



iSCOUT®

extended user manual

December 2022

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1. INTRODUCTION

The iSCOUT® device consists of two parts: main unit and control unit.

1. Main unit:

- Camera with 10 megapixels
- Processor, modem, USB port
- SIM card holder,
- UMTS/GPS antenna (integrated in to the PCB),
- Trap – pheromone, feeding lure or color sticky plate

2. Control Unit:

- Power supply
- Sensor set

The FieldClimate platform includes:

- Pictures hosting
- Image processing
- Diseases modeling, weather forecast
- Coming new value adding services

iSCOUT® can be used in all areas covered by at least UMTS (3G) networks. Solar panel and the battery enable all year-round standalone functioning. After installing the unit and setting the recording interval, iSCOUT® is already fully operational.

Important: iSCOUT® field device needs 3G (UMTS) coverage, and will not be operational under 2G (GPRS) services.

Several versions of iSCOUT® are available with different levels of output offer. Please contact us for further information at support@metos.at

2. DIFFERENT TYPES OF iSCOUT® TRAPS

2.1 iSCOUT® PHEROMONE

This is a trap with side entries and a metal plate inside. Apply insect glue and a pheromone lure of your choice on the metal plate. Wash the metal plate when it is full of insects and put fresh insect glue and pheromone lure on it.

Install the trap in your field accordingly to the crop you wish to monitor. Control unit should be installed above the canopy so the solar panel receives enough light to recharge the battery.

For catching moths: codling moth, grape berry moth, tomato leafminers and many others.



Important

Buy a pheromone from a trusted local reseller – be sure that the pheromone is efficient and stored appropriately (cooled for some days and frozen for some weeks of storage).

2.2 iSCOUT® FLY

This is a feeding lure trap with side and bottom entries covered with 3 mm nettings, attractant container and a metal plate. If you want to catch bigger insects, remove the nettings.

Put liquid attractant into the container and cover it with the metal plate covered with insect glue.

Install the trap in your field accordingly to the crop you wish to monitor. Control unit should be installed above the canopy so the solar panel receives enough light to recharge the battery.

For catching fruit flies: spotted wing drosophila, olive fruit fly, Mediterranean fruit fly and many others.



Important

Buy a liquid attractant from a trusted local reseller – be sure that the attractant is efficient and stored appropriately (cooled for some days and frozen for some weeks of storage).

2.3 iSCOUT® BUG

This is a pyramid trap only with bottom side entry. Once the bug enters the trap, it can no longer exit. Install the trap in your field accordingly to the crop you wish to monitor. Control unit should be installed above the canopy so the solar panel receives enough light to recharge the battery.

For catching bugs: stink bug and many others.



2.4 iSCOUT Color Trap

Designed and developed to monitor sticky traps of different colors. The device comes with high resolution camera and a holder for a sticky plate. Catching various insects depends on the color of the plate used:

- blue: frankliniella occidentalis, thrips tabaci, ...
- yellow: white flies, leafminers, sciarid flies, ...
- white: apple sawfly, plum sawfly, plum fruit sawfly, raspberry beetle.

