

USER'S MANUAL

Telemetry trackers GPS-GSM / UHF (version CX)

Series CREX i KITE

manual : v.1802_1

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1. Introduction

GPS-GSM-(UHF) loggers made by Ecotone have been designed to monitor and migration tests/testing as well as wildlife behaviour. Deep understanding of the principles of operation and loggers handling is the condition of proper deployment and in accordance with its intended purpose.

Before deciding on a purchase and use this type of equipment we suggest to contact us before to discuss the project outcomes and expected results.

Information about behaviour and biology of animals that you are going to monitor are essential for our specialists that prepare/preparing software, shape of housing, method of attachment and others.

Sometimes not everything what You expect is possible to implement or requires a special approach, hence the consultations, analysis of literature and joint outline of the project gives possibility of obtaining good results/effects.

Software, built-in algorithm of operation, housing, powering module and other parameters will be way different in case of burrowing animals, diving or just land ones, with daily or night mode, permanently resident in one climate or migrating.

Together with the device you get our full merit and technical support for the project duration. Our group of scientists, biologists and IT specialists help to solve your problems and surprises that field work often provides.

1.1. The essential information that should be noted

- **active logger/logger ON]**

placed in place with good sky visibility (available GPS signal);

operating temperatures of -50 to +50 C;

distance between active loggers cannot be less than 30cm;

logger cannot be placed on a metal surface;

logger should not be located in close proximity to WiFi or GSM transmitters, nor other equipment emitting strong radio signal or electromagnetic noises;

active logger should work in conditions as close as possible to those that occur after deployment;

logger should not be tested in a car or on the window sill, where working conditions are usually very negative;

active logger cannot be transported in a metal box, including boot, because strong GSM signal emitted “in electromagnetic trap in general leads to damage the electronics of the device.

- **stored logger**

must remain switched off (also for transportation purposes, when there is no GPS signal);

solar panel must be covered;

before switching off ensure that battery level is not lower than 3.9V;

stored within the right temperature tolerance band, from +50C to +250 C;

keep the logger away from magnet and strong magnetic field;

switched off logger must be activated once per month to check the battery level – if the voltage is lower than 3.9V – in case of loggers with solar cell or connecting pins – recharge the battery.

- **placing the logger**

before deploying – logger must be turned on and allow the modules sufficient time to

receive start positions on your telemetry panel/wait until receiving start positions on your telemetry panel;

at the moment of deployment battery level cannot be lower than 3.9V;

take off sticker covering solar panel;

ensure that feathers or fur will not cover the solar,

if necessary – use enclosed foam pad to rise it above the feathers or fur;

Loggers with external antenna – do not touch the raised part of antenna, because electrostatic discharge may damage the electronics. ALWAYS touch earthing object before touching logger, to discharge static electricity.

- **testing loggers**

Although all loggers go through series of tests, we do recommend accurate checking of the equipment – by the user - before deploying. It gives a chance of detection of hidden faults and give time to gain more experience in working with the equipment and with remote programming.

1.2. Main features of Ecotone GPS-GSM loggers

- Data collected by loggers are available on-line.
- Each customer has access to password protected telemetry panel.
- Data transmission is conducted via GSM network.
- Data transfer takes place after collecting 4 or 2GPS positions, in case of collecting additional data (modes marked as +ACC).
- GPS-GSM loggers, depending on the model, have internal memory with capacity from 30.000 up to 60.000 GPS positions, providing trouble-free work at the time when an animal is located in areas without GSM network.
- Data, that haven't been send because of lack of the GSM range, will be send back at the earliest successful GSM communication.
- GPS positions are collected with interval set by the user. To function properly – access to the GPS signal is indispensable.
- Remote change in working parameters of loggers (deployed or not) is possible anytime from telemetry panel. The condition, however, is animal standing within the GSM range.
- Loggers with solar panel have a range of embedded algorithms providing protection against overcharging, as well as to fast and excessive discharging.

2. TELEMETRY PANEL

Telemetry panel enables access to the data collected by logger as well as changing its settings. Each single panel is secured by the password. To log in type in the password and login twice. Each panel has two user access options:

User – the possibility of changing the settings and downloading collected data.

Guest – no possibility of changing the settings, map preview with current GPS position of the logger.

2.1. Menu sidebar

The menu sidebar with settings and data for whole panel

Window with information and settings, related to one logger

The screenshot shows the ECOTONE Telemetry Panel interface. On the left is a sidebar with navigation options: HOME, SETTINGS, MAPS, PATHS & POSITIONS, EXPORTS, and an ACCOUNT BALANCE section showing 0.00 EUR. The main area displays two logger panels, labeled 1 and 2. Each panel shows current status (restart, SMS, GPS), settings (GPS-GSM, GPS-UHF, Accelerometer), and a description. Red callout boxes highlight the sidebar and one of the logger panels.

- **HOME button**

HOME – pressing take you back to the list of loggers.

2.2. SETTINGS button

FORWARD SMS TO – possibility to transfer original SMS-es, sending by loggers to the designated phone number, provided by the client. Remark – this option is at extra charge.

VIEW PROPERTIES

Hide not active numbers – when that option is selected, on the loggers list devices marked as „hide logger” will be hidden (check subsection 2.3)

Hide description – when that option is selected, last column „Description” will be hidden.

