

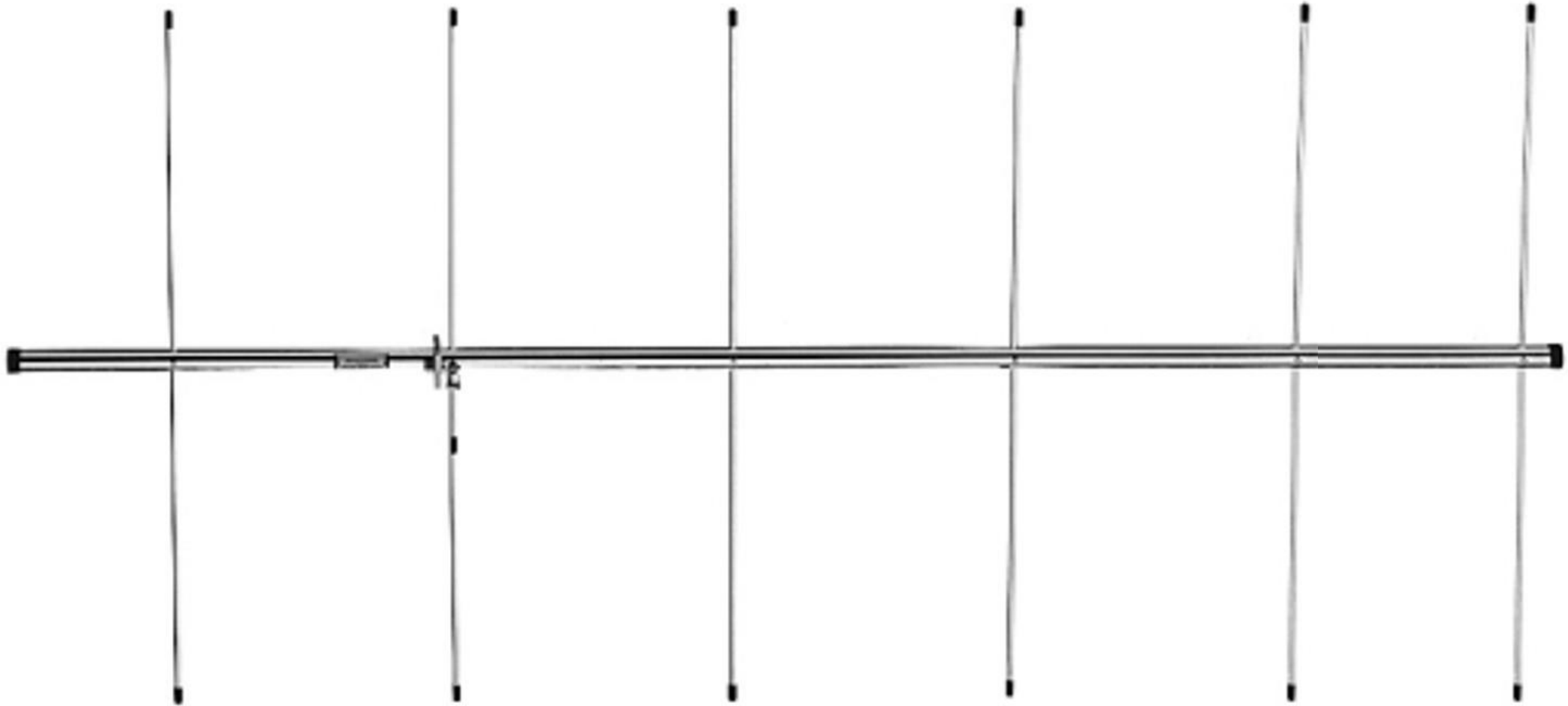
# Aspectos técnicos para la práctica de la instalación de una estación Motus

