RFID for Chicken

Data

http://45.157.177.232:3000/login

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	Impinj E710 Reader Chip Product Brief	impinj
Ennn Series	Impinj E910, E710, E510, and E310 RAIN RFID Reader Chip Datasheet v4	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
	CF811 Even UHF eight-channel Fixed Reader		Chafon	200 tags per sec	USD180	cf811_en.pdf
	CF815 Even E710 UHF four-channel Fixed Reader	E710	Chafon	800 tags per sec	USD195	cf815_en.pdf
🙂	CF816 Even E710 UHF eight-channel (mux) Fixed Reader  16.4*13.5*2.6cm	E710	Chafon	800 tags per sec	USD240	cf816_en.pdf

Purchased	Product	Chip	Company	Speed	Price	Datasheets
	CF800 OS UHF 8 ports fixed reader		Chafon	800 tags per sec	USD380	cf800_en.pdf
	CF-RA8080 UHF RFID ceramic antenna		Chafon	3-4m read range	USD20	cf-ra8080_en.pdf
🙂	CF-RA5005 UHF 5dBi Counter Antenna  PCB size: 12*12cm Antenna coax cable: 3 meters		Chafon		USD27.5	cf-ra5005_cn.pdf
	CF-RA6005 UHF Narrow Angle Beam Antenna		Chafon			cf-ra6005_cn.pdf
🙂	CF661 Prime UHF 6dbi integrated reader		Chafon	200 tags per sec	USD80	cf661_en.pdf

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).

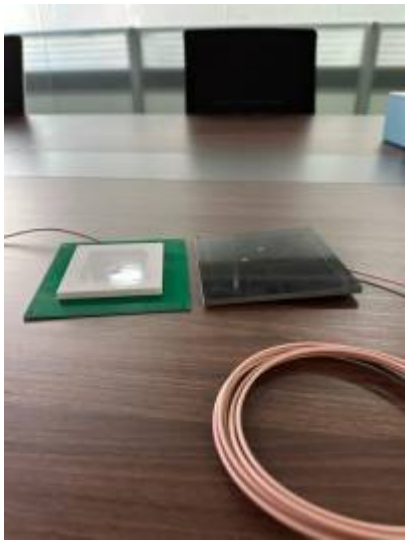


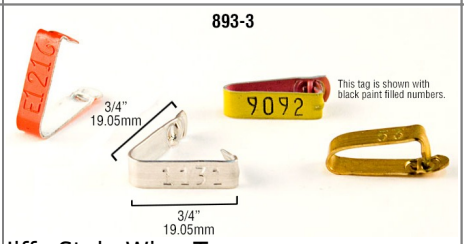
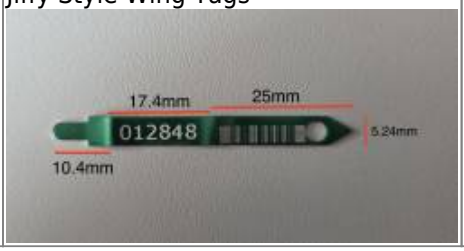
Fig.1 CF-RA8080 (Left) CF-RA5005 (Right)

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	Game and Poultry	game_poultry_2022_flyer.pdf	game_poultry_catalogue_2025_euro_direct_-_english.pdf
2		Wonderband	
3		CCC Tag	
4		Offset CCT Tag	
5	Marc RFID Store		
6	water washing tags		
7	RFID UHF foot ring tags		
8	Made-in-China		

9	Made-in-China Customization		
10	Caisley		
11	National Band & Tag Company	 Jiffy Style Wing Tags 	 Video Wing Banding Directions - National Band & Tag Company (YouTube)

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 Managament	
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)	hitachi_pkg_tag.pdf
Mini-UHF-RFID 8mm ⌀	

