# MOOMONITOR + INSTALLATION

MANUAL


*Experience the difference*

DAIRYMASTER

# Contents

# 1 Introduction

The Dairymaster MooMonitor+ is the most advanced animal behavioural analysis tool in the world

All MooMonitor+ units are equipped with NFC (Near Field Communication) to allow the farmer, AI technician and Vet direct access to the animal's data and history through touch less mobile technology.

The New tags are lighter, have reduced power consumption and longer range.

The MooMonitor+ Base Station is now also equipped with multiple microprocessors for the highest performance radio chips available.

Data is stored securely through cloud based software with no data limits as more space becomes available as data level increases. The Cloud system also reacts to peak data traffic so it never becomes slow.

The Cloud system also allows for Centralized support resulting in less technical support of individual PCs on individual farms and instantaneous software upgrades for all customers

The new MooMonitor+ mobile App now allows for two-way interaction in the new system where information is real-time and actions can be taken immediately e.g. Cow & insemination events can be entered real time.


**Figure 1 - MooMonitor + and MooMonitor + base station with antenna**

# 2 Scope

The information in this manual is intended for qualified technicians trained in the installation of the Dairymaster MooMonitor +

**This manual contains information allowing installers to:**
*Install the Base station*
*Carry out any checks to ensure a successful installation.*
*Troubleshoot an installation*
*Test the MooMonitor + system to ensure data is transmitting and being received.*

The Information in this manual relates to the latest software version of the web interface and mobile devices. This manual contains information for the following:

Web Interface: Software Version 2.5
Android App: Software Version 2.0
IOS App: Software Version 2.0

This latest version of the installation manual contains new information relating to the latest Android and IOS Apps. There have been lots of additional features added to the mobile apps which will enable the user to receive and update more information at any time

For repairs it is recommended that you use Dairymaster replacement parts alone.

Dairymaster warranties cover operation of its parts alone and cannot be held responsible for the malfunction of parts not supplied by Dairymaster.

For further information regarding Dairymasters Moo Monitor + system or any other Dairymaster product please feel free to contact us through e-mail or by telephone using the details given below:

Email: info@dairymaster.ie
Telephone: +353-66-7131124

# 3 Safety


***Before attempting any installation / maintenance works***
*Always isolate the electrical supply.*

## ***Warning***

*To prevent accidental injury ensure all safety devices and PPE are used during any maintenance / installation works.* Always ensure that following guidelines are adhered to at a minimum.

- Follow the current Health & Safety standards appropriate to you region.
- Ensure Tools used, are appropriate for the task.
- The work area has been checked by a suitable person; who has been identified in accordance with the relevant industry / statutory regulations in your region as a capable person to access the work area. This person must deem the work area is a safe suitable working environment.
- Safe systems of work are in place and are being adhered to.
- That all equipment has been checked by a suitable person and are appropriate for the task.

**You alone are responsible for Health & Safety**

**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.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

## 3.1 Canada

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication."

This device complies with Industry Canada licence-exempt RSS standard(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.

*Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada.*

*Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante."*
*"Le présent appareil est conforme aux CNR d'Industrie 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, et*
2. *l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."*

# 4 Mechanical

## 4.1 Pre requisites

The following are the minimum prerequisites for the successful mechanical aspects of the installation of the MooMonitor +

**Equipment & basic checks required:**

1. Suitable scaffolding or lifting equipment that are necessary to accommodate working at heights.
2. It is the responsibility of the installer to ensure that all required statutory safety requirements have been adhered to before attempting installations at height.
3. Suitable mechanical fixing equipment – drills, mechanical fixings, etc are available on site.
4. Ensure a survey has been conducted by a suitable person for any building services, which may be in place before attempting any drilling or cutting in the building fabric.
5. It is the responsibility of the installer to the work area meets any required statutory safety requirements and that all safety measures have been adhered to before attempting any installation or maintenance works.