Technical aspects for the practical installation of a Motus station



# Equipo 1 - Armado de antenna

Team 1 - Antenna assembly



**Producto esperado**  
Expected product

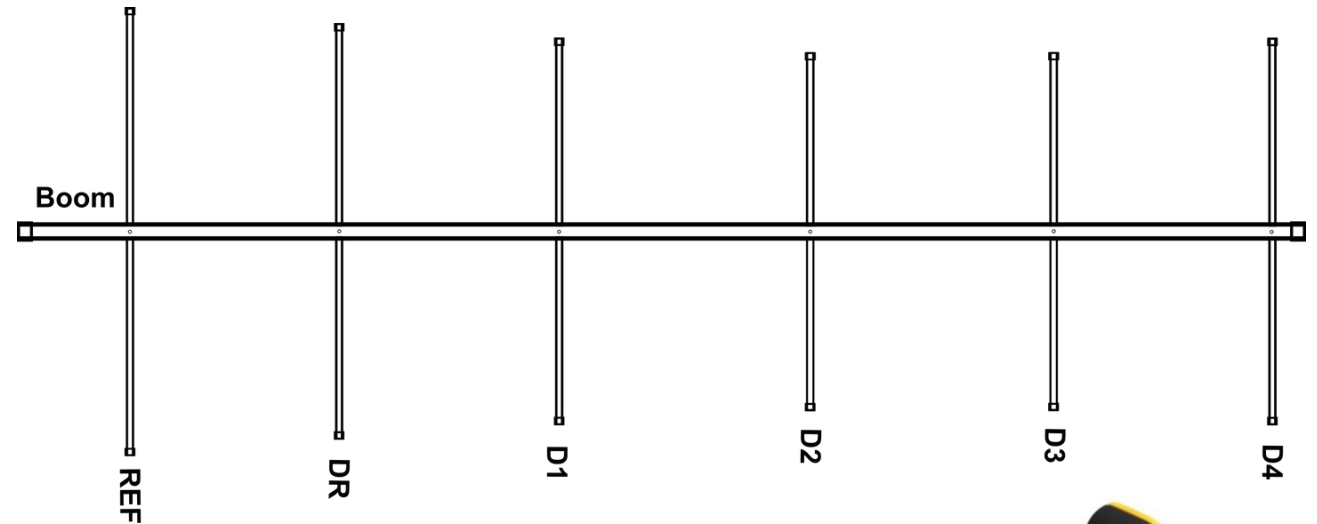
# Equipo 1 - Armado de antenna

## Team 1 - Antenna assembly

### 1.- Corte de elementos

#### 1.- Cutting of elements

| Elemento | Longitud deseada (cm) | Longitud de corte por cada extremo (cm) |
|----------|-----------------------|---|
| REF      | 87.5                  | 5.7                                     |
| DR       | 81.6                  | 8.7                                     |
| D1       | 79.7                  | 9.6                                     |
| D2       | 78.2                  | 10.4                                    |
| D3       | 78.2                  | 10.4                                    |
| D4       | 79.7                  | 9.6                                     |



**Cortadores para los elementos de la antenna de 166 MHz**

Tools for cutting the 166 MHz antenna elements

# Equipo 1 - Armado de antenna

## Team 1 - Antenna assembly

### 2.- Instalación de elementos

#### 2.- Elements installation



Autocle para la instalación de los elementos en la antena

Autocle for installation of the elements on the antenna



Tornillería y gama para armado de antena  
166 mHz

### 3.- Ajuste de la orientación del gama

#### 3.- Adjustment of the gamma orientation



Llaves allen

Ajustar la dirección del gama nos permitira evitar un doblez pronunciado en nuestro cable coaxial

Adjusting the direction of the gamma will allow us to avoid a pronounced bend in our coaxial cable.

# Equipo 2 - Armado de cable coaxial

Team 2 – Coaxial cable assembly



**Producto esperado**

Expected product

# Equipo 2 - Armado de cable coaxial

## Team 2 – Coaxial cable assembly

### 1.- Preparar puntas del cable

1.- Preparing the coaxial cable



Multi herramienta para el corte de puntas del cable coaxial

LMR-400 coax cable prep tool

### 2.- Unir conectores al cable coaxial

2.- Attach connectors to the coaxial cable



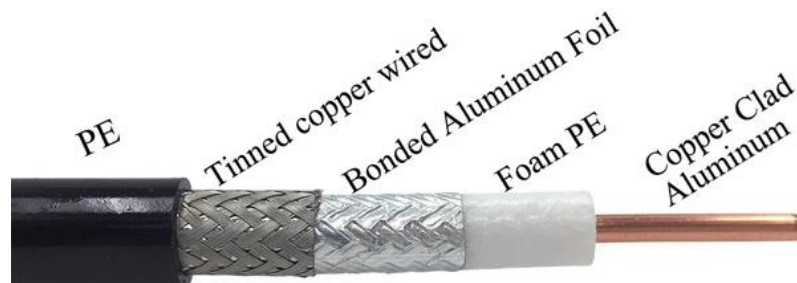
Conectores para cable coaxial

Coax cable connectors



Ponchadora para unir conectores a cable coaxial

Crimp tool



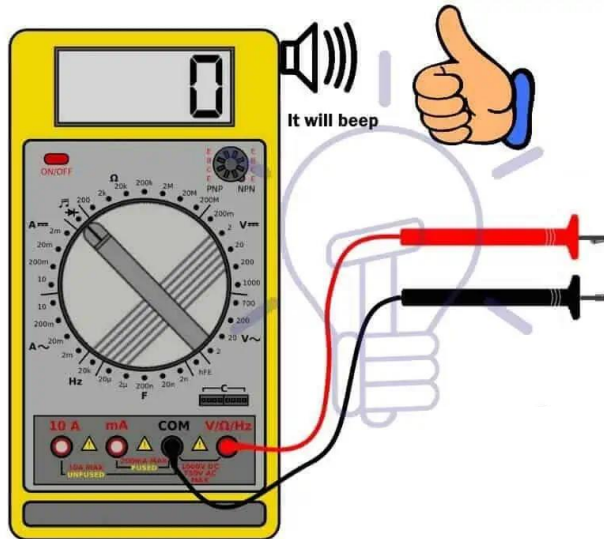
# Equipo 2 - Armado de cable coaxial

## Team 2 – Coaxial cable assembly

### 3.- Prueba de continuidad

#### 3.- Connectivity test

Multímetro



Esto nos confirma que la señal esta siendo transmitida correctamente por el cable.  
This confirms that the signal is being transmitted correctly through the cable.