EXPORT EMAIL – option that enables export of raw data to e-mail address of the user. After entering address you only need to select loggers. Logger like this has to have marked option „e-mail” (check subsection 2.3).

MOVEBANK USERNAME – option that enables export of collected data to Movebank service (<https://www.movebank.org/>). To run the data collected by logger, enter here a name of user, given by Movebank service. Additionally to start this option you need to select loggers, which data will/should be send. Logger like this has to have marked option „Movebank” (check subsection 2.3). Each of abovementioned changes must be confirmed by the **SAVE** button.

DROP-OFF SETTINGS - setting is intended exclusively for devices, which are equipped with remote „drop-off” system.

Command activating „drop-off” can be send in two different ways.

- 1) Command send with the use of base station (if logger is equipped with UHF system).
- 2) Command send by the GSM. For this purpose type whole phone number of the logger in the NUMBER field (11 digits) and in the PASSWORD field – password to „drop-off” for given device. The factory password is: „12345678”. (Password may be changed with use of base station).

Each of abovementioned changes must be confirmed by **ACTIVATE DROP-OFF** button.

Once this is set, in column „Setting Status” of given logger displays information **DROP-OFF=YES** „Drop-off” command may withdraw by re-entering of the phone number in NUMBER text box and entering „xxxxxxx” in PASSWORD text box.



HOME

SETTINGS

MAPS

PATHS & POSITIONS

EXPORTS

ACCOUNT BALANCE

0.00 EUR

[ACCOUNT REPORT](#)

[RECHARGE ACCOUNT -](#)

[CREDIT CARD](#)

[GSM FEE-TERMS OF USE \[EN\]](#)

[GSM FEE-TERMS OF USE \[PL\]](#)

- **Button MAPS**

Preview of GPS data from loggers in Google Maps. Data are divided on particular days and loggers.

- **Button PATH & POSITIONS**

Preview of GPS data from loggers in Google Earth. Data have been divided on monthly or daily data collection from particular loggers.

- **Button EXPORTS**

Data collection in version of .csv files.

stats – list of Master Resets "MR" and settings confirmed by logger "New Settings"

positions – list of GPS positions and rest of parameters collected by loggers, presented in monthly collection.

account balance – account settlement

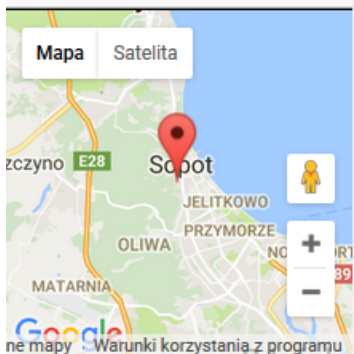
acc – electronic data from accelerator (if logger had active that option)

- **Account Report**

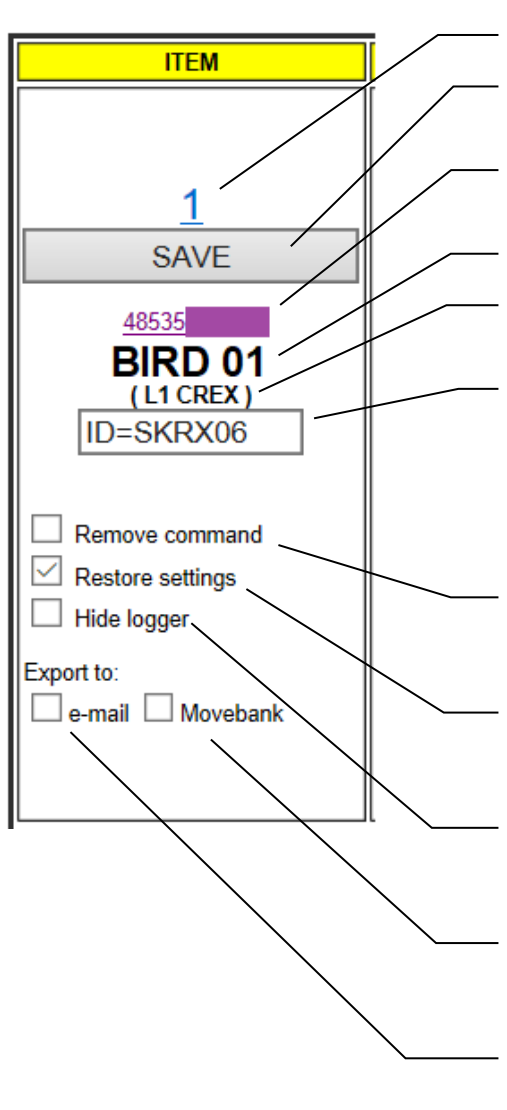
Balance amount for whole whole telemetry panel.

- **Map**

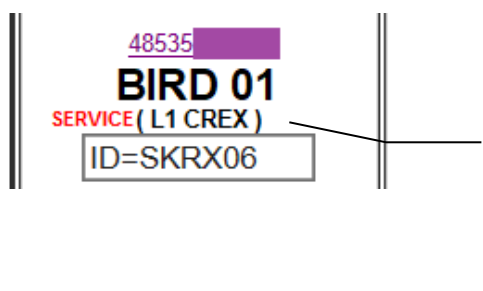
After clicking on any logger's number (chapter 2.3) - in lower left-hand corner of the page the map with last determined position will appear.