Tags size/range comparison CF816

Tag Type	Tag Photo	size	range (CF816)	range (CF661)	conditions
1		7,08 * 1,6mm	0-3mm	~	few mm only at the edge of the antenna
2.1		12,28mm ø	 45cm	 37cm	Less curved surface
2.2		12,28mm ø	 14cm	 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 * 95,5mm	 ~180cm	 ~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
OHLPRO Heavy Duty Drilling Base Tablet Holder	Amazon	Plastic	€23.99	1-3	unclear
OHLPRO Tablet Holder Car Holder	Amazon	ABS Plastic	€24.99	2-3	11.7cm-23.5cm
Mobile Phone Wall Mount	Amazon	ABS plastic	€23.99	2	5.5cm-8.5cm
Czemo Gooseneck Tablet Holder	Amazon	ABS plastic			
K&M 232BK Table Microphone Stand	Thomann		€25		
Roadworx Tablet Clamp	Thomann		€10.50		
Roadworx Spacer 200	Thomann		€7.50		
Roadworx Universal Ball Joint	Thomann		€12.90		
K&M 25960	**Thomann**		**€56**		

Mini PC/ Router

	Product	Company	Datasheet	Quick start guide
Router	Teltonika RUT956	Teltonika	717017-rut956-datasheet-2024-v11.pdf	QSG RUT956
Mini PC	NiPoGi AK1 Plus mini PC	NIPOGI		