### 4.- Sellado de conectores al cable coaxial

#### 4.- Sealing of connectors to the coaxial cable



Conector a pin - No conectado  
Connector to pin - Not connected  
Conector a pin - No conectado  
Connector to pin - Not connected  
Pistola de calor

Heat gun

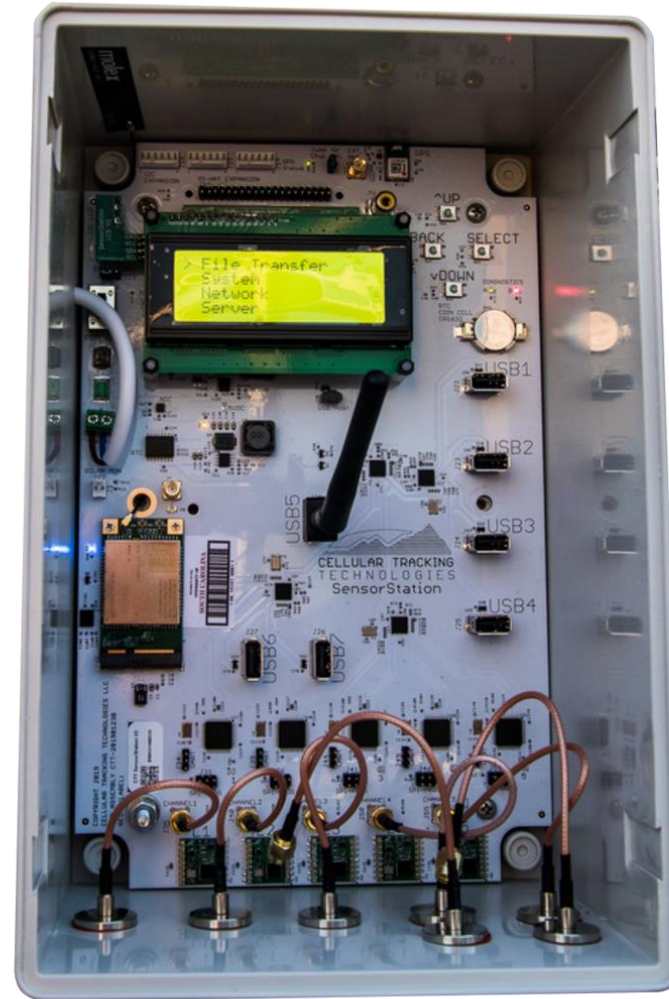
Conectores de nuestro cable coaxial  
Cable coaxial connectors  
Tubo termoretractil  
Heat shrink tubing



Esto evita la entrada de humedad y prolonga la duración de los conectores y el cable coaxial  
This prevents moisture and extends the life of the connectors and coaxial cable.

