



# EcoWood

## User Manual

Samitech EcoWood is a portable microwave solution against xylophages.

Microwaves penetrate deeply and quickly into wood and kill insects at any stage of their life, from egg to adult.

The new version of EcoWood is lighter and easier to use than ever thanks to the new digital touchscreen remote control.



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## Introduction

Thank you for purchasing Samitech EcoWood, the physical solution by microwaves against xylophages in wood.

EcoWood is effective against any type of xylophagous insect such as termites or woodworm, fungi, moths, worms...

Please read this manual carefully before using the equipment, paying special attention to safety instructions..

## Product Description

### Microwave heat technology

Treatments by means of microwaves use a technology similar to a conventional microwave oven, but in this case the radiation is directed in a controlled and concentrated way on the infested area heating the wood until the insects are eliminated. Microwave radiation has a frequency of 2.45GHz and a power of up to 1,000W.

The electromagnetic waves propagate through the interior of the wood causing an increase in wood temperature that varies depending on the properties of the wood and on its humidity and density.

The elimination of pests found inside the wood is achieved by radiation of microwaves on the cellular structure of the insect. Microwave radiation is effective against insects in any development phase.

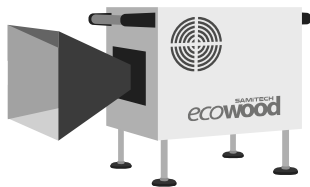
The effect of microwave radiation on wood is twofold. On the one hand, there is a heating of the wood in which the insect lives, and on the other hand, insect being composed mostly of water absorb microwave energy raising their body temperature way above surrounding wood temperature. This explains why their death happens in many occasions before the surrounding wood reaches a lethal temperature.

Wood density and degree of humidity impact the duration of treatments. The denser and drier the wood, the longer the treatment duration.

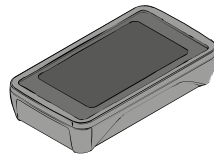
## Product content

Samitech EcoWood consists of the main unit and a remote control that has a touch screen from which the main unit is operated remotely. Additionally, the product includes a microwave leak detector that ensures that the user is always off the radiation hazard area.

The basic kit consists of the items shown below. There is a full range of optional accessories that can be purchased separately.



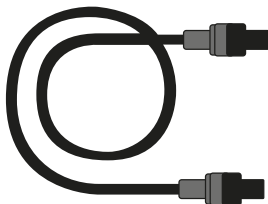
Main unit



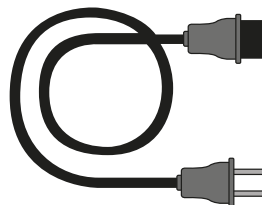
Remote control



Carrying bag



Connection cable



Power cord



Leak detector

## Optional accessories

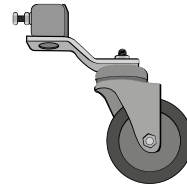
EcoWood has a range of accessories to facilitate the application of treatments in hard-to-reach locations.



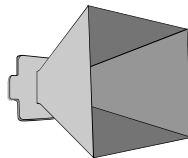
Tripod with winch up to 2,7m



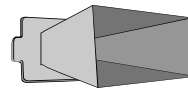
Tripod articulation



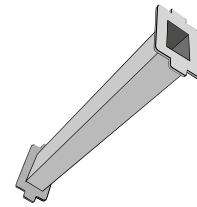
Wheel kit for tripod



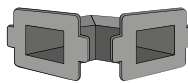
Antenna 30x20cm



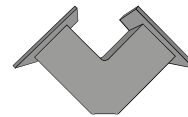
Antenna 30x10cm



Antenna extension 40cm



Horizontal bend



Vertical bend

## Product setup

The following describes the steps to prepare the product before performing a microwave heat treatment.

Your equipment comes ready to be used. You will only need to remove all the elements from the carrying bag and make the connections as described below.

## Tripod setup and operation

EcoWood's range of optional accessories include an extendable tripod that allows operating heights of up to 2.7 m.

