

Preparing Temperature Sensors

The temperature inside the hive can reveal quite a lot about the health of the bee colony. If one measures the temperate of more than one of the combs, one can approximate the size of the brood or see if there is even brood present. This is particularly helpful in the wintertime, as the honey bee colony needs to be completely free of brood for the oxal-acid treatment to free the hive of mites.

List of materials

you will need:

- 6 waterproof D18B20 Sensors (you can order them online for about 2.50 € a piece)
- 1 ribbon cable, 6 pronged about ca 35 cm long, depending on the size of your hive
- 7 pin connectors, 6 -pin (3x2)
- 7 pin connectors, 4 - pin (2x2)
- 7 cableties 150mm
- 7 pin strips 2x2 Pins Rm 2,54
- 3 pronged screened cable, 50 cm long (if you chose to place the cable box further away from your hive, you will need a longer cable. Alternatively you can use a leftover piece of cable from your temperature sensors)
- a protective grating (alternatively flat wooden sticks, such as Popsicle sticks, and food-safe glue)
- a cable stripper
- a vise
- scissors to cut the cable ties
- wirecutters / wire-cutting pliers

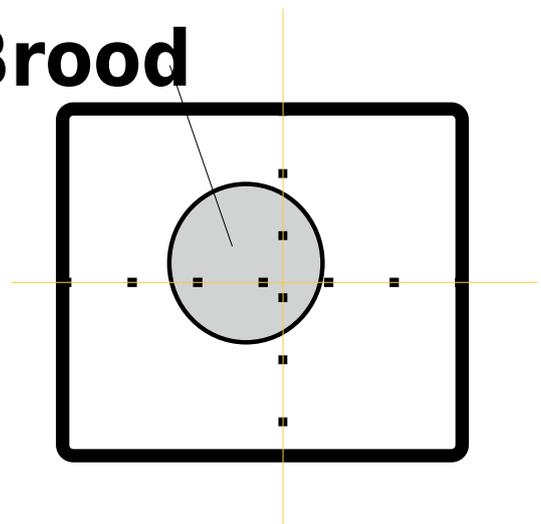


Technical Data

Voltage: 3.0V-5.5V
Temperature range: -55~ +125°C
Accuracy:
(-10°C bis +85 °C): +/-0,5 °C
Single-Bus with unique 64 bit ID

D18S20

Brood

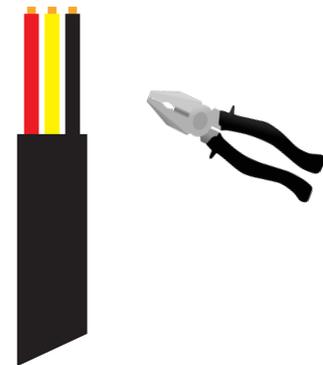
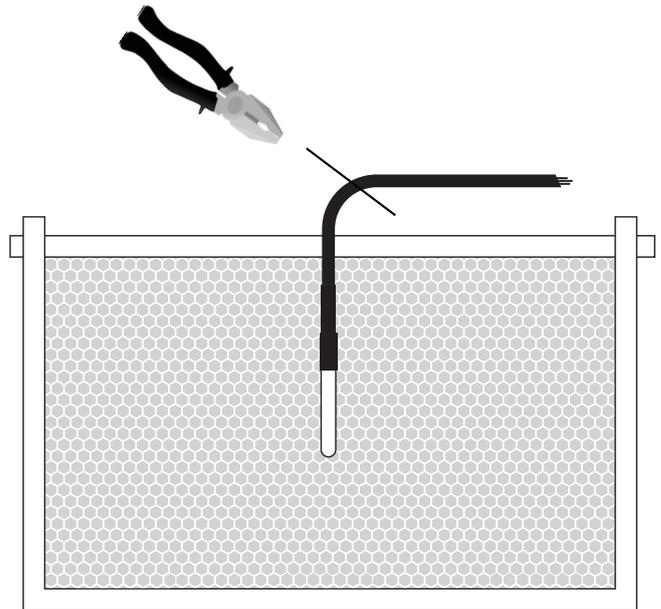


1 Step 1

First you must shorten the sensors to the right length.

