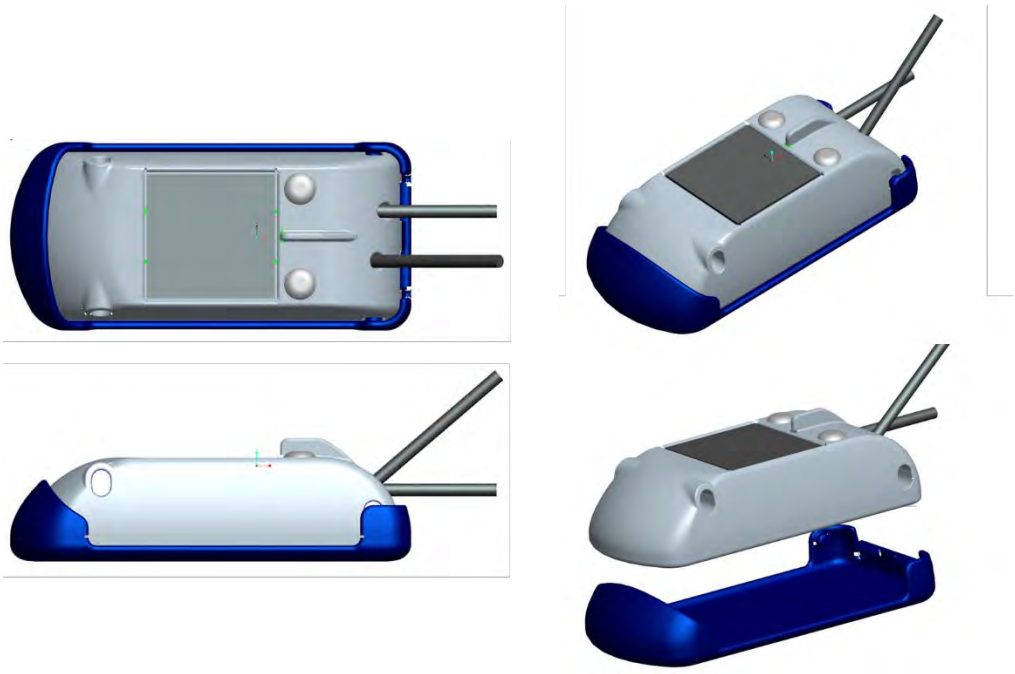
Product Introduction

# Debut® YAWL Series

Debut YAWL is powerful GPS-Solar-ACC tracker that uses INTELINK technology to transmit data directly to mobile phone or professional gateways developed by Druid.

As shown below, YAWL is designed with a base to facilitate the tape attachment method, and also with four holes for harness attachment method.



Typically, YAWL is used on diving species, such as freshwater tortoise, penguins, and cormorants, as it is designed with wet/dry switch to record diving behaviors.

Some researchers also use YAWL on other birds, with the wet/dry sensor removed.

## BASIC SPECIFICATIONS

| MODEL | YAWL C1 | YAWL C2 | YAWL MAX |
|---|---|---|---|
| Appearance |  |  |  |
| Weight | Main device（with wet/dry switch: 6.6g<br>+ base: 2g<br>+ waterproof strengthen: 1.5g | Main device: 11.4g<br>+ base: 2.8g<br>+ wet/dry switch & waterproof strengthen: 2.5g<br>Antenna strengthen: 2g | Main device: 15.3g<br>+ base: 3.4g<br>+ wet/dry switch & waterproof strengthen: 2.8g<br>Antenna strengthen: 2g |
| Dimensions (LWD, antenna not included) | 47 mm x 15 mm x 12 mm | 53 mm x 23 mm x 13 mm | 55 mm x 25 mm x 18 mm |
| Working Temperature | -20°C~60°C | -20°C~60°C | -10°C~60°C |
| Battery Volume | 40 mAh | 210 mAh | 400 mAh |
| Battery Life | Over 300 GPS positions under optimal GPS satellite view at 5-minute interval | | |
| Battery Type | Lithium polymer rechargeable battery, with under-and-over-charging protection | | |
| Solar Type | GaAs solar unit (30% efficiency) with good performance under weak light | | |
| Antenna | External, titanium alloy braided with steel wire with protective coating | | |
| Housing | 3D printed housing, with multiple harness threading holes | | |
| Available Colors | White | | |
| GPS Module | Precision: CEP（50%）5m<br>Maximum update rate: 10 Hz | | |
| Waterproof | IP 68 | | |
| Firmware Upgrade | Remotely via network, or instantly via INTELINK | | |
| Working Schedule | Remotely via network, or instantly via INTELINK | | |
| Global Roaming | Support | | |
| SMS Function | Support (upon request) | | |
| DATA STORAGE | Logged data will be stored in memory if network is unavailable.<br>- Flash memory: 16 MB<br>- Regular data storage: 460 days at default setting (1h GPS+1h ENV+10 min BHV)<br>- BOOST data storage: 280,000 pieces<br>- ACC data storage: 28,700 pieces | | |

