

# RFID for Chicken

## Reseller


| Company                   | Location | SDK                             | Chip Series | Remarks       |
|---------------------------|----------|---------------------------------|-------------|---------------|
| FONKAN                    | Shenzhen | SDK not publically downloadable |             |               |
| INVELION                  | Shenzhen | SDK downloadable                |             |               |
| CHAFON                    | Shenzehn | SDK downloadable                |             | pw: chafonsdk |
| Chicken Wing Tags Plastic |          | Made-in-China                   |             |               |
| Marc RFID Store           |          | Aliexpress                      |             |               |

| Chip        | Product Link   | Company |
|-------------|--|---------|
| E710        | <a href="#">Impinj E710 Reader Chip Product Brief</a>                                | impinj  |
| Ennn Series | <a href="#">Impinj E910, E710, E510, and E310 RAIN RFID Reader Chip Datasheet v4</a> | impinj  |

- Press Release on Ennn SDK:  
<https://www.impinj.com/library/blog/speed-up-device-development-with-impinj-e-family-firmware-and-sdk-v20>

## Chafon Products

| Purchased | Product  | Chip | Company | Speed            | Price  | Datasheets                   |
|-----------|--|------|---------|------------------|--------|------------------------------|
|           | <a href="#">CF811 Even UHF eight-channel Fixed Reader</a>  |      | Chafon  | 200 tags per sec | USD180 | <a href="#">cf811_en.pdf</a> |
|           | <a href="#">CF815 Even E710 UHF four-channel Fixed Reader</a>  | E710 | Chafon  | 800 tags per sec | USD195 | <a href="#">cf815_en.pdf</a> |
| 😊         | <a href="#">CF816 Even E710 UHF eight-channel (mux) Fixed Reader</a><br><br>16.4*13.5*2.6cm | E710 | Chafon  | 800 tags per sec | USD240 | <a href="#">cf816_en.pdf</a> |
|           | <a href="#">CF800 OS UHF 8 ports fixed reader</a>  |      | Chafon  | 800 tags per sec | USD380 | <a href="#">cf800_en.pdf</a> |

| Purchased | Product  | Chip | Company | Speed            | Price   | Datasheets                       |
|-----------|--|------|---------|------------------|---------|----------------------------------|
|           | <a href="#">CF-RA8080 UHF RFID ceramic antenna</a>   |      | Chafon  | 3-4m read range  | USD20   | <a href="#">cf-ra8080_en.pdf</a> |
| 😊         | <a href="#">CF-RA5005 UHF 5dBi Counter Antenna</a><br><br>PCB size: 12*12cm<br>Antenna coax cable: 3 meters |      | Chafon  |                  | USD27.5 | <a href="#">cf-ra5005_cn.pdf</a> |
|           | <a href="#">CF-RA6005 UHF Narrow Angle Beam Antenna</a>  |      | Chafon  |                  |         | <a href="#">cf-ra6005_cn.pdf</a> |
| 😊         | <a href="#">CF661 Prime UHF 6dbi integrated reader</a>   |      | Chafon  | 200 tags per sec | USD80   | <a href="#">cf661_en.pdf</a>     |

## CF816 Multiplexing

- ~0.4s one cycle (Start from port1 to port8)

My suggestion is to buy **CF816** Fixed reader. **CF816** and **CF811** are basically the same, the main difference is that **CF816** is using impinj E710 chip, which is more sensitive in reading and has a higher reading speed. **CF816** also has more API commands than **CF811**.

**CF800** is also using impinj E710 chip and has Android operating system additionally, which I think is not necessary to us. The API of the **CF816** and **CF800** are the same.

And buying two to four **CF-RA8080** UHF RFID ceramic antennas to use with the Fixed reader, The gate size of the chicken house is around 30cm height and 27cm width. The ceramic has a size of 80\*80\*5mm, with circular polarization, its reading angle is 60 degrees forward. So it is possible to cover the gate size. But we can also go for a PCB antenna. For PCB antennas, I suggest **CF-RA5005** UHF 5dBi Counter Antenna, also with circular polarization (120\*120\*6.5mm).