RUT956 setup

Adapterkabel USB auf Seriell RS232

UT232R-500	ut232r-500.pdf

Location

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

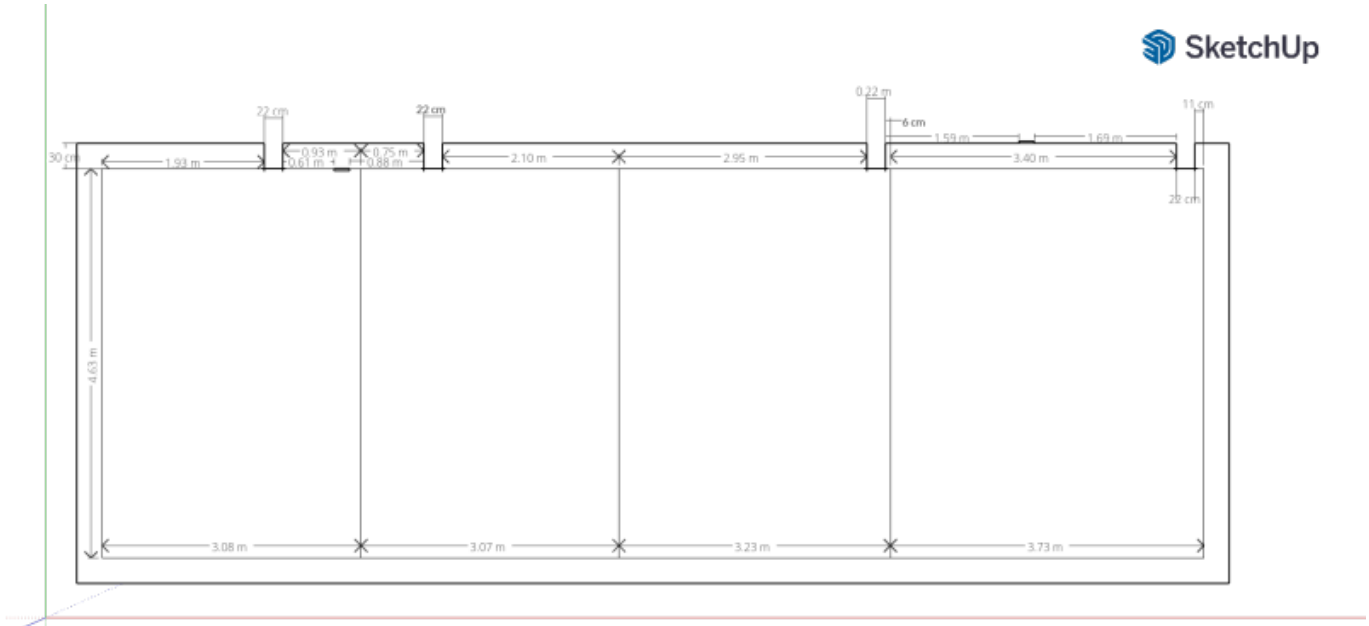
Geometry

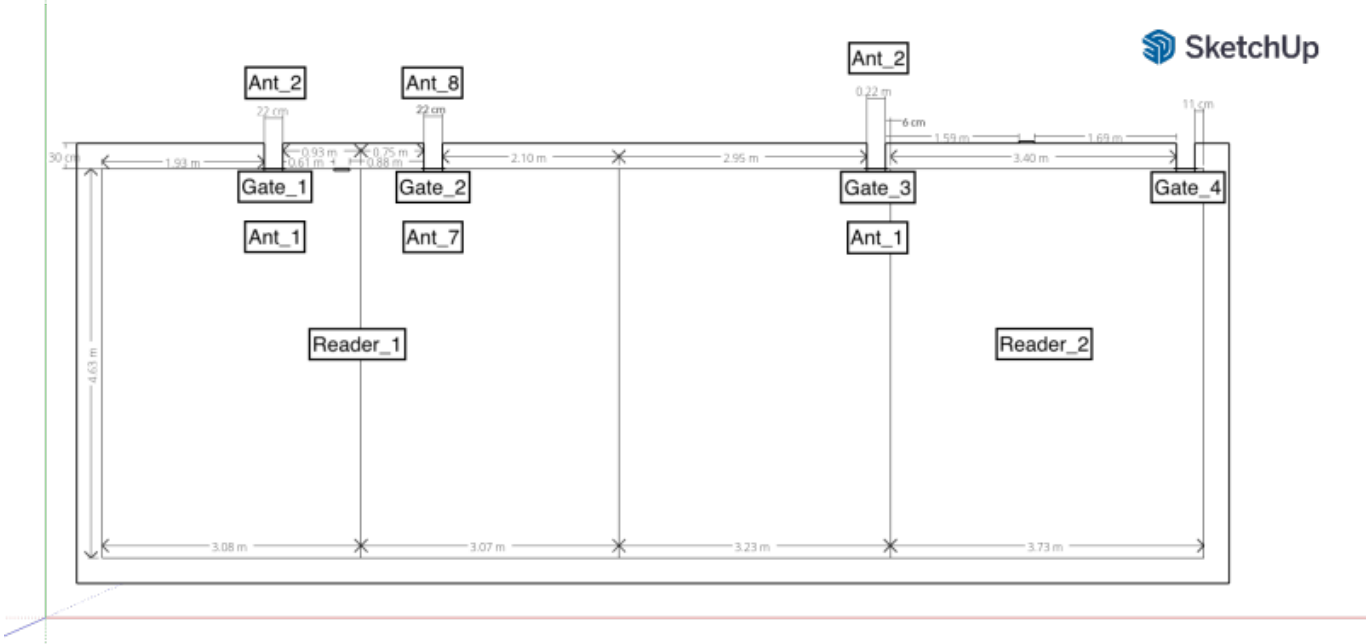
Dicke der Außenwand ca. 30 cm.
Abstand der Klappen

