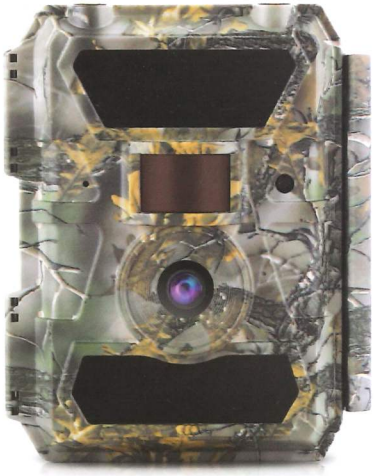
INSTRUCTION MANUAL

LIFEPLAN TRAIL CAMERA



This trail camera is produced for:

Project LIFEPLAN – A Planetary Inventory of Life
www.helsinki.fi/en/projects/lifeplan

Distributed by:

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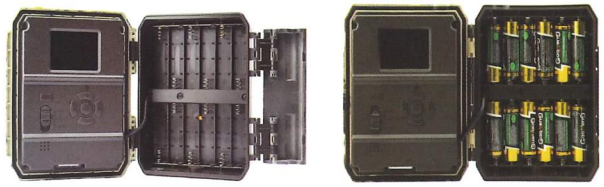
1.2 Preparing the camera for first use

1. Insert the batteries

Open the camera house and insert the batteries in accordance with the markings in the battery compartment. Carefully check the correct polarity.

Note: the camera can be operated on 6 AA or on 12 AA batteries. We recommend using Energizer Ultimate Lithium batteries or high-quality NiMH rechargeable batteries with low self-discharge characteristics, like the Panasonic Eneloop or Eneloop PRO rechargeable batteries. For optimal performance, please select the corresponding battery type in the third tab of the camera menu.



2. Insert the SD card

The SD card should be inserted with the contacts facing down and the label facing up.

Note: We recommend using high quality Class 10 SDHC cards with a capacity between 4 and 32GB.

1.3 Setting up the camera

1. Power on the camera

Move the main camera switch from the OFF position to the SETUP position and wait for the camera to finish the start-up process. Once finished, you should see the camera screen showing the current view of the lens. Now move the main camera switch to ON and close the camera case. The camera is now operational under the default settings (indicated in ORANGE in the scheme below) and ready to be activated by motion triggers. Please refer to the detailed camera settings further in this manual for instructions on adjusting the default settings.

2. Configuring camera settings

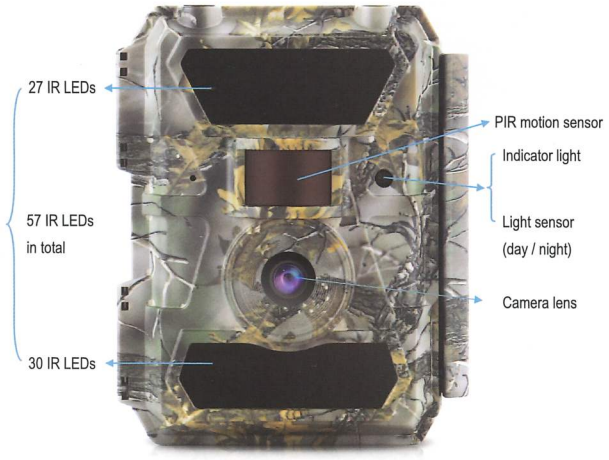
Move the main camera switch from the OFF position to the SETUP position and wait for the camera to finish the start-up process. Once finished, you should see the camera screen showing the current view of the lens. Press the MENU button; you will now enter the camera menu to view and change settings. Press the arrow keys for navigation and the OK key to confirm your settings. Once finished with adjusting the settings, don't forget to switch the main camera switch to the ON position to make the camera operational.

