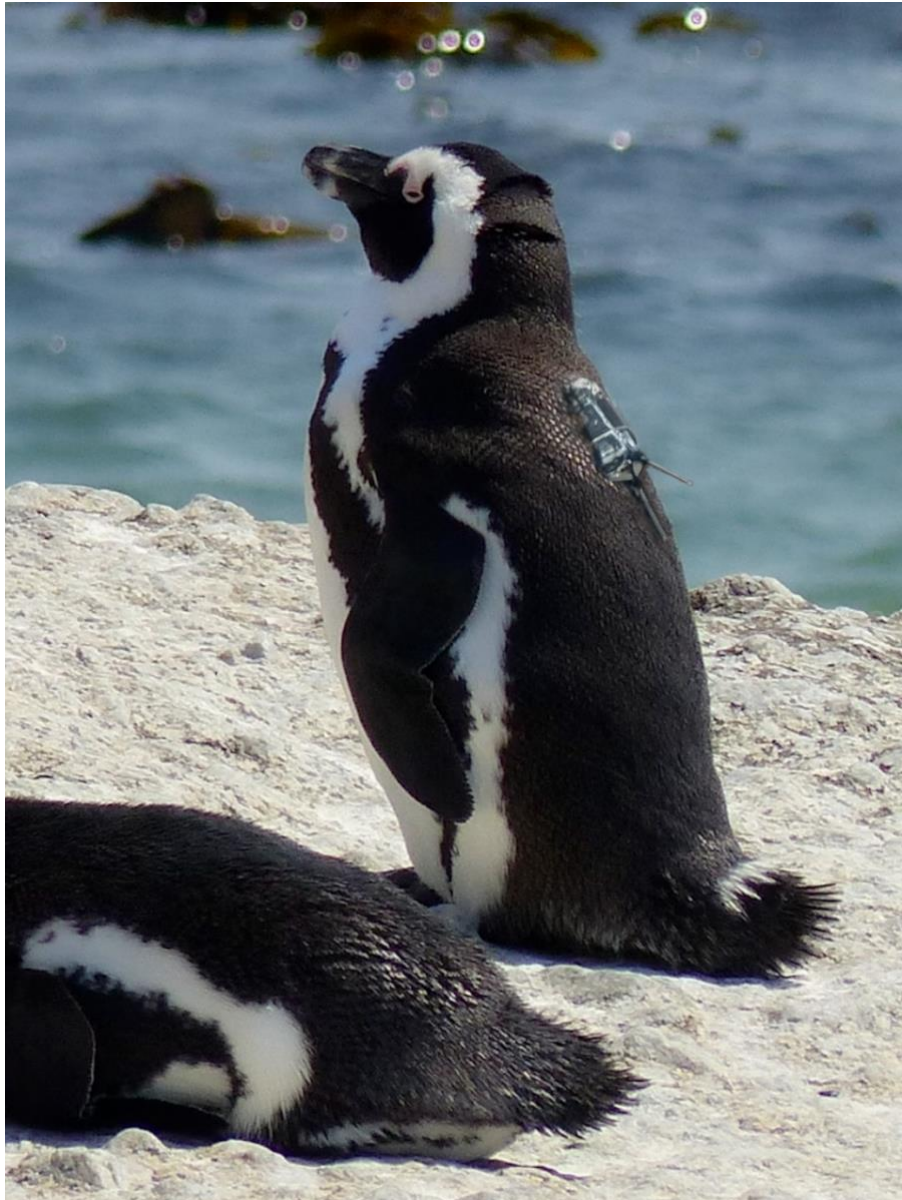CRUID

YAWL

Debut YAWL is a customizable series engineered to accommodate diverse transmission types, batteries, solar units, wet/dry switch options, and deployment methods, tailored to meet the unique needs of your species and projects. Originally crafted with penguins and other sea birds in mind, it is with a flat-shape to facilitate diving behaviors.

Debut YAWL series includes dozens of sub-models which are customized by our users. You can choose from them, or customize new sub-models to suit your project.

HOW IS A YAWL DEVICE BUILT?