## 4.2 Installation procedures

### 4.2.1 Basestation Installation (Main Kit components).

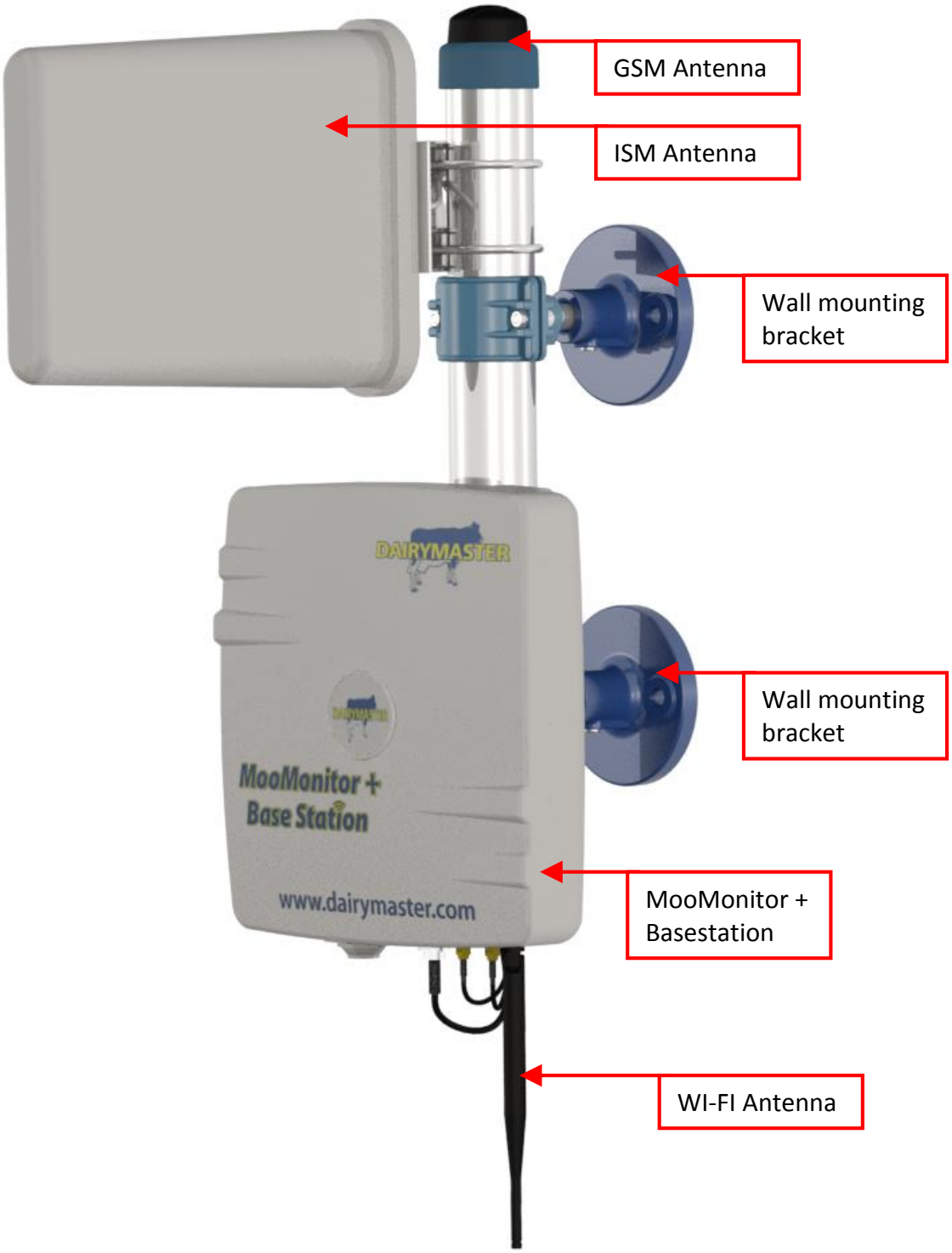


**Figure 2 – Typical MooMonitor + Basestation assembly**

### 4.2.2 Selecting a location for the Base Stations

The MooMonitor+ base station can be wall mounted or pole mounted. The installer will need to survey the site and choose an appropriate location, which will provide the best possible coverage for the ISM antenna to get a strong signal from the MooMonitor+ on the animal.

Installers should note that a clear line of sight is ideal to ensure strong signal strength between the Basestation antenna and the MooMonitor+.

Preferred Connection methods:

1. A wired comms connection to the base station and a PC.
2. Suitable Wi-Fi Connection with sufficient signal strength to ensure no signal loss between the base station and the wireless router.
3. GSM/ GPS Connection with sufficient internet connectivity and speed.

A suitable stable Power Supply is also required to ensure correct operation of the base station. Please refer to section 5 of the manual for further information on the electrical aspects of the installation.

Please see below some indicative layouts which can be used for guidance purposes on the location of the base station.

The main items the installer should concern themselves with is getting a clear line of sight to the collection yard, the dairy and the grazing pasture (this is dependent on farm layout).

The installer should ensure that the antennas are kept away from structures which would impede the signal.