1.4 Schematic overview of the camera menu (default settings in ORANGE)

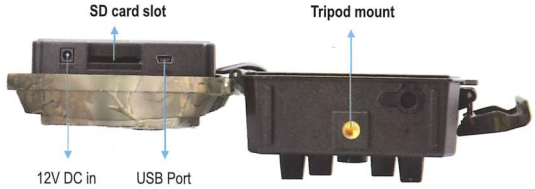
CAM tab		PIR tab	
Cam ID	OFF / ON	PIR Switch	ON / OFF
Cam Mode	PHOTO / VIDEO / PIC + VIDEO	Sensitivity	HIGH / MIDDLE / LOW
Flash LED	ALL / PART	Delay	ON / OFF
Image Size	8MP / 12MP / 24MP	Time Lapse	ON / OFF
Night Mode	MIN. BLUR / BALANCED / MAX. RANGE	Timer1	ON / OFF
Multi-shot	1P / 2P / 3P / 4P / 5P	Timer2	ON / OFF
Video Size	FHD-1080P / HD-720P / WVGA		
Video length	5-59 seconds		
OTHER tab			
Language	English / Dutch / German / French / Italian / Russian / Polish / Hungarian / Czech		
Date/Time	Format: DD:MM:YYYY; HH:MM:SS		
Stamp	ON / OFF		
Battery Type	Alkaline/Lithium / NI-MH		
Frequency	60Hz / 50Hz		
SD Cycle	ON / OFF		
Password	ON / OFF		
Reset	NO / YES		
FW Update	NO / YES		
About	Version: / MCU:		

2. Camera overview and parts description

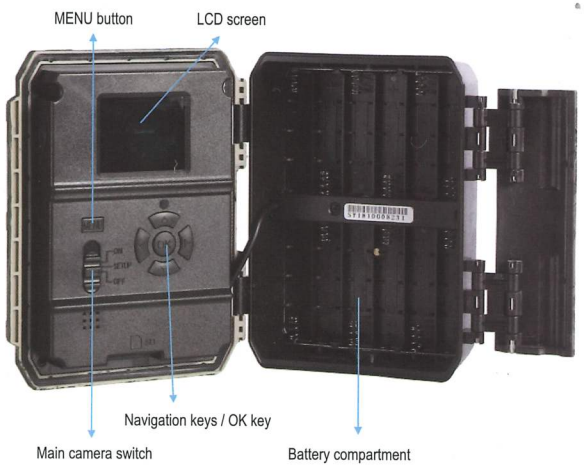
2.1 Figure 1: Front view of camera



2.2 Figure 2: Bottom view of camera



2.3 Figure 3: Internal view of camera



3. Introduction

This trail camera was produced exclusively for the Lifeplan Project. The user menu has been restricted in its functionality and default settings have been adjusted in accordance with the protocols of this project. The remainder of this user manual will describe the full functionality settings of this trail camera, where it will indicated which options are restricted in the current model.

3.1 Power supply

A. Batteries

This camera runs on 6 or 12 AA size batteries. It is designed to work with alkaline, lithium and high-quality NiMH rechargeable batteries. We recommend using Energizer Ultimate Lithium batteries or high-quality NiMH rechargeable batteries with low self-discharge characteristics, like the Panasonic Eneloop or Eneloop PRO rechargeable batteries. For optimal performance, please select the corresponding battery type in the third tab of the camera menu. Batteries should be inserted with correct polarity positions as indicated in the battery compartment. It should be noted that different battery types have different discharge curves. Particularly when using Lithium batteries, one will notice that the battery indication will remain "FULL" for a very long time, while then suddenly running flat. This is due to the nature of this type of battery.

Note: Do not mix batteries types!

B. Indication of average battery life

There are many factors influencing the battery life of a camera. Hence, it is very difficult to estimate how long a camera will run on a set of batteries. The table below therefore provides a very general estimate of battery life based on the use of 12 standard alkaline batteries. Better performance will be achieved with high-quality NiMH rechargeable batteries or with Lithium batteries.

Photos shot per day		Working time	Video clips shot per day		Working time
IR LEDs On					
Max.Range	100 pics	80 days	Video—10s	10 clips	80 days
Balanced	100 pics	75 days			
Min.Blur	100 pics	70 days			
IR LEDs Off					
Photo	100 pics	125 days	Video—10s	10 clips	160 days

C. Solar panel

To bring users better using experience, our engineers designed this camera to be able to work with most standard 12V/2A lithium battery powered solar panels. Any solar panel connected to this camera will never charge the batteries inside the camera itself.

D. Power adapter

This camera can also be powered by an external 12V/ 2A DC adapter. In this case, it is recommended to remove the AA size batteries from the camera's battery compartment.

3.2 SD card selection

Using a memory card is required to operate the camera. When the camera is "ON" and no memory card is used, the screen displays "No card". The SD slot of the camera has a 32 GB memory capacity. Before inserting or removing the memory card, the camera must be turned "OFF". Failing to do so may cause loss of or damage to the pictures / videos already recorded on the memory card. When the SD card is full, the screen displays "Memory Full". The following table shows an approximate quantity of photos or videos that can be recorded by the camera depending on the memory card capacity.

