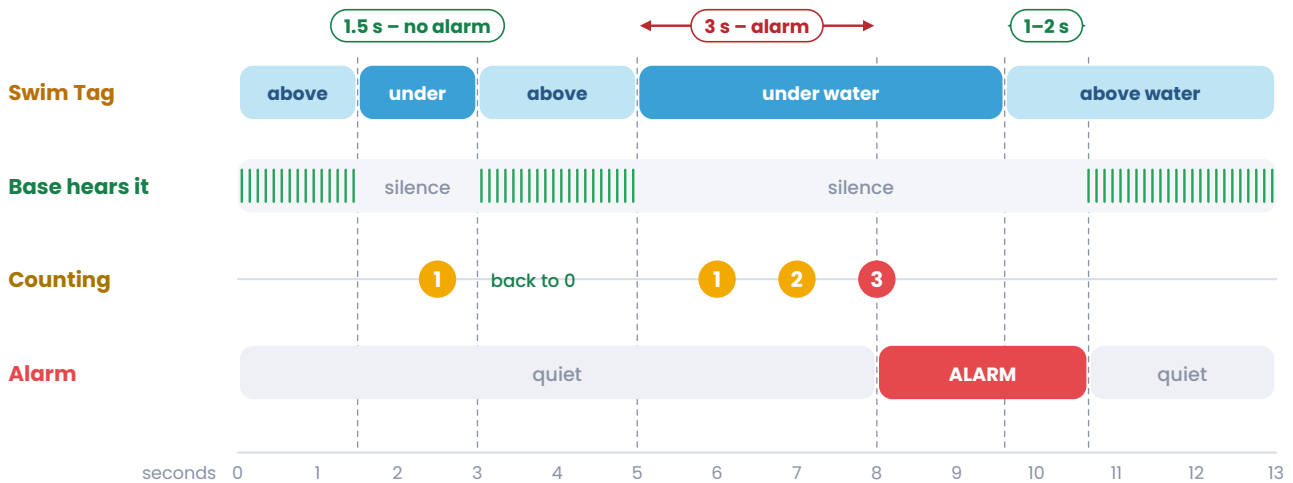
Sea water



even less

The 3-second rule

Not every dip means danger. The Base Station only raises the alarm when the tag has been silent for **3 seconds in a row**. Here is what that looks like over 13 seconds of swimming:



A short dip (left) stays quiet. A long dip (right) sets off the alarm after 3 seconds, and it stops by itself soon after the tag is back above water.

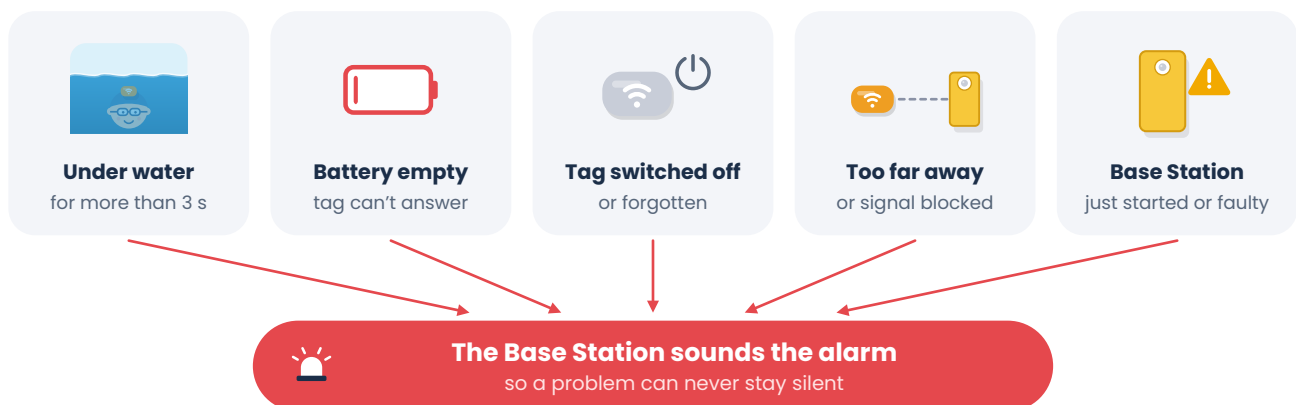


Why 3 seconds?

Short dips – a stroke, a splash, a quick duck – are usually over in less than 3 seconds, so they don't cause false alarms. Anything longer is treated as serious. 3 seconds is quick enough to call you in time, and patient enough to stay quiet during normal swimming.