If you have purchased a tripod with your EcoWood, your main unit will come pre-installed with its corresponding tripod articulation unit. If you purchased the tripod articulation unit separately, screw the joint to the bottom of the main unit using the supplied nuts. You can leave the joint installed permanently as it does not prevent the operation of the equipment without a tripod.

If you have a set of wheels for your tripod, mount them first. Fit the tripod legs into the wheel anchor compartment and secure them by tightening the supplied screws and nut.

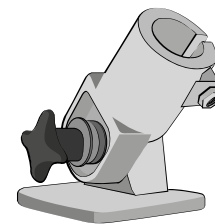
Open all three legs of the tripod completely and rest the tripod on the ground vertically leaving the extendable bar upwards. The tripod has a lifting winch with brake that allows the equipment to be lifted effortlessly. Turn the crank counter clockwise to raise to desired height. Turn the crank clockwise to lower the equipment.

Place the main unit on the tripod by fitting the articulation unit onto the vertical bar of the tripod. It is advisable to tighten the nut on the joint to fix it in such a way that the main unit will not spin on the vertical axis of the tripod. winch

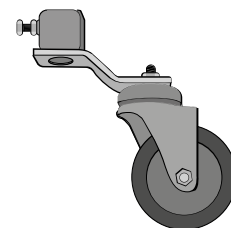
Before making any connection, attach the main unit to the tripod.



Tripod with winch



Tripod articulation unit



Wheels with brake

## Connections



Connect the connection cable to the main unit and to the remote control. The cable is reversible.



Connect the power cord to the head unit and electrical outlet.

Check the safety conditions of both the electrical installation and the main unit at all times.

## Treatment setup

Place the main unit by placing the antenna as close as possible to the surface of the wood you want to treat. Depending on the accessory you have installed, the treatment surface area will be different. The antenna that comes standard has a maximum treatment area of 30x20cm. Keep in mind that the heat generated in the wood will always be greater in the central area of that surface.

On the other hand, the greater the distance at which the object to be treated is, the radiation waves will tend to scatter and the heating effect will be slower.

To perform a treatment, you must do several successive sessions making a sweep that runs over the entire surface to be treated. To prevent cold areas in the perimeter of each treated area, it is advisable to leave a small overlap of 5cm between applications.

Avoid the presence of people and animals in an area of 12 meters around the equipment when performing a treatment. If the treatment is to be carried out on a wall, floor or ceiling next to neighbours, it is advisable to make sure in advance with the leak detector that there is no danger of exposure to radiation and, if there is, the neighbour evacuates the adjacent area during the treatment.

## Treatment

Once the checks described in the previous section have been made and the main unit has been placed in its initial position, we are ready to start the treatment.