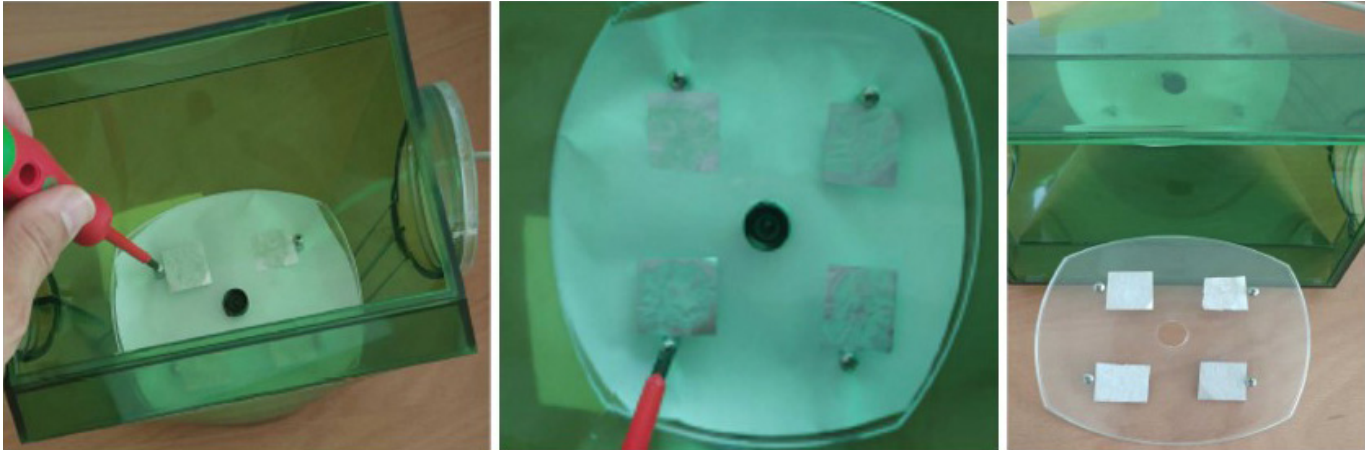


[VIDEO: iSCOUT Color Trap Assembly](#)

3. SIM CARD AND BATTERY, SOLAR PANEL

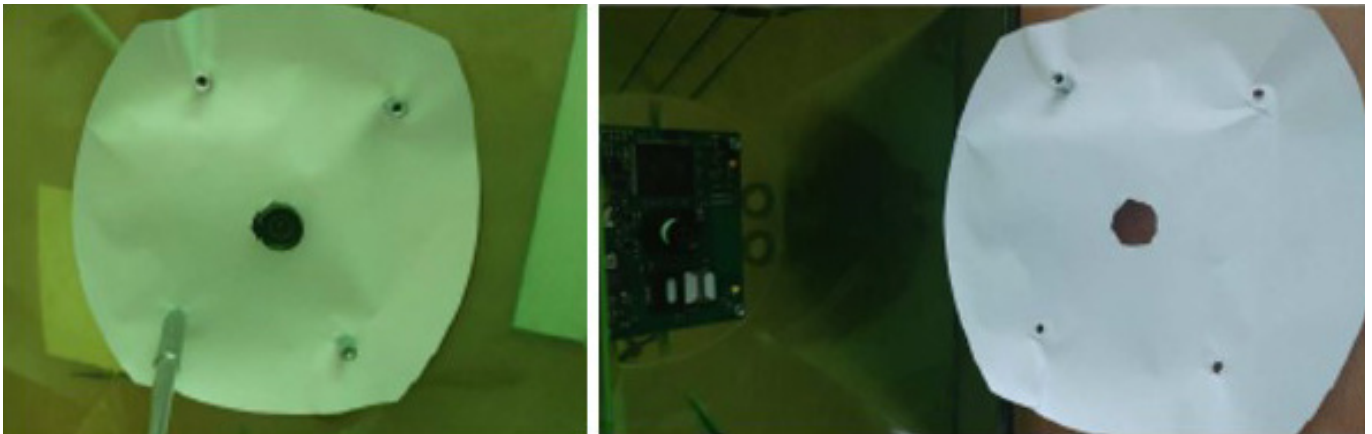
The SIM card holder is placed on the PCB in the main unit. To access it, follow these steps:

1. Unscrew the plastic plate.
2. Carefully unscrew screws below the plastic plate (they are holding the paper).



Picture: Unscrew and remove plastic plate

3. Remove the paper



Picture: Unscrew and remove the paper

4. Now you can access the SIM card holder. See instructions below on how to insert the SIM card.
5. After you've installed the SIM card, put all parts back together: 1. put back the paper, 2. screw back the holders of paper, 3. put the plastic plate back on and finally screw the plastic plate.

A SIM card from a 3G cellular service provider is needed. To insert or remove a SIM card:

- Slide the metal part to the right to unlock the holder
- Open the holder from the left side and insert or remove the SIM card
- Close the holder
- Lock the holder by sliding the metal to the left (you should hear or feel a click).



Picture: Sim card holder

3.1 HOW TO DEACTIVATE (DISABLE) PIN REQUEST

This can be done using:

- a GSM handset device or
- directly with the USB <=> PC connection

Attention: Please always check that the PIN request for the SIM is disabled.

3.2 SIM CARDS AND PROVIDER SETTINGS

We have prepared an extended table of Internet connection settings for various cellular service providers worldwide, which is available in the device memory (we are continuously adding new providers). You can check if your provider is in the table by sending an e-mail to support@metos.at.

