BILL'S HOME TECH

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AN EXTENDED GUIDE · NO. 1852

Updated November 2026

Smart Beehive Monitors — A Plain-English Guide for Backyard Beekeepers

Scales, sensors, and apps that let you check on your bees without opening the hive

Tech Made Simple. Service Made Personal.

Bill Davis — Bill's Home Tech

(330) 200-8042 · bill@billshometech.com · Atwater, Ohio

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Everything in this guide, with page numbers. Skip to whichever chapter answers your question right now.

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THE 60-SECOND VERSION

1 The 60-Second Version

The whole idea, if you only have a minute.

A smart beehive monitor is one or more small sensors that live in and under your hive and report to an app on your phone. Instead of opening the hive to find out what is happening — which chills the bees and sets them back — you glance at a chart. The common measurements are weight (a scale under the hive), temperature and humidity (a small sensor on the frames), and sometimes sound or bee traffic.

- What it tells you: when nectar is coming in, when a colony is getting ready to swarm, and whether the bees are alive and warm through winter — all without lifting the lid.
- What it costs: a single internal temperature sensor is often under fifty dollars; a full weight scale runs a few hundred; a hub for around-the-clock remote reporting is extra.
- How you read it: most sensors talk to your phone over Bluetooth when you walk up to the hive. Add a hub and they report all day, from anywhere, over the cell network, Wi-Fi, or a low-power radio.

> **GOOD TO KNOW**
>
> You do not have to buy a whole system at once. Most beekeepers start with one inexpensive temperature sensor on one hive, get comfortable reading the app, and add a scale or a hub later. It is a hobby you can grow into a dollar at a time.

WHAT IT IS

2 What a Smart Hive Monitor Actually Is

A few small gadgets and an app — nothing you have to wire up.

Picture a matchbox-sized sensor that sits on top of the frames, under the lid, reading the temperature and humidity inside the hive. Picture a flat scale, like a bathroom scale built to live outdoors, that the hive sits on and that weighs it all day. Each of these is a self-contained battery gadget. There is nothing to wire to the house and no plug in the beeyard.

The sensors save their readings and hand them to the free app on your phone. The app turns a stream of numbers into simple charts: a line that climbs when honey is coming in, a temperature that holds steady at brood-nest warmth, a weight that dips a little each night as the bees cool and fan.

Two ways the data reaches you

The simplest sensors use Bluetooth, the same short-range signal your phone uses for wireless earbuds. You walk up to the hive, open the app, and it collects whatever the sensor has stored. That is free and needs nothing else — but you have to be near the hive. The second way adds a small hub that stays in the beeyard, gathers from the sensors around the clock, and sends everything to the internet so you can watch from your recliner. More on that in its own chapter.

> *People think this is complicated electronics. It really is a little thermometer that texts its homework to your phone. If you can use a weather app, you can read a hive sensor.*

THE SENSORS

3 The Sensors, One by One

What each kind measures and why a beekeeper cares.

There are only a handful of things worth measuring in a hive, and each one answers a different beekeeping question. You do not need all of them. Here is the whole menu.

Sensor	What it measures	What it tells you
Internal temperature	Warmth on the frames	Whether brood is being raised and the cluster is alive in winter
Humidity	Moisture inside the hive	Ventilation and damp problems, and nectar being cured into honey
Weight (hive scale)	Total weight of the hive	Nectar coming in, stores being eaten, and sudden drops from swarms
Sound / acoustics	The hum of the colony	Queen problems and swarm preparation, read from how the bees sound
Bee counter / flight	Traffic at the entrance	How much foraging is happening on a given day
GPS tracker	The hive's location	An alert and a location if a hive is moved or stolen

For most backyard beekeepers, an internal temperature sensor is the best first purchase — it is the cheapest, and 'are my bees alive and warm?' is the question that keeps you up at night in January. A hive scale is the most informative second step, because weight is the single richest number in beekeeping.

