BroodMinder-T91-T91 User Guide

Thanks for purchasing the BroodMinder-T91. We have made every effort to provide you with a simple to use, reliable device.

We highly recommend that you watch the installation video available at BroodMinder.com/videos. (This isn't quite ready yet, we will be posting something soon)

If you have any questions or problems, please don't hesitate to contact Mike at Support@BroodMinder.com. We also appreciate any feedback that you can give us to make the product better.

Very Best,

Your BroodMinder Team

Quick start instructions.

- IMPORTANT: Sync all devices and **post your data to MyBroodMinder.com** before starting your BroodMinder-T91
- Place the BroodMinder-T91 in the apiary with the solar panel towards the sun.
- Remove the cover held on by 4 screws.
- Slide the power switch to the right
- The unit will do a lot of flashing (explained below).
- Replace the cover – **Pay careful attention to the gasket, water ingress will ruin things**
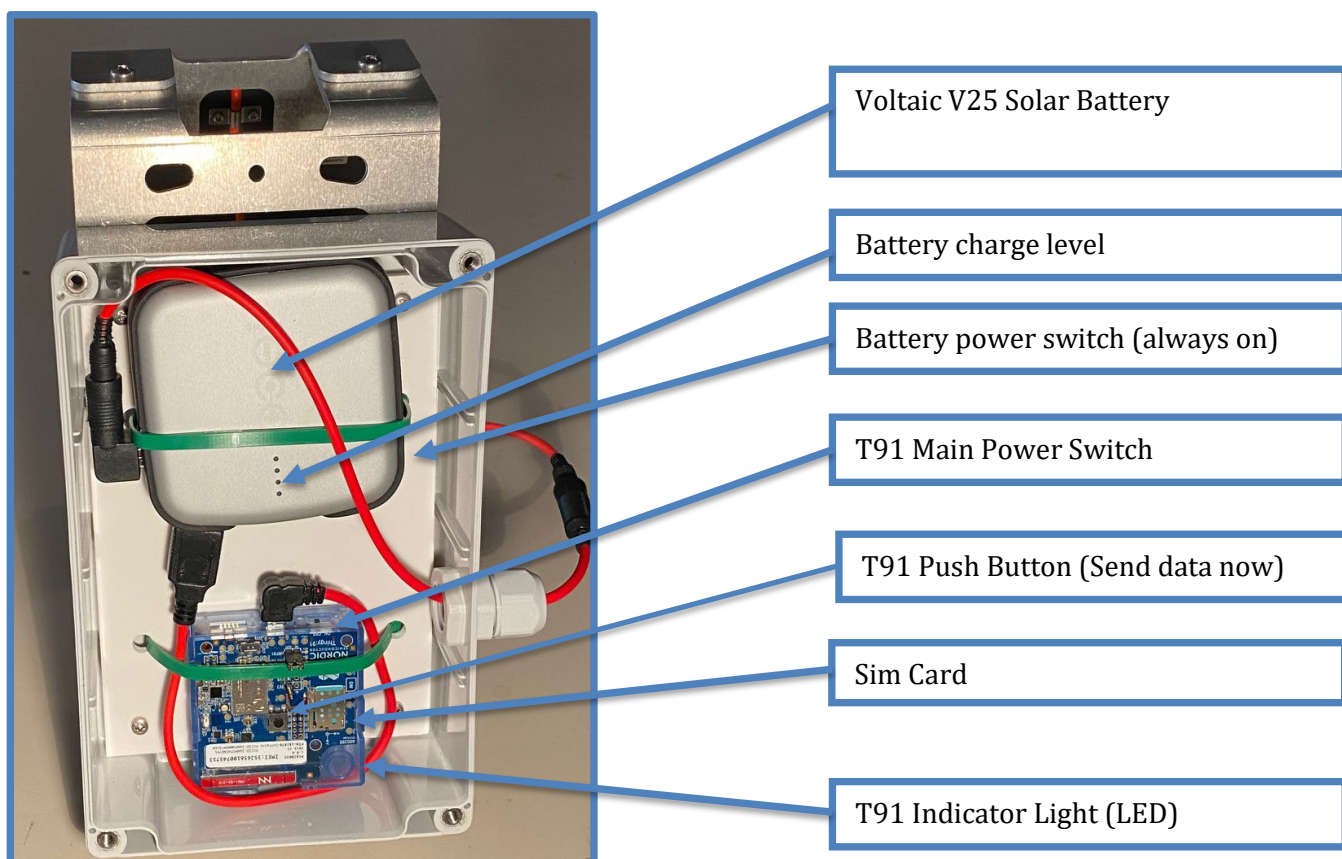- DONE! – Data should start showing up in MyBroodMinder.com after rapid flashing stops.
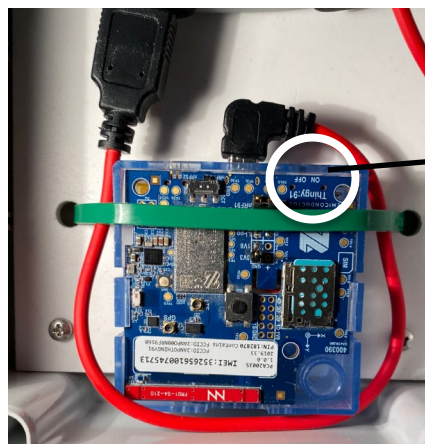
On/Off Switch