It might happen that your iMETOS is one of the first devices set up with a specific provider. In this case, you will need to set these parameters with your PC via USB port or sending SMS with the correct settings to the station.

Note

To set new APN settings send a special SMS to the station, with APN settings, its username and its password. Before sending the SMS, insert SIM card into iSCOUT®. The SMS with APN settings has the following form – example:

! SerialNr 0 APN,USERNAME,PASSWORD !

! 0000D1C 0 gprs.zain.bn,(*),(*) !

APN: Access point name

Username: Username for this APN (often empty)

Password: Password for this APN (often empty)

3.3 SIM CARD: PRE-PAYED OR CONTRACT

Pre-paid SIM cards may be used temporarily or for service purposes. For operation, a contract SIM card is a more cost effective choice.

Every picture file has 10±2MB depending on the complexity of the image so the data plan on your SIM should be calculated with the following formula:

Monthly data plan = 12 (MB per picture) * number of cameras * shootings per day * 30 (days per month)

Example:

iSCOUT® with 1 camera and 2 shootings per day will need a Minimum monthly data plan with:
12MB * 1 camera * 2 shoots per day * 31 days per month = 0.75 GB/month

You can connect more devices in a chain to one control unit. In this case, you have to consider the correct number of cameras in calculating monthly data plan.

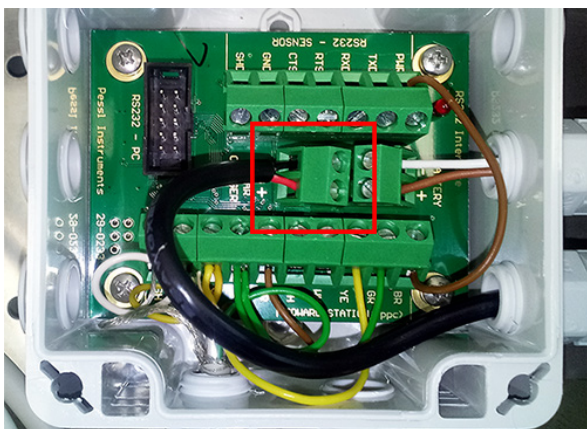
3.4 BATTERY AND SOLAR PANEL

After you have successfully inserted the SIM card it is time to connect the battery and solar panel.



Picture: Connect the battery cable to the free connector (minus, white cable with connector). Battery must always be unplugged transportation purposes.

[VIDEO: iSCOUT - connecting the battery](#)

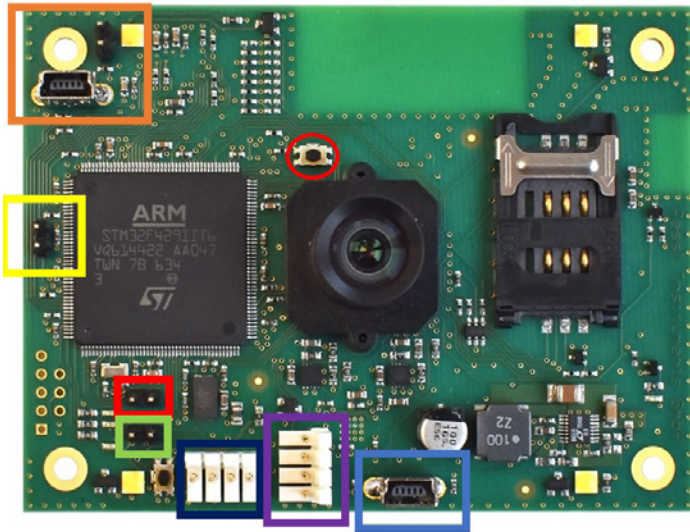


Picture: Unscrew four screws on the control unit box and open it. Once open connect the solar panel cable to the SOLAR CHARGER connector on the control unit board (marked with red square on the picture). Connect the red cable to + and black cable to -. After successfully connecting the solar panel, close the control unit box and screw the four screws.