SD card Size / resolution	4 GB	8 GB	16 GB	32 GB
Photo (pictures)				
8 MP	2104	4238	8476	16952
12 MP	1445	2910	5816	11632
24 MP	735	1480	2957	5914
Video (hours)				
WVGA	04:01:48	08:20:44	16:05:45	33:56:02
HD	02:50:42	05:52:35	11:38:43	24:09:16
FHD	01:58:31	04:27:27	08:30:21	18:04:52

3.3 USB Connection

The camera is equipped with a micro USB 2.0 connection port. When the camera is connected via a USB cable to a computer, the screen will display "MSDC". Press "MENU" once to switch from "MSDC" to "PC Cam". The camera can now be used as a PC webcam. Press "MENU" again to go back to the "MSDC" mode for transferring files between the computer and the camera.

4. Operation List

4.1 Video / Photo playback

Move the main camera switch to the SETUP position to enter the live view mode. Press arrow button "↑" to enter Playback mode; press "←" and "→" for navigating through the pictures or videos, and press "OK" to play a video. Press arrow button "↑" again to exit the playback mode.

4.2 Delete files or format the SD card

In Playback mode, press the "MENU" button to delete files (DEL), or to format the SD card (FORMAT...). Press the "MENU" button again to exit.

Deleting files

To delete one file, navigate to that specific picture or video via the playback mode, then click MENU, and click OK while having the "DEL" option selected. Then select "ONE" and click OK again. Then confirm once more by selecting "YES" and clicking OK.

To delete all files, navigate to any picture or video via the playback mode, then click MENU, and click OK while having the "DEL" option selected. Then select "ALL" and click OK again. Then confirm once more by selecting "YES" and clicking OK.

Formatting the SD card

To format the entire SD card, navigate to any picture or video via the playback mode, then click MENU, and click OK while having the "FORMAT..." option selected. Then select "YES" and click OK again. Then confirm once more by selecting "YES" and clicking OK.

4.3 Auto power off

In SETUP mode whilst being in the live view screen, the camera will automatically power off after 3 mins of no keypad touching. When the camera is in the menu configuration pages, it will not auto power off.

4.4 Operation menu

To adjust the camera settings via the operation menu, first move the main camera switch to SETUP and wait for the camera to start up. Then press the MENU button once to enter the camera settings menu. Use the arrow keys to navigate through the three main tabs and the individual settings under each tab. Press "OK" to select a specific setting or to confirm a chosen setting, and press MENU to exit that specific setting and move up one level in the user menu. Keep pressing the MENU button to move up in the menu structure and to ultimately leave the settings menu altogether and enter back into the live view screen.

Note: For some settings, the user needs to press MENU to save & exit the configuration after pressing "OK" to confirm; (Cam ID, Delay, Time Lapse, Timer, Password)

CAM tab (default settings in ORANGE)

Settings (options given)	Explanation / Programmable options
Cam ID OFF / ON	Select "ON", press "OK", to set a unique camera ID consisting of up to 12 characters. Use the arrows buttons UP and DOWN select the desired character. The Cam ID will also be printed on the image strip at the bottom of each recorded image. **Lifeplan: this setting has been FIXED to ON, with the default Cam ID "LP0000". The last 4 numbers are user-adjustable.**
Cam Mode PHOTO / VIDEO / PIC + VIDEO	PHOTO: the camera records photos in response to motion events VIDEO: the camera records videos in response to motion events PIC+VIDEO: the camera first records one or more photos, and then records a video in response to the same motion event **Lifeplan: this setting has been defaulted to PHOTO, and the PIC+VIDEO option has been switched off.**
Flash LED ALL / PART	ALL: all 57 IR LEDs will be used during nighttime recordings PART: only the top 27 IR LEDs will be used during nighttime recordings **Lifeplan: this setting has been defaulted to ALL.**
Image Size 8MP / 12MP / 24MP	**Lifeplan: this setting has been defaulted to 12MP.**
Night Mode MIN. BLUR / BALANCED / MAX. RANGE	MIN. BLUR: Short exposure time to minimize motion blur for better image quality; shortened IR flash range; MAX. RANGE: Longer exposure time to extend IR flash range for better night vision; lower image quality; BALANCED: combination of above 2 options; **Lifeplan: this setting has been defaulted to BALANCED.**
Multi-shot 1P / 2P / 3P / 4P / 5P	Based on the option selected here, the camera will record between 1 and 5 pictures in response to each motion event (i.e., per trigger). The time between individual photos is about 1 second. **Lifeplan: this setting has been defaulted to 5P, meaning that 5 photos will be recorded each time the camera is triggered by motion.**
Video Size FHD-1080P / HD-720P / WVGA	**Lifeplan: this setting has been FIXED to FHD-1080P (1920*1080). The user has no option to adjust this setting anymore.**
Video length 5-59 seconds	**Lifeplan: this setting has been defaulted to 5 seconds.**