GOOD TO KNOW

Humidity and temperature are usually combined in one small sensor, so you often get both for little more than the price of temperature alone. Sound and bee-counting are newer and more specialized — interesting, but not where a beginner needs to start.

READING WEIGHT

4 What the Hive Scale Is Telling You

Weight is the richest number in the beeyard — here is how to read it.

If you only ever add one real instrument to a hive, make it a scale. Weight gathers up almost everything the colony is doing into a single daily line, and once you learn to read it you can tell remarkable things without ever lifting the lid.

The daily sawtooth

A healthy hive's weight does not hold perfectly flat through the day. It typically rises during the day as foragers bring in nectar and water, then dips overnight as that nectar is fanned down into honey and some moisture leaves. On a chart this looks like a gentle sawtooth. The pattern itself is a sign of a working colony.

- A steady climb over days or weeks: the nectar flow is on. The bees are bringing in more than they use — this is when supers fill.
- A slow decline: the flow has stopped and the colony is living on its stores. In late summer and winter this is normal and worth watching so they do not run out.
- A sharp drop of several pounds in minutes, on a nice day: often a swarm leaving, taking its weight in bees and honey with it.
- A drop at the wrong time of year: could be robbing, a dead-out, or a hive knocked over — a reason to go look.

WATCH OUT

One scale reads the whole hive, so a weight change can have more than one cause. A big midday drop is usually a swarm, but it could be you pulling honey, or someone bumping the hive. The scale tells you something changed and when; your eyes confirm what.

> *The scale does not replace the beekeeper. It just tells you which hive to walk out to, and roughly what you will find when you get there. That is worth a great deal on a busy spring day.*

WHAT THE NUMBERS MEAN

5 Nectar Flow, Swarming, and Overwintering

The three big questions the data answers.

Strip away the gadgetry and smart monitoring really answers three questions that every beekeeper asks every year. Here is how the numbers speak to each.

Is the nectar flow on?

Rising weight, day after day, is the clearest signal in beekeeping that forage is abundant. Watching the scale tells you when to add supers so the bees have room, and when the flow has tapered off so you can think about pulling honey. You stop guessing from the calendar and start reading your own bees.

Are they about to swarm?

Swarming is how colonies reproduce, and losing a swarm means losing half your bees and much of your honey crop. Two signals hint at it: a change in the hive's sound as the colony prepares, and then the unmistakable sharp weight drop when the swarm actually leaves. Sound-based systems try to warn you before it happens; the scale confirms the moment it does.

Did they make it through winter?

This is the one that matters most to backyard keepers. In winter you must not open the hive — it can chill the cluster fatally. A temperature sensor in or near the cluster lets you see that the bees are still generating heat, and the scale shows them slowly eating down their stores at a safe pace. A cluster temperature that falls to match the outside air is the hard news that a colony has died, and at least you learn it without a

disruptive inspection.

A simple way to use the readings each season

1. Spring: watch the scale start to climb and add supers when the flow turns on, so the bees have room to store it.
2. Early summer: keep an eye out for a sound change or a sharp weight drop that signals a swarm, and inspect the hive it points to.
3. Late summer: note when the climb stops, then decide about pulling honey and leaving enough stores behind.
4. Fall and winter: check cluster temperature to confirm the bees are alive, and watch weight fall slowly so they do not run out of food.

> **GOOD TO KNOW**
>
> None of this requires you to be a scientist. The apps mostly do the interpreting — they label the flow, flag an unusual drop, and chart winter stores. Your job is to glance, notice, and decide whether to walk out to the hive.

GETTING THE DATA

6 How the Readings Reach Your Phone

Bluetooth up close, or a hub for around-the-clock reporting.

This is the part that decides how much you spend and how often you see your data, so it is worth understanding plainly. There are two levels.

Level one: Bluetooth, walk-up reading

The sensor stores its readings and hands them to your phone over Bluetooth when you are within a few dozen feet. This is free beyond the sensor itself and perfect if your hives are in the backyard and you pass them daily. The limit is simple: no phone nearby, no update.