Any problem = alarm

SST is built to **fail safe**: silence always means “the tag is answering”. Whatever stops the answers, you will hear it.



What SST cannot do

It cannot see the swimmer – it only knows whether the tag is above or below the water. It cannot protect anyone who is not wearing a charged, switched-on Swim Tag. It never replaces an adult who is watching. Use SST as an extra layer of safety.

3

Getting ready

CHAPTER 3

Five simple steps before the first swim – and a 10-second test before every swim.

Set up in five steps

1

Charge the Swim Tag

Snap the magnetic charger on – **+** to **+** – and charge it fully. A full charge lasts about 3 hours (chapter 5).



2

Place the Base Station

At the pool edge, dry and plugged in. As **high** as you can, with a clear view of the whole pool – no metal, walls or crowds in between.



3

Switch the Base Station on

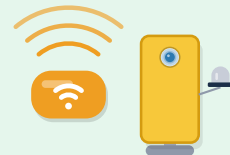
The alarm sounds at first. That's normal: the Base Station assumes the worst until it hears the tag – and you know the siren works.



4

Switch the Swim Tag on

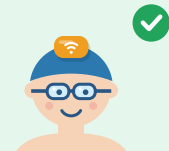
Take it off the charger and switch it on. Within a few seconds the alarm stops and the **blue light** comes on: the two parts have found each other.



5

Fit the tag, test, swim

Fix the tag high on the swim cap (next page), do the dunk test – then enjoy the water.

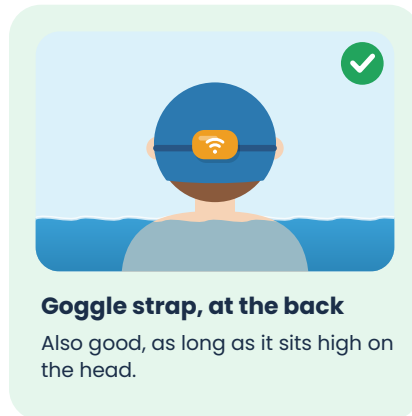
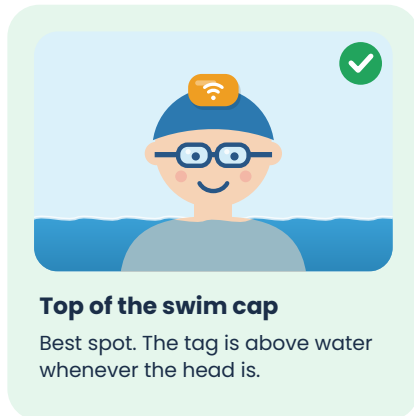


Order doesn't matter

You can also switch the tag on first. The alarm always sounds for a moment when the Base Station starts, then stops as soon as the tag answers.

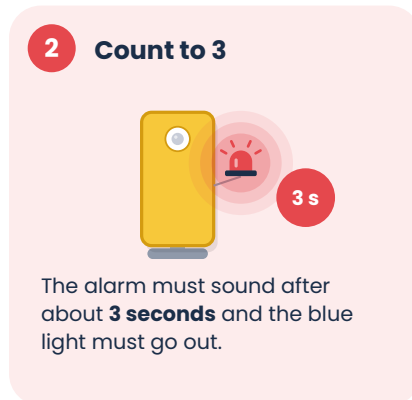
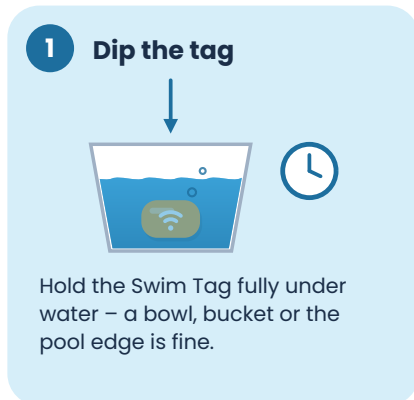
Where to wear the Swim Tag

The tag must be **above water whenever the swimmer's head is**. Fix it firmly, high on the head.



The dunk test – before every swim

It takes ten seconds and proves the whole chain works: tag, radio, Base Station and siren.



No alarm during the test?

Don't swim with SST until it passes. See **Troubleshooting** (chapter 6).



