

# Cockatoo

## **Cockatoo Bryon & Myriota Satellite Installation Guide**

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## Revisions

Issue	Date	Revision
V0.8	24 <sup>th</sup> Nov 2021	Initial draft
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## 1 About this Manual

This document outlines the features, functionality, key installation, and operational information for the Cockatoo range remote endpoints. The Cockatoo is available from Taggle or its authorised resellers, including Honeywell Smart Energy in the USA.

Data captured and transmitted by the Cockatoo needs to be paired with a Data Service Agreement (DSA) available from Taggle or Honeywell depending on the product variant.

The DSA can include the delivery of data via various industry accepted protocols.

The visualisation of Cockatoo data and associated alerts is available in a range of cloud-based platforms including

- Aqualus Water
- Aqualus Vision
- Honeywell Videre Water
- Honeywell Videre Vision

Please contact Taggle for more information on these related services.

### Notice

Failure to read and follow these instructions can lead to misapplication or misuse of this product, resulting in personal injury and damage to equipment, along with potentially voiding the product warranty.

Proper performance and reliability of the Cockatoo depend upon installation in accordance with these instructions. Improper installation or faulty devices connected to the Cockatoo may not be covered under warranty.



**Cockatoo installation must comply with all the applicable federal, state and local rules, regulations and codes.**

## 2 Statements of Compliance

### Byron Radio Enabled Cockatoo – Models CK2-T1-I and CK2-T1-C

#### 2.1.1 FCC & RSS

This device complies with Part 15 of the FCC Rules and with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference; and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

This equipment complies with the FCC and ISED Canada radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and all persons during normal operation.

Note:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Warning: Any changes or modifications not expressively approved by the grantee could void the user's authority to operate this equipment.

#### 2.1.2 RSS (French)

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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**Satellite Radio Enabled Cockatoo – Models CK2-S1 and CK2-S2**

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**2.1.3 FCC & RSS**

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TBA

**2.1.4 RCM**

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TBA



The satellite Cockatoo is **ONLY** authorised for use on this countries where it is formally certified for use. Use in other countries is prohibited.



The provision of data service by Taggle from a satellite enabled Cockatoo does not imply or authorise the use of the Satellite enabled Cockatoo in unauthorised juristrictions.

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### 3 Storage, Handling and Transport

The Cockatoo includes lithium thionyl chloride non-rechargeable batteries which are integrated into the product. Taggle also offers spare parts batteries for the Cockatoo.

Lithium thionyl chloride batteries, as a standalone battery are classified as UN3090 (Lithium Metal) and when packaged in the Cockatoo as UN3091 (Lithium Metal).

All Cockatoo's ship at or with 100% State of Charge (SOC). With improper handling, storage or use, the Cockatoo or battery spare parts may pose a serious safety hazard in the rare case of an electrical short, rupture or exposure to fire/extreme heat.



#### Warning

- Do not attempt to disassemble the Cockatoo.
- Do not short the connector contact points or terminals.
- Do not attempt to recharge a battery from the Cockatoo.
- Do not attempt to force discharge a battery or the Cockatoo.
- Do not attempt to use the Cockatoo if it is physically damaged.
- Do not incinerate or heat the Cockatoo above 90 degrees Celsius.

Changes or modifications to the product that are not expressly approved by Taggle could void the user's authority to operate the equipment, warranty and product safety.

#### For Shipping, Transport and Storage purposes

The endpoint is shipped in Flight Mode whereby it does not transmit. This serves multiple purposes including ensuring maximum battery life and meeting safety restrictions relating to shipping radio transmitters.

If shipping endpoints or batteries by air carrier you are responsible for ensuring compliance with the air carrier's and IATA guidelines for the products described in this document.

The information below outlines the UN Classification and associated lithium content.

Product	Class (UN)	UN no	Battery Size	Total Ah per Product	Total per Product	
					Battery Weight (grams)	Total Lithium Metal content (grams)
Cockatoo (1B)	Class 9	UN3091	1 x D-cell	19.0	100	4.9
Cockatoo (2B)	Class 9	UN3091	2 x D-cell	38.0	200	9.8
Cockatoo (3B)	Class 9	UN3091	3 x D-cell	57.0	300	14.7
Cockatoo (4B)	Class 9	UN3091	4 x D-cell	76.0	400	19.6
Battery Spare Part	Class 9	UN3090	1 x D-cell	19.0	100	4.9

#### Local Laws and Regulations

When operating a device, always comply with the local laws and regulations. The safety precautions provided in this document are in addition/supplementary to the local laws and regulations.

#### Battery Disposal

Local regulations with respect to battery disposal vary by country and state. The user is responsible for safe disposal.

If you require further information with respect to safe disposal of a Cockatoo, contact Taggle.

## 4 Terminology

Term	Meaning
Byron	The Taggle LPWAN ISM band radio
Cockatoo	Any variant of Cockatoo (accommodate for the variation in radio transmitter, sensor interface, antenna type, power configuration or support sensor,
Message	The assembly of sampling data, other related Cockatoo and environmental data into a data package for transmission at some future time.
Sample	The value/s related to a specific sensing device at a specific point in time.
Sampling Rate	Number of sensor sample readings per day.
Swipe	<p>The act of swiping an NFC enabled device over the “magnet symbol” below the TAGGLE logo on the Cockatoo to que a message for radio transmission. The immediacy of transmission will depend on the type of radio module in the Cockatoo.</p> <p>Upon receipt of transmission, A Bryon radio swipe event can be viewed on the Swipe page</p>
Survey Tool	The Taggle Byron radio transmission validation web page is calling the <b>Survey Tool</b> . This page confirms that a Cockatoo or taggle Byron radio device has been transmitting and its messages are being received. It is important to note this will not validate the sensor reading, and the User will need to follow the sensor vendor’s instructions or check the end data visualisation platform into which the sensor data is being delivered, if not the Vision platform.
Tag	A generic name used by for any Taggle radio endpoint, including the Cockatoo.
Transmission	A message which is transmitted by the installed radio transmission device in the Cockatoo, which may be stored (cached) it is waiting for a satellite to pass.
Vision	Vision is the name of the sensor data visualisation platform, which is also called Aqualus Vision (offered by Taggle) and Videre Vision ( offered by Honeywell).

## 5 Quick Start Guide

If have already reviewed this manual, this **Quick Start Guide** can act as refresher to ensure the major activation steps have been completed.

### Step 1- Locating and Mounting.

1. Locate the best position for reliable radio transmission
2. Fix the Cockatoo bracket to the desired location, ensuring the unit is vertical.
3. Mount the Cockatoo to the bracket and fix in place using the hose clamp.

### Step 2 - Connecting

4. Wire up the sensor(s) to the connector(s) and confirm correct wiring.
5. Attach the sensor connector(s) to the Cockatoo and ensure connector is properly sealed.
  - Confirmed seal by checking the head of the connector has separated slightly from the body of the connector as shown below and is fully seated into the jack. Without a properly connected sensor cable, the Cockatoo will stay in **FLIGHT** mode (and will not wake up).



6. If required, connect the external power source and external antenna, ensuring a complete and proper seal with the Cockatoo jacks.
7. Attach sensor to target location or device to be monitored.

### Step 3 - Device Activation

8. Swipe NFC enabled device over the magnet symbol under the Taggle Logo.
9. Open NFC App and confirm that Cockatoo is in **OPERATIONAL** mode.
10. Wait 10 seconds
11. Confirm transmission receipt

#### For Taggle Byron Radio

- Confirm radio transmission receipt via the Survey Tool web page
  - Australia <http://survey.taggle.com.au/monitor>
  - Outside Australia [https://survey.taggle.com.au/usa/monitor\\_test](https://survey.taggle.com.au/usa/monitor_test)

#### For Myriota Satellite Radio

- If validating transmission, wait required time for satellite to pass and confirm data receipt on your real time Internet connected device.

### Step 4 - Document job completion information

12. Capture all relevant installation information on the paper or Aqualus or Videre Field Operations Application (refer to Appendix for example of relevant information to capture)

# **Section 1 - Product Information**

## 6 Cockatoo Overview

The Cockatoo is multi-purpose remote telemetry unit, which offers a range of sensor interfaces, radio communications, choice of internal and external power and sampling/transmitting behaviours.

### What's in the box

Each individual Cockatoo unit includes:

- Cockatoo
- Connector/s for sensor/s (Optionally – this may be pre-attached to a sensor if sourced at the same time as the Cockatoo)
- Stainless Steel Mounting Bracket
- Stainless Steel clamp – 85mm to 110mm expandable
- Quick Start Guide

### Configurable Variants of the Cockatoo

The Cockatoo is available in a range of variants to support differing sensing and radio communication options including:

- **Sensor interfaces** - Pulse Counter, 420ma, Encoder UI-1203, SDI-12, Single and Dual Float switch, Rain gauge
- **Radio** - Taggle Byron ISM band radio and Myriota Satellite.
- **Power** - External or Internal power from 1 to 4 non rechargeable D-Cell batteries with between 19Ahr to 76Ahr
- **Antenna** - Internal or external antenna.