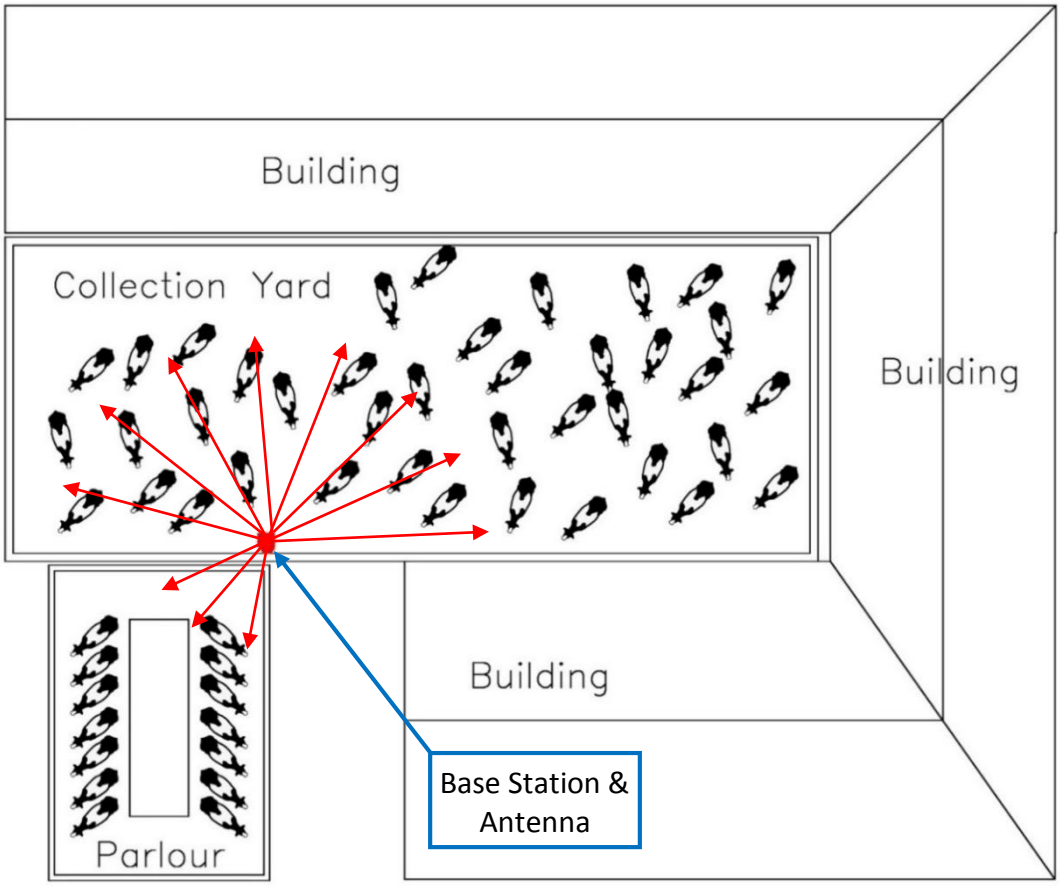


**Figure 3 – Typical layout of a farm complex with Base station covering collection yard, dairy and buildings**

In Figure 3, we see a typical layout of a farm complex, with collection yard, dairy and surrounding buildings.

The general guidance for a situation like this would be as follows:

1. Mount the antenna in a location which will allow for line of sight over the collection yard. (cows will be in the collection yard at least twice per day allowing for data upload).
2. The base station and the antenna should be mounted no less than 2m above ground level to avoid animal interference.
3. When installing conduct a range test to confirm sufficient signal is available around the complex to allow for data upload.