[VIDEO: iSCOUT - connecting the solar panel](#)

4. HOW TO CONNECT THE iSCOUT® TO THE PC

4.1 iSCOUT® BOARD DESCRIPTION



Picture 6: iSCOUT® printed circuit board

Orange: USB and jumper intended for service in company only

Yellow: boot jumper – used for boot mode of device, to install new firmware

Red: jumper J2 – used to access modem via terminal window

Green: jumper J1 – used to access terminal window menu

Blue: main usb port, used to connect device to pc

Purple: to connect another iSCOUT® device in chain (coming soon)

Dark blue: connector for control unit

Red circle: force communication button

Modes of communication:

SPY mode: to see the processes that are currently going on, connect USB cable to the PC and the main USB on the device, no jumpers on

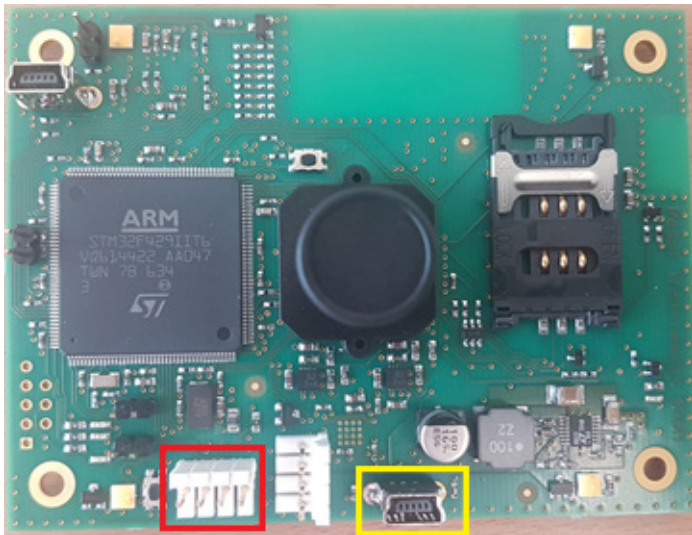
TERMINAL WINDOW mode: to access terminal window menu, connect USB cable to PC and the main USB on the device, and jumper on J1

TRANSPARENT mode: to access modem through terminal window, connect USB cable to PC and the main USB on the device, and jumper on J2

BOOT mode: to have station in boot mode, so you can upload the new firmware, connect USB cable to PC and the main USB on the device and jumper on boot jumper.

4.2 CONNECT iSCOUT® TO THE PC

1. Unplug the control unit from iSCOUT® unit



Picture: Unplug the connector from control unit – marked with red square

2. Connect iSCOUT® unit to your PC with USB cable to mini-USB

Use the mini USB port in the lower central part of the board (marked with yellow square in the picture above).

3. Place the jumper in position J1. If you have access to the internet, USB drivers will be installed automatically. To enter different modes of communication, please follow instructions in section 4.1.

Attention:

The iSCOUT® device has two mini-USB ports. Use the one labeled as “MAIN-USB” (the other one is only for service purposes).

USB driver

The PC should automatically recognize the iSCOUT® device once you connect it via the USB and it will install the needed driver itself with no additional intervention. In case of problems or in the case that your first installation is offline, you can previously download and install the driver from the following link: www.st.com

5. PREPARATION OF YOUR iSCOUT® UNIT BEFORE FIELD INSTALLATION

To check the proper operation of the system before going to the field for installation, the following procedure is highly recommended:

Basic requirements:

- PC with terminal application installed
- Type A USB to Mini USB cable
- Jumper

NOTE: You can use the terminal program of your choice. Or you can use our specific terminal program which you can find at: www.metos.at or contact our support team at support@metos.at.

5.1 CHECK THE COMMUNICATION

Look for the scene that you want to take pictures of. Identify the best location for the camera – take into consideration the sun position. We recommend the use of a sun position application

This is recommended to be done in an indoor environment (e.g. your office). To correctly connect your iSCOUT® unit to your PC, please follow instructions in chapter 4.

Open a terminal window on your computer and select the correct serial port, associated with the camera in your system. Place the jumper in position J1 and you will see the following text in terminal window:

```
=====
USER: \ MAIN MENU
=====
(1) SYSTEM
(2) CONTROL UNIT
(3) MODEM
(4) FLASH
(5) CAMERA
```

Select SYSTEM (press nr. 1 on your keyboard), and in the next menu select QUICK VIEW (again nr. 1). Now you will see station info and its serial number.

Press ESC button on your keyboard several times, to return to the main menu. Then Insert the SIM card in the SIM card holder and fix it (you must hear a click when you lock it).

In terminal window select MODEM (3), then select SEND DATA (3) and finally remove the jumper from position J1 (to set up the station in spy mode). Now you will see the information of the communication process in the terminal window.