Fig.1 CF-RA8080 (Left) CF-RA5005 (Right)

**CF-RA6005** UHF Narrow Angle Beam Antenna fits the gate width perfectly, but it is not waterproof.

And two **CF661** integrated readers, with a read range 0-6 meters. Prime reader and Fast reader are using the same SDK.

## Wing Tags

|   | Seller                                  | Wing Tags   |   |
|---|---|---|---|
| 1 | <a href="#">Game and Poultry</a>        | <a href="#">game_poultry_2022_flyer.pdf</a>   | <a href="#">game_poultry_catalogue_2025_euro_direct_-_english.pdf</a> |
| 2 |   | <a href="#">Wonderband</a>  |   |
| 3 |   | <a href="#">CCC Tag</a>   |   |
| 4 |   | <a href="#">Offset CCT Tag</a>  |   |
| 5 | <a href="#">Marc RFID Store</a>         |   |   |
| 6 | <a href="#">water washing tags</a>      |   |   |
| 7 | <a href="#">RFID UHF foot ring tags</a> |   |   |
| 8 | <a href="#">Made-in-China</a>           |  |   |

|    |                             |   |   |
|----|-----------------------------|---|---|
| 9  | Made-in-China Customization |    |   |
| 10 | Caisley                     |   |   |
| 11 | National Band & Tag Company | <p style="text-align: center;">893-3</p>  <p style="text-align: center;">Jiffy Style Wing Tags</p> |  <p><b>Video</b></p> <p>Wing Banding Directions - National Band &amp; Tag Company (<a href="#">YouTube</a>)</p> |

### How to Mount Wing Tags to Little Chicks













**Video**

How to place Jiffy style wing bands on chicks - Darrel Millen ([YouTube](#))

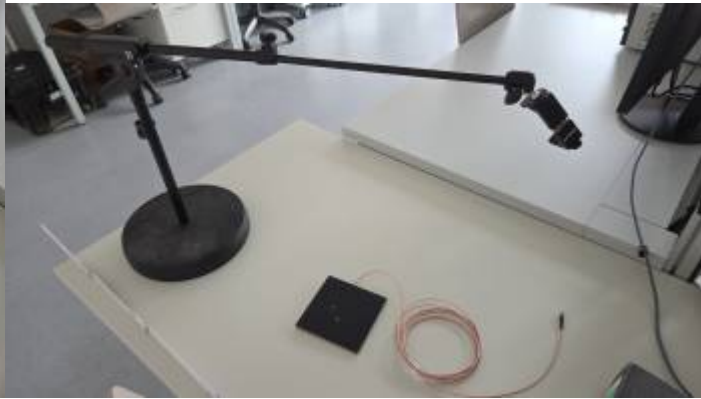
### UHF RFID tags set of various size

|  |                                     |
|--|-------------------------------------|
| 860-960MHz ISO18000-6C UHF RFID tags samples 10pcs per kind *10kinds   |                                     |
| 10PCS Sample Long Range 1-12M RFID UHF Tags Wet Inlay Adhesive Sticker EPC Gen2 6C 860-960Mhz For Asset Tracking Inventory |                                     |
| Passive UHF RFID Anti Metal Sticker 18000-6c Ultra Thin RFID Metal Sticker Tag for Asset Tracking Management               |                                     |
| 10PCS Long Range RFID UHF Tags Sticker Wet Inlay 860-960mhz Alien U7 EPC Global Gen2 ISO18000-6C                           |                                     |
| 860-960MHz ISO18000-6C UHF RFID anti metal tags RFID passive cards   |                                     |
| Hitachi UHF Ultra Small Package Tag (2.5mm x 2.5mm)  | <a href="#">hitachi_pkg_tag.pdf</a> |
| Mini-UHF-RFID 8mm ø  |                                     |