## 7 Cockatoo Variants

The product code can be broken down to reveal the configuration of the Cockatoo, using following the logic **CK2 –Field 1-Field 2-Field 3-Field 4-0-Field 5-Field 6**

Example

- Cockatoo Product code: CK2 - T1- I - 4B - 420 - 0 – 0 - AU
  - The above Cockatoo is a Taggle Byron ISM band radio, with internal antenna, 4 x batteries with 76Ahr supporting a generic 420mA sensor.

### Field 1 - Radio Type

Value	Meaning
T1	Taggle Byron Radio – ISM Band
T2	Taggle Byron Radio – IOT Band (Aust)
S1	Myriota Satellite Radio – Service 1
S2	Myriota Satellite Radio – Service 2
C1	Cellular Radio - NB-IOT (Australia)
C2	Cellular Radio - NB-IOT/Cat M

### Field 2 – Antenna Type

Value	Meaning
I	Internal Antenna
C	External Antenna

### Field 3 – Power Source

Value	Meaning
1B	1 x D-cell battery
2B	2 x D-cell battery
3B	3 x D-cell battery
4B	4 x D-cell battery
Ext	External Power

### Field 4 - Interface

Value	Meaning
420	4-20mA
232	RS232
485	RS485
S12	SDI-12

### Field 5 – Firmware to support sensor

Value	Meaning
PCA	Pulse Counter
FL1	Single Float
FL2	Dual Float
ENC1	UI-1203 - encoder protocol (1 sample per transmit)
ENC2	UI-1203 - encoder protocol (2 sample per transmit)
ABB4	ABB Aquamaster 4 Modbus Water Meter
AQT410	Vaisala AQT410 Modbus Air Quality Sensor
ARO	Arad Octave Modbus Water Meter
ATMOS41	ICT International ATMOS 41 SDI-12 Weather Station
BSEC	Blue Siren Electrical Conductivity Probe
CCL	Chloroclam water quality sensor
DCES2	Decagon ES-2 SDI-12 Electrical Conductivity Sensor
EC02	EDS EC-02 Modbus Electrical Conductivity Sensor
EPG100GX	Enviropro EP100GX-XX SDI-12 Soil Moisture Probe
FL900	FL900 Serial Flow Logger
GEN	Generic

Value	Meaning
I500	Aquamonix I500 Serial Flowmeter
iEM3255	Schneider iEM3255 Modbus Electricity Meter
K3700	Krohne 3700 Modbus Water Meter
OMNI	Aquatec Omnismart Modbus Sewer Controller
P200	Siemens Siltrans P200 4-20mA Pressure Sensor
PdBi	Pulsar dBi 4-20mA Ultrasonic Level Sensor Family
PMC11	Endress Hauser PMC11 4-20mA Pressure Sensor
PPMB	Acrulog PPM and PPB 4-20mA Pressure Sensor
WXT530	Vaisala WXT-530 SDSI-12 Weather Station
<i>Other</i>	<i>Additional devices not listed or added since document was published.</i>

**Field 6**

Value	Meaning
AU	Australia
US	United States
SG	Singapore
BR	Brazil
CA	Canada
HK	Hong Kong
<i>Other</i>	<i>Additional devices not listed or added since document was published.</i>

## 8 Cockatoo Operating Specifications

These tables are subject to update without notice.

### Processing and Interface

MCU	Onboard MCU
Operating modes	Flight mode (standby with no radio transmission.) Operational mode
Sensor interface types (Selected at time of manufacture)	Pulse Counter Rain Gauge 4-20mA Single Float Dual Float RS-232 RS-485/Modbus SDI-12 Analogue (pending) Encoder UI-1203 (pending)
NFC	Field readable and reprogrammable – installation and configuration. (Requires Taggle approval)

### Telemetry Behaviour

Sampling	Configurable by Taggle at manufacture or installation via NFC
Alarms	Configurable by Taggle at manufacture or installation via NFC
Transmission	Configurable by Taggle at manufacture or installation via NFC

### Physical Details

Dimensions	213mm (L) x 96mm (D)
Weight (approx.)	Approximately 1 kg (Varies dependent on number of batteries fitted)
Enclosure Material	Ultradur PBT
Ingress Protection	Cockatoo: IP68 Hermetically sealed Connectors: IP67
Temperature	-10°C to 60°C (Average temperature not to exceed 30°C)

### Connectors

Sensor connector (S)	Stainless Steel M-12 A coded female jack
Power connector (P) (optional)	Stainless Steel M-12 A coded male jack
External antenna (A) (optional)	Stainless steel SMA female jack

**Radio****Taggle Byron**

Module	Taggle Byron A31
Operating Frequency/Band	915-928MHz LIPD band in Australia 902-928MHz ISM band in USA
Signal Type	Direct Sequence Spread Spectrum
Communication Type	One-Way Communication
Operating Range	~2-5km Urban ~5-50km Rural (Dependent on local installation conditions)
Power	500 mW

**Myriota Satellite**

Module	Myriota proprietary
Operating Frequency/Band	Service 1 – VHF/UHF <ul style="list-style-type: none"> <li>• VHF TX - 160-161Mhz</li> <li>• UHF RX - 400 - 401Mhz</li> </ul> Service 2 – UHF/UHF <ul style="list-style-type: none"> <li>• UHF TX – 399 - 400Mhz</li> <li>• UHF RX – 400 - 401Mhz</li> </ul>
Communication Type	One-Way Communication
Latency	Coverage window every 2 to 3 hours, when in line of sight.
Message size	Uplink 20 bytes per message
Operating Coverage	Australia and USA

**Power**

Internal Power	1 to 4 D-cells non rechargeable batteries (19Ahr to 76Ahr)
External Power	9 to 30 volt external power source

Note: Battery life will vary based on the sampling and transmit frequencies, and type of interface used (and if powering the sensor)

## 9 Connector Jacks

The Cockatoo has up to three connector jacks on the base of unit, depending on the configuration. The connector jacks are –

- Sensor connector jack (S) (default on all variant)
- Power connector jack (P)
  - (optional) External power connector jack
  - (optional) Dual float device – second float
- External antenna connector jack (A) (optional)

### 9.1 Connector Jack Layout

To properly orientate the base of the Cockatoo, ensure the bracket mounting lug in the base of the unit is at the top when the Cockatoo is lying on its side. The image in Figure 2 – Base view of the Cockatoo and it's connector jacks.