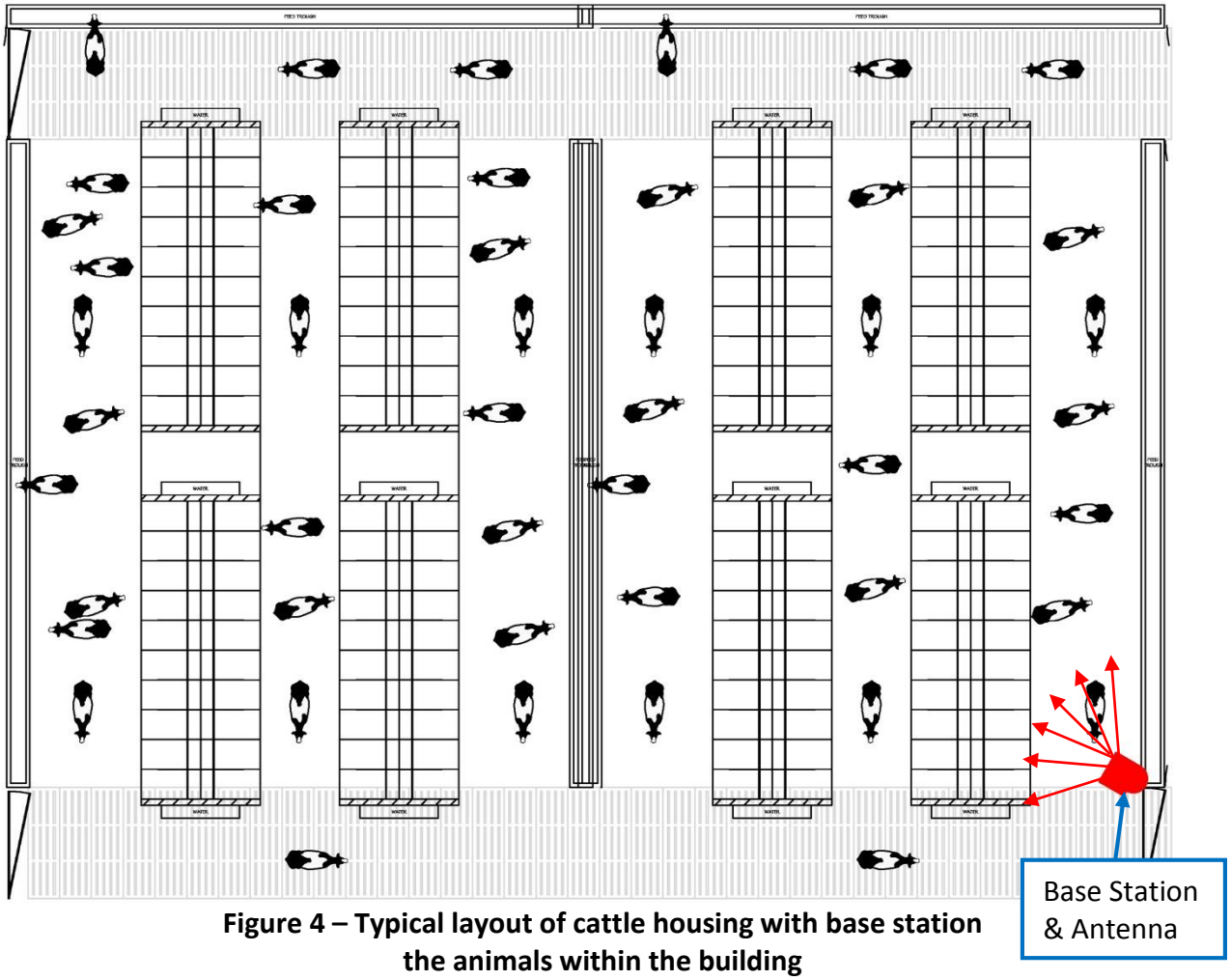


**Figure 4 – Typical layout of cattle housing with base station the animals within the building**

In Figure 4, we see a typical layout of cow housing complex. The general guidance for a situation like this would be as follows:

1. Mount the antenna in a location which will allow for line of sight over the entire building. In the example above the base station is located in the corner of the building looking out over the animals.
2. The base station and the antenna should be mounted no less than 2m above ground level to avoid animal interference.
3. When installing conduct a range test to confirm sufficient signal is available around the complex to allow for data upload.