# Tags size/range comparison CF816

| Tag Type | Tag Photo   | size            | range (CF816)  | range (CF661)  | conditions   |
|----------|---|-----------------|--|--|--|
| 1        |    | 7,08 *<br>1,6mm | 0-3mm  | ~  | few mm only at the edge of the antenna   |
| 2.1      |    | 12,28mm<br>ø    | <br>45cm     | <br>37cm    | Less curved surface  |
| 2.2      |   | 12,28mm<br>ø    | <br>14cm     | <br>14cm    | 14cm for the more curved surface was measured in the condition that pointing the tag either to right or left. And the detection was very bad when pointing the tag upward or downward. |
| 3        |  | 4 *<br>95,5mm   | <br>~180cm | <br>~99cm | warpped to a surface area of 17mm * 9.22mm   |

## Mounting for antennas



25 cm diameter for the base  
44 cm height including base  
44-74 cm for the arm





| Product   | Seller         | Material    | Price      | number of Arms | length can hold |
|---|----------------|-------------|------------|----------------|-----------------|
| <a href="#">OHLPRO Heavy Duty Drilling Base Tablet Holder</a> | Amazon         | Plastic     | €23.99     | 1-3            | unclear         |
| <a href="#">OHLPRO Tablet Holder Car Holder</a>               | Amazon         | ABS Plastic | €24.99     | 2-3            | 11.7cm-23.5cm   |
| <a href="#">Mobile Phone Wall Mount</a>                       | Amazon         | ABS plastic | €23.99     | 2              | 5.5cm-8.5cm     |
| <a href="#">Czemo Gooseneck Tablet Holder</a>                 | Amazon         | ABS plastic |            |                |                 |
| <a href="#">K&amp;M 232BK Table Microphone Stand</a>          | Thomann        |             | €25        |                |                 |
| <a href="#">Roadworx Tablet Clamp</a>                         | Thomann        |             | €10.50     |                |                 |
| <a href="#">Roadworx Spacer 200</a>                           | Thomann        |             | €7.50      |                |                 |
| <a href="#">Roadworx Universal Ball Joint</a>                 | Thomann        |             | €12.90     |                |                 |
| <b>K&amp;M 25960</b>  | <b>Thomann</b> |             | <b>€56</b> |                |                 |

## Mini PC/ Router

|         | Product                                 | Company   | Datasheet  | Quick start guide          |
|---------|---|-----------|--|----------------------------|
| Router  | <a href="#">Teltonika RUT956</a>        | Teltonika | <a href="#">717017-rut956-datasheet-2024-v11.pdf</a> | <a href="#">QSG RUT956</a> |
| Mini PC | <a href="#">NiPoGi AK1 Plus mini PC</a> | NIPOGI    |  |                            |

## RUT956 setup

## Adapterkabel USB auf Seriell RS232

[UT232R-500](#) | [ut232r-500.pdf](#)

## Location



<https://maps.app.goo.gl/hS5ABpBWNq8r5ujq9>

## Geometry

Dicke der Außenwand ca. 30 cm.