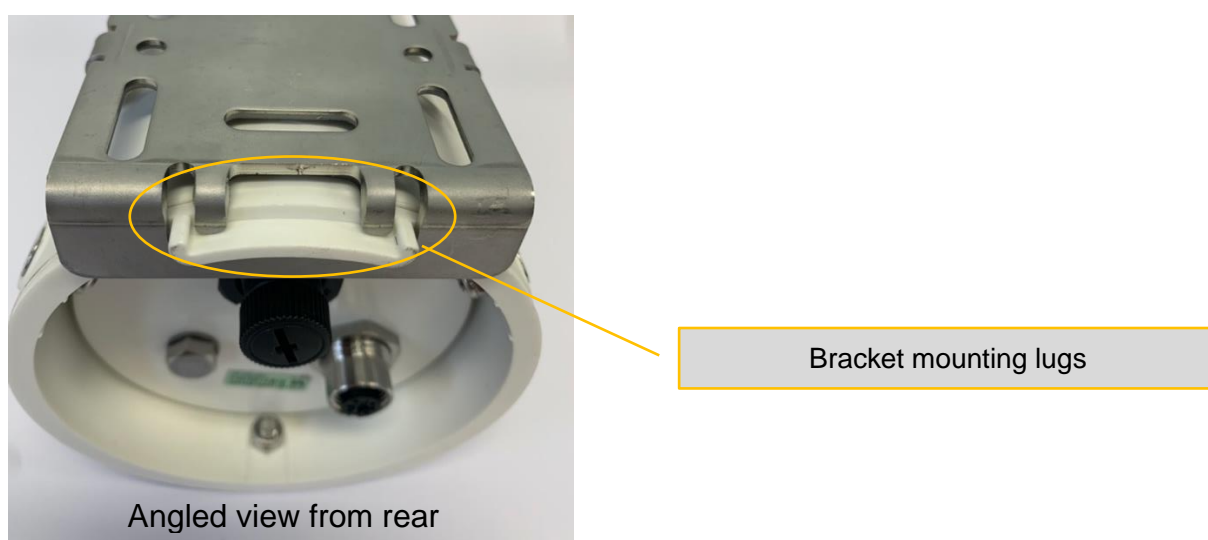


Figure 1- Angled view of the Cockatoo from the rear of the device

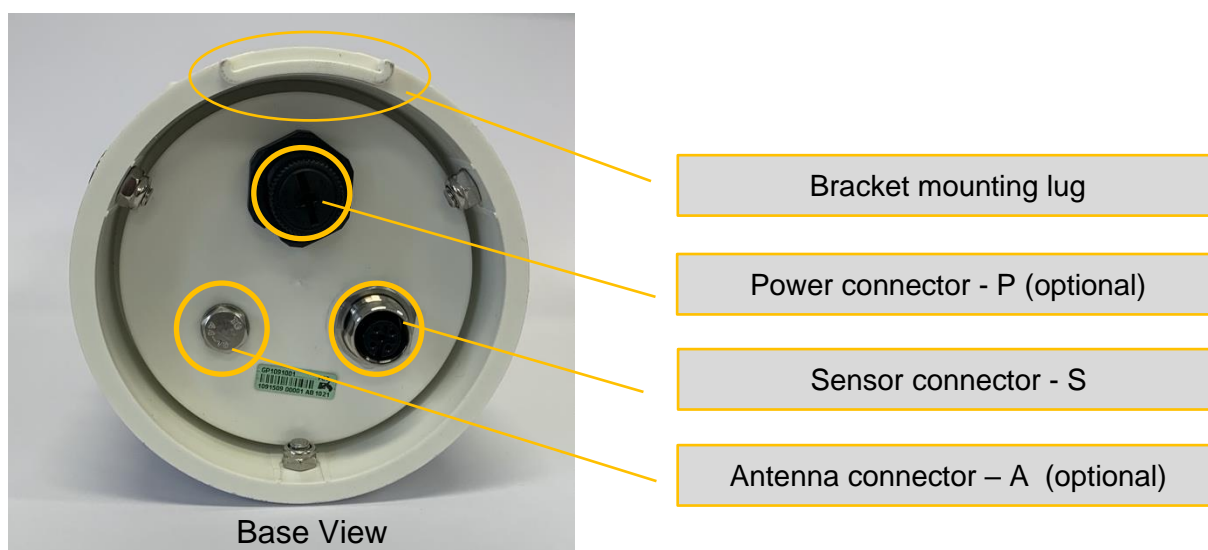


Figure 2 – Base view of the Cockatoo and it's connector jacks

## 9.2 Connectors

All Cockatoo's are supplied with a male Sensor plug which mates with the female Sensor jack on the base of the Cockatoo. External power and dual float switch variants of Cockatoo have second male Power jacks fitted and are supplied with a matching female Power plug.



Figure 3 – Sensor Connector Plug



Figure 4 – Power Connector Plug

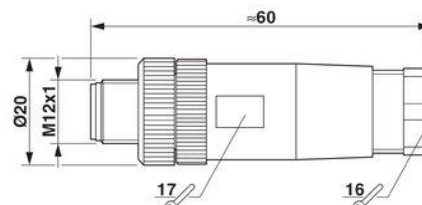


Figure 5 - Side profile view of the complete connector

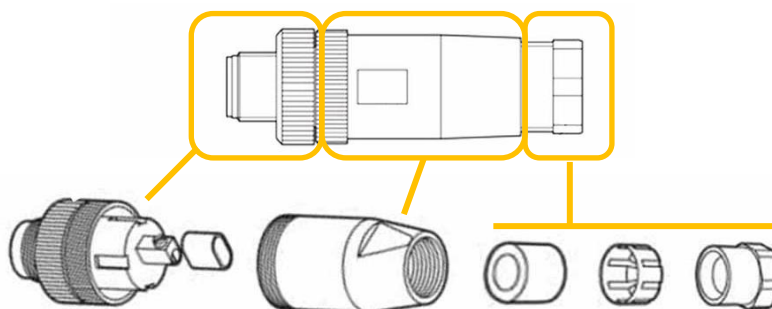


Figure 6 - Explode view of connector

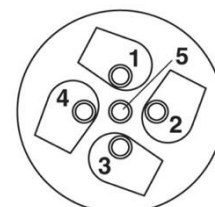
### 9.2.1 Wiring

Disassemble the connector into its three main component parts as shown below

The sensor cable **MUST** be between 6mm to 8mm in diameter, with the sheath stripped by 20mm and each individual wire stripped to 5mm in length to enable proper mating to the terminal block.

Figure 7 - Terminal Block of Sensor connector

Note each terminal is individually numbered



Component Part	Torque
M12 Knurl	0.4Nm
Screw terminal Block	0.2Nm
Pressure Screw with Sleeve Housing	0.8Nm to 1Nm





**Sensor cable must be between 6mm and 8mm in diameter to ensure proper seal within the connector.**

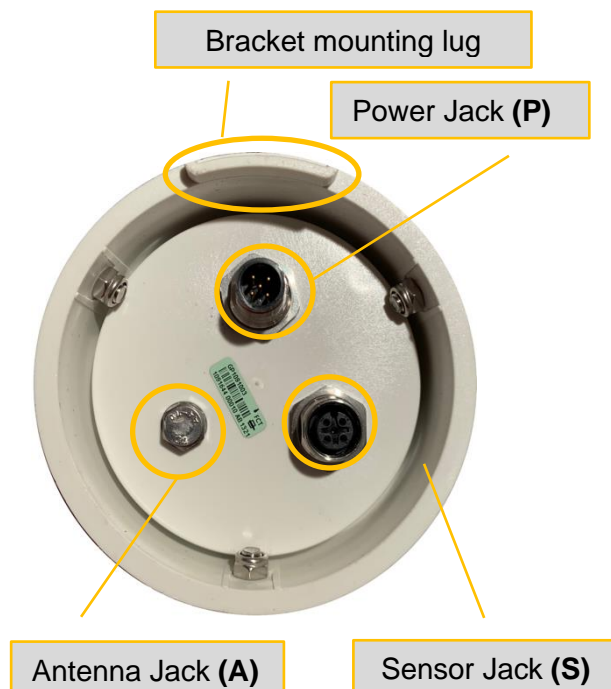
### 9.2.2 Replacement Parts - Phoenix Contact

Connector	Supplier part number	Supplier URL
Sensor Connector	SACC-M12MS-5CON-PG9	<a href="http://www.phoenixcontact.com">www.phoenixcontact.com</a>
Power Connector	SACC-M12FS-5CON-PG9	<a href="http://www.phoenixcontact.com">www.phoenixcontact.com</a>

### 9.3 Jacks

The connector jacks on the base on the Cockatoo will vary based on the model and its specifications. The provided connectors are different for each connector jack to aid correct assembly.

Jack	Location	Mating Plug
Sensor Jack	<b>S</b> (refer to diagram)	 Male Plug
Power Jack	<b>P</b> (refer to diagram)	 Female Plug
External Antenna	<b>A</b> (refer to diagram)	SMA male (Not supplied)



#### 9.3.1 Power Connector (Model CK2-\*-\*-EXT)

Cockatoo models with the EXT option are powered from an external 9-30V DC power supply. The power is connected via the Power jack (location P) using the supplied female plug.

Ensure the supply voltage is between 9 and 30 volts DC at 1.5 amps.

##### Power Connector

Connector Pin	Cockatoo
1	9 to 30 Volt DC
2	NA
3	GROUND
4	NA
5	NA



**Ensure the external power supply is wired to the P Jack only.**

### 9.3.2 Main Sensor Connector Wiring Instructions

The tables below describe the wiring configuration of the main sensor connector, shown in location S (described earlier in this section) on the base of the Cockatoo and using the male connector (below).



Figure 4 - Male connector

#### 4-20ma

Connector Pin	Cockatoo
1	POWER_OUT
2	SIGNAL_IN
3	NA
4	NA
5	NA

#### RS485

Connector Pin	Cockatoo
1	NA
2	B/Z
3	GROUND
4	A/Y
5	NA

#### SDI-12

Connector Pin	Cockatoo
1	12V
2	SIGNAL_IN
3	GROUND
4	NA
5	NA

#### Pulse Counter

Connector Pin	Cockatoo
1	TAMPER
2	PULSE_0
3	GROUND
4	PULSE_1
5	NA

#### RS232

Connector Pin	Cockatoo
1	NA
2	RX
3	GROUND
4	TX
5	NA

#### Rain Gauge

Connector Pin	Cockatoo
1	TAMPER
2	PULSE_0
3	GROUND
4	PULSE_1
5	NA

### 9.3.3 Float Switches





It is important to follow the instructions for wiring of float switches, as incorrect wiring or swaping connectors will create invalid alarms.

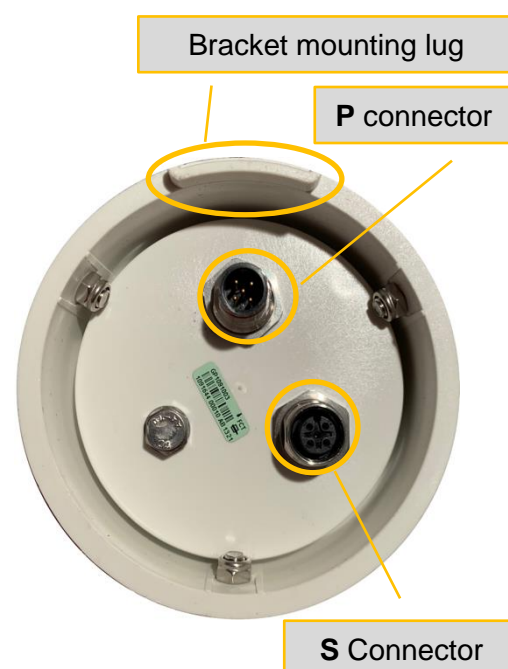
#### Wiring Float Switches

To ensure the correct behaviour of the float switch Cockatoo, it is important that correct connector is wired to the nominated top or bottom float. The top and bottom float use different connectors and have different wiring configurations.