A YAWL sub-model mainly consists of six parts: PCBA, battery, solar unit, housing, wet/dry switch, and attachment style. Below table lists the components available currently:

Component	Available Options
PCBA [1]	NANO, MINI 2G, MINI 4G, MINI 5G, MINI LoRa, MINI Argos
Battery [2]	40 mAh, 210 mAh, 400 mAh, 550 mAh
Solar Unit [3]	1pcs, 2pc
Wet/Dry Switch [4]	YES, NO
Attachment Style [5]	Harness, Tesa-tape
Housing [6]	C2, C2 Max, C2 Max E, C3 Max E, C4 Max, C5 Max

[1] The core electronic component, known as the Printed Circuit Board Assembly (PCBA), serves as the central nervous system of the device, dictating its primary functionalities. For instance, a YAWL sub-model equipped with a NANO PCBA shares identical functionalities with the NANO model. However, it offers flexibility in battery selection, solar options, housing variations, and the addition of supplementary features such as a wet/dry switch or depth sensor.

[2] Our standard battery options are all lithium polymer rechargeable battery, and users have the option to customize with alternative batteries based on their specific requirements.

[3] YAWL series devices incorporate Gallium Arsenide (GaAs) solar units with a remarkable 30% efficiency, ensuring optimal performance even in low-light conditions. Currently, we utilize the 17mm*16mm variant, with the option to include one or two units as per preference.

[4] The optional "Wet/Dry Switch" enhances the functionality of YAWL sub-models, enabling the device to track diving behaviors. Furthermore, devices equipped with this switch can be configured to conserve energy by halting GPS signal transmission when submerged, thus avoiding unnecessary power consumption. Sub-models lacking this feature are denoted with an "S".

[5] Our attachment options consist of two types: harness and Tesa-tape. The harness type incorporates specifically designed holes for threading, while the Tesa-tape attachment method includes a provided plate for ease of application, as illustrated in the end of this document.
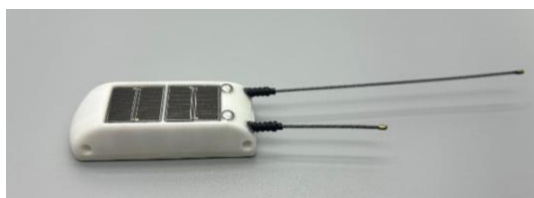
[6] The housing of our devices is tailored to accommodate various species. The "Max" designation indicates ample space to house a MINI series PCBA and a battery exceeding 210mAh capacity. Conversely, the "E" designation signifies a housing featuring an elevated solar panel, catering to larger birds with dense feathers that may obstruct solar charging. Below are a few illustrative examples:
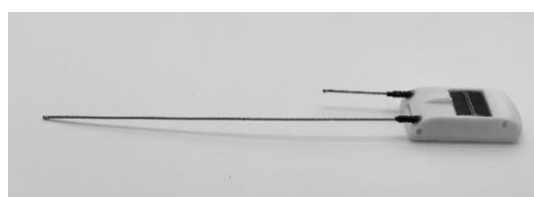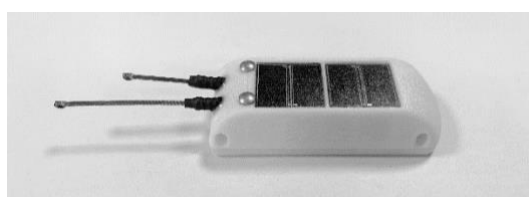
YAWL C2 Max S E (LoRa)

YAWL C3 Max E (4G)

YAWL C4 MAX (5G)

YAWL C5 Max S (Argos)

YAWL C2 Max S (Argos)

YAWL C2 MAX S

OTHER SPECIFICATIONS

Item	Description
Antenna Material	• Type A: 7*7 titanium alloy wires braided, with plastic tubing for protection (0.8mm diameter) • Type B: 7*7 steel wire braided, with plastic tubing for protection (1mm diameter) (Select antennas materials based on animal behavioral characteristics. Type A features better metal fatigue resistance so it suits for birds that will has the long antenna dangling and swaying all the time, and type B is stronger against cutting by sharp beak.)
Housing Material	3D printed housing, with multiple harness threading holes
Housing Color	White by default (other colors are available)
Waterproof	IP 68 (tested as being sub-merged 20cm underwater for 7 days) (For deep diving species, we can inject epoxy into the housing for further strengthening.)
Working Temperature	-20℃~60℃

EXISTING SUB-MODELS

Below listed the existing sub-models grouped by the data transmission method.