## DATA TYPES

- GPS: longitude, latitude, altitude, geoid height, course, GPS satellite quantity
- ENV: light intensity, temperature, inner air pressure, voltage
- BHV: ODBA (overall dynamic body acceleration)
- ACC: x/y/z acceleration data at 25 Hz (by default)
- Diving duration

## DATA COLLECTION MODES

User can choose from the following data collection modes, and specify the related parameters to suit the condition and objective of the study.

### ■ Regular Mode

- GPS interval: 5 min ~1 day
- ENV interval: 5 min ~1 day
- ODBA interval: 10 min/30 min
- ACC interval: 25 Hz, 3 seconds in every 10 min (by default)

Above ranges can be set on webpage/App. If other settings are required, please contact us.

### ■ Sleep Mode

This mode is to save power by deactivating certain type of data collection for:

- a certain period (from minutes to months)
- a regular period each day (a maximum of 16 hours)

### ■ Wet/Dry Switch Mode

This mode is suitable for diving species. When YAWL is in water, it will stop searching for GPS signal in vain. When YAWL is emerged from water, it will immediately search for GPS signals to generate a GPS data, regardless of the regular GPS interval setting.

By default, YAWL detects its wet/dry status every 3 seconds.

## INTELLIGENT FREQUENCY OPTIMIZATION (BOOST)

The BOOST function intelligently increases the frequency for data collection when certain conditions are met (good charging, fast movement, etc.).

The default setting is as below:

- Frequency Optimization: GPS at every 1/2/5/10 min
- Flight Detection: GPS at 20 seconds

With BOOST, the device portrays detailed movement tracks and attempts more frequent data transmission without manual intervention, keeping long-term energy balance and avoiding the possibility of battery drain caused by radical settings during bad weather.

## DATA TRANSMISSION

- Transmission method: INTELINK based on Bluetooth 5.0
- Maximum uplink/downlink speed: 1 Mbps/1 Mbps
- Output power: 8 dBm
- Transmission distance: 80~120m with ordinary smart phone; up to 1200m with Debut series gateway products

## EXTRA FUNCTIONS brought by INTELINK®

INTELINK® technology enables remote connection to your YAWL devices to perform various operations and realize many amazing functions.

To establish such connection, you only need an ordinary smart phone or/and a Debut series gateway device.

**Debut gateways could be a HUB, TAG or QUEST. The connection distance is 800~1200m depending on environment. For more information about the gateways, please contact Druid or your local distributor.*

### ■ Tracker Recovery

With ECOTOPIA app, a device and a mobile phone will automatically function as a beacon

system. The mobile phone will ring if the device is detected nearby. The closer they are, the louder the ringing sound will be. This provides a convenient way to find lost devices.

- **Firmware Upgrade & Setting Modification**

  The user can easily upgrade the firmware or change data collection settings for a device nearby using ECOTOPIA APP.

- **Raw Acceleration Data Collecting**

  Raw x/y/z acceleration data could be very useful for behavioral research, especially when the data can be combined with timestamps, GPS, environmental data, and the bird's activity rhythm. However, the raw data can seldom be obtained due to its large size.

  With INTELINK, the user can not only download the raw data from memory, but also obtain real-time raw acceleration data by connecting a mobile phone to YAWL.

- **In-situ Modeling**

  During the process of obtaining real-time raw data described as above, the user can also mark the data with behavior tags. ECOTOPIA App provides comprehensive tools for In-situ modeling, which includes real-time x/y/z acceleration visualization and data downloading, video shooting, and behavior tagging. All these data will be combined under the timestamps and saved for later verification and analysis.

  With the help of Druid's AniAct® behavior algorithm platform, the user will be able to generate acceleration-based behavior algorithm for different species.

  Furthermore, such algorithm can be loaded into the tracker and be conducted on board. Then, the tracker will be able to send back continuous computed result of behavior tags instead of discontinuous raw data. This will expand the data dimensions and bring breakthrough on bird research and ecology conservation.