If using non-Taggle provided floats you need to ensure the **down** position of the float has the float in a “**closed**” electrical state. Wiring the float in the **down** position in an “**open**” electrical state will lead to invalid operation of the Cockatoo. This point is particularly important as some 3<sup>rd</sup> party floats may be provided with two or three wire configurations.

The wiring of the connectors to the floats and which float is assigned to the lower location in the sewer pit is important to ensure the alarm conditions are properly provided in the data feed provided for the Cockatoo.

Float location	Location	Connector
Top Float	<b>P</b> (refer to diagram)	 Female Connector
Bottom Float or Float for single float configurations	<b>S</b> (refer to diagram)	 Male connector



Bottom Float (Single) connector

Connector Pin	Cockatoo
1	NA
2	SIGNAL_IN
3	GROUND
4	NA
5	NA

Top Float connector for dual float

Connector Pin	Cockatoo
1	NA
2	NA
3	GROUND
4	SIGNAL_IN
5	NA

## 9.4 Antenna

### 9.4.1 Internal Antenna (Model CK2-T1-I)

Most Cockatoo devices ship with an internal antenna and it is important ensure the top of the device is positioned correctly to maximise the radio transmission.

The antenna propagation image highlights how the radio waves propagate from the top half of the Cockatoo.



Figure 5 - Internal antenna propagation pattern

### 9.4.2 External Antenna (Model CK2-T1-C)

For deployments in challenging RF environments such as pits and manholes the external antenna option can be used.

It is important to note there is no internal antenna in this configuration, and the Cockatoo is fully dependent on the external antenna for all radio transmissions.



**The Cockatoo is certified for use with the Taoglas RI.02 3.2dBi Roadmarker antenna. Use with other antennas is not recommended, and under no circumstances should the gain of the external antenna exceed 3dBi.**



**Use of high gain directional antennas is not permitted.**



**To retain IP68 protection ensure the external antenna connector is properly and fully attached to the Cockatoo.**

<Intentional Blank>

## 10 Mounting bracket

Each Cockatoo ships with a stainless-steel mounting bracket, which attaches to the rear of the Cockatoo and locks into the base.

### Bracket Anatomy

The mounting bracket has been engineered to securely lock onto the body of the Cockatoo with two teeth at the top and two teeth at the base. Two slits on the side of the bracket are for a stainless-steel hose clamp to firmly hold the body of the Cockatoo onto the bracket.

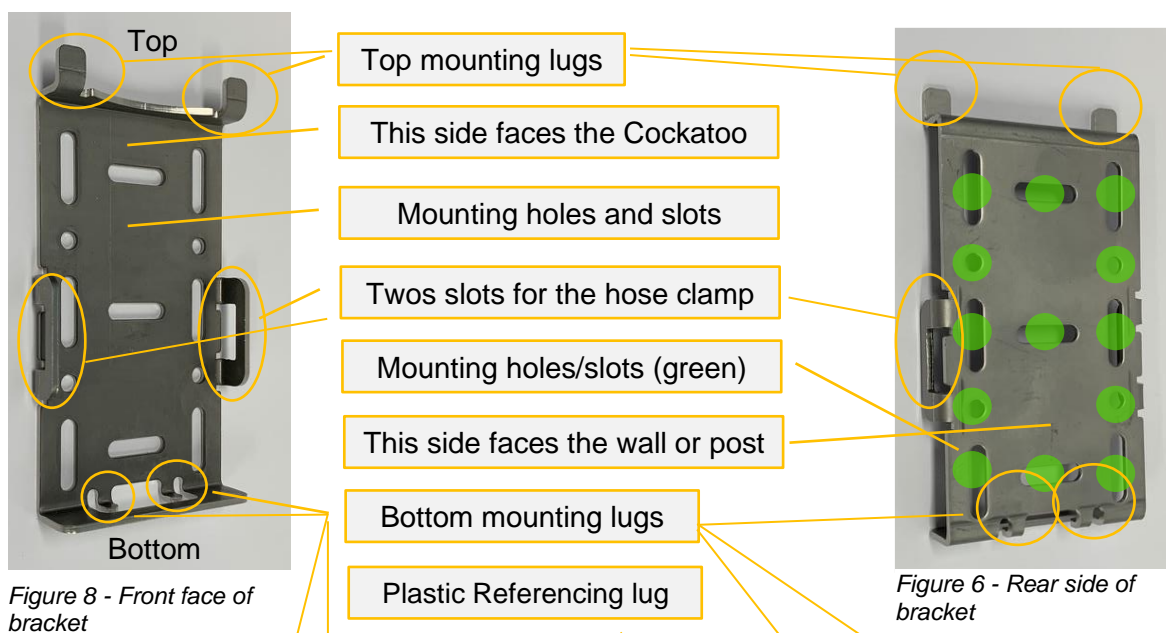


Figure 8 - Front face of bracket

Figure 6 - Rear side of bracket

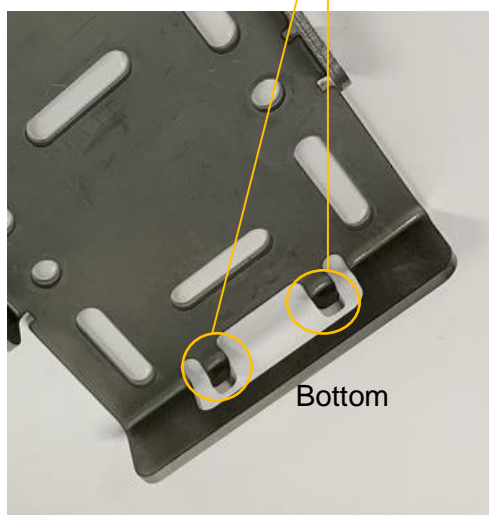


Figure 9 - Base of bracket showing lugs

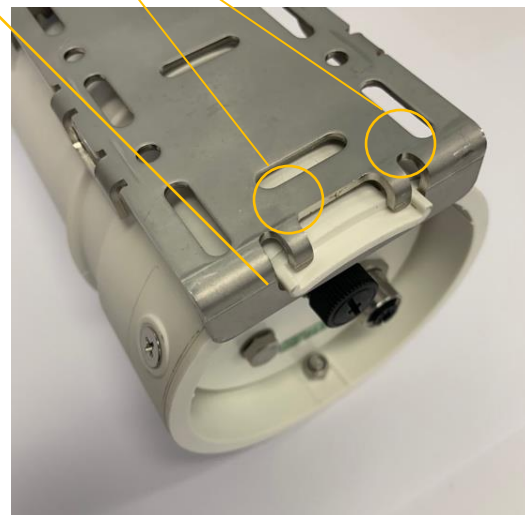


Figure 7 - rear side of bracket showing mounting lugs locked into Cockatoo.

Dimensions	Value
Height	126mm (5 inch)
Width	68mm ( 2.7inch)
Steel Thickness	2mm
Holes	M5
Slots	M5 x 20mm

## Attaching the Bracket to the Cockatoo

There are two sets of referencing lugs to aid proper attachment of the bracket to the Cockatoo. One pair at the top, and one pair at the bottom which lock into the plastic protrusion from the base of the Cockatoo, as showing the image



Figure 11 - Top referencing lugs connecting to Cockatoo.



Figure 10 - Bottom referencing lugs marrying into the base of the Cockatoo.

## Securing the bracket to the Cockatoo

The Cockatoo is shipped with a stainless-steel hose clamp (>100mm diameter). To secure the Cockatoo to the bracket, open the clamp and slide it through the two vertical slots showing in the image, insert the Cockatoo and then tighten the hose clamp.



**Mount the bracket to its final mounting location prior to affixing the hose clamp to the Cockatoo. Bracket mounting holes are not accessible once the Cockatoo is secured to the bracket.**



## **Section 2 - Installation Steps**

## 11 Locating, Mounting and Activation Steps

Locating and mounting of the Cockatoo is important to ensure maximised radio transmission performance, reduced stress on the connector jacks, reduced likelihood of the device being covered by debris.