Abstand der Klappen

Stall 1

1 zu 2: 1,60 m

2 zu 3: 5 m

3 zu 4: 3,56 m

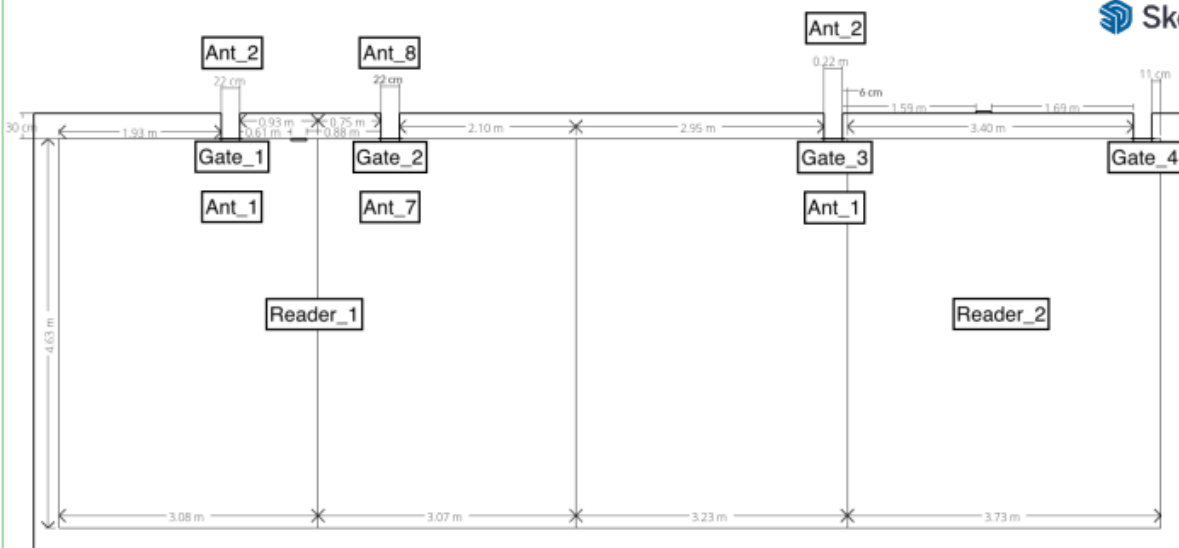
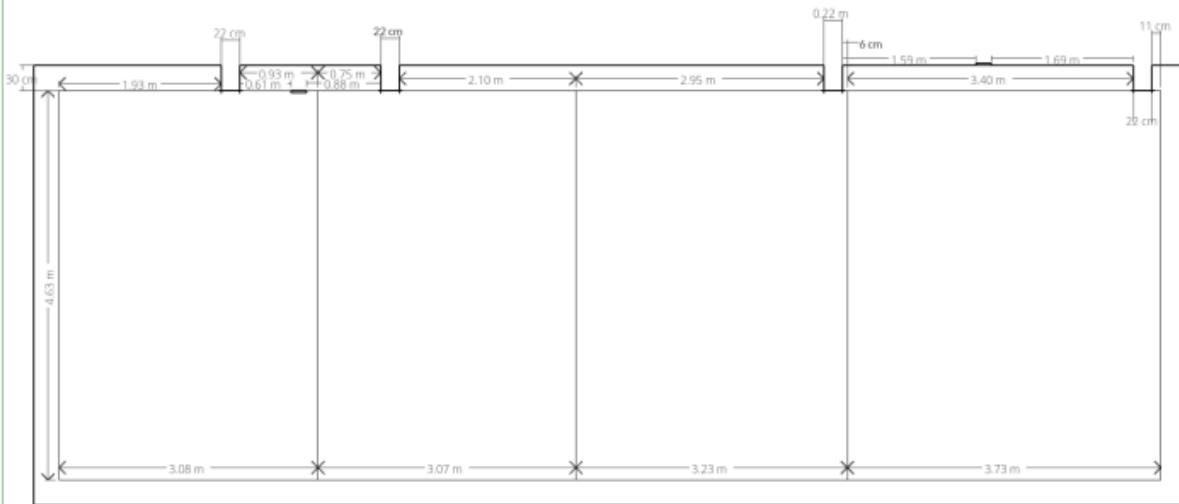
Stall 2