Before every swim

Tick all five, then enjoy the water

- ☐ Swim Tag **fully charged** (a full charge lasts about 3 hours)
- ☐ Base Station at the pool edge, plugged in, **blue light on**
- ☐ **Dunk test passed:** alarm after about 3 s, stops when the tag is lifted out
- ☐ Tag fitted firmly, **high on the swim cap**
- ☐ An adult is **watching the swimmers** – the whole time

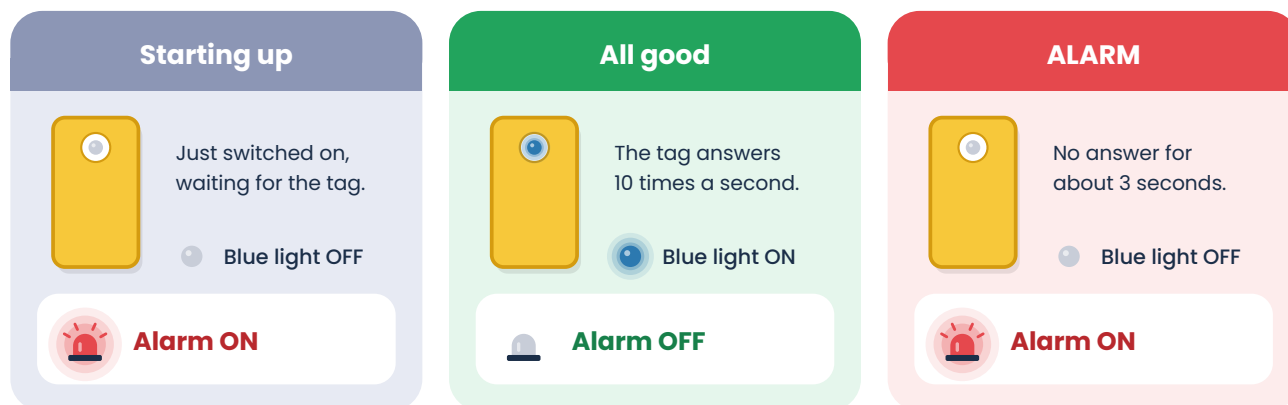
4

At the pool

CHAPTER 4

In daily use you only need two things: the Base Station's **blue light** and its **alarm**. They always do the opposite of each other.

What the Base Station tells you



When the alarm sounds



1. Look at the swimmer – right away.

Always check the swimmer first, the equipment second.



2. Swimmer under water or struggling?

- **Get them out and help at once.** Call for help if needed.



2. Swimmer is fine?

- Maybe they were diving, or the tag slipped low. The alarm stops by itself within **1–2 seconds** of the tag being back above water.



3. Alarm keeps going, but the swimmer's head is above water?

- Take the swimmer out of the water until you know why.
- Check the tag: switched on, charged, sitting high on the cap?
- Is the Base Station too far away, too low or blocked? See chapter 6.

Good to know

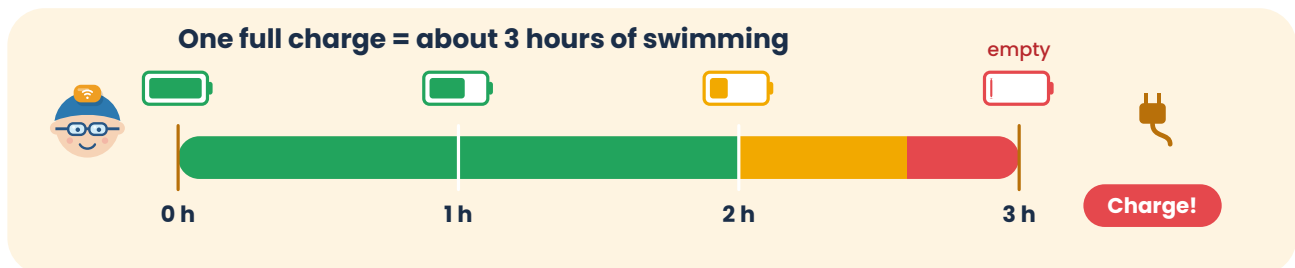
- **Diving and underwater games** will set off the alarm – that is SST doing its job. Explain the 3-second rule to your swimmers before they get in.
- **Stay within earshot** of the Base Station the whole time.
- **After the swim**, switch the Base Station off first, then the tag – otherwise the alarm will sound as soon as the tag stops answering.