2.3. Detailed description of panel's column – ITEM: data about the logger



Item number
SAVE button – for approval settings changes and saving notes in Description field
Phone number of the device, after clicking map with last determined position will appear (check chapter 2.2)
Name of the logger
Name/type of the telemetry panel (related with set of specific settings and options); check chapter 2.5
Logger ID – shows current logger's program and name given by the UHF. For example for device which ID=SKRX06 – first letter means name of the program ('S' in this case), remaining three letters and two digits inform us about logger's name, used in work of UHF (in this case „KRX06)
Remove command – in case, when we have new command ready to be send, after marking option Remove command and confirming with SAVE – it will be removed
Restore settings – after choosing this option, when logger will make Master Reset then it will take last settings from the panel. Condition necessary to meet – reset has to be done in the GSM range.
Hide logger – devices marked as a „Hide logger” can be hidden on the panel. To accomplish this task hiding option has to be chosen in the Settings sidebar (check chapter 2.2)
Tickling option Movebank enables data transfer between logger and Movebank service. To send the data – please provide login-in details (check chapter 2.2)
Tickling 'e-mail' option will cause sending data from loggers also to an e-mail address. A few e-mail addresses can be added.



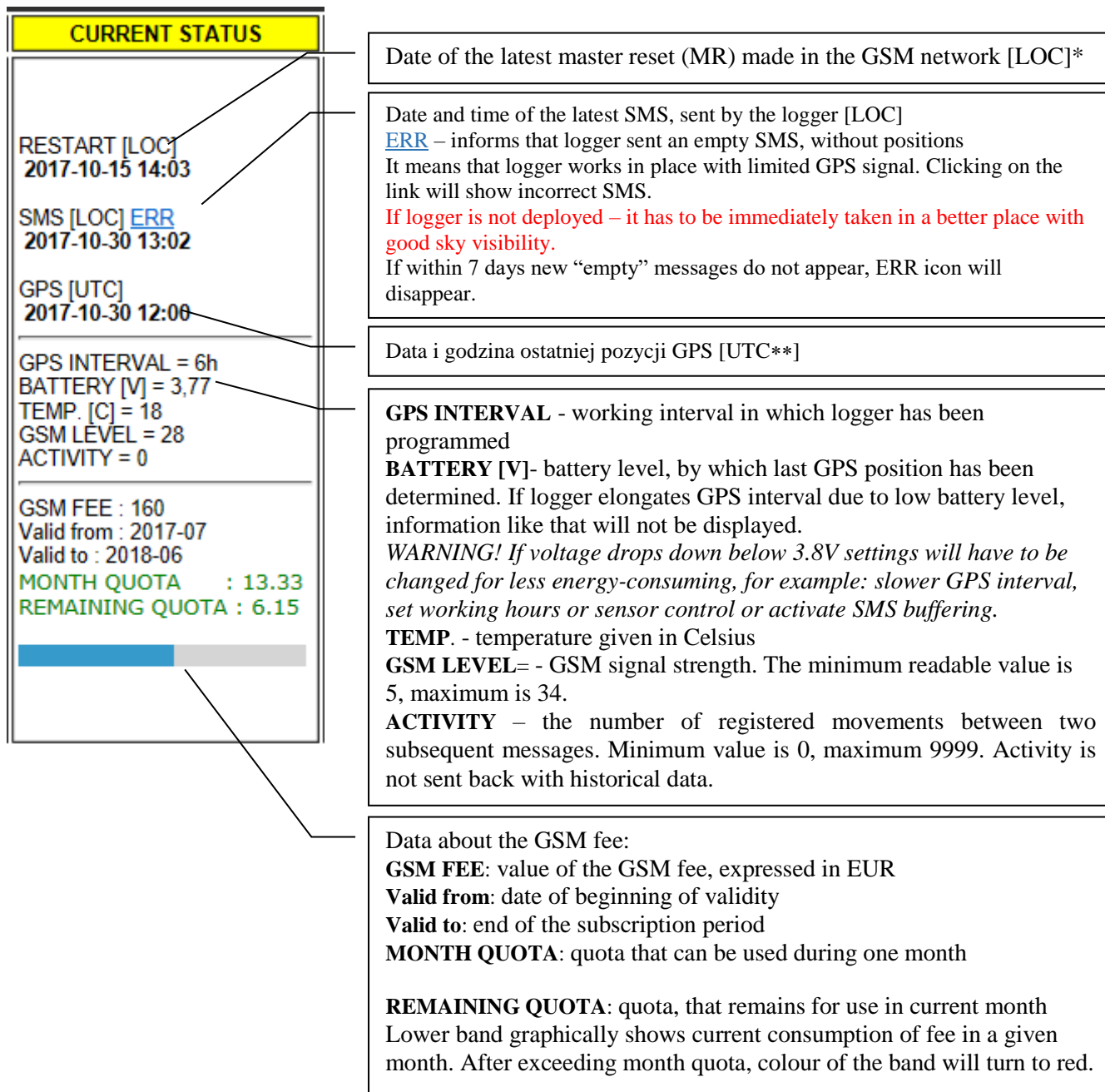
„SERVICE” description means that logger is during repair, in our service section.
Data collected in the course of that period will not be visible for the user, so charge for data transfer will not be counted.