Level two: a hub for always-on monitoring

Add a small hub that stays in the beeyard. It collects from all your sensors around the clock and sends the data on to the internet, so you can watch from the house or from

a thousand miles away. Hubs differ by how they connect.

Connection	How it reaches the internet	Best when
Wi-Fi hub	Uses your home Wi-Fi	Hives are close enough to the house to catch Wi-Fi
Cellular hub	Uses the cell network, like a phone	Hives are out of Wi-Fi range but have cell coverage
LoRa radio	Long-range low-power radio to a base unit	An outyard with no Wi-Fi; relays to a connected hub

GOOD TO KNOW

The cellular hub is the one most beekeepers with a remote yard end up wanting, because it works anywhere there is a phone signal. Some carry a small subscription for the data service, so check that before you buy — the box is only part of the cost.

WATCH OUT

A hub needs a signal where your hives actually sit, which may be a hollow or a treeline with weak coverage. Confirm you get a cell or Wi-Fi signal standing at the hive before you count on a hub working there.

Rather not do this yourself? I'll come to your home and set it up for you — a flat $99 first visit across Portage County, Ohio and nearby communities. Outside the area? I also help remotely by phone or screen-share. Book at billshometech.com/book or call (330) 200-8042.

POWER IN THE YARD

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Batteries, Solar, and Keeping It Running

No outlet in the beeyard — and you do not need one.

There is no power cord to the hive, and that is by design. The small in-hive sensors sip so little power that a single coin or AA-type battery commonly lasts a year or more, because they wake up, take a reading, send it, and go back to sleep. You change the battery about as often as a smoke detector.

Hubs and scales use more power because they are awake and talking more often. Many are designed for a small solar panel that keeps them topped up through the season, so you set them and forget them. A cellular hub in particular is a good candidate for solar, since it is the hungriest part.

- In-hive sensors: long battery life, change it yearly at a routine inspection and you will rarely be caught out.
- Scales and hubs: heavier draw, often paired with a small solar panel or a larger rechargeable battery.
- Cold weather: batteries weaken in deep cold, exactly when winter monitoring matters most, so fresh batteries going into fall are a good habit.

> **TIP**
>
> Put a reminder on your phone to replace sensor batteries each spring, at your first full inspection of the year. Fresh batteries going into the busy season means you will not lose data during the flow or over the following winter when you cannot easily get in.

THE PRODUCTS

8 The Products Worth Knowing

Real names in the market as of late 2026 — always confirm current pricing.

A handful of companies make monitoring gear aimed at hobbyist beekeepers. The most established name for a mix-and-match, start-small approach is BroodMinder, whose individual sensors and prices are shown below from their own store. Several other brands take a more all-in-one approach; their exact prices change and often involve a subscription, so treat the notes as a starting point and check each company's site.

Product	What it is	Rough cost (late 2026)
BroodMinder-T2	Internal temperature sensor (Bluetooth)	From about $48
BroodMinder-TH2	Internal temperature + humidity sensor	From about $77
BroodMinder-W5	Full hive weight scale	About $260
BroodMinder-CELL / WiFi hub	Hub for around-the-clock remote reporting	Cellular hub from about $15; Wi-Fi hub about $190 (service may apply)
BuzzBox (OSBeehives)	Audio-based health and swarm alerts, app	Varies; check current pricing
Pollenity / Apis / similar	All-in-one scale and sensor platforms	Varies; often sold with a subscription

GOOD TO KNOW

BroodMinder also runs free apps and a web dashboard, and supports a citizen-science project (BeeCounted) where keepers share data. Reading your own sensors with the phone app is free; the paid pieces are the hub hardware and, for some brands, an online subscription for always-on data.

WATCH OUT

Prices, product names, and whether a subscription is required change often. The figures here are rough and were taken from the makers' own listings as of late 2026. Check the current page for the exact sensor and your country before you order.