PIR tab (default settings in ORANGE)

Settings (options given)	Explanation / Programmable options
PIR Switch ON / OFF	With PIR Switch OFF, the camera will not respond to motion events. With PIR Switch ON, the camera records photos/videos in response to motion events. **Lifeplan: this setting has been FIXED to ON. The user has no option to adjust this setting anymore.**
Sensitivity HIGH / MIDDLE / LOW	Higher sensitivity is 1) more sensitive to movements by smaller subjects; 2) longer detection distance; 3) easier for sensor to detect difference between body heat and outdoor temperature; 4) easier to trigger camera. **Lifeplan: this setting has been defaulted to HIGH.**
Delay ON / OFF	This setting determines the time between two triggers. If set to ON, a specific time interval between photos or videos upon motion can be set. During the set delay interval, the camera will not respond to motion. **Example:** Camera will wait 5 minutes between photo/video recordings even though there may be continuous movement in front of the camera if the pre-set time interval is 00:05:00 **Configurable delay time:** 00:00:03 ~ 23:59:59. **Lifeplan: this setting has been defaulted to OFF.**
Time Lapse ON / OFF	This setting allows the user to record photos/videos at pre-set intervals, regardless of motion events. **Example:** if set to ON with the time interval set at 1 hour, the camera will automatically record a photo/video every hour. **Configurable interval:** 00:00:05~23:59:59. **Lifeplan: this setting has been FIXED to OFF. The user has no option to adjust this setting anymore.**
Timer1 ON / OFF	This setting allows the camera to work only during a specific period of the day. Select "ON", press "OK", to set the beginning time and end time (hour/minute). **Example**: 15:00 – 18:00; camera only works between 15:00 – 18:00 hrs. **Lifeplan: this setting has been FIXED to OFF. The user has no option to adjust this setting anymore.**
Timer2 ON / OFF	Second timer for a second activity period of the day. Select "ON", press "OK", to set the beginning time and end time (hour/minute). **Example**: 15:00 – 18:00; camera only works between 15:00 – 18:00 hrs. **Lifeplan: this setting has been FIXED to OFF. The user has no option to adjust this setting anymore.**

OTHER tab (default settings in ORANGE)	
Settings (options given)	**Explanation / Programmable options**
Language	Options are English / Dutch / German / French / Italian / Russian / Polish / Hungarian / Czech **Lifeplan: this setting has been FIXED to ENGLISH. The user has no option to adjust this setting anymore.**
Date/Time	Manually set date/time. Format: DD:MM:YYYY; HH:MM:SS **Lifeplan: this setting has been defaulted to "15:07:2020 00:00:00". The user should adjust this to the correct date-time before use!**
Stamp ON / OFF	Info strip with camera ID, moon phase, temperature, date and time on each photo. **Lifeplan: this setting has been defaulted to ON.**
Battery Type Alkaline/Lithium / NI-MH	Select Alkaline/Lithium in case of using either of these types of batteries. Select NI-MH in the case of NiMH rechargeable batteries. The choice affects the battery meter indication on the home screen of the camera. **Lifeplan: this setting has been defaulted to NI-MH.**
Frequency 60Hz / 50Hz	50HZ, 60HZ; improper setting may cause the camera screen to flicker. **Lifeplan: this setting has been defaulted to 50Hz.**
SD Cycle ON / OFF	Select "ON" and press "OK" for the camera to continue to record photos/videos when the SD card is full. The oldest photos/videos will automatically be deleted. **Lifeplan: this setting has been FIXED to OFF.**
Password ON / OFF	A password of up to 12 characters can be set to protect people from entering the camera menu. Select "ON" and press "OK" to enable password protection for your camera. **Lifeplan: this setting has been defaulted to ON with a pre-set 6 character password. The user will receive the default password from the Lifeplan coordinator.**
Reset NO / YES	Select "Yes" to reset the camera back to factory default settings. **Lifeplan: resetting brings camera back to default Lifeplan settings.**
FW Update	Option to update firmware when available **Lifeplan: users will be informed when this is needed.**
About	Firmware version in camera (Version: / MCU:)