2.4. Detailed description of panel's columns – CURRENT STATUS – information about the current state of the logger

MONTH QUOTA: quota that can be used during one month

REMAINING QUOTA: quota, that remains for use in current month

Lower band graphically shows current consumption of fee in a given month. After exceeding month quota, colour of the band will turn to red.



CURRENT STATUS

RESTART [LOC]
2017-10-15 14:03

SMS [LOC] **ERR**
2017-10-30 13:02

GPS [UTC]
2017-10-30 12:00

GPS INTERVAL = 6h
BATTERY [V] = 3,77
TEMP. [C] = 18
GSM LEVEL = 28
ACTIVITY = 0

GSM FEE : 160
Valid from : 2017-07
Valid to : 2018-06
MONTH QUOTA : 13.33
REMAINING QUOTA : 6.15

Progress bar: [Blue segment] [Grey segment]

Date of the latest master reset (MR) made in the GSM network [LOC]*

Date and time of the latest SMS, sent by the logger [LOC]
ERR – informs that logger sent an empty SMS, without positions
It means that logger works in place with limited GPS signal. Clicking on the link will show incorrect SMS.
If logger is not deployed – it has to be immediately taken in a better place with good sky visibility.
If within 7 days new “empty” messages do not appear, ERR icon will disappear.

Data i godzina ostatniej pozycji GPS [UTC**]

GPS INTERVAL - working interval in which logger has been programmed
BATTERY [V]- battery level, by which last GPS position has been determined. If logger elongates GPS interval due to low battery level, information like that will not be displayed.
WARNING! If voltage drops down below 3.8V settings will have to be changed for less energy-consuming, for example: slower GPS interval, set working hours or sensor control or activate SMS buffering.
TEMP. - temperature given in Celsius
GSM LEVEL= - GSM signal strength. The minimum readable value is 5, maximum is 34.
ACTIVITY – the number of registered movements between two subsequent messages. Minimum value is 0, maximum 9999. Activity is not sent back with historical data.

Data about the GSM fee:
GSM FEE: value of the GSM fee, expressed in EUR
Valid from: date of beginning of validity
Valid to: end of the subscription period
MONTH QUOTA: quota that can be used during one month
REMAINING QUOTA: quota, that remains for use in current month
Lower band graphically shows current consumption of fee in a given month. After exceeding month quota, colour of the band will turn to red.

*LOC – local time of the SIM operator

**UTC – Universal Time Coordinated

Black background by the logger means, that validity of the GSM fee has expired, immediately contact the ECOTONE office in order to pay for the next subscription period.

The screenshot shows the ECOTONE web interface. On the left is a navigation menu with options: HOME, SETTINGS, MAPS, PATHS & POSITIONS, EXPORTS, and ACCOUNT BALANCE. The ACCOUNT BALANCE section shows a balance of 197.16 EUR. The main area displays two configuration items:

- Item 1:** ID=B30SpA. Settings include GPS-GSM, GPS-UHF, and Accelerometer settings. The current status shows a GSM fee expiration date of 2017-10-03.
- Item 2:** BIRD 02 (ID=B30SsR). Settings include GSM status (RESTART, SMS), GPS-GSM, GPS-UHF, and Accelerometer settings. The current status shows a GSM fee expiration date of 2016-10-24 17:01.

2.5. Detailed description of panel's columns – NEW SETTINGS

2.5.1. Set of settings for „TRINGA”

NEW SETTINGS		
GPS-GSM SETTINGS		
GPS INTERVAL [hours]	ON HOURS [UTC]	OFF HOURS [UTC]
SENSORS	GSM	ACC REPORT
ACCURACY	GPS TIMEOUT	SMS BUFFER
GPS-UHF SETTINGS NO CHANGE		
GPS INTERVAL [minutes]	ON HOURS [UTC]	OFF HOURS [UTC]
ACCURACY	GPS TIMEOUT	UHF INTERVAL
STOPS IN BASE	SPEED/ALTITUDE	VHF/UHF
ACCELEROMETER SETTINGS		
INTERVAL [minutes]	SAMPLING [Hz]	N SAMPLES

- 1min
- 2min
- 4min
- 5min
- 10min
- 15min
- 30min
- 1h
- 2h
- 3h
- 6h
- 12h
- 24h
- 1min+acc
- 2min+acc
- 4min+acc
- 5min+acc
- 10min+acc
- 15min+acc
- 30min+acc
- 1h+acc
- 2h+acc
- 3h+acc
- 6h+acc
- 12h+acc
- 24h+acc
- W24h+acc
- R

GPS INTERVAL [hours]

Working interval in which logger has been programmed/defines frequency with which GPS data will be collected

Loggers (CX) have ability to set frequency of data collection from 1min to 24h.

There is also the option to collect additional data together with GPS position:

N_satellites – number of satellites on the basis of which position has been determined

Speed – speed given in knots. The speed is measured on the basis of the GPS coordinates.

Altitude – altitude given in meters a.s.l. Altitude measurement is by GPS coordinates.

