Parakeet - User Manual

Revision History

Revision	Date	Details
1.0	22-10-2019	Initial Daft

Taggle Systems Pty Ltd
Level 1, 101 Sussex St, Sydney, NSW 2000, AUSTRALIA

+61 2 8999 1919

www.taggle.com.au

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1) Scope of this Manual

This manual contains installation instructions for the Taggle Systems PARAKEET endpoint.

Taggle Parakeet endpoints installation must comply with all the applicable federal, state and local rules, regulations and codes.

Failure to read and follow these instructions can lead to misapplication or misuse of this product, resulting in personal injury and damage to equipment.

Proper performance and reliability of Taggle Parakeet endpoints depend upon installation in accordance with these instructions. Endpoints not properly installed may not be covered under warranty.

2) FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Radiation Exposure Statement:

The equipment complies with FCC Radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

3) Compatible Encoders/Registers

The below Encoders/Registers connect to the Parakeet Sensus endpoint

 Honeywell SM700	 Badger Meter High Resolution LCD Encoder

4) Parakeet® Endpoint connector variartions

Endpoint Configurations	Encoder Connection
Endpoint only with in-line connector	Connect the endpoint to an encoder using the in-line connector.
Endpoint only with flying lead for field splice	See Field Wiring guide
Endpoint/Encoder assembly with inline connector	Factory pre-wired; no splicing necessary

5) Installation Guidelines

Install the endpoint/encoder assembly according to these guidelines:

- Indoor/Outdoor installation:
  - Indoor installation is **recommended**. Mount endpoints indoors, in the floor joist near an outside wall and away from large metal objects.
  - Outdoor installation is acceptable and may be required where signal strength does not support indoor installation
  - Pit installation: It is preferred that the Parakeet Endpoints are mounted through a non metal pit lid. Otherwise, mount it as close to the underside of the lid as possible (See page 5).

NOTE: Incorrectly installed endpoints may not be covered under warranty.

6) Radio Test Mode

The PARAKEET SENSUS can be set into Radio Test Mode by one of two methods. Essential for confirming radio performance at installation.

The first method involves activation of an internal reed switch using a magnet presented over the indicated label below - referred to as a “SWIPE”. The second method is triggered by presenting an NFC reader over the labelled area – referred to as a “TAP”. Both these locations are marked below on the endpoint housing.

Magnet “Swipe” and NFC “Tap” locations

A Swipe or a Tap will cause the device to immediately transmit a burst of packets, to aid field testing during device installations and PRIOR to the connection of the Encoder/Register. This means that every endpoint can be used as a Survey Tool to test for connection to the Taggle Network. Access to this survey tool page will be granted by Taggle Systems.

7) Out of the Box

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.

8) To activate the device at installation

Connect the Parakeet Sensus to a Sensus protocol enabled Encoder/Meter and trigger the device **Radio Test Mode** as previously described via a “SWIPE” or “TAP”. Doing this places The endpoint into Operational Mode for the remainder of the endpoints life.

If a PARAKEET SENSUS is disconnected from a Sensus protocol sensor at any point, the PARAKEET does **not** return to Flight Mode, instead reporting communication errors.

9) Confirming an Installation

Reading a PARAKEET SENSUS endpoint immediately after installation verifies proper operation and reading performance. Before leaving the installation site, the installer can use a web-app to confirm the endpoint wiring has been done correctly and that the endpoint is broadcasting RF data for reading.

Access to this page will be granted by Taggle Systems.

10) Configuration via NFC

NFC interactions that modify the behavior of the device require an approved Taggle NFC application. All of these communications are encrypted using AES-128 with a unique key per device.

Contact Taggle for more information.

11) In-line connector instructions

The PARAKEET SENSUS is shipped preconfigured to work with certain Sensus protocol encoders and ships as standard with Nicor Connector but other connector types such as 308 and Twist Tight can be supplied.

Warning: BEFORE JOINING, MAKE SURE ALL SURFACES OF THE CONNECTOR ENDS ARE CLEAN, DRY, AND FREE OF ANY DEBRIS OR DIRT. THIS STEP IS IMPORTANT TO MAKE SURE THE CONNECTOR REMAINS WATER TIGHT AND SUBMERSIBLE.

Nicor Connector

1. Pull the dust cap(s) off.
2. Locate the arrow on each connector. With the arrows pointed toward each other, push the ends together until the encoder side connector is fully seated into the endpoint side connector. There should be no visible gap. See the last image in Figure below.