WHAT IT COSTS

9 What a Starter Setup Really Costs

From under fifty dollars to a full remote rig.

The nice thing about hive monitoring is that there is a sensible entry point at almost any budget. You do not have to decide between nothing and the whole system.

- Toe in the water, under $50: one internal temperature sensor on one hive, read by your phone over Bluetooth. Enough to learn whether you even like having the data.
- A real picture, roughly $75 to $300: add a temperature-and-humidity sensor, and then a weight scale — the scale is where most of the insight lives.
- Always-on from indoors, add $150 to $300 plus possible service: a hub so the sensors report around the clock without you walking out, over Wi-Fi or the cell network.
- Theft protection, extra: a GPS tracker if your hives sit out of sight or have been targeted.

For a backyard keeper with one or two hives in sight of the house, a temperature-and-humidity sensor plus a scale, read over Bluetooth, is a genuinely useful setup for a few hundred dollars and no ongoing fees. The hub and its service are what you add when the hives move out of easy reach.

TIP

Buy the scale before the second fancy sensor. One good scale on your strongest hive teaches you more about nectar flow, stores, and swarming than any other single device — and there are no monthly fees to read it with your phone.

SETTING IT UP

10

Setting It Up Yourself

An afternoon job, not an electrician's.

Getting started is genuinely a do-it-yourself afternoon. Here is the order that keeps it simple.

1. Download the maker's free app on your phone and create an account.
2. Turn on the sensor (usually pulling a battery tab) and let the app find it over Bluetooth — it will show up by its own serial number.
3. Place an internal sensor on top of the frames, under the inner cover, where the bees will seal it in a little with propolis. That is normal and does not hurt it.
4. For a scale, level the ground, set the scale down, and place the hive squarely on it so the weight is even.
5. If you are adding a hub, set it where it gets a signal, power it (or its solar panel), and let the app link it to your sensors.
6. Open the app over the next few days and watch the charts fill in — that is all the 'operating' there is.

TIP

Label each sensor in the app with the hive it is in — 'Hive 1, the big Italians' — right away. Serial numbers all look alike, and a plain name is how you will tell your charts apart next summer.

WATCH OUT

Do not seal a Bluetooth-only sensor inside a metal cover or a lot of foil insulation, which can block the signal. A standard wooden or thin cover is fine. If the app cannot find the sensor, a metal barrier between it and your phone is a common cause.

GPS AND THEFT

11 GPS Trackers and Hive Theft

A quiet insurance policy for hives out of sight.

Hive theft is real, especially where hives sit on remote land or out of view, and a strong colony with equipment is worth real money. A GPS tracker is a small battery device you tuck inside a hive, out of sight. If the hive moves, it can send you an alert and show you where it has gone.

- Alerts on movement: you get a message if a hive leaves its spot, which is the first you might otherwise hear of a theft.
- Location tracking: the tracker reports its position so the hive can potentially be found and recovered.
- Deterrence: a visible note that hives are tracked can be enough to send an opportunist elsewhere.

A tracker needs cell coverage to report, and it uses more power than a simple in-hive sensor, so most use a larger rechargeable battery and sometimes a subscription for the cellular service. For a backyard keeper with hives beside the house this is usually unnecessary; for an out-apiary on borrowed land it can be worth every penny.

> **GOOD TO KNOW**
>
> Even if recovery is uncertain, the alert matters. Knowing within the hour that a hive has moved gives you a real chance to act and to notify the sheriff while a trail is fresh.

COMMON QUESTIONS

12 Common Questions

The things beekeepers ask me most.

Will the sensor hurt or bother the bees?

No. The in-hive sensors are small, sealed, and passive. The bees treat one like any other object in the hive, coating the edges with propolis. It takes up a little space

under the cover and otherwise goes unnoticed.

Do I need internet at the beeyard?