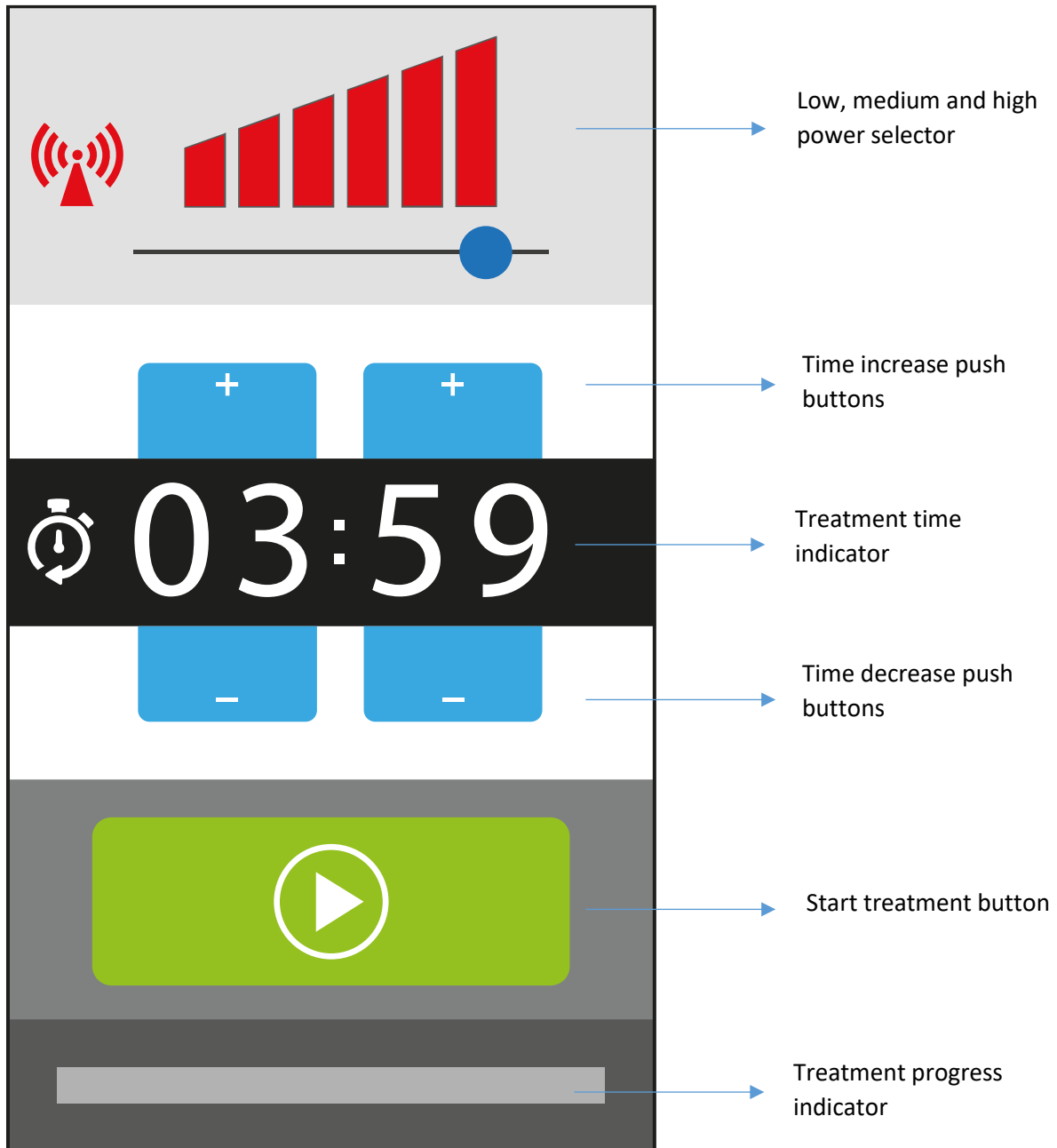
1. Turn on the main unit by placing the switch located on the main equipment in the "I" position. The internal fan will start working. This action does not initiate any treatment and therefore there is no radiation at this time.
2. Take the remote control in hand and move away respecting the safety distance and always towards the back of the main unit. Remember to always carry the leak detector with you.
3. Select the desired treatment duration and power level on your touchscreen.
4. Check that the emergency stop button of the remote control is not pressed, otherwise the equipment will never start working.
5. Press the green button on your touchscreen to start treatment. You will hear the warning horn indicating radiation throughout the treatment time.
6. Once the timer countdown is over, the treatment is complete and it will be safe to approach the main unit.
7. Move the main unit to the next position and repeat the process from point 3.

## User interface

The remote control of your equipment allows you to control remotely and easily all the operations during the treatment: power level, treatment duration, start, stop, progress and remaining time of the treatment.

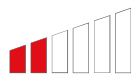


Samitech EcoWood allows radiation control at three power levels: low, medium and high. The higher the power level, the heating of the treated wood will be greater. The duration of treatment is limited to a maximum of 16 minutes per session. See the time guide.