Stall 1
1 zu 2: 1,60 m
2 zu 3: 5 m
3 zu 4: 3,56 m

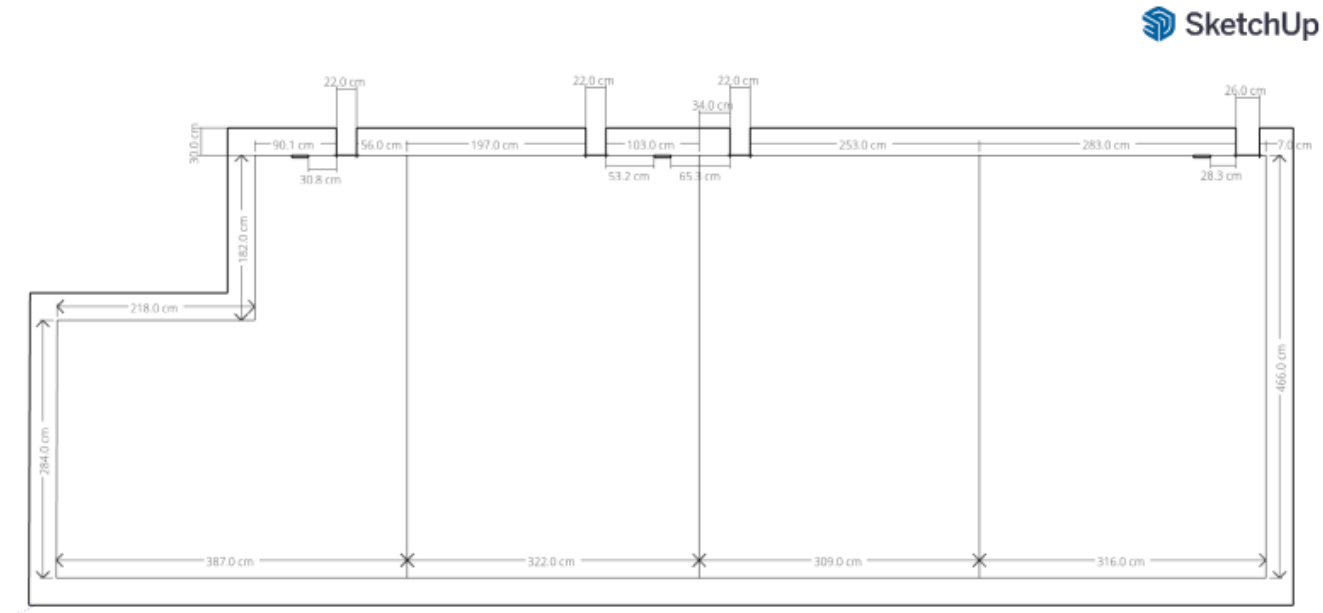
Stall 2
5 zu 6: 2,48 m
6 zu 7: 1,28 m
7 zu 8: 5,20 m