### Steps - Summary

1. **Locate** - Identify the mounting location, and if necessary, the external antenna.
2. **Test Location** – Test that the proposed location is suitable for radio transmissions
3. **Mount** – Fix the Cockatoo bracket and confirm it is firm attachment to the surface.
4. **Attach** - Fasten the Cockatoo to the bracket and tighten the supplied hose clamp.
5. **Connect** – Attach the sensor connector/s, and if required external power & external antenna
6. **Cockatoo Test radio** – Swipe the Cockatoo and confirm receipt of data transmission
7. **Install** – mount the sensor to the target equipment or mounting location
8. **Restrain** – Coil excess sensor cable ensuring no undue pressure of connectors on the jacks.
9. **Test Sensor** – change the state of the sensor and then swipe the Cockatoo to initiate a transmission (Byron radio only)
10. **Validate** - Confirm receipt of radio transmissions in the sensor visualisation platform.

### Required tools and Materials

#### Cockatoo (standard box contents)

- Cockatoo, Bracket, 110mm Hose clamp, Connector plugs

#### Sensor

- Sensor
- Sensor cable (must be 6mm to 8mm diameter)

#### Mounting

- 4 x M5 bolts or screws (for bracket mounting)
- Cable Ties
- Tamper seals - 2mm (optional)
- Other mounting accessories (as required for location)

#### Tools

- Small flat head screwdriver suitable for 4mm screw (to connect sensor to terminal block of sensor plug)

#### Activation Equipment

- NFC enabled phone or Tablet
- NFC reader app (refer to Appendix – NFC Application)
- Taggle High Power Survey Tag (optional but recommended for pit installations.)
- Work Order
- Site capture sheet (optional –Appendix – Field installation information Capture Sheet)

## 11.1 Step 1 – Determining the optimal mounting location

### Purpose

To maximise the radio performance of the Cockatoo it is important to ensure the location, position and likely changes in the physical environment are considered prior to installation.

### 11.1.1 Cockatoo with internal antenna

#### 11.1.1.1 Byron Radio – Above Ground

For best results are achieve by having the Cockatoo above ground, positioned vertically and away from any close objects which may block the transmission, such as wall, metal equipment/building.

In the case of enclosed spaces, first test the radio performance of the Cockatoo, and if challenged for radio transmissions, consider using an external antenna. Try ensure the area is not fully enclosed to allow the radio signal the best opportunity to reach the Receiver.



Figure 12 - Good example unobstructed site.

### Alternative solutions

In the example below, mounting a Cockatoo inside this water meter cabinet and relying on the internal antenna will have impaired results. In such an instance, it is best to use a Cockatoo with external antenna, with the Cockatoo mounted inside the cabinet and a small mushroom antenna place outside the enclosure.

#### Metal Enclosures

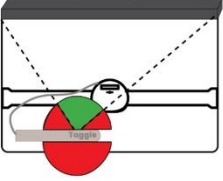
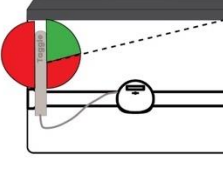
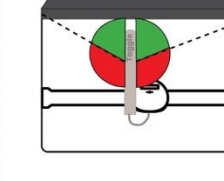
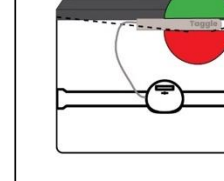
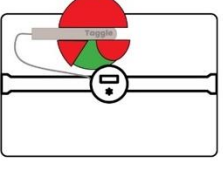
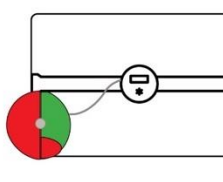
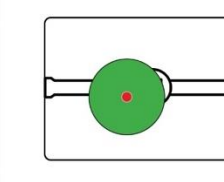
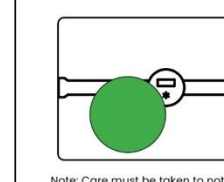


### 11.1.1.3 Byron Radio – Below Ground








When installing below ground, first confirm the Cockatoo radio transmission can penetrate the intended pit lid or covering. This can be achieved by positioning a Taggle High Power Survey tag temporarily in the desired location whilst it is transmitting.

#### Positioning of antenna to influence signal strength

The examples below are in meter pits with the top row being a side view and bottom row of image being a top-down view.

	Poor (less than 20% signal strength)	Fair (25% signal strength)	Better (40-50% signal Strength)	Best (plastic NICOR lid) 50% + signal strength)
Side View	<p>Bottom of pit</p>  <p>The deeper in the pit the more signal attenuation</p>	<p>Side of pit with upright tag</p>  <p>As the antenna is on one end of the tag, pointing this end upwards assists the signal.</p>	<p>Upright tag on water meter piping antenna tip close to lid</p>  <p>Here the antenna is also clear of all the pit walls.</p>	<p>On lid at the center of the plastic lid</p>  <p>Here the tag is mounted directly on the lid, away from the pit walls, with a NICOR RF transparent pit lid.</p>
Top View				 <p>Note: Care must be taken to not break the tag/sensor cable when removing the lid for manual check read/servicing the pit.</p>

The below examples of other Byron radio transmitters in meter pits.

Poor	Fair	Better	Best (Plastic / NICOR lid)
 <p>Here the tag is close to the lid, so it is still a reasonable installation</p>			
		 <p>Being in the center would be better</p>	

The below example is of a similar powered device to the Cockatoo mounted sideways



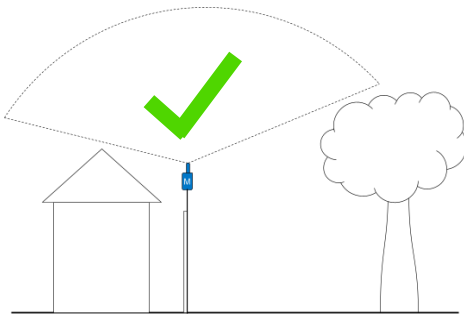
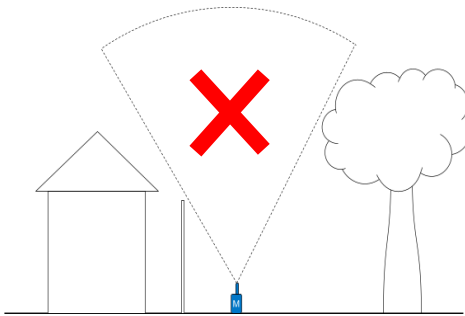
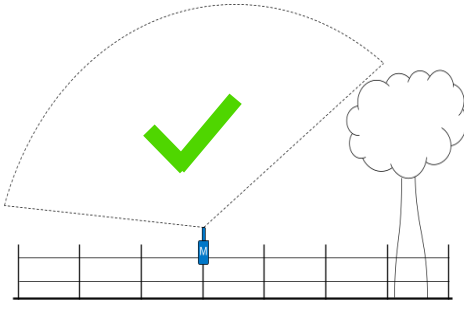

### 11.1.1.4 Myriota Radio

The Cockatoo – Satellite devices should be deployed with a full and unobstructed view of the sky in all directions to maximise transmission success on every satellite pass.

Physical obstacles including trees, buildings, and poles will block signals and may degrade system performance. The internal antenna variant should be mounted externally with suitable clearance where the Cockatoo is housed within, or near to, metal or concrete structures. The diagrams below are designed to show how the sky view of a Cockatoo can be reduced by proximity to adjacent obstructions but improved with vertical elevation of the Cockatoo.

#### Ideal location and Positioning

Ideally the Cockatoo should have a full sky view that includes visibility on the horizons at elevations above 10 degrees. The following diagrams show examples of more desirable deployments for a Myriota-enabled device.

	Good Example	Poor Examples
<b>Site 1</b>	 <p>Elevation significantly improves breadth of sky in clear view</p>	 <p>Ground level presents too many close obstacles obstructing a fuller sky view</p>
<b>Site 2</b>		
<b>Site 3</b>		

---

### 11.1.2 Cockatoo with external antenna

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#### 11.1.2.1 *Byron Radio (Model CK2-T1-C)*

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Pit installation: It is preferred that the Radio Endpoint is mounted under a non-metal pit lid, however if the radio transmission cannot penetrate the lid after testing with a Taggle High Power Survey Device an external antenna may be needed.

The recommended external antenna is the Taoglas RI.02.01.3000W ISM band Roadmarker antenna.

<https://www.taoglas.com/product/roadmarker-ri-02-915mhz-adhesive-antenna-smam/>

The antenna has a gain of 3.2dBi. The Cockatoo is certified for use with this antenna only.

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**Use of High gain directional antennas is not permitted.**

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**Below ground installation with external road marker (white) Antenna.**



**Below ground installation with buried external road marker (white) Antenna.**

Note in this example, the road marker antenna is NOT covered with bitumen but a radio transparent rubber material.



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#### 11.1.2.2 *Myriota Radio*

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Cockatoo does support the use of an external antenna; however, it is recommended to use the internal antenna as it has been tuned to maximise the radio performance of direct to satellite connectivity.

If requiring an external antenna, it is advisable, if feasible, to mount the Cockatoo outside with broad visibility of the sky as described in the earlier section.

## 11.2 Step 2 – Radio Test the proposed mounting location

### Purpose

Prior to permanently installing the Cockatoo, it is advisable to confirm the proposed location has acceptable radio coverage.