Light – light intensity (value from 0 – 138)

Acceleration – basic data from 3-axis acceleration sensor (XYZ)

To collect additional data select interval with insertion “+acc”, for example: “6h+acc”.

ATTENTION! Transfer of GPS positions with additional data is two times more expensive than typical GPS positions.

R – command that resets system. Shall be used in case of problems with logger’s work. Before use please consult with Ecotone service.

ATTENTION! During programming logger, parameter GPS INTERVAL [hours], has to be chosen, otherwise settings will not be send!

ON HOURS [UTC] and OFF HOURS [UTC]

It is possible to set period of time, when logger collects the GPS data:

Hours should be select from dropdown list and set in the UTC time.

Choosing OFF option in OFF HOURS box and turns off working hours control:



Setting working hours will not be active if any type of sensor control will be selected from drop-down list SENSORS. Those sensors serve as a primary consideration.

Setting working hours:

- is recommended whenever possible, to limit power consumption to ensure battery life. It is possible for example in case of the animals not active during night.
- is absolutely necessary in case of nocturnal animals for example in burrow, cave, where there is no GPS signal. During long-term work without access to the GPS signal batteries will be discharged fast and logger will stop working.

SENSORS

- OFF
- DAY
- NIGHT
- ACCs1
- ACCs2
- ACCs3
- ACCs4
- ACCs5
- ACCs6
- ACCs7
- ACCs8
- ACCs9

Sensors built-in afford the opportunity to control their work.

Light sensor DAY/ NIGHT – designated only for devices with solar panel

(do not set this parameter in loggers without solar!).

DAY – logger will work only during the daytime.

NIGHT – logger will work only during the darkness.

Acceleration sensor – choosing this parameter will cause collecting data due to GPS interval selected by the user, when animal achieves the necessary activity. In case when activity is below the selected value, logger collects data with 6h frequency.

ACC REPORT



CX loggers can collect daily reports regarding activity of an animal. Activity data are collected every 30 minutes.

The data so collected are available in the fold „EXPORTS” in „acc” catalogue (check chapter 2.2)

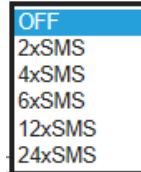
Check box:

OFF – turns off the report,

GSM – activates collecting and sending report by the GSM.

ATTENTION! Sending of ACC Report is payable.

SMS BUFFER



In CX loggers, to save energy, can be applied mechanism “SMS buffer” with GPS positions – it is recommended in case of collecting data with very short intervals.

An example – if 4xSMS is selected and logger works in 1h interval (without additional data) then delivery attempt will be taken after 16hours.

With GPS interval 30min or shorter/less automatic buffering 2xSMS is started.

ACCURACY

Setting accuracy of the GPS position measurement (ECO/MED/HIGH).

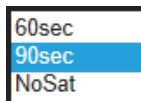


ECO - 80% of collected GPS positions are within a 20-m radius from indicated location;

MED - 90% of collected GPS, positions are within a 20-m radius from indicated location;

HIGH – 95% of collected GPS positions are within a 20-m radius from indicated location.

GPS TIMEOUT



With this setting we define how much time logger has to determine GPS position.

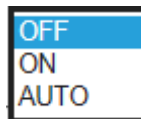
If position is not determined within the time limit – record without position will rise.

60sec – recommended in case of problems with battery maintenance;

90sec – this setting increases accuracy of measurement GPS position. Use when level of battery charge is high enough;

NoSat – with this setting if logger doesn't detect signal from any satellite – it will turn off the system for time, resulted from given interval, to save energy. Use this setting for animals often staying in burrows, hollows, rock bays, diving and other places preventing the GPS signal to be located.

VHF/UHF



Setting is designed for loggers with built-in VHF transmitter.

Settings:

OFF – after receiving this setting VHF transmitter will be turned off;

ON – after receiving this setting, VHF transmitter will be activated.

(ATTENTION! Switched on “full-time” lowers the battery level).

AUTO – with this option VHF transmitter is controlled by activity sensor. As long as animal stays active – VHF transmitter is active too. Whereas an animal does not show any activity for 12 hours then VHF transmitter starts sending. However when activity will be detected again – VHF transmitter turns off.

2.5.2. Set of settings for type “L1 CREX”

Set of settings intended for handling with dual system: GSM and UHF

NEW SETTINGS		
GPS-GSM SETTINGS		
<input type="text" value=""/>	<input type="text" value="00"/>	<input type="text" value="OFF"/>
GPS INTERVAL [hours]	ON HOURS [UTC]	OFF HOURS [UTC]
<input type="text" value="OFF"/>	<input type="text" value="OFF"/>	<input type="text" value="OFF"/>
SENSORS	ACC REPORT	SMS BUFFER
GPS-UHF SETTINGS <input type="text" value="NO CHANGE"/>		
<input type="text" value="15min"/>	<input type="text" value="00"/>	<input type="text" value="00"/>
GPS INTERVAL [minutes]	ON HOURS [UTC]	OFF HOURS [UTC]
<input type="text" value="ECO"/>	<input type="text" value="90sec"/>	<input type="text" value="5min"/>
ACCURACY	GPS TIMEOUT	UHF INTERVAL
<input type="text" value="NO"/>	<input type="text" value="SP"/>	<input type="text" value="OFF"/>
STOPS IN BASE	SPEED/ALTITUDE	VHF/UHF
ACCELEROMETER SETTINGS <input type="text" value="NO CHANGE"/>		
<input type="text" value="10min"/>	<input type="text" value="5"/>	<input type="text" value="16"/>
INTERVAL [minutes]	SAMPLING [Hz]	N SAMPLES