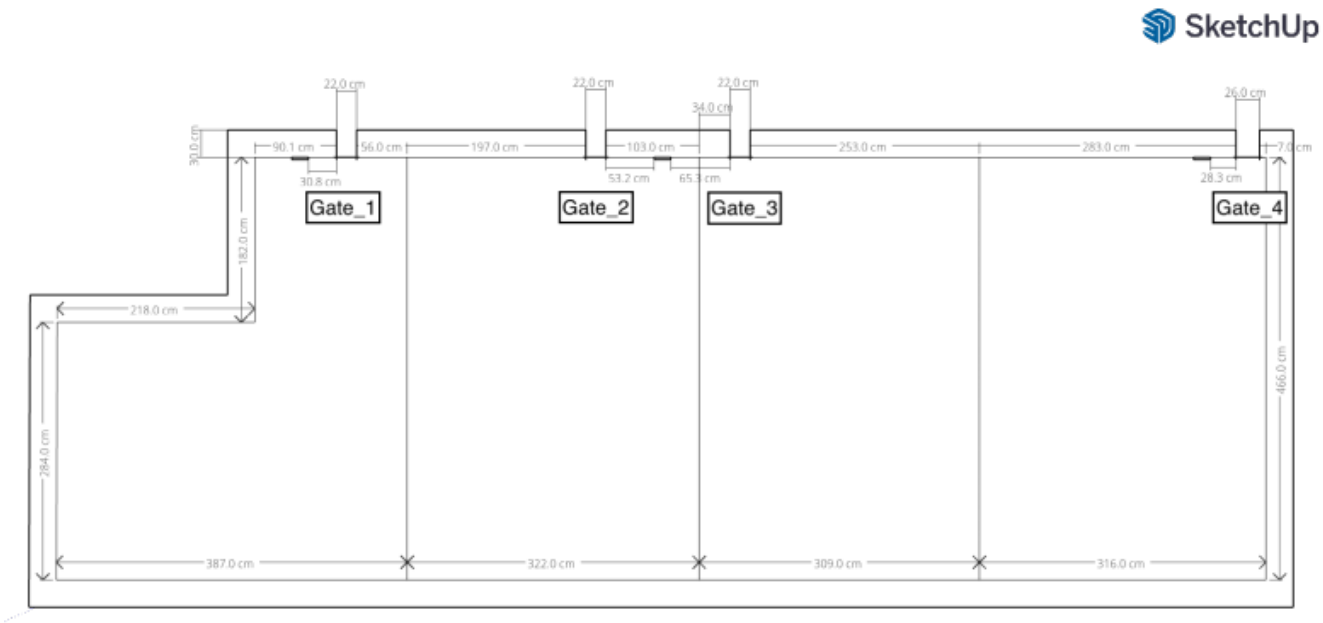
Chicken coop 1


SketchUp
22 cm
22 cm
0.22 m
6 cm
11 cm
30 cm
1.93 m
0.93 m
0.61 m
0.75 m
0.88 m
2.10 m
2.95 m
1.59 m
1.69 m
3.40 m
20 cm
4.63 m
3.08 m
3.07 m
3.23 m
3.73 m


SketchUp
Ant_2
Ant_8
Ant_2
Gate_1
Gate_2
Gate_3
Gate_4
Ant_1
Ant_7
Ant_1
Reader_1
Reader_2
4.63 m
3.08 m
3.07 m
3.23 m
3.73 m

Chicken coop 2


SketchUp
22.0 cm
22.0 cm
22.0 cm
34.0 cm
26.0 cm
30.0 cm
90.1 cm
56.0 cm
197.0 cm
103.0 cm
253.0 cm
283.0 cm
7.0 cm
30.8 cm
53.2 cm
65.3 cm
28.3 cm
182.0 cm
218.0 cm
284.0 cm
466.0 cm
387.0 cm
322.0 cm
309.0 cm
316.0 cm


