



GEOSAT
Electronic Eye
Sustainable Fishing

USER'S MANUAL

UM027EN09

TABLE OF CONTENTS

| | | |
|-----|--|----|
| 1 | PRECAUTIONS FOR USE | 1 |
| 2 | SYSTEM DESCRIPTION | 2 |
| 2.1 | Main objectives | 3 |
| 2.2 | Operating features | 3 |
| 3 | MODES OF OPERATION | 5 |
| 3.1 | Electronic Eye in the hold | 8 |
| 3.2 | Security against tampering | 9 |
| 4 | DOWNLOAD OF IMAGES FROM ELECTRONIC EYE | 11 |
| 4.1 | Settings for direct download | 11 |
| 4.2 | Download | 12 |

1 PRECAUTIONS FOR USE

- ☞ Before handling or connecting the equipment, please read this manual.
- ☞ Place the dust cap on the USB connection jack adapter when not in use.
- ☞ **Periodic cleaning of the cameras' lenses** is recommended to prevent blurred images due to dirt.
- ☞ This device works with a voltage of 230 V. Refrain from manipulating the external power supply to prevent risk of electrocution.
- ☞ Check the condition of the power supply to verify it is properly insulated in order to prevent any risk of electrical contact.
- ☞ To connect the device to the mains, do not overload outlets or use large extension cords as they may overheat and cause fires.
- ☞ Ensure the system is not directly exposed to naked flame or heat source and prevent it from falling.
- ☞ Do not perform any other operation not included in this manual to avoid damage of the equipment.

2 SYSTEM DESCRIPTION

Electronic Eye is a remote electronic monitoring system with automatic HD still image capture for the control of bycatch and other illegal activities.

Each Electronic Eye unit can take images from up to three cameras.

All activities during fishing operations are registered in tamper-proof images with embedded GPS position, date and time.

With the help of these images, the observer can analyze and distinguish species, estimate fishing quota and verify the fishing techniques used during the trip.



2.1 Main objectives

- 🕒 Identify the fishing method used: Free school vs. FAD, type of bait in longline, etc.
- 🕒 Establish the exact quantity of fish kept on board.
- 🕒 Establish the quantity of discarded fish (returned to the sea).
- 🕒 Monitor the discard of large size species: turtles, sharks, etc.
- 🕒 Control transshipment activities.
- 🕒 Illegal fishing operations in restricted areas.

2.2 Operating features

Electronic Eye system uses **high definition (HD)** still images with **2 megapixel** resolution. Camera typical shutter speed is **1 image every 5 seconds (Configurable. Maximum rate: 1 image/second)**. It takes pictures at a higher or slower rate depending on vessel speed and may also be triggered by an external sensor when a conveyor belt, winch, etc. begins to operate.

2MP
CAMERA



The **images** taken are stored in an internal **solid state drive** with a **maximum** storage capacity of **6 months**.



All **images** are **encoded with the vessel's route** (GPS positions, date and time they were taken). Therefore, the observer can check the images of any position he wants by following the vessel's route.



Electronic Eye is secure and tamper-proof. Images cannot be modified as they are encrypted. Its **proprietary security system with four security levels with passwords** ensures a higher protection level. Only authorised users can visualize its images.



For **higher security** in case of power cut, the system has **back-up batteries with up to 2 hours** taking pictures. The Electronic Eye can continue doing tracking after this time, for a **configurable period**.



As a working tool for the observer, Marine Instruments developed Beluga software. With this software, the observer can simultaneously analyse the images of all Electronic Eye installed on board as well as visualizing the fishing operation on the map.



All **images** taken by all Electronic Eye on board **can be downloaded** in a **USB** (external hard disk drive or USB flash drive).



Electronic Eye can also work as satellite VMS (Iridium satellite communications). This way, the ship owner will be able to follow the vessel's route using Marine Instruments MSB software.

3 MODES OF OPERATION

The system can be configured for outside use with satellite transmission (master), outside use without satellite transmission (slave) or for inside use (hold). The features of each one of them are as follows:

OUTSIDE USE WITH SATELLITE TRANSMISSION [MASTER]. Electronic Eye installed on the outside of the vessel and configured in this way, have GPS coverage and transmits via Iridium every hour by default, the following parameters: latitude, longitude, last photo number and some configuration parameters.

OUTSIDE USE WITHOUT SATELLITE TRANSMISSION [SLAVE]. Electronic Eye installed on the outside of the vessel and configured in this way, have GPS coverage but DO NOT transmit data via Iridium.

INSIDE USE. This configuration applies to Electronic Eye installed inside the vessel. These do NOT have GPS coverage and do NOT have Iridium satellite transmission.

The Electronic Eye fast trigger operates in two ways:

-  **Depending on the vessel speed (needs GPS coverage):** A threshold speed is set. When exceeded, the trigger frequency changes.

Example of the settings according to the vessel activity:

| | FISHING | SAILING |
|-----------------------------|---------|---------|
| SPEED (knots) | 0-4 | >4 |
| TRIGGER FREQUENCY (seconds) | 5 | 60 |

- In *Fishing Mode (fast trigger)*, when speed is less or equal to 4 knots, the time between images is 5 seconds.