5

Battery & charging

CHAPTER 5

The Swim Tag runs on a rechargeable battery: about **3 hours of swimming** on one full charge. The Base Station is plugged in and needs no battery.



What happens when the battery runs out?

The tag simply stops answering – and after 3 seconds the Base Station sounds the alarm. So an empty battery can never go unnoticed. Still, don't let it get that far: **keep swims under 3 hours and charge after every session.**

How to charge

The Swim Tag has two charging contacts, marked + and -. Charging is just a matter of snapping the magnetic charger onto them – the right way round.

1 Rinse & dry



Rinse the tag with fresh water, then dry it – especially the two contacts.

2 Match + to +



Hold the magnetic charger so **+ meets +** and **- meets -**. It snaps on by itself.

3 Charge fully



Leave it connected until it is fully charged: about 3 hours of swimming.

4 Pull it off

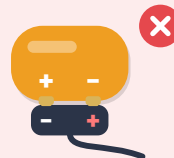


Pull the charger off. The tag is ready for the next swim.



Right way round

+ to + and **- to -**. The charger clicks into place and the tag charges.



Wrong way round

Reversed, the tag does not charge and could be damaged. Just turn the charger round.



Battery tips

- Only charge a **dry** tag, and charge it after every swim – even a short one.
- Switch the tag off when you are done – it still uses a little power while waiting.
- A full charge no longer lasts about 3 hours? Have the battery replaced.



6

Troubleshooting

CHAPTER 6

Most problems come down to the battery, the distance or the tag sitting too low. Try the suggestions in order.

**The alarm won't stop after switching on**

1. Is the Swim Tag switched on and charged?
2. Bring the tag closer to the Base Station, out of the water.
3. Wipe any water off the tag.
4. Switch both parts off and on again.

**False alarms while swimming normally**

1. Move the tag higher on the cap – it may dip under too often.
2. Put the Base Station higher and closer, with a clear view of the pool.
3. Is the battery low? Charge it.

**The alarm sounds at the far end of the pool**

1. The tag is at the edge of its range.
2. Move the Base Station closer to the middle of the pool side, and higher.
3. Clear metal or other obstacles out of the way.

**The battery doesn't last 3 hours**

1. Was it fully charged – with the charger the right way round (+ to +)?
2. Cold water and older batteries shorten the time.
3. Switch the tag off after every swim.
4. Still short? Have the battery replaced.

**Nothing happens at all**

1. Check the Base Station's power adapter, cable and socket.
2. Try a different power adapter.
3. Still dark and silent? Contact whoever built or supplied your SST.

**No alarm during the dunk test**

1. Was the blue light on before the test?
2. Was the tag **fully** under water for at least 3 seconds?
3. Did the siren sound at switch-on? If not, check it is connected.
4. **Don't rely on SST until it passes the test.**



Care & key facts

CHAPTER 7

A little care keeps SST reliable for a long time – and here are all the key numbers on one page.

Care



Rinse the tag with **fresh water** after every swim – especially after chlorine or salt water – and dry it, including the two charging contacts.



Check the tag before each use: **no cracks** in the housing, **clean contacts**. Keep the charger's magnetic head clean too – magnets pick up metal dust and grit.



The Base Station needs power. **Unplugged, it cannot sound the alarm.**



Keep both parts away from metal boxes and cases – **metal blocks the radio.**



Don't leave either part in hot sun or in a hot car.

Key facts

Alarm	after about 3 seconds without an answer from the tag
Alarm stops	1–2 seconds after the tag is back above water
Checks	10 per second while the tag is answering
Swim Tag battery	about 3 hours of swimming per full charge
Charging	magnetic charger – always + to + and - to - , only on a dry tag
Base Station	plugged in; blue light on = tag answering
At switch-on	alarm sounds until the tag is found – usually a few seconds
Radio	2.4 GHz, direct from tag to Base Station – no Wi-Fi, router, app or internet
Water	a few centimetres of water are enough to block the signal
Sets	one Base Station watches one Swim Tag; they are paired with a secret code



For the person who builds or programs SST

The alarm delay is `LINK_TIMEOUT_MS` in `link_protocol.h`. For the 3-second alarm in this manual set it to `3000` – the supplied code uses `5000` (5 s). Put the same file on both boards. Give every SST set its own secret key (`LINK_PSK`), so a tag from another set can never keep your Base Station quiet.

For about 3 hours: a connected tag keeps its radio on and draws roughly 100–150 mA, so plan on a cell of at least 500 mAh.