# Equipo 3 - Armado de gabinete

## Team 3 – Enclosure assembly



**Producto esperado**  
Expected product



# Equipo 3 - Armado de gabinete

## Team 3 – Enclosure assembly

### 1.- Atornillar SensorStation al gabinete

1.- Screw SensorStation to the enclosure



Gabinete para resguardar el  
SensorStation

Enclosure for SensorStation

### 2.- Realizar orificios en la caja para conectores y balastro

2.- Make holes in the box for connectors and ballast



### 3.- Instalar aditamentos

3.- Install attachments



Conectores hembra  
Ant Station  
ors



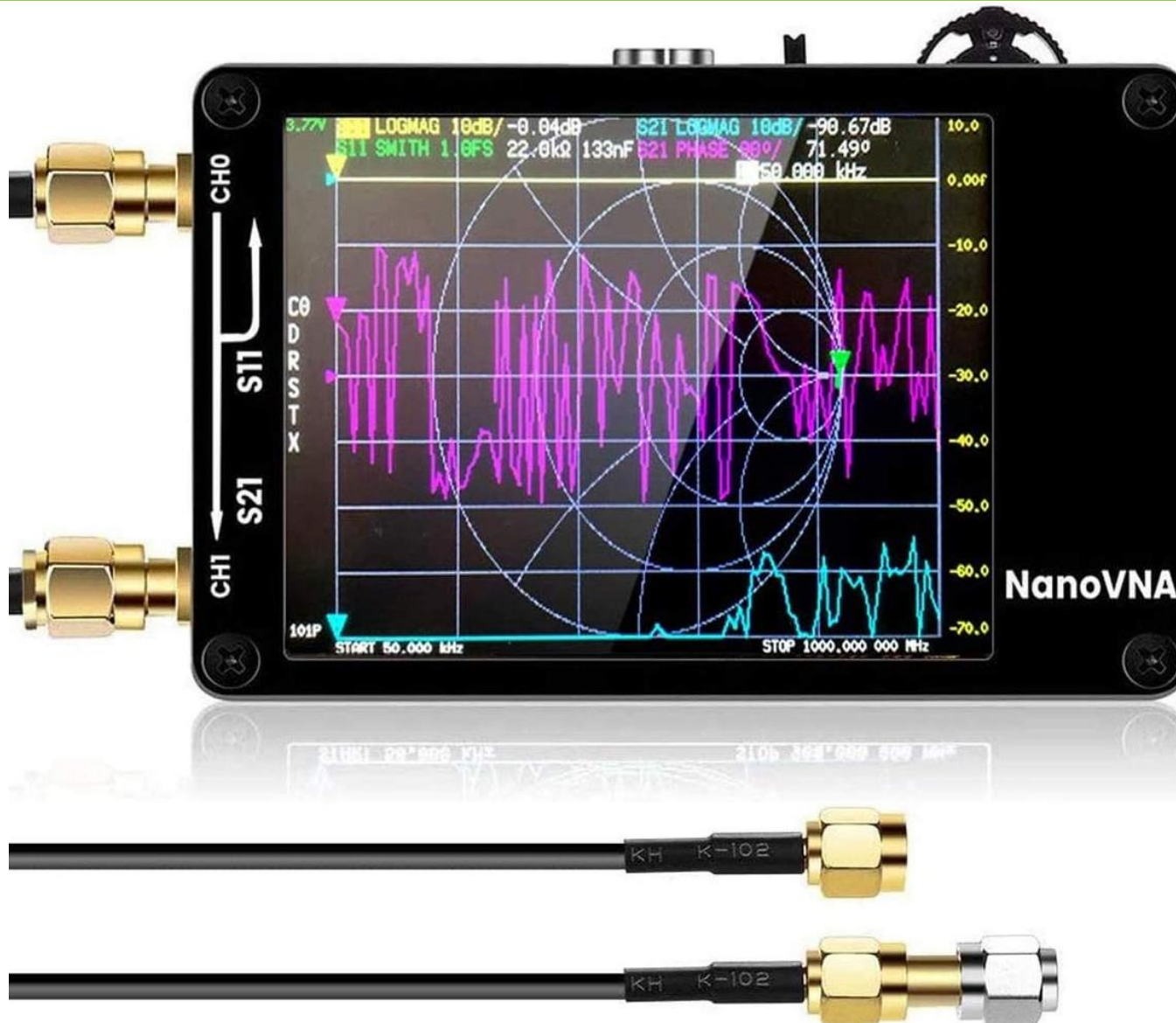
Fiberhome dongle para  
antenas de 166 mHz  
Balastro para dar  
energía a  
SensorStation