Fishing Mode has a time limit to avoid taking a large number of images when the vessel is at port and also to save storage space.

- In *Sailing mode (slow trigger)*, when speed is greater than 4 knots, the time between images becomes 60 seconds.



The time lapse between pictures in each mode and the duration of the *Fishing Mode* (fast trigger) is configurable via Wi-Fi or satellite (telecommand).

 **With external sensor (in cranes...):** When the sensor is activated, Electronic Eye takes a number of pictures in fast mode (configurable via Wi-Fi). The image counter resets with each sensor signal.



An inductive proximity sensor or an external hydraulic pressure switch (not supplied with the system) is required.

Both camera trigger modes (speed or sensor) can be used combined in the same Electronic Eye system.

3.1 Electronic Eye in the hold

The Electronic Eye installed in the hold take images of the process of the catch being stored. Thanks to these images, the observer can see in full detail the species caught even at the conveyor belts that carry the fish to the refrigerators in the case of purse seiners.



Real image taken by an Electronic Eye in the hold

The system continuously takes images of the activity in the hold. The fast camera trigger is only activated by external sensor, when the conveyor belts, winches, etc. start to operate. Every time external sensor is activated, Electronic Eye takes a number of images in fast mode (trigger settings configurable via Wi-Fi).



The Electronic Eye installed inside the vessel will not have GPS coverage, so camera will not be triggered by speed.



One external inductive proximity sensor (not supplied with the equipment) is required.

3.2 Security against tampering

To avoid tampering of the Electronic Eye or its images, they have implemented different security systems:

Electronic Eye access

- 🔒 Wi-Fi password for remote access to Electronic Eye.
- 🔒 Installer profile protected by password: only for configuration.
- 🔒 Observer profile protected by password: only for image downloading.
- 🔒 Lockable stainless steel box to protect connectors.

Image protection

- 🔒 Each image has GPS position, date and time at which it was taken embedded in it.
- 🔒 All data is encrypted with proprietary security system to avoid the tampering of images.
- 🔒 Images will always be referenced to the GPS positions they were taken. Electronic Eye works with an internal GPS. Therefore, it is not possible to modify GPS positions.
- 🔒 Images can only be visualized entering a password in Marine Instruments (M.I.) *Beluga* software.
- 🔒 Password needed to decode the vessel's positions in M.I MSB tracking software.

- 🔗 Images are linked to an index that works as a record of the vessel's activity.
- 🔗 The number of the last image and several status data are transmitted via satellite in the Electronic Eye configured as VMS (through Iridium satellite network).

Hardware protections

- 🔗 Protection against disconnection or unauthorised downloading with metallic lock.
- 🔗 Seal sticker for detection of possible disconnection of camera wire.
- 🔗 Security against power cut.

4 DOWNLOAD OF IMAGES FROM ELECTRONIC EYE

To download the images stored in Electronic Eye, it is necessary to connect a hard disk drive or USB flash drive with enough free space to contain the images.



Downloading of all Electronic Eye images can take up to 6 hours, depending on the type of storage device used. For this reason, **we recommend using an external hard drive SSD (solid state disk) for faster download.**

4.1 Settings for direct download

The user has three downloading options that are configurable via Wi-Fi. The options are:

-  *Copy all to fill external USB memory.* For long fishing trips on which most of the storage device is filled. Downloading may take several hours.

Download of images to fill the entire USB storage device connected to Electronic Eye (external hard disk drive or USB flash drive).

- ☞ *Copy all between dates to external USB memory.* For short fishing trips. Avoids long downloading periods.

Download of images between specific dates. **Bear in mind that every time you wish to download data, dates should be changed.** If not, it will always download the same selection of images, and if the date is very old, no data will be obtained.

- ☞ *Copy from the day to the external USB memory every 5 minutes.* Images are copied to the external device every 5 minutes.

If this mode is selected, images will only be copied from the moment the storage device is plugged in.

- ☞ *None:* Don't use this option. If this mode is selected, images will not be downloaded when the storage device is plugged to Electronic Eye.

4.2 Download

Once settings for image download are set, follow these steps:

STEP 1. Open the metallic lock using the key supplied with the system.

STEP 2. Connect the storage device (hard drive or USB) to the USB port of the adapter supplied.

STEP 3. Connect the adapter to the Electronic Eye as seen in the image. **Downloading of images starts automatically after a few seconds. The system's blue LED stays on during download and turns off when it ends.**



During download, the system does not take pictures and Wi-Fi is not available. Downloading may take a few hours.

STEP 4. When the blue LED is off, the download is complete. Disconnect the storage device and the adapter.

STEP 5. Replace the connector dust cap in the Electronic Eye download connector.

STEP 6. Lock the seal with the key.



This process should be repeated in all Electronic Eye installed on board.



Install the software BELUGA supplied in the PENDRIVE USB.

For further information about the software BELUGA, consult the document “DC040 BELUGA. USER QUICK GUIDE”.

Warranty conditions for this product are available at Goesat website.



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