GPS-GSM Settings:

GPS INTERVAL [hours] – working interval/interval in which logger has been programmed/defines frequency with which GPS data will be collected

- 1min
- 2min
- 4min
- 5min
- 10min
- 15min
- 30min
- 1h
- 2h
- 3h
- 6h
- 12h
- 24h
- 1min+acc
- 2min+acc
- 4min+acc
- 5min+acc
- 10min+acc
- 15min+acc
- 30min+acc
- 1h+acc
- 2h+acc
- 3h+acc
- 6h+acc
- 12h+acc
- 24h+acc
- W24h+acc
- R

Loggers (CX) have ability to set frequency of data collection from 1min to 24h.

There is also the option to collect additional data together with GPS position:

N_satellites – number of satellites on the basis of which position has been determined

Speed – speed given in knots. The speed is measured on the basis of the GPS coordinates.

Altitude – altitude given in meters a.s.l. Altitude measurement is by GPS coordinates.

Light – light intensity (value from 0 – 138)

Acceleration – basic data from 3-axis acceleration sensor (XYZ)

To collect additional data select interval with insertion “+acc”, for example: “6h+acc”.

ATTENTION! *Transfer of GPS positions with additional data is two times more expensive than typical GPS positions.*

R – command that resets system. Shall be used in case of problems with logger’s work. Before use please consult with Ecotone service.

ATTENTION! During programming logger, parameter GPS INTERVAL [hours], has to be chosen, otherwise settings will not be send!

ON HOURS [UTC] and OFF HOURS [UTC]

It is possible to set period of time, when logger collects the GPS data:

Hours should be select from dropdown list and set in the UTC time.

Choosing OFF option in OFF HOURS box and turns off working hours control:

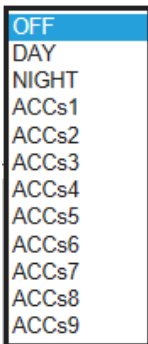


Setting working hours will not be active if any type of sensor control will be selected from drop-down list SENSORS. Those sensors serve as a primary consideration.

Setting working hours:

- is recommended whenever possible, to limit power consumption to ensure battery life. It is possible for example in case of the animals not active during night.
- is absolutely necessary in case of nocturnal animals for example in burrow, cave, where there is no GPS signal. During long-term work without access to the GPS signal batteries will be discharged fast and logger will stop working.

SENSORS



Sensors built-in afford the opportunity to control their work.

Light sensor DAY/ NIGHT – designated only for devices with solar panel

(do not set this parameter in loggers without solar!).

DAY – logger will work only during the daytime.

NIGHT – logger will work only during the darkness.

Acceleration sensor – choosing this parameter will cause collecting data due to GPS interval selected by the user, when animal achieves the necessary activity. In case when activity is below the selected value, logger collects data with 6h frequency.

ACC REPORT

CX loggers can collect daily reports regarding activity of an animal. Activity data are collected every 30 minutes.

The data so collected are available in the fold „EXPORTS” in „acc” catalogue (check chapter 2.2)

Activity data for UHF module are collected every 3 minutes and send to base station at the earliest communication.

To read collected activity data source file should be converted from .txt format, using AccConverter program, available at: http://telemetry.ecotone.pl/public/Program_AccConverter/

Check boxes:

OFF - turns off the report

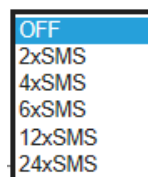
UHF – activates collecting and sending report by the UHF

GSM – activates collecting and sending report by the GSM

UHF+GSM – activates collecting and sending report by the UHF and GSM

ATTENTION! Sending of ACC Report is payable.

SMS BUFFER



In CX loggers, to save energy, can be applied mechanism “SMS buffer” with GPS positions – it is recommended in case of collecting data with very short intervals.

An example – if 4xSMS is selected and logger works in 1h interval (without additional data) then delivery attempt will be taken after 16hours.

With GPS interval 30min or shorter/less automatic buffering 2xSMS is started.

GPS-UHF Settings

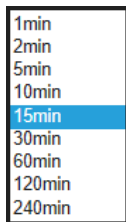
This set of settings control work of UHF logger and can be use alternately with settings send by the base station.



To make changes to the UHF settings - select option „CHANGE”.
To leave the UHF settings UHF without any changes - select „NO CHANGE”
To turns off the UHF system - select „OFF”

ATTENTION! During programming logger, parameter GPS INTERVAL [hours], has to be chosen, otherwise settings will not be send!

GPS INTERVAL [minutes]



Setting frequency of collecting GPS position.
ATTENTION! In data collected by radio, positions collected by the GSM will be added.

ON HOURS [UTC] and OFF HOURS [UTC]

It is possible to set period of time, when UHF system collects the GPS data.

Hours should be select from dropdown list and set in the UTC time.