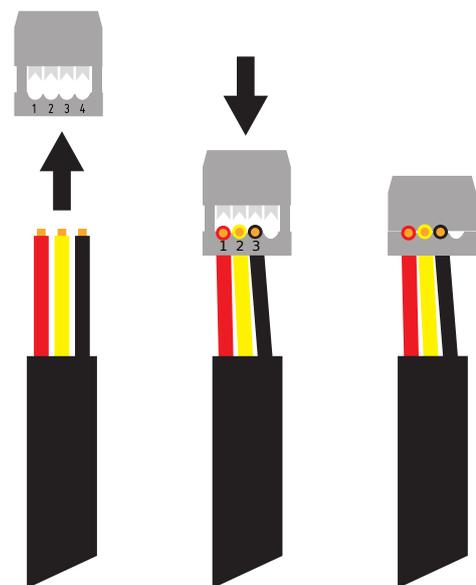
You should have 5 temperature sensors for your hive and 1 temperature sensor for outside of your hive.

The 5 sensors for the interior of the hive should be at a length where they hang in the middle of the frame. Cut the cable for the 5 temperate sensors to a length that is approximately 2 cm longer than the length of half of the frame. The 6th cable must be at length where it can be led through the entry of the hive all the to the outside of the hive. This length will vary from hive to hive, so measure yours to find the right length for you. Using a stripper, remove the black insulation to expose the individual colored wires of the cable - but do not strip the colored insulation from the individual strands!



2 Step 2

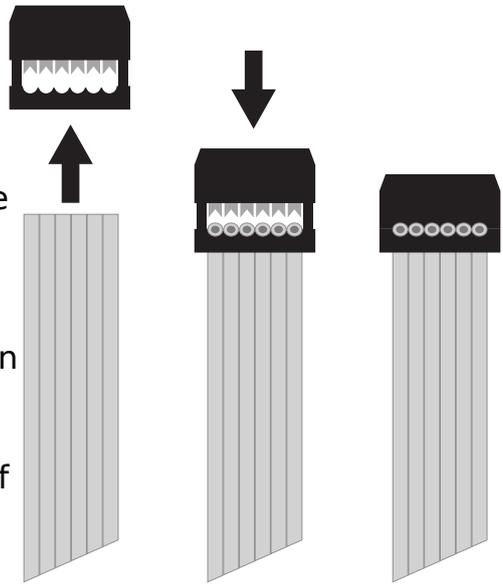
The next task requires a little bit of concentration, so let's focus! We must connect the gray plugs to the three colored wires on the end of each sensors. The plugs have space for 4 to 6 cables, but we are only going to utilize three spaces. It is of utmost importance that you use the same cable arrangement for each sensor. For example you can place the red cable on the left hand side, yellow in the center and black on the left and leave one space free. Once you place the wires in the plug, gently fasten it tightly. If you do not use the same arrangement for each plug it will not work and the plugs are hard to detach once fastened, so be careful on this step!



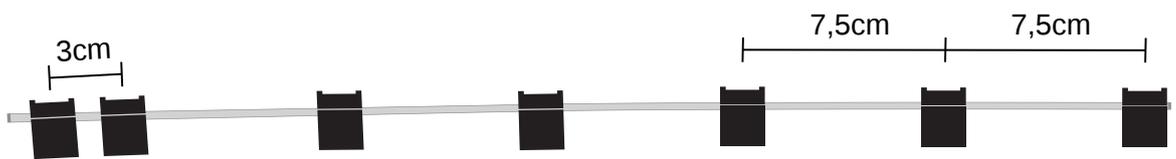
3 Step 3

Adapt the ribbon cable to the length of your hive. Now mount the connector on the ribbon cable. To do this, simply place the ribbon cable in the connector and press it firmly together with the vice.

The first one goes to the very end of the ribbon cable. The distance between the next 4 connectors should be 7.5 cm. Then place the two plugs at a distance of 3cm from the end of the cable. You can adjust this to the size of your hive.



All plugs must be in the hive, they are not weatherproof!



4 Step 4

The next step is to connect the sensors with the ribbon cable. For this step you need the pin headers and the cable ties. Insert the pins between sensor and the ribbon cable. Then fix the whole thing with a cable tie. Finally fix the cable that connects the flat ribbon array to the board in the same way.