SketchUp
22.0 cm
22.0 cm
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34.0 cm
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197.0 cm
103.0 cm
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7.0 cm
30.8 cm
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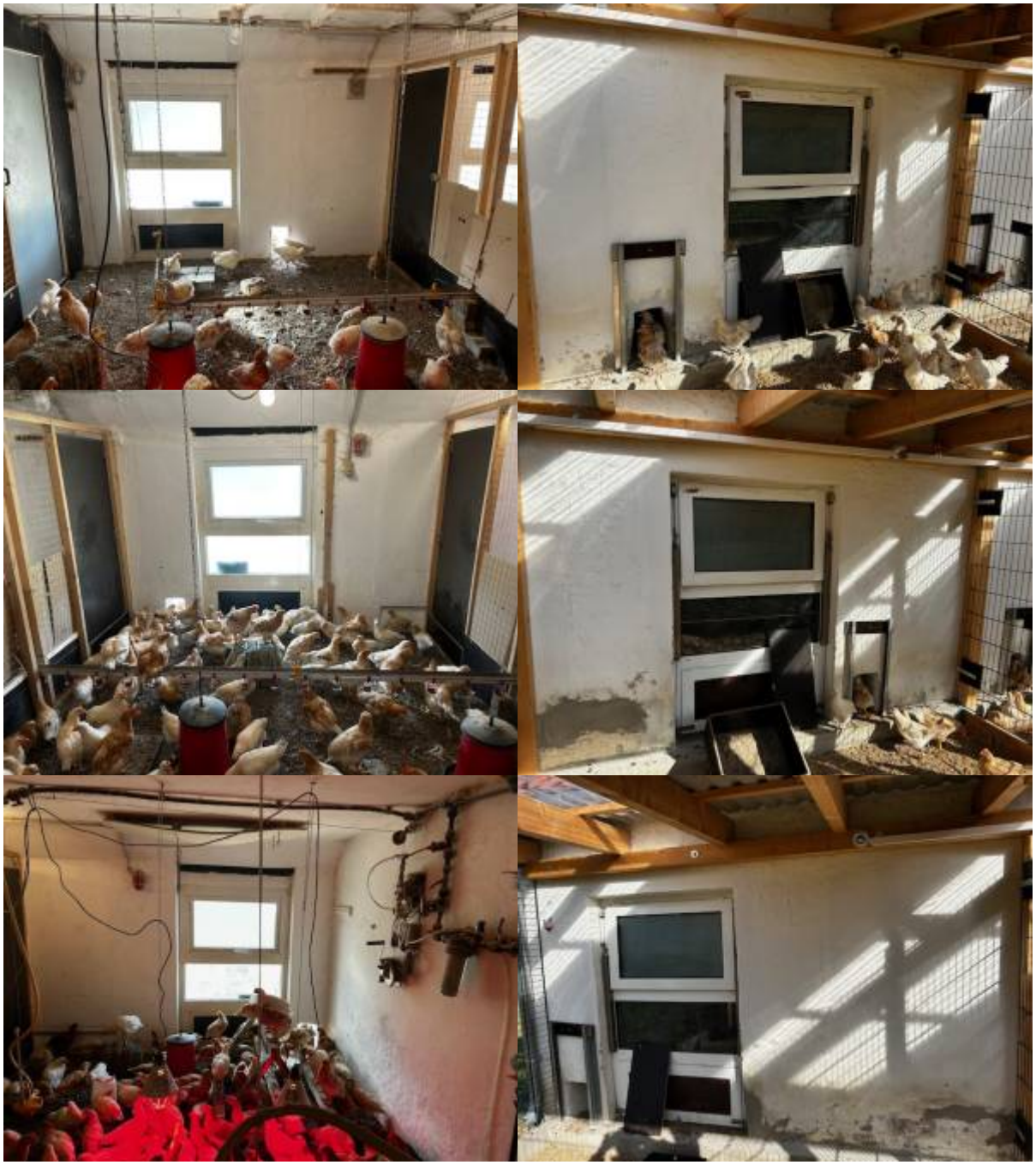
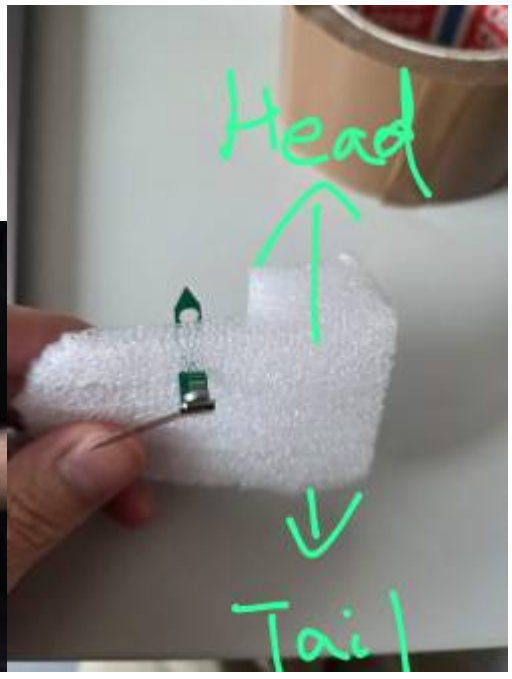
28.3 cm
Gate_1
Gate_2
Gate_3
Gate_4
182.0 cm
218.0 cm
284.0 cm
466.0 cm
387.0 cm
322.0 cm
309.0 cm
316.0 cm



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 rifd 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 45º

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
```

systemd

```
sudo nano /etc/systemd/system/reader1.service
```

```
[Unit]
Description=RFID Reader 1
After=network-online.target
Wants=network-online.target

[Service]
Type=simple
User=chicken_2
WorkingDirectory=/home/chicken_2/Documents/Reader_online
ExecStart=/home/chicken_2/Documents/Reader_online/chicken/bin/python \
  /home/chicken_2/Documents/Reader_online/reader1.py \
  --port /dev/ttyUSB0 \
  --power 30 \
  --antennas 1,2,7,8 \
  --interval 0.1
Restart=always
RestartSec=5
StandardOutput=append:/home/chicken_2/Documents/Reader_online/reader1_stdout
.log
StandardError=append:/home/chicken_2/Documents/Reader_online/reader1_stderr.
log

[Install]
WantedBy=default.target
```

```
sudo systemctl daemon-reexec
sudo systemctl daemon-reload
sudo systemctl enable myscript.service
sudo systemctl start myscript.service
```

Stop systemctl

```
sudo systemctl stop reader1.service
```

```
sudo nano /etc/systemd/system/reader1.service
```

```
sudo systemctl daemon-reload
```

```
sudo systemctl start reader1.service
```

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