You should not see any error messages. In case of errors, please check if the SIM card is unlocked and make sure the 3G data service is available (in the log of communication process should be indicated, that it's connected through UMTS). In case of an error please send a log file to support@metos.at. In this way we can start solving your problem very fast.

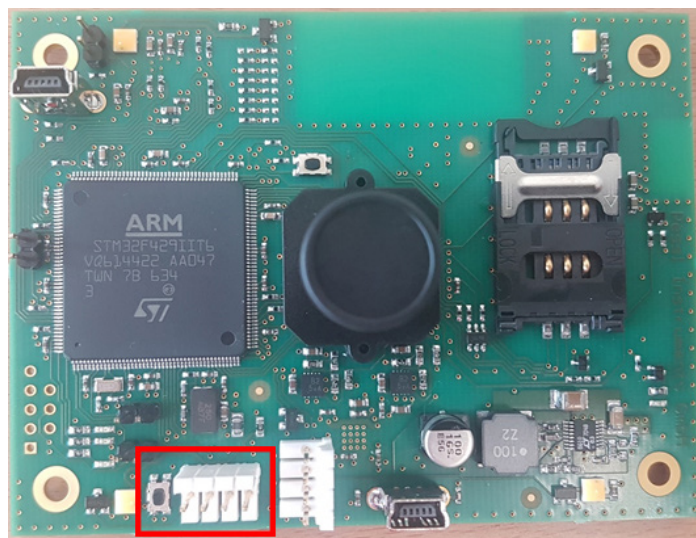
You will see the following text in terminal window:

```
<pre>
<networking
bearer_type='UMTS'
mcc_current='232'
mnc_current='10'
mcc_sim='232'
mnc_sim='10'
sim_id='8943102101104029497'
apn_country='Austria'
apn='drei.at'
user='drei'
passwd=""
roaming='0'
/>
</pre>
```

5.2 FINAL TEST BEFORE FIELD INSTALLATION

To do a final test, do the following:

- Unplug the battery and the solar panel from the control unit.
- Unplug the USB cable from iSCOUT® unit
- Connect the cable from control unit to the iSCOUT® unit – make sure that it is connected in the right way – as shown on the picture below.



Picture: Connect the connector from control unit to iSCOUT® device

- Connect the battery to the control unit
- Connect the solar panel to the control unit
- After approximately one or one and a half hour you should see the photos on the web site (it depends on the quality of the internet connection).
- Unplug the battery and solar panel for transport or storage.
- Your iSCOUT® device is ready for field installation!

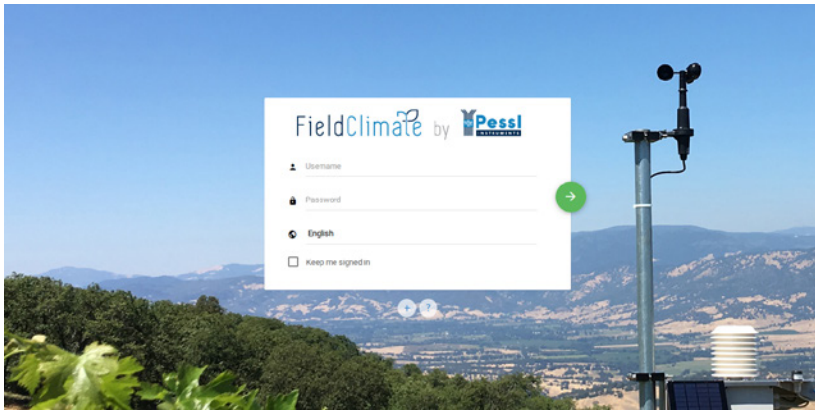
6. ACCESSING THE PICTURES AND SERVICES FROM FieldClimate

6.1 USE YOUR iSCOUT®

First you need to register on the FieldClimate platform, which gives you the access to the photos taken by the camera and to the data in charts or tables. FieldClimate provides a powerful decision support system for growing your crops (plant protection, irrigation, sowing, harvesting, fertilizing and more).

6.1.1 REGISTER AS A NEW USER ON FieldClimate.com

Follow the steps below to register as a new user.



Picture: Go to fieldclimate.com/login and click the button "+" (red circle).