1   The BroodMinder-T91

BroodMinder-T91 is an optional component which sits in your apiary and relays data from your BroodMinders directly to MyBroodMinder.com via a CELL connection. We have designed the BroodMinder-T91 to automatically begin working when power is turned on.

The main components of the BroodMinder-T91 are identified below.

Voltaic V25 Solar Battery

Battery charge level

Battery power switch (always on)

T91 Main Power Switch

T91 Push Button (Send data now)

Sim Card

T91 Indicator Light (LED)

1.1   Quick Start Instructions

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- Place the BroodMinder-T91 in the apiary with the solar panel towards the sun
- Remove the cover held on by 4 screws
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- Replace the cover – **Pay careful attention to the gasket, water ingress will ruin things**
- DONE! – Data should start showing up in MyBroodMinder.com after rapid flashing stops

1.2   Installation

You can install your BroodMinder-T91 in many different configurations depending on circumstances. The bracket on the back of the electronics enclosure may be flipped as shown in some of the examples. (note: picture show the prior version of the BroodMinder-CELL but orientation is similar)

Here are a few installation considerations

- The solar panel will fully charge the battery with about 4 hours of good, direct sunlight.
- The battery should last 10-15 days with no good sunlight
- Wireless reception is hampered by trees. Mounting on a tree may be problematic if your signal is marginal.
- In extreme cases we can suggest a more sensitive antenna (Cellular only). Contact us at Support@BroodMinder.com.
- Tie wraps or pipe clamps may be used to secure the system
- A small 3' post like available at major hardware stores works well. They have tabs that can be slightly bent to allow the BroodMinder-WIFI/CELL to be inserted. Then, a tie wrap at the bottom secures the unit.

1.3   Manual Upload

You can force data to be sent to MyBroodMinder by pressing the T91 Push Button. This is a good way to understand if all of your BroodMinders are close enough for detection. Once the LED stops flashing, look at MyBroodMinder to see how many devices were uploaded. More about that below.

1.4   Solar Battery Always-On Mode

 Voltaic is now shipping V25 batteries (silver, not white) which are always in "always on" mode. There are no controls that you need to be concerned with.

V25 Battery

1.5   BroodMinder-T91 Indicator Lights

The LED light on the T91 indicate a lot of different things about the operation. Normal start will look like this:

Normal startup
- 1 Quick green flash   ; System is starting
- 1, 5 second blue flash   ; see below
- 2, quick green flashes   ; Cell connection is being made
- 3 quick green flashes   ; MyBroodMinder connection is being made
- 1 long green flash   ; startup process was successful

Immediately after startup
BroodMinder -T91 will scan for 15 seconds for BroodMinder devices and then transmit to MyBroodMinder.com
- 1 quick green flash for every BroodMinder advertisement (data) found
- 1 quick green flash every second even if no broodminders are found.
- 1 long green flash if everything went fine

Every 10 minutes
The BroodMinder-T91 will wake up every 10 minutes and scan for new data. It will upload to MyBroodMinder.com once per hour at the top of the hour. As long as the BroodMinder-T91 is operational, it will flash 1 quick green flash every 30 seconds.

1.6   Error Conditions

If the LED flashes red, then something has gone wrong. Try to power off the device wait 5 seconds and power back on to clear the error. It it persists then contact support@BroodMinder.com. (this section will improve in the future.)

1.7   MyBroodMinder.com Indication

You can understand how well your BroodMinder-T91 is working by looking at the status in MyBroodMinder.Com.