INTELINK (NANO inside)

Name	Attachment Method	Weight (gram)	Wet/Dry Switch	Dimensions (LWD, mm)	Battery (mAh)	Solar Unit
YAWL C2	Tesa-Tape	14±0.3	Yes	53*23*13	210	1
YAWL C2 S	Harness	11.5±0.3	No			
YAWL C2 Max S 550	Harness	17.3±0.3	No	58*25*15	550	
YAWL C2 Max S E 550	Harness	21±0.5	No	58*25*24		
YAWL C4 Max 550	Harness	22.2±0.5	Yes	60*25*15		2

INTELINK (MINI LoRa inside)

Name	Attachment Method	Weight (gram)	Wet/Dry Switch	Dimensions (LWD, mm)	Battery (mAh)	Solar Unit
YAWL LoRa C2 Max S E 550	Harness	21.6±0.5	No	58*25*24	550	1
YAWL LoRa C5 Max S 550	Tesa-Tape	19.5g±0.5	No	60*25*15		2

Network (MINI 2G/4G/5G inside)

Name	Attachment Method	Weight (gram)	Wet/Dry Switch	Dimensions (LWD, mm)	Battery (mAh)	Solar Unit
YAWL 2G C2 Max 550	Both	20.2±0.5	Yes	56*25*15	550	1
YAWL 5G C2 Max 550	Both	19.5±0.5				
YAWL 4G C2 Max 550	Both	20.3±0.5				
YAWL 4G C3 Max E 550	Harness	23±0.5		53*25*30		2
YAWL 4G C4 Max 550	Harness	20.5±0.5		60*25*15		

Satellite (MINI Argos inside)

Name	Attachment Method	Weight (gram)	Wet/Dry Switch	Dimensions (LWD, mm)	Battery (mAh)	Solar Unit
YAWL Argos C2 Max S 550	Both	18.4±0.3	No	56*25*15	550	1
YAWL Argos C 4 Max S 550	Harness	20±0.3		60*25*15		2
YAWL Argos C 5 Max S 550	Tesa-Tape	19.5±0.3		60*25*15		
YAWL Argos C 5 Max S 210	Tesa-Tape	15.5±0.3		60*25*15	210	

PRICING

Sub Model-Name	Device (Feed Subscription)	Ecotopia Data Services [1] (per unit per year)	Debut Renewal Plan [2]
YAWL C2	549	59.88	/
YAWL C2 S	399	59.88	/
YAWL C2 Max S 550	399	59.88	/
YAWL C2 Max S E 550	399	59.88	/
YAWL C4 Max 550	599	59.88	/
YAWL LoRa C2 Max S E 550	499	59.88	/
YAWL LoRa C5 Max S 550	499	59.88	/
YAWL 4G C2 Max 550	1349	131.88	399
YAWL 4G C3 Max E 550	1399	131.88	399
YAWL 4G C4 Max 550	1399	131.88	449
YAWL Argos C2 Max S 550	1199	59.88	349
YAWL Argos C 4 Max S 550	1249	59.88	399
YAWL Argos C 5 Max S 550	1249	59.88	399
YAWL Argos C 5 Max S 210	1249	59.88	399

Note: The prices are in US dollar.

[1] To know more about Ecotopia Data Service, please click:

https://www.ecotopiago.com/help/en/#/essential/data_service/overview

[2] To know more about Debut Renewal Plan, please click:

https://www.youtube.com/watch?v=IM75JLGhsHU&t=6s

CUSTOMIZATION SERVICE

We welcome customization requests for YAWL sub-models. If the assembly can be achieved using existing components, no additional customization fee is necessary. However, if a bespoke housing design is requested, a one-time customization service fee of USD 499 will apply.

ACCESSORIES

YAWL series can be used for back-mount using harness, or with a plate to facilitate Tesa-tape attachment which is typical for penguin, cormorant, and gannet, etc.

BACK-MOUNT

Each device will be provided along with 2 meters of 3.5mm or 5mm wide UHMWPE tape (for harness use) and 6 aluminum rings (for binding the harness) for free.

TESA-TAPE

If you choose the Tesa-tape type, a matching 3D-printed plate will be provided. You can use Tesa-tape to fix the base on animal body, and then push the main device into the slot to complete the installation. The main device can be easily removed and reused, as in this way it is not easily damaged by Tesa-tape.