Ballast for SensorStation power



# Equipo 4 - Montaje y calibración de antenas

Team 4 - Antenna assembly and calibration



SWR entre 1 y 1.5

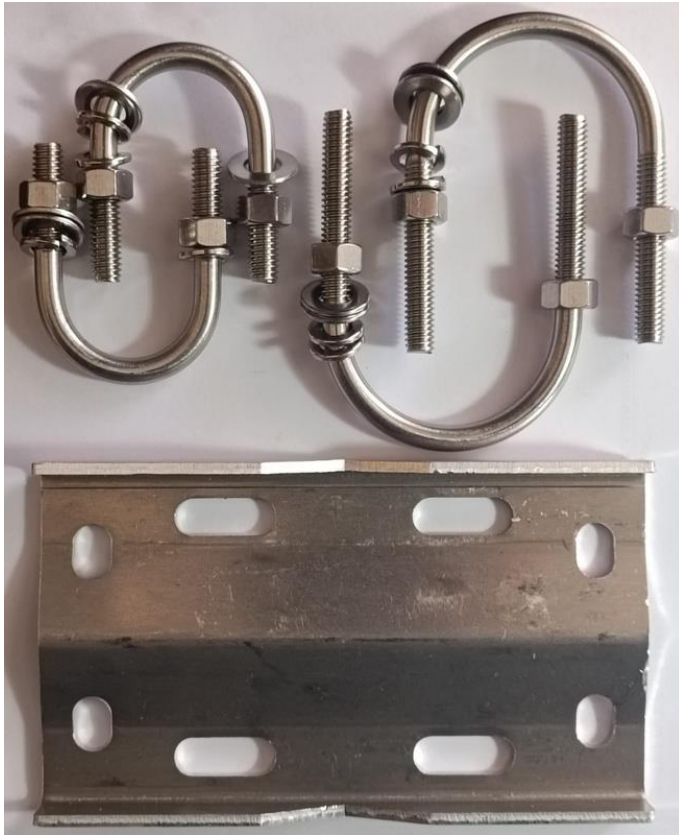
Producto esperado  
Expected product

# Equipo 4 - Montaje y calibración de antenas

## Team 4 - Antenna assembly and calibration

### 1.- Montar antena a estructura

1.- Mount antenna to structure

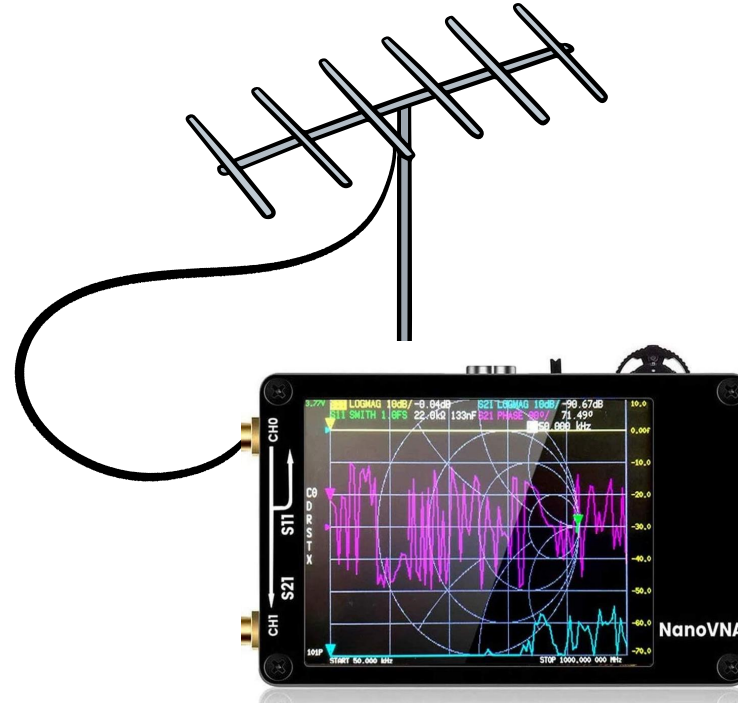


Placa para montar antena en estructura

Antenna mounting plate

### 2.- Programar Nano-VNA y conectar con cable coaxial a antena

2.- Program Nano-VNA and connect with coaxial cable to the antenna.

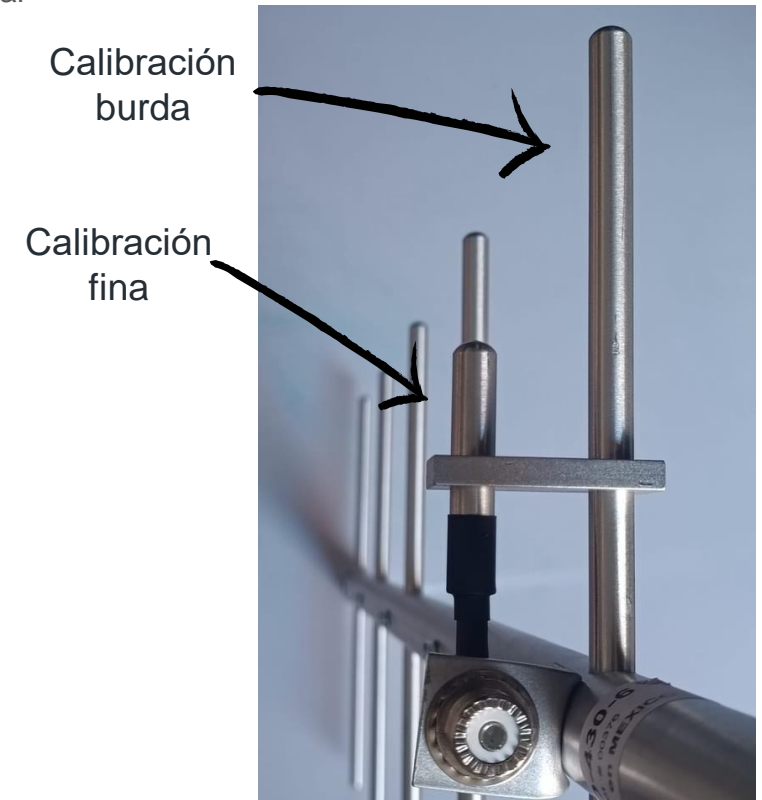


Nano-VNA para la calibración de antenas

Nano-VNA for antenna calibration

### 3.- Ajustar gama SWR deseado entre 1 - 1.5

3.- Set desired SWR range between 1 - 1.5



Gama de antena para calibración

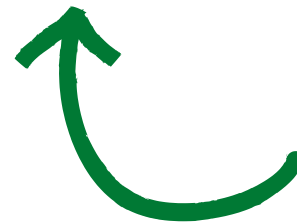
Antenna gamma for calibration

# Do you want a prize?

- Record videos horizontally.
- Videos no longer than 40 seconds.
- Scan the QR code that will take you to a link to upload the recorded videos.