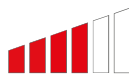


#### Power selection

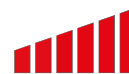
Select the desired power by sliding the horizontal bar with your finger. Power can be set to three levels:



Low



Medium



High

#### *Selection treatment duration*

Use the "+" and "-" buttons to increase or decrease the desired treatment duration in minutes and seconds. When treatment has started, the timer starts a countdown to indicate the remaining time.

#### *Start and stop treatment*

Press the green button to start the treatment with selected parameters. When treatment starts, the button will turn red and you can press it to stop treatment if necessary.

#### *Progress indicator*

At the bottom of the screen is a progress bar indicating the evolution in percentage of the ongoing treatment.

If at any time it is necessary to stop the treatment, you can press the red stop button or press the emergency stop button as well.

The equipment will not generate any type of microwave radiation if the remote control is not properly connected. Accidental disconnection of the remote control will instantly stop any treatment.

## Pre-treatment required checks

Inspect thoroughly and confirm that all objects are safe and suitable for treatment. Check objects and identify any existing damage to properly inform the customer beforehand. It is recommended to take photographs as proof of existing damage before treatment.

Be careful with coatings such as varnishes and paints as elevated temperatures could damage or alter them. Microwave radiation produces very rapid heating that could be harmful to some materials.

Avoid radiating large metal objects such as structures, coatings or metal plates, both inside the wood and in the area behind the treated area. In general, nails, screws and small metal elements are not a problem, but it is recommended to have them properly located and pay special attention if sparks or clicks occur during treatment. When in doubt, avoid treating sensitive areas or areas with the presence of metals.

Avoid the presence of people and animals in an area of 12m around the main unit during any treatment. If the treatment is to be carried out on a wall, floor or ceiling with neighbours on the other

side, it is advisable to make sure in advance with the leak detector that there is no danger of exposure to radiation and, if there is, the neighbour leaves the sensitive area during the treatment.

### Objects that should not be treated:

- Animals, plants or seeds.
  - Metals.
  - Food & Beverage.
  - Medicines.
  - Electronic, medical and laboratory devices.
  - Cosmetics and toiletries.
  - Pressurized containers (aerosols, sprays, carbon cartridges, fire extinguishers, etc).
1. Waxy objects (candles, paintings, etc.).
    - Firearms and ammunition.
  1. Valuable objects or objects of special sentimental or irreplaceable value (photos, jewelry, etc.).
    - Documents, money, receipts, etc.
    - Magnetic, optical, solid and mechanical media and storage devices (hard drives, optical SSDs, USB sticks, videotapes, cassettes, etc.).
    - Flammable, or combustible materials (solvents, oils, glues, paints, lacquers, varnishes, etc.).
    - Printer ink or toner cartridges.
    - Photographic material (films, negatives, developers, paper, etc.).
    - Corrosive or hazardous chemicals (bleaches, cleaners, etc.).
    - Any type of object that can be damaged or deteriorated by heat.

This list of objects is not exhaustive. All objects to be treated should be thoroughly inspected to confirm that they are suitable for heat treatment. Any other sensitive objects that can be identified by the operator or customer during the inspection must be removed.

In case of doubts with any object, do not treat it.

Removed objects should be visually inspected for evidence of infestation. If they are infested, and these objects are not suitable for heat treatment, a suitable alternative method should be used to treat them.

## Estimated treatment durations

Each wood heat treatment is different. The parameters to carry out the treatment will have to adapt to the object, to the wood's density, thickness and humidity and to the type of pest that you want to attack.

Remember that insect eggs are found in the deeper layers of the wood; however, the larvae tend to feed in the outer or inner layers of the bark of the wood. Therefore, the duration of the treatment will normally be shorter when fighting the larvae than when we want to fight the eggs.

Below are the usual treatment durations depending on the humidity of the wood to be treated.