FieldClimate by Pessl

LOGIN INFO

Username

Password (min 5 characters)

Confirm password (min 5 characters)

BASIC INFO

First name

Last name

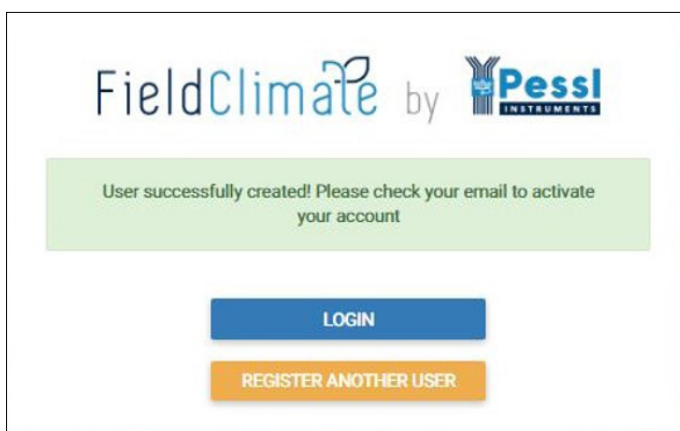
Email with format: example@test.com

English

Austria

Please review the following terms and conditions before you sign up for FieldClimate services. By checking the box you indicate your agreement. [Privacy Statement](#), [User Agreement](#)

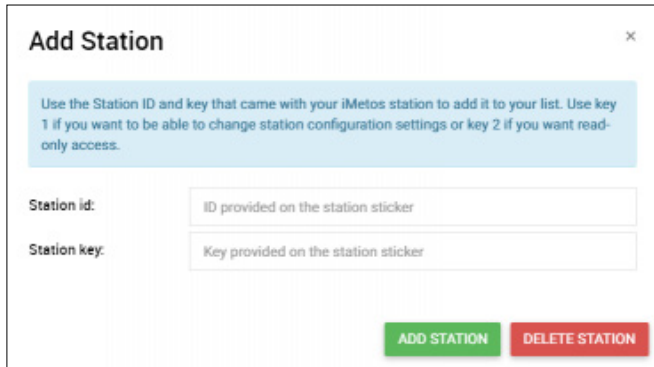
Picture: Insert your personal data & e-mail.



Picture: Check your e-mail and click on the link to activate the user account you created.

6.1.2 ADD THE iMETOS TO YOUR ACCOUNT

Now you can login to FieldClimate.com. To add your iMETOS device, click on the icon in the top right corner **User Menu > Add/Remove station**. It will ask you for the Station Serial number (SN) and the station key. Now the silver sticker which came with your iMETOS has to be used. Key 1 gives you full (admin) access and enables you to change all the settings and set up the iMETOS. With Key 2 the user is not allowed to change the station parameters, but can access all the data.



Picture: Add station to you account.

6.1.3 iSCOUT®: STATION DATA AND SETTINGS

You can browse through all stations by clicking the icon **Station List in the top right corner**.

Click on the station name to select it.

Access the iSCOUT® page, by clicking the **Eye icon** on the left side of the bar.

To choose which **picture** you want to see **in full-size**, use the **date selection tool** at the bottom of the page.