- Graba videos en horizontal.
- Videos no más largos de 40 segundos.
- Escanea el código QR que te llevará a un enlace para subir los videos grabados.

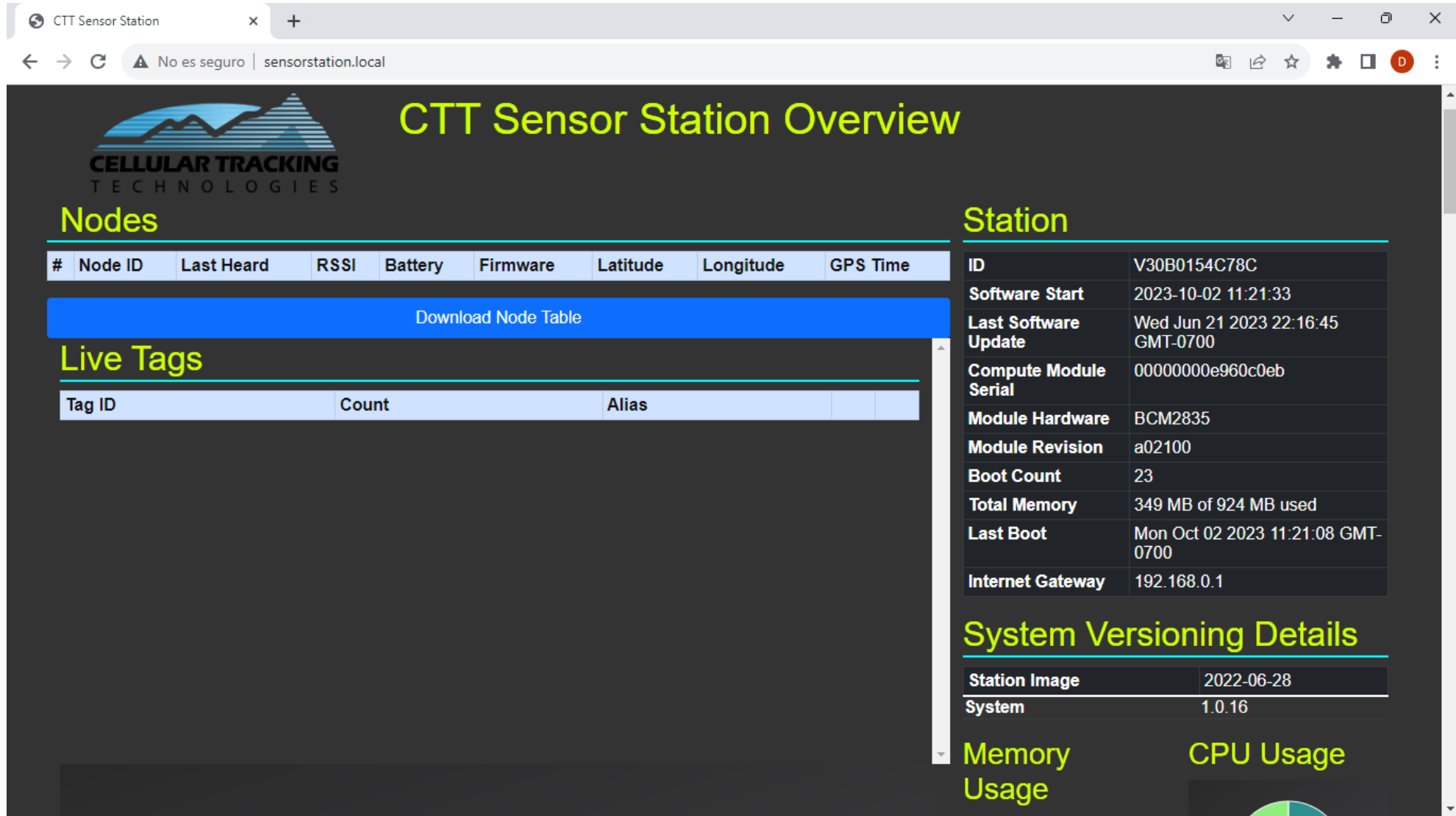


Manos a la obra!!!!  
Let's get to work



# Equipo 5 – Conexión a Sensorstation

## Team 5 – Sensorstation connection



The screenshot shows a web browser window displaying the 'CTT Sensor Station Overview' page. The page features a dark theme with yellow and blue accents. It includes a navigation menu with 'Nodes' and 'Station' sections. The 'Nodes' section contains a table with columns for Node ID, Last Heard, RSSI, Battery, Firmware, Latitude, Longitude, and GPS Time, along with a 'Download Node Table' button. The 'Station' section contains a table with various system details. Below the 'Station' section is a 'System Versioning Details' section with a table for Station Image and System. At the bottom, there are sections for 'Memory Usage' and 'CPU Usage' with corresponding progress indicators.