12) Mounting Instructions

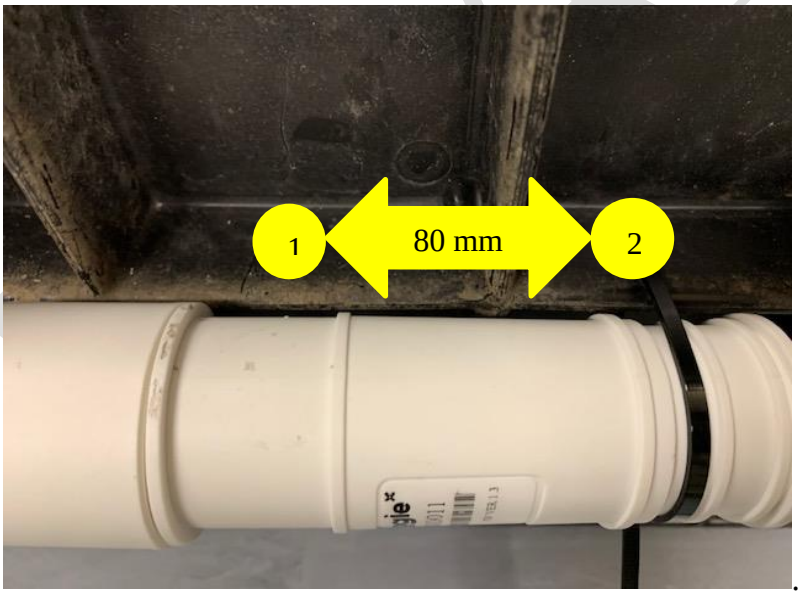
Pit Installations.

The Parakeet Transmitter works best when positioned as close to the top of the pit lid as possible. While mounting vertically just underneath OR through the lid is preferred. Taggle also recommends placing the endpoint horizontally under the lid as shown below, provided the modification is acceptable with local and state laws.

NOTE: If possible, ensure the Antenna end of the endpoint is positioned close to end of the lid from which it is opened.

Figure 1: shows Parakeet with Antenna positioned closest to lid opening point

1. Remove the pit lid and make TWO 5 mm size holes 1 and 2 as shown in the figure below, spaced 80 mm apart. Feed a high quality cable tie through each holes so that they loop through and around the locating grooves in the Parakeet. Securing it so it does not move.



2. Tighten the cable ties so that the endpoint is secured to the top of the lid. Trim the excess length of cable tie and keep a tidy site.

Figure 2: Trim excess cable ties length and discard appropriately

Other Installations.

The Parakeet is suitable for both below ground installation in meter and irrigation pits, as well as above ground mounted on posts or other non-metallic structures such as fences. As with all radio devices superior range and reliability will be achieved with above ground deployments.

The device should be at least 15cm away from nearby solid objects to avoid de-tuning the antenna. Fixing directly to metal structures is not recommended.

Product Overview Summary Sheet

Overview

The Parakeet Sensus is a one-way, battery powered wireless telemetry unit designed for domestic and commercial water meters to support low cost, utility scale automatic meter reading (AMR) using Taggle Systems proprietary ISM band technology.

Functionality

Operation: The Parakeet Sensus endpoint communicates with a water meter outputting Sensus encoded data and captures hourly interval read data and other meter status information. The data is then encrypted and transmitted to the Taggle receiver and its analytics software.

Activation: All Parakeet Sensus are shipped in an inactive, non-transmitting state. The endpoint begins transmitting once successfully connected to a compatible water meter via the Series III Nicor AMR Connector and it is *either:*

- Swiped with a magnet*
  OR
- Tapped with any NFC enabled device*

Installers will be given a web app to view the successful endpoint connection to the Taggle Network

* More details on NFC tap and Swipe in the *Parakeet Sensus User Manual.*

Transmit Mode: 922MHz license free DSSS transmit only based on proprietary Taggle Byron chip.

Data Storage: The endpoint stores the last transmitted reading on memory.

Transmitted Message: The Parakeet Sensus transmits its unique serial number, meter reading data, and relevant status indicators from the water meter. Each message is encrypted using AES-256 and sent to the Taggle Receiver Network via Virtual Private Network to the Taggle Cloud.

Taggle Parakeet Sensus Device with 3-pin Nicor connector

Application

Configurations: The endpoint is multipurpose and can be deployed in indoor, outdoor and pit applications. Electronics and battery assembly are fully encapsulated in epoxy for environmental integrity.

The housing has been engineered to withstand harsh environments and protect the electronics from direct sunlight and water ingress.

Meter/Encoder Compatibility: Sensus protocol enabled positive displacement meters with compatible encoder; outputting electronic meter readings via wire or 3-pin Nicor connector.

Leak Detection: The Parakeet Sensus forwards hourly messages to the Taggle Cloud where analytics are performed to accurately detect leaks.

Features

Communication type	One-way
Application type	Monitor
Reading interval type	Hourly reading intervals delivered hourly
Battery indication	✓
Tamper indication	✓
Firmware Upgrades	✓