5. Camera specifications

Image Sensor	5 Mega Pixels Color CMOS
Effective Pixels	2560x1920
Day/Night Mode	Yes
IR range	20m
IR Setting	Top: 27 LED, Bottom: 30 LED
Memory	SD Card (4GB – 32GB)
Lens	F=3.0; FOV=52°; Auto IR-Cut-Remove (at night)
PIR Angle	60°
LCD Screen	2" TFT, RGB, 262k
PIR distance	20m (65feet)
Picture size	8MP / 12MP / 24MP
Picture Format	JPEG
Video resolution	FHD (1920x1080), HD (1280x720), WVGA(848x480)
Video Format	MOV
Video Length	05-59 sec. programmable
Multi Shot	1-5 pictures per trigger
Trigger Time	0.3s
Trigger Interval	Configurable between 3 seconds and 24 hours
Photo + Video mode	Yes
Time Lapse	Yes
SD Card cycle option	Yes
Operation Power	Battery: 9V; DC: 12V
Battery Type	12AA
External DC	12V
Stand-by Current	0.135mA
Stand-by Time	5~8 months (6×AA~12×AA)
Interface	USB/SD Card/DC Port
Mounting	Strap (back); Tripod (bottom and back); Python cable (back)
Operating temperature	-25°C to 60°C
Storage temperature	-30°C to 70°C
Operation humidity	5% - 90%
Waterproof specification	IP66
Dimensions	148*117*78 mm
Weight	448 grams
Certifications	CE / FCC / RoHs

6. Troubleshooting

6.1 Photos do not capture the object of interest

1. Check whether the PIR switch in the user menu is set to ON.

2. Check whether the PIR sensitivity is set to HIGH.

3. Try to place your camera in areas where no heat sources are in the camera's field of view.

4. In some cases, placing the camera near water will make the camera take images with no subject in them. Try to aim the camera over ground.

5. Try to set camera on stable and immovable objects, such as large trees.

6. At night, the motion sensor may detect objects beyond the range of the IR illumination. Reduce distance setting by adjusting sensor sensitivity.

7. The rising sun or sunset can trigger the motion sensor. Try to aim your camera in a position that it is not directly facing the sun.

6.2 Camera stops taking images or will not take images at all

1. Please make sure that the SD card is not full. If the card is full, camera will stop taking images. The alternative is to turn on the SD Card Cycle option to avoid such a problem.

2. Check the batteries to make sure that the voltage is sufficient for the camera to run, also during the night.

3. Make sure that the main camera switch is set to "ON" and not in the "OFF" or "SETUP" position.

5. Please format the SD card inside the camera before using it or when the camera stops taking images.

6.3 Night vision flash range does not meet expectations

1. Please check to make sure that the batteries are fully charged or at least have sufficient power.

2. "Max Range" offers better IR flash range. Given IR flash range values are based on Max Range setting; so please adjust Night Mode to Max Range for better night vision flash range;

3. High-quality 1.2V NiMH rechargeable AA batteries generally offer much better IR flash range than standard alkaline batteries. Lithium batteries generally perform best.

4. To ensure accuracy and quality of night time image, please mount your camera in a dark environment without any obvious light sources;

5. Some structure (like trees, walls, ground, etc.) within the flash range can get you better night time images; please do not aim the camera to a totally open field where there is nothing within IR flash range to reflect the flash back. It's like shining a flashlight into the sky at night, all light will be scattered and you will not see anything.

7. Warranty

Our products are warranted against defects in materials and workmanship for a period of three years from the date of original purchase. If a defect exists, we will, at our option and to extent permitted by law (1) repair the product at no charge using new or refurbished parts; (2) exchange the product with a functionally equivalent product that is new or refurbished.

This warranty excludes damage resulting from abuse, accident, modifications or other causes that are not defects in materials and workmanship, or by someone other than our authorized technicians. This warranty only covers failures due to defects in materials or workmanship under normal usage.

To obtain warranty service, please contact the distributor of this camera (details provided below) to determine the nature of problem before return the product under this warranty (with a written description of the problem and print samples) for repairing or exchanging.

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