### CTT Sensor Station Overview

**Nodes**

| #                                   | Node ID | Last Heard | RSSI | Battery | Firmware | Latitude | Longitude | GPS Time |
|-------------------------------------|---------|------------|------|---------|----------|----------|-----------|----------|
| <a href="#">Download Node Table</a> |         |            |      |         |          |          |           |          |

**Live Tags**

| Tag ID | Count | Alias |
|--------|-------|-------|
|--------|-------|-------|

**Station**

|                       |                                   |
|-----------------------|-----------------------------------|
| ID                    | V30B0154C78C                      |
| Software Start        | 2023-10-02 11:21:33               |
| Last Software Update  | Wed Jun 21 2023 22:16:45 GMT-0700 |
| Compute Module Serial | 00000000e960c0eb                  |
| Module Hardware       | BCM2835                           |
| Module Revision       | a02100                            |
| Boot Count            | 23                                |
| Total Memory          | 349 MB of 924 MB used             |
| Last Boot             | Mon Oct 02 2023 11:21:08 GMT-0700 |
| Internet Gateway      | 192.168.0.1                       |

**System Versioning Details**

|               |            |
|---------------|------------|
| Station Image | 2022-06-28 |
| System        | 1.0.16     |

**Memory Usage**

**CPU Usage**

# Equipo 5 – Conexión a Sensorstation

## Team 5 – Sensorstation connection

Crear el siguiente archivo ".json" para conectar el sensorstation a internet

Create a ".json" file to connect sensorstation to wifi network

```
{  
  "ssid":"my_ssid",  
  "psk":"my_password"  
}
```

Conectar USB a SensorStation

Connect USB to Sensorstation

1

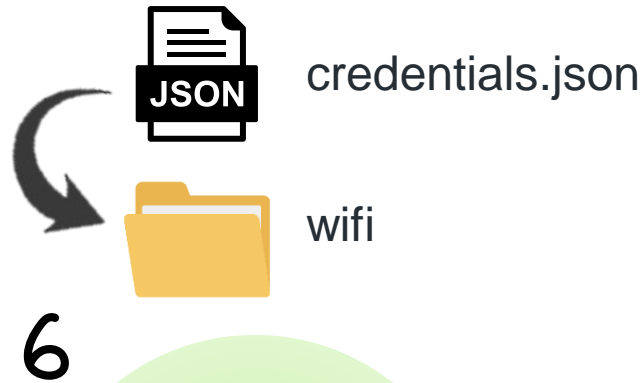
```
> File Transfer  
System  
Network  
Server
```