### 11.2.1 Byron Radio Test the proposed mounting location (Byron only)

#### Requirement Items

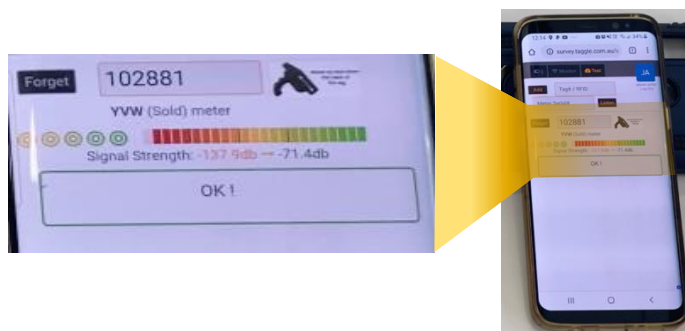
- NFC enabled phone or tablet
- Taggle High Power Survey Tag (optional)
  - Required where proposed mounting location is sealed when closed, such as a sewer manhole, or exposed location.
- Sensor with Cockatoo connector properly attached to the sensor cable.

#### Action

1. Select device and position it at the proposed location for radio test.
  - If using Cockatoo - Connect sensor cable to Cockatoo (the sensor does not need to be fixed to its target asset at this time) The Cockatoo CANNOT leave FLIGHT mode without a sensor connected.
  - If using Survey Tag - Position the Survey Tag at the location and orientation proposed for the Cockatoo.
2. Execute radio transmission –
  - If using Cockatoo - Wake up the Cockatoo by swiping the letter “a” on the Taggle symbol with your NFC enabled device, as shown in Figure 15 - NFC swipe location.
  - If using Survey Tag - turn on the Survey Tag to start transmitting
3. Wait 30 seconds
4. Open the **Survey Tool web page** and confirm the transmission has been heard.
  - Access to the **Survey Tool** at the web addresses below:
    - Australia <http://survey.taggle.com.au/monitor>
    - Americas [https://survey.taggle.com.au/usa/monitor\\_test](https://survey.taggle.com.au/usa/monitor_test)
  - Enter the ID number of the Cockatoo or Survey Tag into the device field.
  - Confirm the status is “OK”, as shown in the image.



Figure 13 - NFC swipe location



- If you don't have access to the Survey Tool, please contact or email your Reseller Representative or
  - if in Australia contact your Taggle Representative or [enquiries@taggle.com.au](mailto:enquiries@taggle.com.au).
  - if in USA, North or South America contact [enquiries@viderewater.com](mailto:enquiries@viderewater.com)
  - Your request will require the following details: as an example
    - Name: John Smith
    - Email: [johnsmith@waterco.com](mailto:johnsmith@waterco.com)
    - Company: Council Name
    - Job Title: AMR Installer
    - Your Reseller's name: ACME Water Solutions
    - Phone Number: 0404 000 000

### 11.2.2 Satellite Radio Test the proposed mounting location

#### Purpose

Validate the Cockatoo satellite radio is functioning and can confirm its GPS location.

#### Requirement Items

- NFC enabled phone or tablet
- NFC Reader App (refer to Appendix – NFC Application for example)
- Sensor with Cockatoo connector properly attached to the sensor cable.
- Cockatoo

#### Action

1. Connect sensor cable to the Cockatoo. The Cockatoo CANNOT leave FLIGHT mode without a sensor connected.
2. Position the Cockatoo at the proposed location for radio test.
3. Wake up the Cockatoo
  - Open your **NFC Tools** app or similar app on the mobile phone
  - Select **READ** and then Tap the phone over the letter "a" on the Taggle logo on the Cockatoo, as per image below.
  - You should be presented with a dialog box and a tick symbol. This indicates a successful NFC interaction with the Cockatoo.
  - Sequence of Actions below -

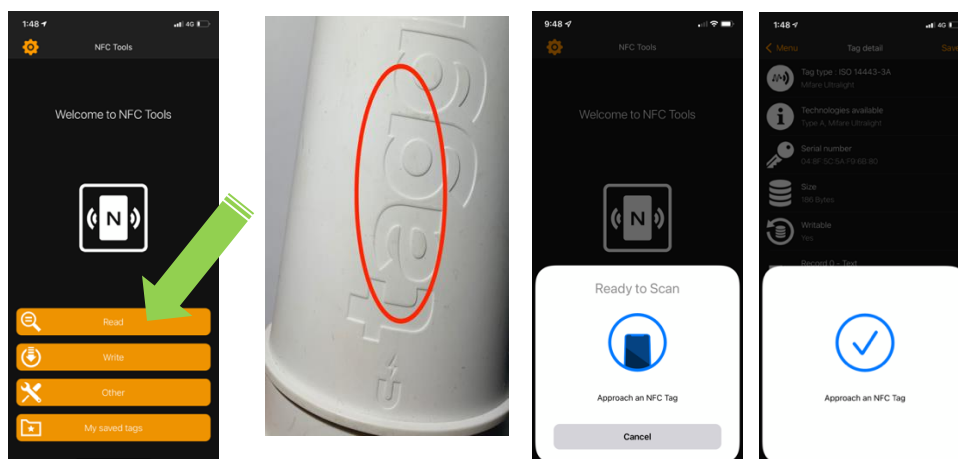
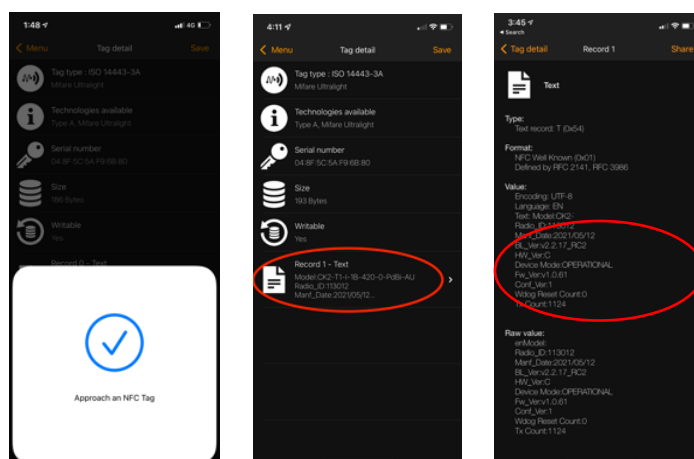


Figure 14 - NFC Tools App and tapping sequence with Cockatoo

4. Wait 60 seconds.
5. With the **NFC Tool** app open on the phone select **READ** again and tap the “a” location on the Taggle logo. You should be presented with a dialog box and a tick symbol.
6. Wait 30 seconds.
7. With the **NFC Tool** app open on the phone select **READ** again and tap the “a” location on the Taggle logo. You should be presented with a dialog box and a tick symbol. Once the tick dialogue box disappears, click on the **Record 1- Text** section (red oval below), and scroll down to the **Value:** section and confirm the following conditions.
  - Device Mode → reads “**OPERATIONAL**”
  - Tx Count: → reads any number greater than 1
  - GPS LOCK: → reads “1”



## Troubleshooting

1. The sensor cable must first be attached to the Cockatoo before attempting the activation.
2. The sensor plug must have all wires correctly connected, refer **Connector Jacks** section
3. If the Cockatoo is in Device model = “FLIGHT” mode. Disconnect and reconnect the sensor cable, and then repeat from Step 1 above.
4. If the Cockatoo has GPS LOCK does not equal to “1”. Wait 5 minutes and repeat steps above starting from Steps 5.

### 11.3 Step 3 - Fix the Cockatoo bracket

#### Purpose

Securely mount the bracket to a solid structure or location to ensure no movement.

#### Requirement Items

- 4 x M5 bolts or screws
- Cockatoo bracket
- Other mounting accessories (as required for location)

#### Action

1. Practice sliding the Cockatoo into the bracket before fixing the bracket to the wall/mounting location, as aligning the bottom teeth of the bracket to the Cockatoo can be tricky.
2. Fix the bracket to the mounting location using the available holes or slots (green dots) in diagram below

### 11.4 Step 4 - Fasten the Cockatoo to the bracket

#### Purpose

The installer needs to mate the two upper teeth of the bracket into the mounting holes in the top of the Cockatoo, whilst ensuring the teeth at the bottom of the bracket mate with the lug on the base of the Cockatoo.

#### Action

1. Slide the Cockatoo into the upper and bottom teeth of the bracket. Ensure the Cockatoo is slid vertically into the bracket to ensure the bottom teeth can properly mate with the lug.