Not for the basic setup. Bluetooth sensors talk straight to your phone when you walk up, no internet required. You only need a connection — Wi-Fi or cell — if you add a hub so the hives report to you around the clock from a distance.

Does it replace opening the hive?

It reduces how often you need to, which is the real gift, especially in cold months when you should not open up at all. But it does not replace a proper inspection for eggs, brood pattern, and disease. Think of it as knowing which hive to inspect and when, not as a reason never to look.

Is the data hard to understand?

The raw numbers can look busy, but the apps do most of the work — charting the trends, labeling the nectar flow, and flagging unusual changes. If you can read the weather or a step-counter app, you can read these.

> **GOOD TO KNOW**
>
> If you keep bees as a hobby and your hives are in the backyard, start with the simplest thing: one temperature-and-humidity sensor read by your phone. It costs little, needs no internet, and answers the question that worries hobbyists most — are my bees alive and warm.

IS IT FOR YOU

13 Is Hive Monitoring Right for You?

A simple way to decide where to start.

Here is the short version of how I help folks think it through. It comes down to where your hives are and what keeps you guessing.

- Hives in the backyard, want to fuss less and chill the bees less? A Bluetooth temperature-and-humidity sensor is a perfect, cheap start — no hub, no fees.

- Want to understand nectar flow, stores, and swarming? Add a scale. It is the single most informative device you can own.
- Hives at an out-yard you cannot visit often? That is when a cellular hub, and maybe a GPS tracker, earns its keep.
- Just want to know the bees survived the winter? One cluster temperature sensor answers that, and only that, for very little money.

You do not have to guess, and you do not have to buy it all at once. Put one sensor on one strong hive, learn to read the app over a season, and let your own curiosity tell you what to add next. The bees will show you what is worth measuring.

GOOD TO KNOW

If you would like a hand, I am glad to help you pick a first sensor, get the app set up on your phone, place a hub where it actually gets a signal, and make sure your charts are labeled so they make sense to you — so the technology stays in the background and you can just enjoy your bees.

CHEAT SHEET

Everyday Cheat Sheet

Keep this page handy. It points you straight to what to do for each task.

I want to...	Do this...
Watch the nectar flow	A hive scale shows weight climbing day by day when the bees are bringing it in
Catch a swarm early	A sudden weight drop, or a change in hive sound, often means a swarm left or is close
Check overwintering	A temperature sensor in the cluster tells you the colony is alive without opening the lid
Monitor from indoors	Add a hub so sensors report around the clock to the app, not just when you are standing there
Deter and track theft	A GPS tracker tucked in a hive can alert you if it moves and help locate it
Start small and cheap	A single internal temperature sensor is often under fifty dollars to try the idea
Get help	Call Bill: (330) 200-8042