5 zu 6: 2,48 m

6 zu 7: 1,28 m

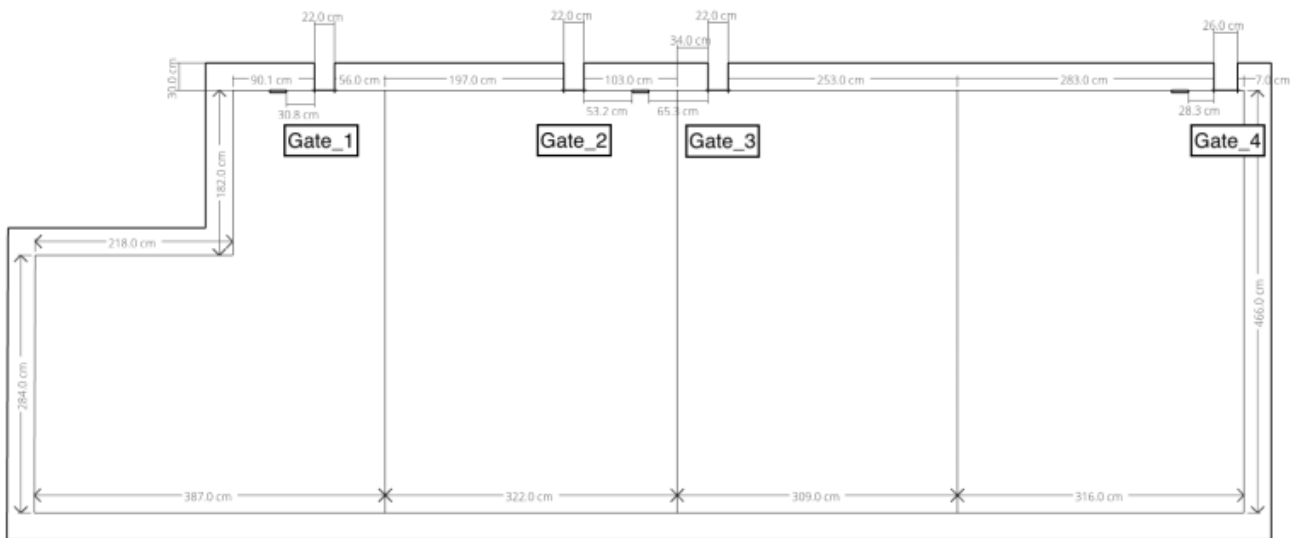
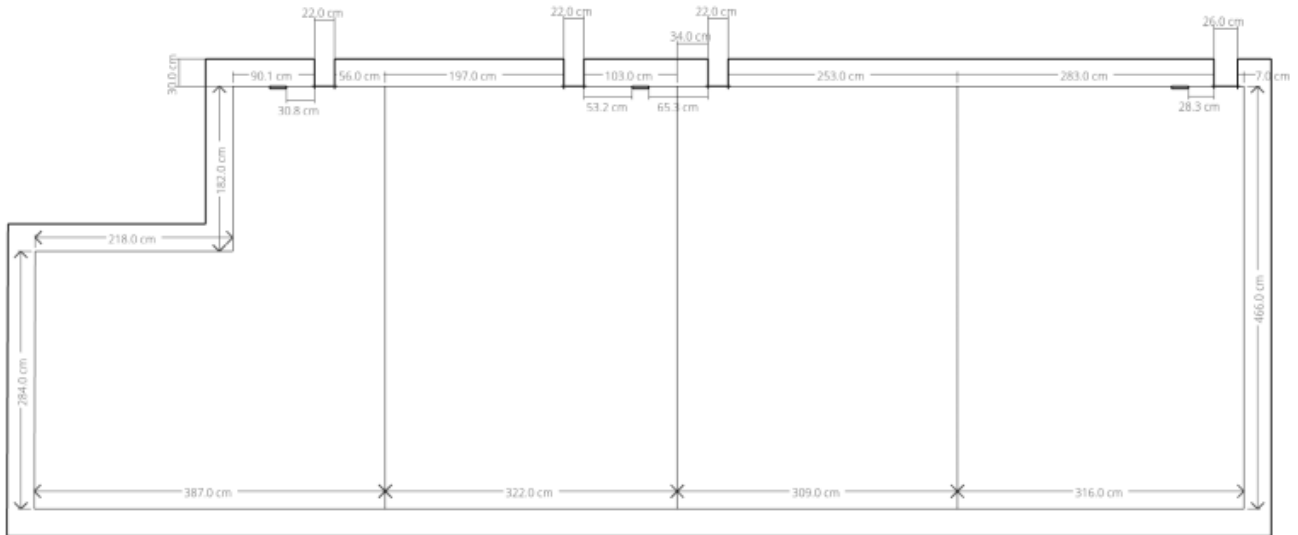
7 zu 8: 5,20 m