Choosing OFF option in OFF HOURS box and turns off working hours control:

Setting working hours for the UHF system is independent of the working time of the GSM system.

Setting working hours is recommended whenever possible, to limit power consumption to ensure battery life.

ACCURACY



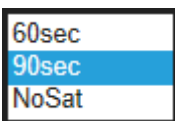
Setting accuracy of the GPS position measurement (ECO/MED/HIGH).

ECO - 80% of collected GPS positions are within a 20-m radius from indicated location;

MED - 90% of collected GPS, positions are within a 20-m radius from indicated location;

HIGH – 95% of collected GPS positions are within a 20-m radius from indicated location.

GPS TIMEOUT



With this setting we define how much time logger has to determine GPS position.

If position is not determined within the time limit – record without position will rise.

60sec – recommended in case of problems with battery maintenance;

90sec – this setting increases accuracy of measurement GPS position. Use when level of battery charge is high enough;

NoSat – with this setting if logger doesn't detect signal from any satellite – it will turn off the system for time, resulted from given interval, to save energy. Use this setting for animals often staying in burrows, hollows, rock bays, diving and other places preventing the GPS signal to be located.

UHF INTERVAL



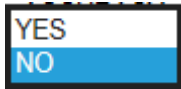
This setting determines how often logger will communicate with the baste station.

1 min – greatly influences battery consumption, use only as a last resort, when logger is charged well;

5 min – recommended setting

10 min – this setting reduces power consumption, but elongates chances for communication with base station.

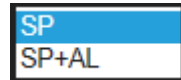
STOPS IN BASE



Turns on/turns off data collecting in GPS-UHF system, whenever logger appears in the range of the base station signal. It's one of the functions that significantly limits battery use.

Advice: It is worth to leave base station by the entrance of burrow, cave, roost sites, when observed animal spends a lot of time. It is particularly important in places where the GPS signal is very weak.

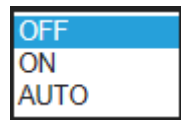
SPEED/ALTITUDE



Enables collecting of additional data, such as speed (SP) or speed + altitude (SP + ALT).

Advice: It is recommended to select speed (SP), because altitude measurement requires longer work of the GPS module, which may have significant impact on battery lifetime.

VHF/UHF



Setting is designed for loggers with built-in VHF transmitter.

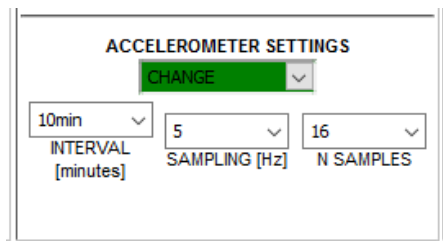
Settings:

OFF – after receiving this setting VHF transmitter will be turned off;

ON – after receiving this setting, VHF transmitter will be activated. (ATTENTION! Switched on “full-time” lowers the battery level).

AUTO – with this option VHF transmitter is controlled by activity sensor. As long as animal stays active – VHF transmitter is active too. Whereas an animal does not show any activity for 12 hours then VHF transmitter starts sending. However when activity will be detected again – VHF transmitter turns off.

ACCELEROMETER SETTINGS



Setting controls mode of accelerometric data collection by the UHF system.



To make changes to the accelerometric settings - select option „CHANGE”.

To leave the settings without any changes - select „NO CHANGE”

To turns off collecting of the accelerometric data - select „OFF”

ATTENTION! During programming logger, parameter GPS INTERVAL [hours], has to be chosen, otherwise settings will not be send!

2.6. Detailed description of panel's column – SETTINGS STATUS – presents settings that have been sent to the logger.

Delivery status of control command and settings confirmation by the logger are shown in column SETTINGS STATUS using colours and time stamp.

After selecting parameters and clicking SAVE button, till the moment of logger's reaction, command with new settings is awaiting in the queue on the server, field of new settings is marked in yellow.

SETTING STATUS	
SET DATE [CET] 2017-11-14 22:44	Date and time [CET***] of setting new parameters by the user (on telemetry panel)
SENDING DATE [LOC] 2017-11-09 19:02	Date and time [LOC*] of sending previous settings from the panel
CONFIRMATION DATE [LOC] 2017-11-09 19:02	Date and time [LOC*] of confirmation adoption of previous settings by the logger
COMMAND = MANUAL	Command: The method of system's reset: MANUAL: manually with the use of magnet, MR: automatically after Master reset
GPS-GSM SETTINGS: GPS INTERVAL = 6h DUTY HOURS = 00 - OFF ACCURACY = SENSOR = DAY GPS TIMEOUT = 90sec VHF/UHF = ACC REPORT = GSM SMS BUFFER = 2xSMS	New settings for the GSM module: GPS-GSM interval; operation interval DUTY HOURS: working hours ACCURANCY: measurement accuracy SENSOR: setting control by the sensors (light or motion) GPS TIMEOUT: limiting time of searching for the GPS satellites VHF/UHF: work of VHF transmitter (info active only for GSM-GPS) ACC REPORT: collecting and transfer of daily accelerometric data SMS BUFFER: buffering of the GPS data
GPS-UHF SETTINGS: GPS-UHF SETTINGS = CHANGE GPS INTERVAL = 15min DUTY HOURS = 06 - 20 UHF INTERVAL = 5min STOPS IN BASE = NO SPEED/ALTITUDE = SP VHF/UHF = AUTO DROP-OFF = YES	New settings for the GPS-UHF module (applies only to loggers with the UHF): GPS-UHF SETTINGS: „CHANGE” – changing settings, „NO CHANGE” settings without changes, „OFF” – turning OFF the UHF module GPS INTERVAL – operation interval DUTY HOURS – working hours UHF INTERVAL – attempts interval of communication with the base station STOPS IN BASE – logger's work in the range of base station SPPED/ALTITUDE – registration of the speed, or speed with the altitude VHF/UHF- work of VHF transmitter (information active only for GSM-UHF loggers)
GPS-UHF SETTINGS: SSN015014005900000006 200012MAKCE 010 005 016	DROP-OFF – appearance of such information means, that command activating drop-off mechanism has been set (check chapter 2.2)
	Code with new settings to be send for the UHF module. Code can be read in TRACKER program in the field „Decoder”