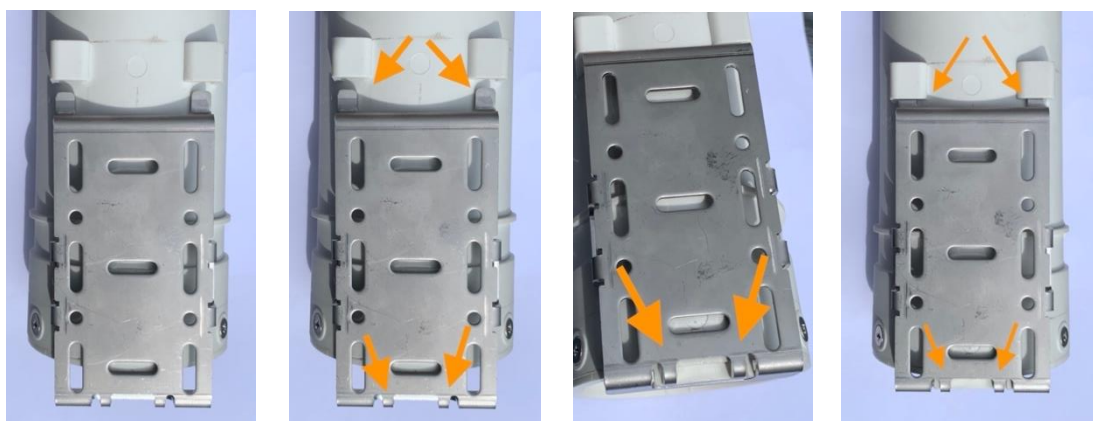


Figure 15 - Sliding the Cockatoo into the Bracket

2. Insert the and tighten the hose clamp.



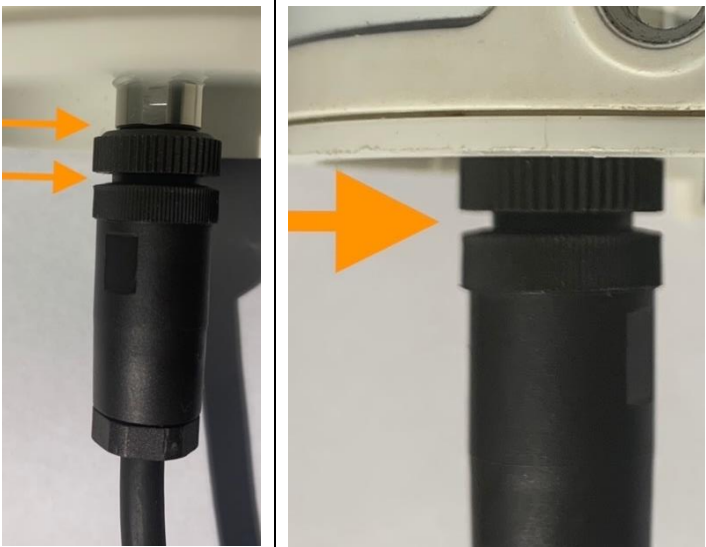

## 11.5 Step 5 - Attach the sensors and connectors

### Purpose

Ensure proper and water-resistant seal between connector and Cockatoo Jack

### Action

It is important for proper seal to be achieved between the sensor connector and the jack for the connector to be fully tightened. As fully tightened connector will draw the connector into the jack and as it tightens create a visible separation of the head of the connector from the body, as shown in the image below

CORRECT	INCORRECT
<p>Proper seal -</p> <p>Note the zoomed in image and the separation of the head from the body of the connector when tightened.</p>	<p>Insufficiently tightened connector to the jack on the Cockatoo</p>
	

## 11.6 Step 6 - Test radio

### Purpose

Once mounted reconfirm that the Cockatoo transmission can be heard.

### Action

1. Repeat Step 2 now using the Cockatoo, along with connection to external power and external antenna as appropriate.

## 11.7 Step 7 - Install – mount the sensor to the target equipment /location

### Purpose

Install the sensor on the equipment/asset or in the desired location.

### Action

1. Execute the required steps as described by the vendor of the Sensor
  - If installing a Taggle provided sensor, consult the Appendix to this document for installation advise or consult with your Reseller.

## 11.8 Step 8 - Restrain excess cable coil.

### Purpose

Environmental conditions can change after installation, and it's important to ensure that there will not be undue stress placed on the connector when fastened to the Cockatoo.

### Action

1. Coil and fasten separately from the Cockatoo any excess cable to a solid mounting point.
  - Pay particular attention to ensure the coiled cable has sufficient excess cable length from the coil to the Cockatoo to does not place any undue strain in the Cockatoo jacks as shown below.



## 11.9 Step 9 - Test Sensor

### Purpose

Once mounted and sensors are connected reconfirm that the Cockatoo transmission.

### Action

Repeat Step 2 now using the Cockatoo with all sensors connected, along with external power and antenna as appropriate.

## 11.10 Step 10 - Validate - Confirm receipt of radio transmissions

### Purpose

Validate correct in field readings to those being published on the data feed or presented in the data visualisation platform.

### Action

Capture the real time state /condition of the sensed environment and time of reading and compare with the data available on the published data feed and presented in the visualisation platform.



**Owing to the use of the satellite enabled Cockatoo in remote locations, it is strongly advisable to confirm receipt of transmission to before leaving the commissioning location.**

# **FAQ and Trouble Shooting**

## 12 FAQ

### **Can the Cockatoo batteries be increased or replaced?**

- The Cockatoo can hold 1 to 4 non-rechargeable batteries (19Ahr to 76Ahr). The number of batteries in the device can be determined from the product code. Examining the product code, the characters after the 3<sup>rd</sup> hyphen represent the power configuration: 1B= 1 battery, up to 4B = 4 batteries, and EXT meaning externally powered.
- The batteries used in the Cockatoo are a non-rechargeable lithium metal battery. Contact Taggle to know more.

### **Does the Cockatoo support wire tamper seals?**

- The Cockatoo has three tamper resistant bolts with holes for 3<sup>rd</sup> part tamper seals

## 13 Trouble Shooting

### Confirming Cockatoo is in OPERATIONAL mode

If unsure if the Cockatoo is in FLIGHT mode or OPERATIONAL mode, use an NFC enabled app to read the operational status of the Cockatoo.

More information and an example NFC App is in

## Appendices

### Appendix – NFC Application

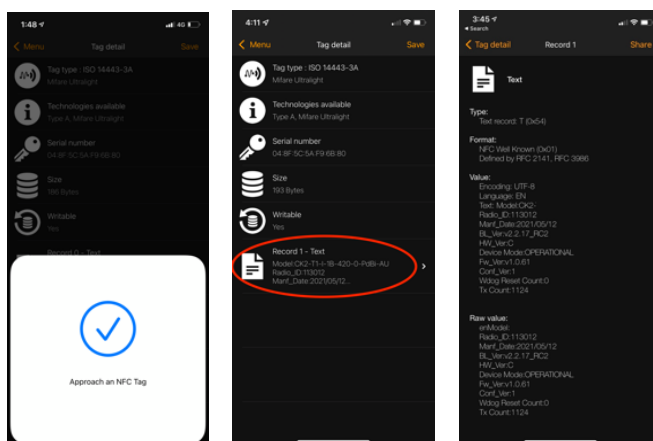
#### Cockatoo will not exit FLIGHT mode

To exit FLIGHT mode the Cockatoo must have a sensor connected. Provided the Cockatoo has sufficient internal or external power, once a Cockatoo has been placed in OPERATIONAL mode, it will stay in this mode (even if the sensor connector is disconnected.)

#### Confirming the GPS Lock on the Cockatoo Satellite

With the **NFC Tool** app open on the phone select **READ** again and tap the “a” location on the Taggle logo. You should be presented with a dialog box and a tick symbol. Once the tick dialogue box disappears, click on the **Record 1- Text** section (red oval below), and scroll down to the **Value:** section and confirm the following conditions.

- Device Mode → reads “**OPERATIONAL**”
- Tx Count: → reads any number greater than 1
- GPS LOCK: → reads “1”



# Appendices

## 14 Appendix – NFC Application

The Cockatoo is shipped in a low power stand-by mode, known as **FLIGHT** mode. In this mode the satellite radio is disabled to conserve battery and render the device safe for transport in air cargo.

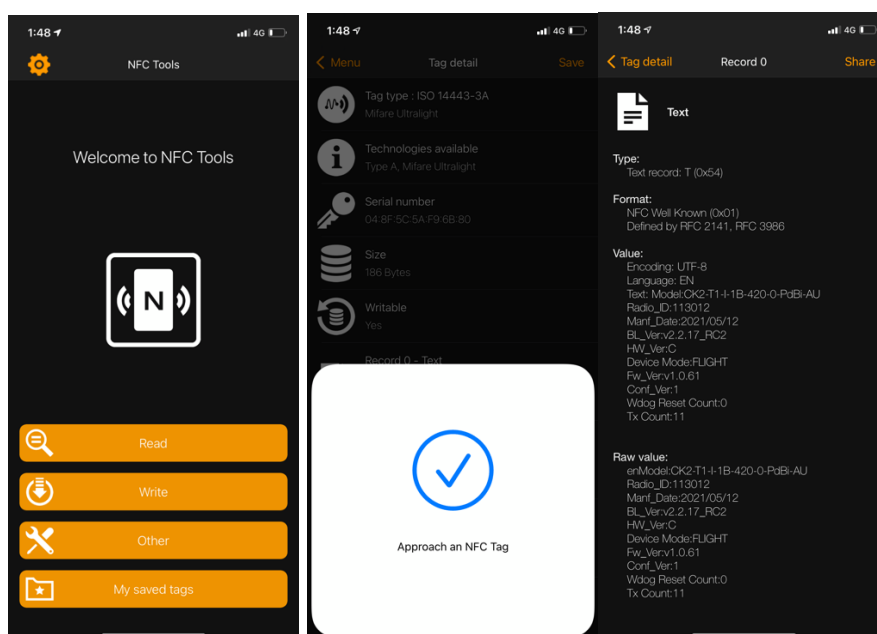
To activate the Cockatoo an NFC enabled smartphone running a free NFC App is required. Prior to arriving at site please install an NFC reader App such as one below or similar.