Table of thickness and treatment duration

Thickness	Low humidity (2-7%)	High humidity (8-15%)
0-25 mm	2:30	2:00
25-50 mm	3:00	2:30
50-75 mm	6:00	5:00
75-100 mm	7:00	6:00
100-150 mm	8:30	7:30
150-200 mm	9:30	8:30

Indicated times have been obtained in laboratory tests and are shown for guidance. The ambient temperature will influence the necessary duration of the treatment.

In general, the temperature of 60°C can be considered as a lethal temperature measured inside the wood.

The treatment needed to reach in high depth ( $\geq 5\text{cm}$ ) can increase wood surface temperature to very high temperatures. Confirm that the temperature is appropriate for the object you want to treat.

### Precautions during treatment

Do not allow access to the work area to people or animals. Respect the safety distance of 12 meters around the equipment.

If treatment needs to be stopped, tap the red button on the screen or press the emergency stop button. Treatment will stop immediately.

Do not tamper with equipment wiring during operation.

Do not interrupt the power supply during treatment. If there is a power interruption, you must repeat the treatment in full.

At the end of the treatment, be careful with the treated objects, their temperature will be elevated. It may take several minutes for wood to dissipate heat.

## Safety Instructions

Please read the instructions carefully before using this equipment.

The operator must respect at all times the safety measures detailed in this manual.

The operator assumes all responsibility for the improper use of the equipment.

Use this device only as described in the manual. Any other use may cause fire, explosion, electric shock, damage to equipment, objects, or injury to humans

### Resin warnings and wood impregnations

Resin and various wood impregnation products can be heated above desired treatment temperature, liquefy and spill on other surfaces or the main unit itself. Be careful with the presence of these substances when performing a treatment.

### Fire warnings

Objects that are composed of combustible, flammable or explosive materials, or objects that may become combustible, flammable or explosive when in high temperatures should not be treated. Keep any combustible, flammable, or explosive material out of reach of equipment.

Large metal objects such as structures, coatings or metal plates should not be treated, both inside the wood and in the area behind the treated area. In general, nails, screws and small metal elements are not a problem, but it is recommended to have them properly located and pay special attention if sparks or clicks occur during treatment. When in doubt, avoid treating sensitive areas or areas with the presence of metals.

Do not treat an object if you do not know its composition or have doubts about its reaction when heated.

Do not jeopardize in any case the safety of objects, equipment and the place where you are performing the treatment.

Make sure you have the proper fire detection and extinguishing equipment before beginning a treatment.

## Electrical Safety Warnings

This device is not intended for use in bathrooms, washing areas or similar places where it may come into contact with water or high humidity. Never place the main unit where it could fall or come into contact with water or any type of liquid.

Do not place humid or wet objects on the main unit. Do not use the equipment outdoors.

Do not use this device in places where flammable products such as petrol, solvents, paint, or other flammable liquids are used or stored.

Do not insert or allow objects entering the ventilation opening of the main unit, as this could cause electric shock or fire or damage the unit.

Do not use this appliance with a damaged cable or plug or after the device has malfunctioned, dropped or damaged in any way. Take the unit to an authorized service centre for service, adjustment, or repair.

Do not cover the cable with carpets, rugs, or similar covers. Place the cable and device away from passage areas.

Do not bend or tighten the cable and do not use if it is damaged.

Do not attempt to open or repair the main unit yourself. Doing so could cause harm or personal injury.

When the treatment is finished, turn off the unit and disconnect the cable from the power outlet.

Wait about 10 minutes before touching the treated objects. Never touch objects treated with unprotected fingers immediately after treatment.

After the work is complete, clean equipment surfaces that have been in contact with the ground or objects with a dry cloth and carefully pack the equipment to keep it in good condition and transport it properly.

**CAUTION:** Some parts of this product may get very hot and cause burns. Particular attention should be paid when children and vulnerable persons are present.

**WARNING:** To avoid overheating, do not cover the main unit.

**Note:** Some objects are particularly sensitive to heat and may be damaged by exposure to temperatures reached during treatment. To minimise the risk of any damage, these objects should not be treated and should be kept apart for the entire duration of the treatment.