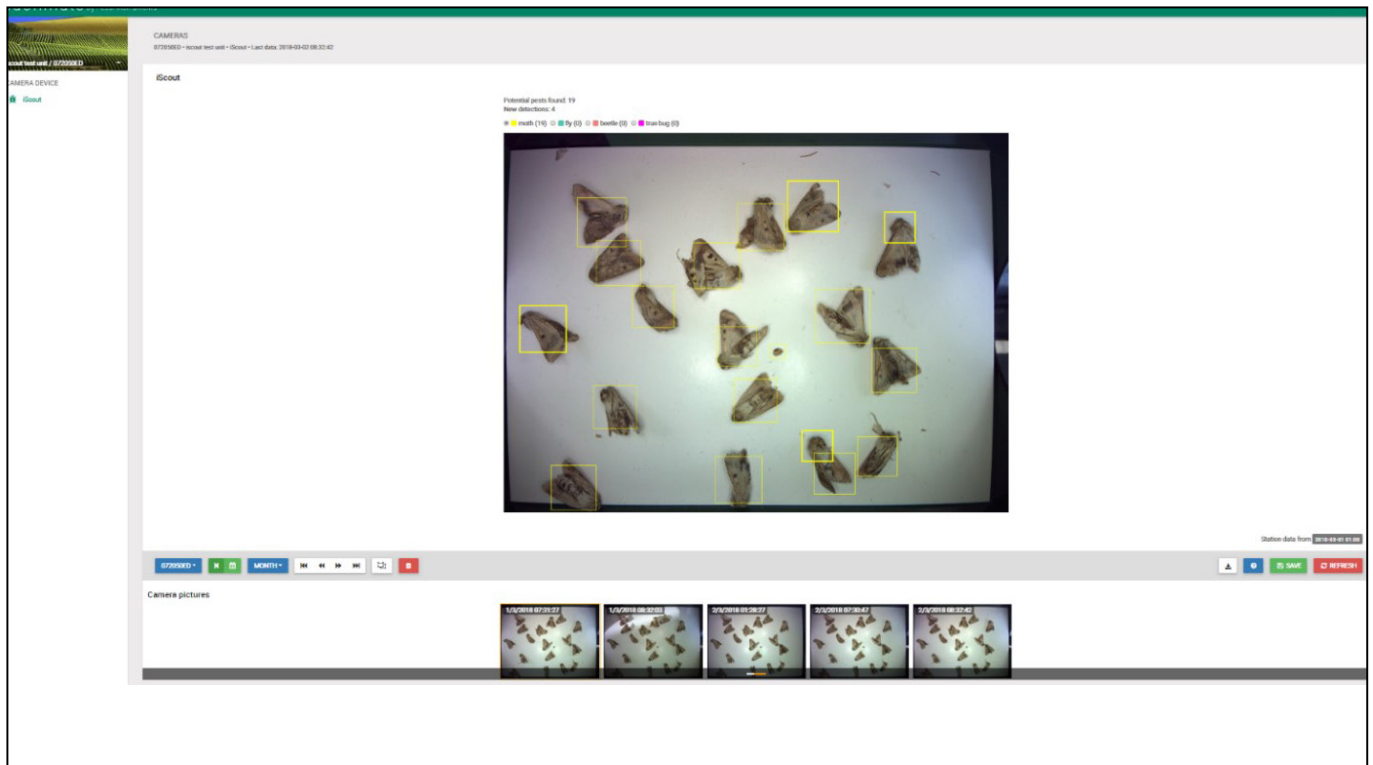
6.1.4 INSECT DETECTION TOOL

Insect detection tool **automatically detects** and counts all insects marked with rectangles. **Thicker rectangles** mark the new insects the system detected, based on the previous image.

You can **edit** the drawn **rectangles** on the image – change size, remove or add new rectangles.

Select the rectangle and **label/mark the insect** accordingly.

Remember to **save** at the end. You can also **export** the image.



Picture: Insect detection tool.

On **STATION SETTINGS** page set up your iMETOS device.

Station settings > Configuration: Ensure that Time zone and location are properly set (you need to set it up manually, otherwise the station will not take and send photos at the time in your time zone).

- You can drag the marker on the map to mark your location.
- You can enter location (by address) into location search box and then click GO! button.
- You can enter coordinates of the device location to Longitude, Latitude, Altitude boxes (you can acquire coordinates with the help of your mobile phone, if it has built-in GPS).

Manually enter the station time zone:

- Select the correct time zone from a drop-down list.

Under **Transfer settings**, you can define how your iMETOS device sends the data. Note that the settings for logging interval and transmission times will work with the default values – first photo at 7am Austrian time – as long it is not changed.

In scheduler please select the hours at which you wish your iSCOUT® station to take a picture and send it to the server.

BE AWARE: taking and sending a picture consumes a lot of energy, so decide wisely about how many times per day you want to take and send a picture. During cold periods of the year, picture taking and sending is recommended only once per day.

BE AWARE: sending a picture consumes a lot of transfer data, if station sends two pictures per day, monthly use of data will be app. 0,75 GB. Not to exceed this data amount, there is a limitation of taking picture only three times per day.

When you finish with configuration, do not forget to save the new settings (click on save configuration button).

Under Camera, you can setup camera settings. Note that wrong settings can result in corrupted images.

Change these settings only if you are an expert.

For further inquiries visit [FieldClimate Manual](#).

Note: When the season is over, remove the device from the field, disconnect the solar panel and the battery to avoid discharge and store it indoors until the next season.