## Chicken coop 1





## Chicken coop 2





## Wall





### Kalisto Test



Tag is mounted from outer part of the wing to inner part as shown on the right. The rfid tag is faced

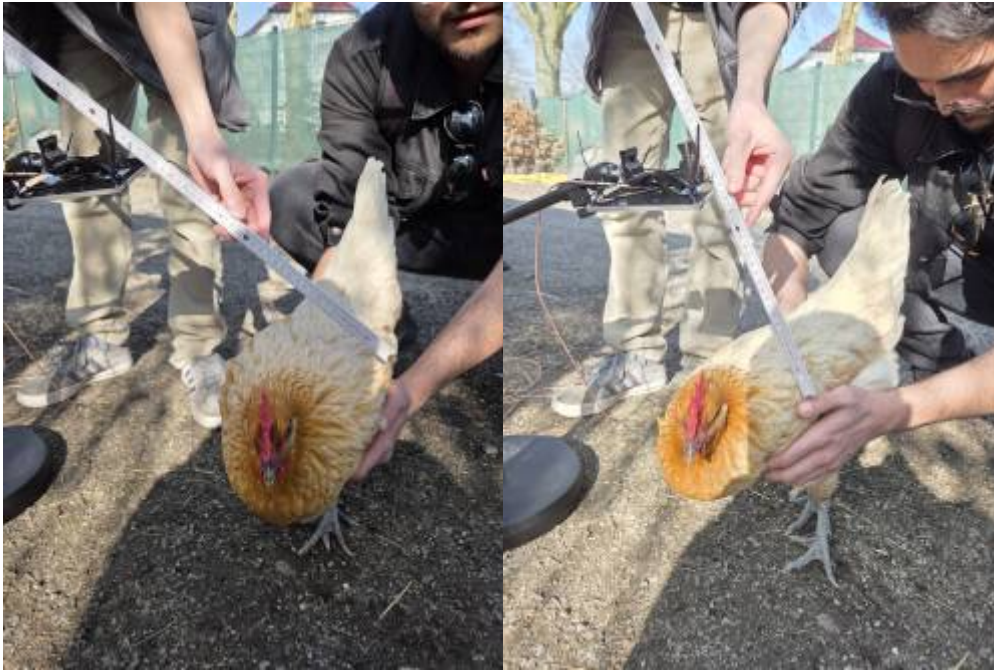
outside



Approximate of 24 cm height of the rfid tag from the ground



Antenna placed horizontally at 50 cm height on the ground able to read the rfid tag reliably. Antenna was then lifted up to at most 100 cm and still able to read the rfid tag (read range approximately 25-70cm).



33 cm read range from the side of the antenna



44 cm read range with antenna tested from tilted 35 to 45°

## Installation on 14.05.2025

### OpenVpn

PiVPN

RUT956 Config - VPN

```
sudo nano /etc/openvpn/ccd/Router956-Chicken  
--> iroute 192.168.1.0 255.255.255.0
```

```
sudo nano /etc/openvpn/server.conf  
--> route 192.168.1.0 255.255.255.0  
--> push "route 192.168.1.0 255.255.255.0"
```

```
sudo systemctl restart openvpn
```

## More informations about wing band/tags

- [Kevin J.McGowan's Crow study](#)
- [Jane Robinson \(2022\): RFID in Turkey Breeding: A better path to progress](#)
- [GPS Pigeon Tracking Ring](#)
- [Friends of Red Kites in the North East of England](#)
- [Phil Littler and John Middleton \(2014\): Marsh Harriers strike out across Europe](#)
- [Rogier Poultry Supplies: Leg Bands, Wing Bands, and Zip Ties](#)

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