- Android App – link is here [NFC Tools\\*](#)
- Apple App – link is here [NFC Tools\\*](#)

The activation process is very straightforward. Once the Cockatoo is installed it requires a single NFC “tap” (similar to a tap and go payment) to reboot the device. On reboot the Cockatoo will check that the sensor is connected, (if a satellite variant it will update its location using its internal GPS receiver) and transition to OPERATIONAL mode, where it will commence taking sensor readings and transmitting data.

### Checking the Status of the Cockatoo

1. Download and install an NFC reader app, such as the examples above.
2. Confirm NFC App is functional.
3. Ensure the sensor cable is properly connected the Cockatoo and tight. Without a properly connected sensor cable, the Cockatoo will stay in FLIGHT mode (and will not wake up).
4. Open your NFC app on the mobile phone, select READ and then Tap the phone over the letter “a” on the Taggle logo on the Cockatoo, as per below. You should be presented with a dialog box and a tick symbol. This indicates a successful NFC interaction with the Cockatoo.
5. Proceed to the information screen and review the status and condition of the Cockatoo.



**Note: Taggle does not endorse or guarantee availability of the Apps described in this section and lists them for example purposes.**

\*NFC Tools rights are owned by WakDEV. Taggle has no relationship with WakDEV.

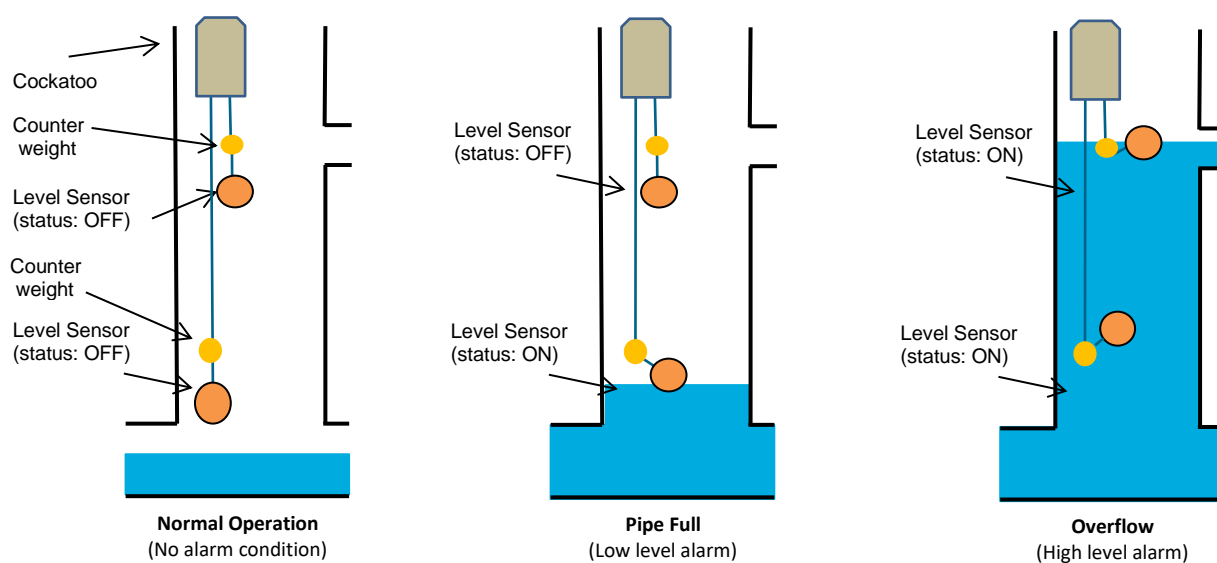
## 15 Appendix – Dual Float installation Guide

### Overview

Single and dual float sensors have a number of applications and configurations based on the specific use cases including -

- Stormwater manhole
- Life stations
- Sewer manholes
- Detention tanks

### Sensor and Alarm States



### Floats with Counterweights

### External Antenna Solution



**Installation examples\***

\*Note: Images are of LSTT previous generation to Cockatoo

## 16 Appendix – Ultrasonic or Radar level Sensor

### Overview

Ultrasonic and radar level sensors have a number of applications and configurations based on the specific use cases and their ability to detect the level of change including -

- Stormwater manhole
- Life stations
- Sewer manholes
- Detention tanks

### Installation Examples\*



\*Note: Images are of LSTT previous generation to Cockatoo



\*Note: Images are of LSTT previous generation to Cockatoo

### Cockatoo example with Ultrasonic 6m depth level sensor



## 17 Appendix – Pressure Monitoring

### Overview

The Cockatoo can be used with a range of pressure sensors.

Contact Taggle for more information.

### Installation Examples\*



\*Note: Images are of LSTT previous generation to Cockatoo

## 18 Appendix – Weather station/ Air Quality

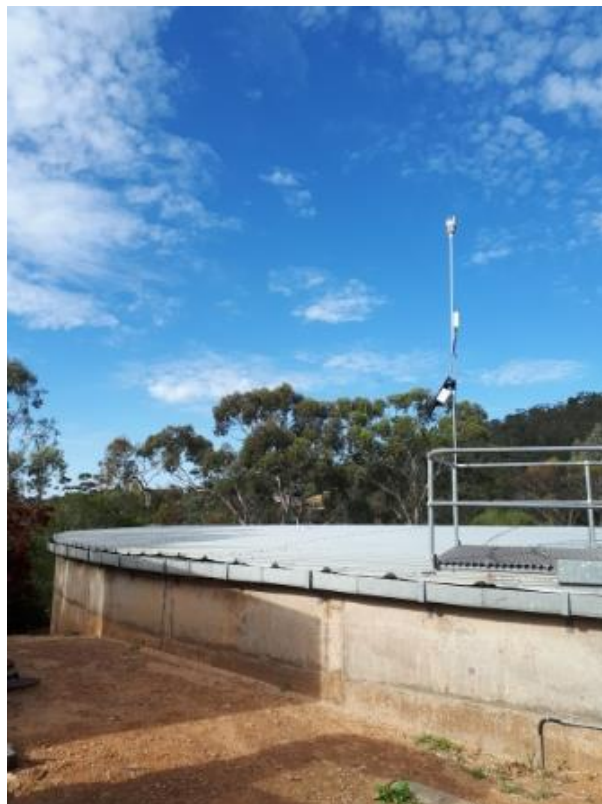
### Overview

The Cockatoo currently supports some weather station and air quality sensor, some listed below:

- Vaisala WXT-530 SDSI-12 Weather Station
- Vaisala AQT410 Modbus Air Quality Sensor

Contact Taggle for other vendor brands and models.

### Installation Examples\*



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\*Note: Images are of LSTT previous generation to Cockatoo

## 19 Appendix - Replacement Parts

### Cockatoo

Part	Supplier part number	Supplier URL
Battery	Contact Taggle	Taggle
Bracket	Contact Taggle	Taggle
Hose Clamp	General hardware supply	na

### Connectors

Part	Supplier part number	Supplier URL
Sensor Plug	SACC-M12MS-5CON-PG9	<a href="http://www.phoenixcontact.com">www.phoenixcontact.com</a>
Power Plug	SACC-M12FS-5CON-PG9	<a href="http://www.phoenixcontact.com">www.phoenixcontact.com</a>

## 20 Appendix – Field installation information Capture Sheet

Sample work order data capture sheet for **Aqualus Vision** or **Videre Vision**

Asset location	Details	Comment
Property Location		
Location Nick name (Optional)		
Date		
Time of Installation		
Employee ID		
<b>Radio endpoint</b>		
Tag Serial Number	ID:	
Tag Model le CK2-T1-il4B-0-0-PCA-AU		
<b>Sensor</b>		
Serial number		
Sensor Condition		
<b>Asset Information</b> Details of the asset/location where the sensor and Cockatoo were installed.		
Asset Name		
Asset Key		
Asset GPS - Latitude		
Asset GPS - Longitude		
<b>Photos</b> Capture here any reference information to assist associating the image to work order, such as time stamp, phone used or filename		
Image 1		
Image 2		
Image 3		
Image 4		
<b>Installation Validation</b>	<b>Passed (Y/N)</b>	
Radio Test		
Survey Page screen shot		
Images of install captured		
<b>Comments</b>		

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<end>