Once the -T91 is assigned to your user account, you can assign the -T91 to your apiary in the Configure | Hubs section of MyBroodMinder.com.

Once assigned, you will see a display similar to that shown below.

Note that you can see the most recent time each BroodMinder device updated.

- Signal level – This is the cellular signal strength. The higher the better. Watch it for consistency.
- Hub status – This is a counter that indicates things are running OK. We use it for support.
- Temperature/Humidity/Pressure – These are measured by the T91, but since we are inside a weatherproof box, take the readings with a grain of salt.
- Take note of the signal level of the BroodMinder devices. These will help you position the -T91
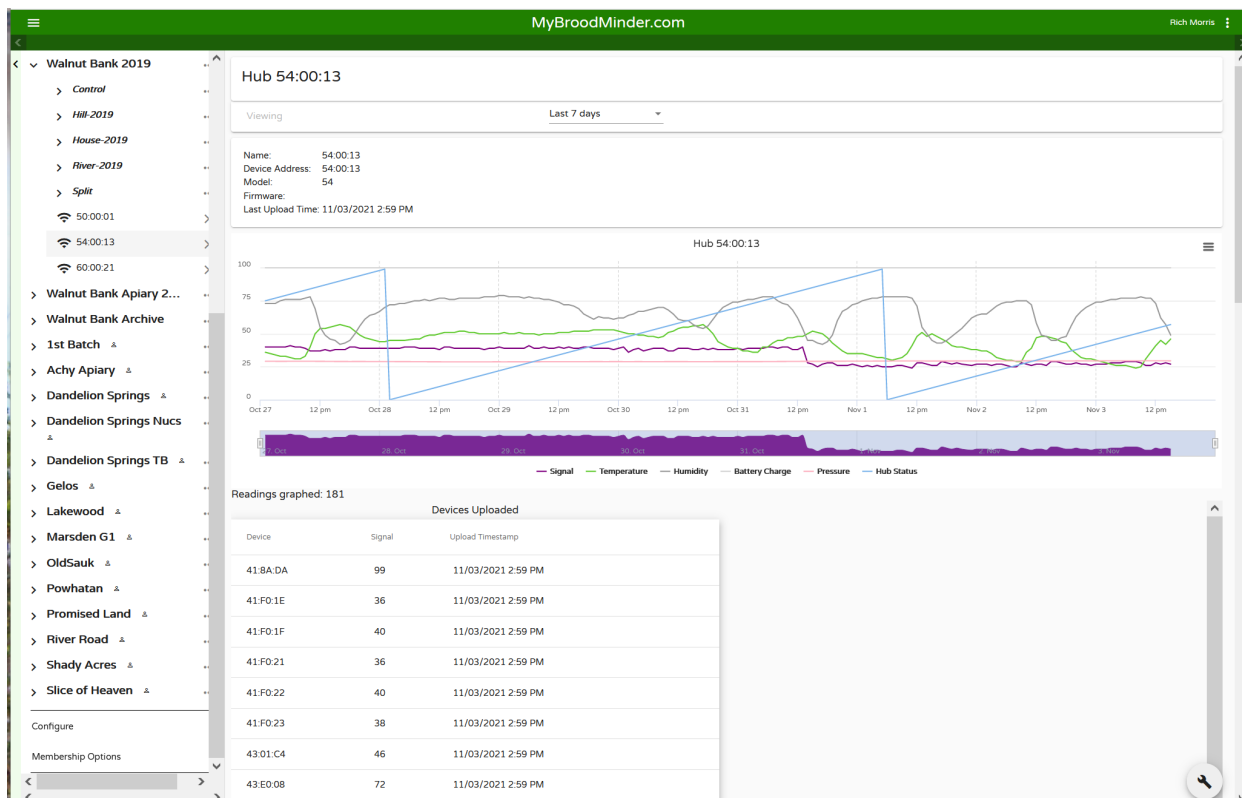
1.8   BroodMinder-T91 Firmware Update

If instructed to perform a firmware update, then here is the process. (only do updates when instructed). Be patient, it can take 5 minutes. However, if it take more than 10 minutes, cycle the power and the -T91 should recover.