- *LOC – local time of the SIM operator
- **UTC – Universal Time Coordinated
- *** CET- Central European Time

If command with new setting has been already sent, but we want to phase out new settings, choose Remove command and confirm by SAVE, that will remove last command from the queue (check chapter 2.3)

```

SET DATE [CET]
2017-11-22 16:24
SENDING DATE [LOC]
2017-11-22 16:24
CONFIRMATION DATE [LOC]
2017-11-22 16:25
COMMAND = MR
GPS-GSM SETTINGS:
GPS INTERVAL = 2h
DUTY HOURS = 00 - OFF
ACCURACY =
SENSOR = DAY
GPS TIMEOUT =
VHF/UHF =
ACC REPORT =
SMS BUFFER =
GPS-UHF SETTINGS:
GPS-UHF SETTINGS = NO
GPS INTERVAL = 15min
DUTY HOURS = 00 - 00
UHF INTERVAL = 5min
STOPS IN BASE = NO
SPEED/ALTITUDE = SP
VHF/UHF = OFF
    
```

RED: colour of the panel means that new settings has been sent to logger – but has not yet been confirmed by the logger. If colour will not change to green within 10 minutes, then sending new settings must be repeated.

```

SET DATE [CET]
2017-10-06 08:09
SENDING DATE [LOC]
2017-10-06 12:05
CONFIRMATION DATE [LOC]
2017-10-06 12:07
COMMAND = MANUAL
GPS-GSM SETTINGS:
GPS INTERVAL = 2h
DUTY HOURS = 00 - OFF
ACCURACY =
SENSOR = OFF
GPS TIMEOUT =
VHF/UHF =
ACC REPORT =
SMS BUFFER =
GPS-UHF SETTINGS:
GPS-UHF SETTINGS = CHANGE
GPS INTERVAL = 15min
DUTY HOURS = 00 - 00
UHF INTERVAL = 5min
STOPS IN BASE = NO
SPEED/ALTITUDE = SP
VHF/UHF = OFF
    
```

GREEN: colour of the panel means, that logger took new settings and accepted. Next part of data will be send in a new mode.

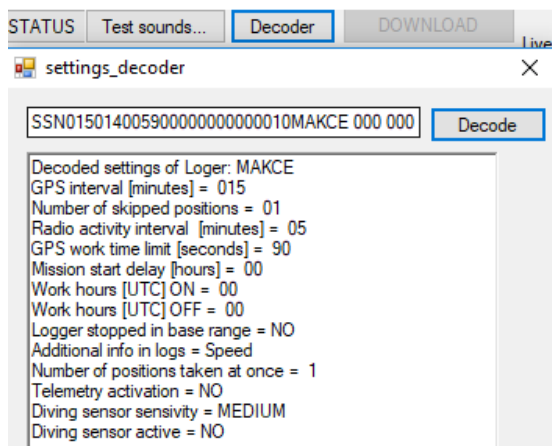
GPS-UHF SETTINGS:

```

SSN0150140059000000000000
00010MAKCE 000 000 000
    
```

„GPS-UHF SETTINGS” window:
Review of the last settings sent by the GSM panel (settings sent by base station will not be visible here).

To encode record copy the content of the window and put in „Decoder” located in TRACKER program:



2.7. Detailed specification of the columns - DESCRIPTION

DESCRIPTION
<div style="text-align: center; border: 1px solid black; padding: 2px; margin: 10px auto; width: 80%;">ECOTONE DESCRIPTION</div> <div style="border: 1px solid black; padding: 2px; margin: 10px auto; width: 80%;">FELIS-CX XS GPS-GSM</div> <div style="text-align: center; border: 1px solid black; padding: 2px; margin: 10px auto; width: 80%;">CLIENT DESCRIPTION</div> <div style="border: 1px solid black; height: 50px; width: 80%; margin: 10px auto;"></div>

„Description” column contains characterizations related with the logger.

ECOTONE DESCRIPTION – administrator characterization concerns particular logger. User is not entitled to change its content.

CLIENT DESCRIPTION – place where user can put his notes and comments. Each change should be approved by the “SAVE” button, at the beginning of the line.

„DESCRIPTION” column can be hidden to do not take up space on the screen (check chapter 2.2)