AT A GLANCE

A Picture to Follow Along

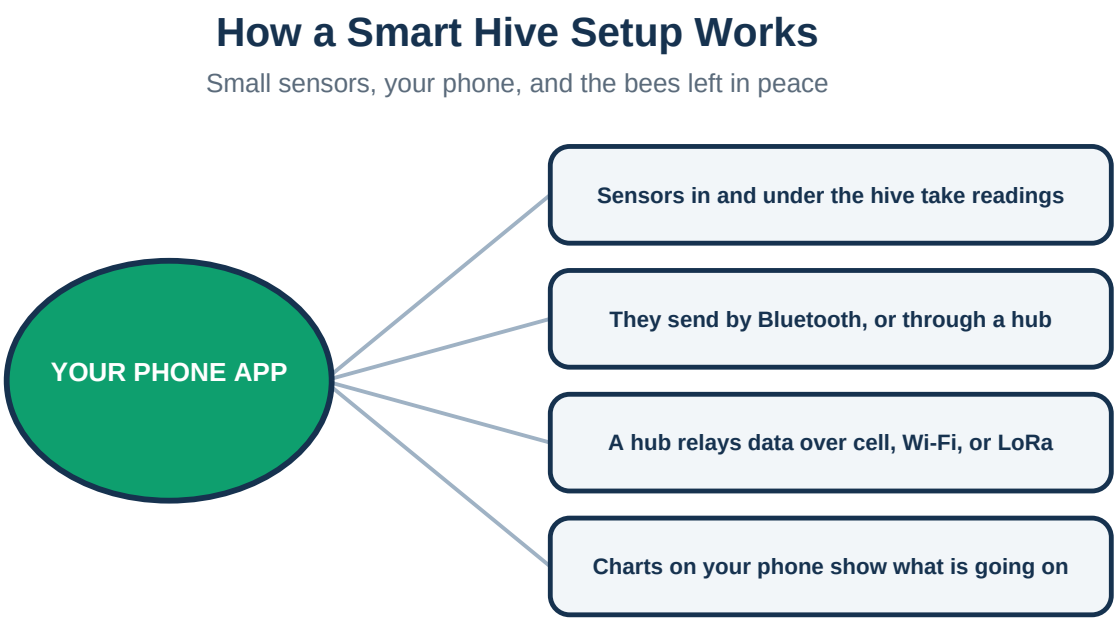


Illustration — a schematic. Set-up screens differ; each takes only a few minutes.

AT A GLANCE

A Second Look

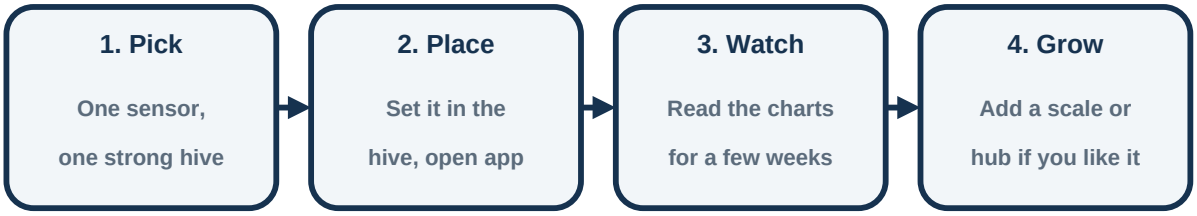


Illustration — a schematic. The order is a suggestion; do one box at a time.

A schematic of the plan — company steps vary; the order does not have to.

BEFORE YOU GO

A Note From Bill

A quick note from Bill. I write these guides to make home tech a little less frustrating, and I do my best to keep every step accurate and up to date. Still, every home, device, and setup is a bit different, so I can't promise a guide will match yours exactly or fix your particular problem. These guides are for general information only — they're not professional, legal, or financial advice, and they don't replace your device's own manual or the manufacturer's instructions. Please go slow, use your own good judgment, and use everything here at your own risk. If a step involves electrical wiring, a gas appliance, a water heater, plumbing, or climbing a ladder — or if anything just doesn't feel safe — please stop and call a licensed professional (or give me a call at 330-200-8042). Bill's Home Tech and Bill Davis can't be responsible for any damage, data loss, or injury that results.

HOW I CAN HELP

Your Visit — and My Promise

You don't have to remember all of it — just that a friendly, patient person is one call away, whenever you'd rather have a hand.

KEY SPECS

In your home — $99 flat for the first visit, no contracts and no surprises, with a 30-day come-back-free follow-up. In-home visits cover Portage County, Ohio and nearby communities.
Outside the area? Remotely — $49 for a screen-share session (free for Support Plan members, $39/mo), refundable if I can't fix it — and credited toward a visit if you'd rather have me in person. Book either at billshometech.com/book.

GOOD TO KNOW

My promise — If you're not 100% satisfied with your visit, I'll come back at no charge, or refund the full $99. No questions, no awkwardness. That's how I'd want to be treated.

Whenever you're ready, I'll come to your home anywhere in Portage County, Ohio and nearby communities, at your pace. Too far for a house call? I also help remotely. Book at billshometech.com/book or call (330) 200-8042. — Bill

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