2

```
> Mount Usb  
Unmount Usb  
Download  
Get WiFi
```

3

```
Usb  
Mount:success
```



4

```
Mount Usb  
Unmount Usb  
Download  
> Get WiFi
```

5

```
WiFi  
Uploading:success
```

7

```
File Transfer  
System  
> Network  
Server
```

8

```
Cellular  
> Ping  
Hostname  
IP Address
```

9

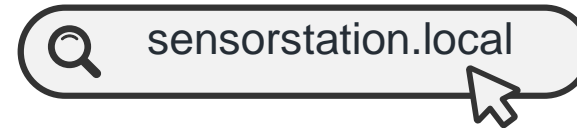
```
Internet  
Connected
```

# Equipo 5 – Conexión a Sensorstation

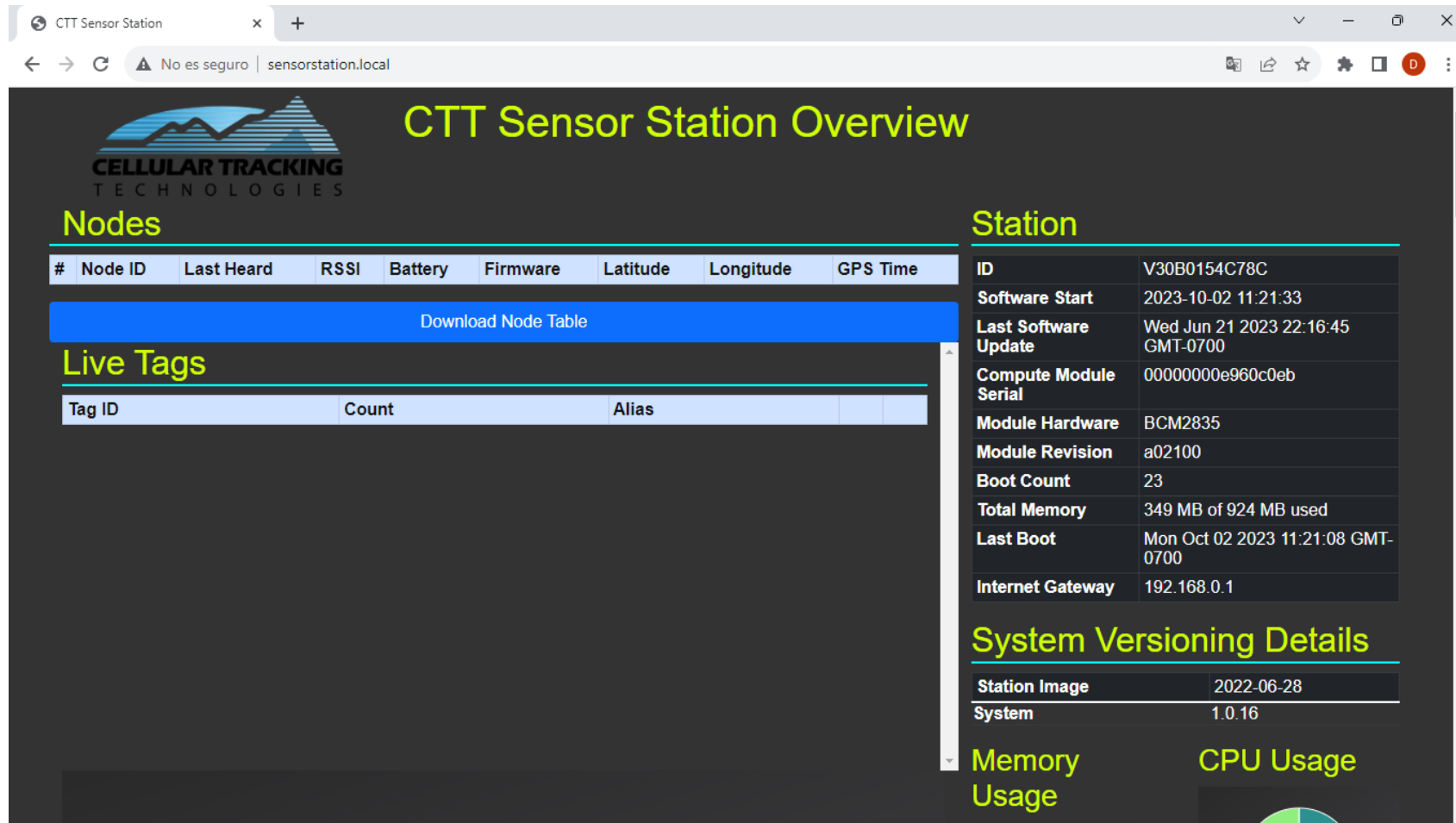
## Team 5 – Sensorstation connection

(((•))) Se puede acceder al interfaz del SensorStation al estar conectado en la misma red WiFi

The SensorStation interface can be accessed when connected to the same WiFi network.



O por vía cable Ethernet  
Or via ethernet cable



**CTT Sensor Station Overview**

**Nodes**

| #                   | Node ID | Last Heard | RSSI | Battery | Firmware | Latitude | Longitude | GPS Time |
|---------------------|---------|------------|------|---------|----------|----------|-----------|----------|
| Download Node Table |         |            |      |         |          |          |           |          |

**Live Tags**

| Tag ID | Count | Alias |
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|--------|-------|-------|

**Station**

|                       |                                   |
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| ID                    | V30B0154C78C                      |
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| Last Boot             | Mon Oct 02 2023 11:21:08 GMT-0700 |
| Internet Gateway      | 192.168.0.1                       |

**System Versioning Details**

|               |            |
|---------------|------------|
| Station Image | 2022-06-28 |
| System        | 1.0.16     |

**Memory Usage**      **CPU Usage**



Cable Ethernet  
Ethernet cable



Adaptador Ethernet a USB  
Ethernet to USB adapter



# Equipo 6 – Registra tu estación Motus

## Team 6 – Motus station deployment

Motus Wildlife Tracking System x +

motus.org/data/project/stations?projectID=357

## Project Stations

[Manage your receivers](#)

[Instructions](#) [Map](#)


Your stations may be viewed on a map or in a table. Use the filter options below to locate a station or restrict the view to active stations (those with an active receiver deployment).


View: [Active](#) | [Inactive](#) | [All](#) |


Filter stations by name or ID:  [Filter](#) [Clear filters](#)

[Add a new station](#)


Map Table

 Stations with active deployments

 Stations without an active deployment

 Selected station

Mapa Satélite



Mapa Satélite

Map showing station locations across North America (Canada and Estados Unidos). A green pin indicates a station with active deployments in Alaska (AK).

Select a station from the map or table displayed at the left.

# FINAL EVALUATION



- Please help us answering a 1 minute post-workshop survey

- Por favor ayudanos con una encuesta post-taller de 1 minuto.