- Power off the device wait a few seconds and power it back on
- The LED will flash green and then will turn blue for 5 seconds
- While the blue light is on, press the black T91 Push Button
- The LED will flash blue 3 times to indicate the firmware process is initiated
- 2, quick blue flashes   ; Cell connection is being made
- 3 quick blue flashes   ; MyBroodMinder connection is being made
- 1 long blue flash   ; startup process was successful
- 2 quick blue flashes   ; repeats every 2 seconds while firmware is being loaded
- 5 long green flashes   ; update is successful going to reboot and update
- Nothing happens   ; writing the update takes 30 seconds
- Normal boot LEDs   ; -T91 will automatically reboot like normal

1.9   Cell phone App

There is no app needed for the BroodMindeer-T91. All information is monitored using MyBroodMinder.

1.10 Voltaic V25 Instruction Manual Cell phone App

USB Battery Pack & Solar Charger Instructions
For V25, V50 & V75
support.voltaicsystems.com
Instructions
The Voltaic USB Battery Packs are designed to charge most USB devices including smartphones, tablets, DSLR cameras, and microcontrollers.
To charge your device, simply plug into either of USB outputs.
These battery packs can recharge via any USB port or from a Voltaic 5-6V solar panel. Battery packs can be charged while charging your device.
The interior of a solar charger case can become hot in the sun. In hot conditions, open the battery compartment to increase air flow and avoid overheating.
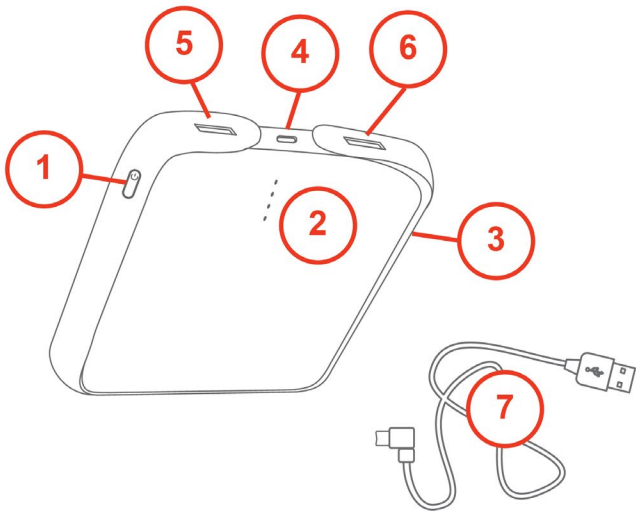
Product Details

1. Power Level Button
2. Power Level Indicator
3. MicroUSB Input
4. USB C Input
5. USB Output 1
6. USB Output 2
7. MicroUSB Charging Cable

Charging USB Devices
Tips for Fastest Solar Charging
Place solar panel outside in direct sunlight. Panel will not work inside. Charge time increases on cloudy days.
Point panel directly at the sun, avoid shading the panel.
Confirm LEDs on battery are lighting up in sequence.

Specifications
V25 Battery: Li-Ion, 6,400mAh / 23Wh
V50 Battery: Li-Ion, 12,800mAh / 47Wh
V75 Battery: Li-Ion, 19,200mAh / 71Wh
All USB Battery Packs:
USB Outputs: 5V/2A / 3A max Output
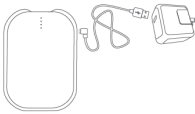Inputs: 5-6V/2A MicroUSB and 5V/2A USB C

Protections: Short circuit over charge, over discharge, over temperature, under temperature

Discharge and charge fully every 5 months to preserve battery life. Store betwen 20 - 35 C (-4 to 95 F). Charge between 0 and 45 C (32 to 113 F). Do not expose battery to high heat or direct flame. Dispose of properly. Do not throw in trash or incinerate. Do not get battery wet, store in high humidity or otherwise short circuit. Do not disassemble or tamper with battery.

The interior of a solar charger case can become hot in the sun. In hot conditions, open the battery compartment to increase air flow and avoid overheating

Charge Battery from USB or USB-C

Recharge the battery from a Voltaic 5-6 Volt solar panel or any USB port (with the included MicroUSB Charging Cable). Can also be recharged via USB-C using any USB Type C cable (not included).

Battery Level Indicator
Press Power Level Button to show charge level. LEDs will blink when charging and indicate charge progress.

●	○	○	○	25% Full
●	●	○	○	50% Full
●	●	●	○	75% Full
●	●	●	●	100% Full

Charge Times (Hours)

Power Source	V25	V50	V75
USB (5V)	3	5	8
5W Solar Panel	6	12	18
10W Solar Panel	3	6	9