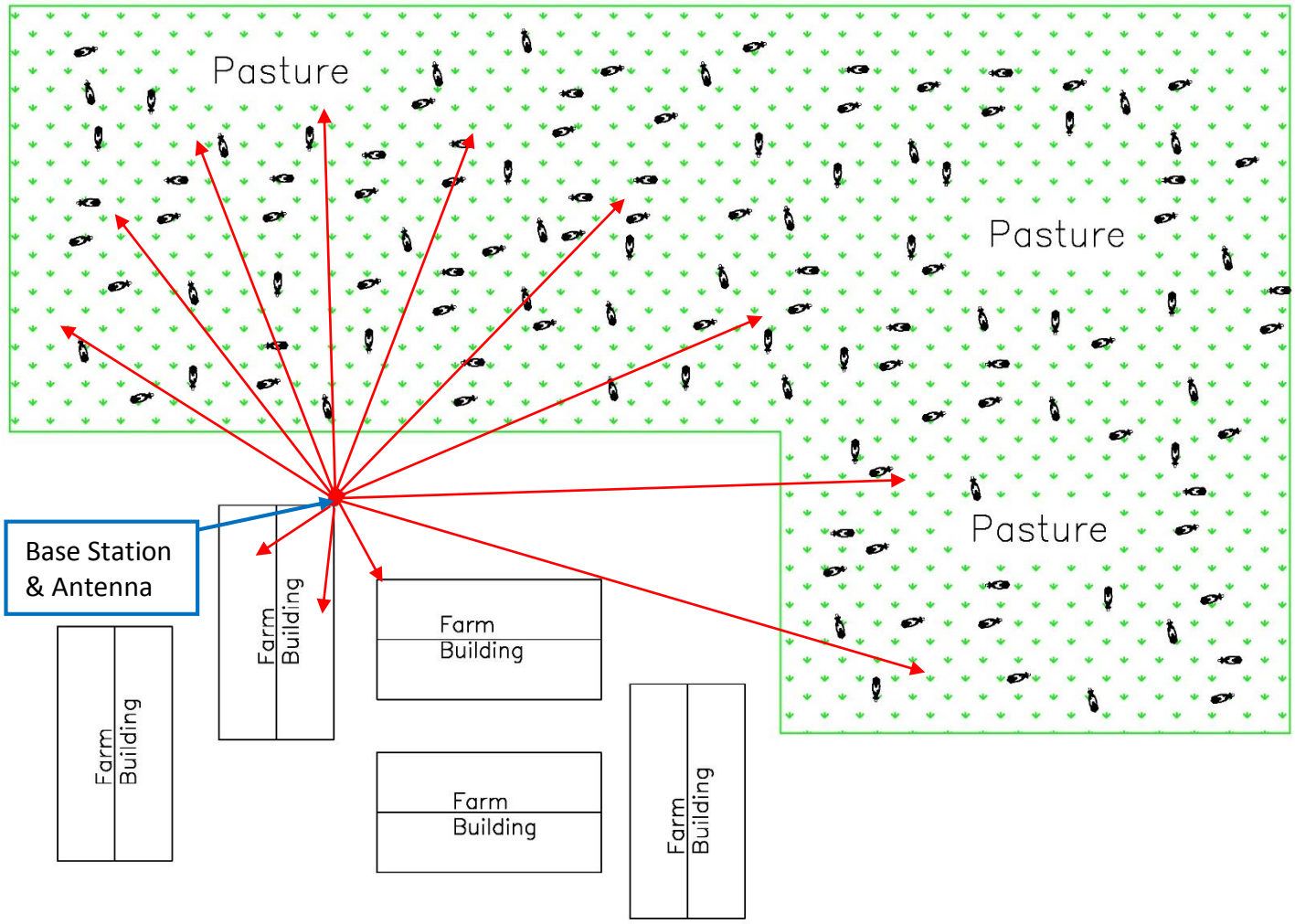


**Figure 5 – Typical layout of a farm complex leading on to a pasture area**

In Figure 5, we see a typical layout of a farm complex leading onto a pasture area. The general guidance for a situation like this would be as follows:

1. Mount the antenna in a location which will allow for line of sight over the entire pasture.
2. The base station and the antenna should be mounted no less than 2m above ground level to avoid animal interference.

**Important Note:**

**In areas where large distance coverage is proposed using the ISM antenna, the installer must be aware that slopes or rises in elevations such as valleys, hills or large buildings could block the signal preventing data transmission.**

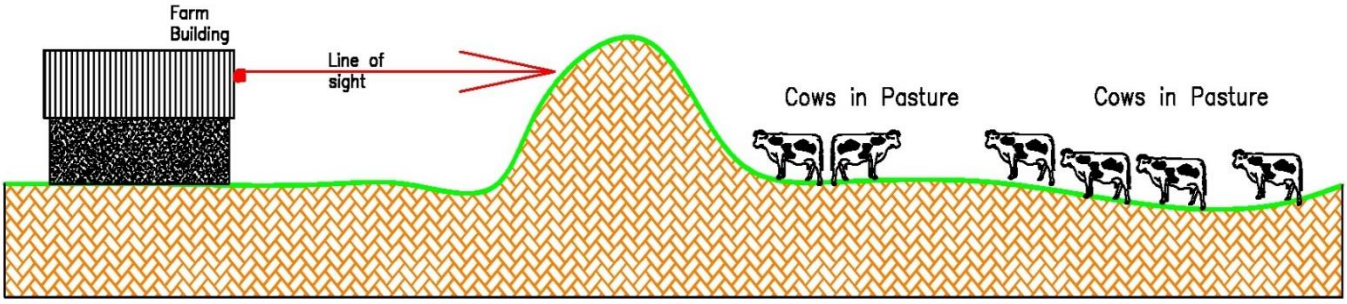


**Figure 6 – Sending a signal to a pasture with hills causing obstructions**

**Line of Sight lost**

In certain cases an installer may be fitting a base station in an area with hills and other obstructions such as buildings blocking the line of sight from the base station to the MooMonitor+ on the animals in the pasture.
As shown above the signal from the base station may be blocked causing loss of data.

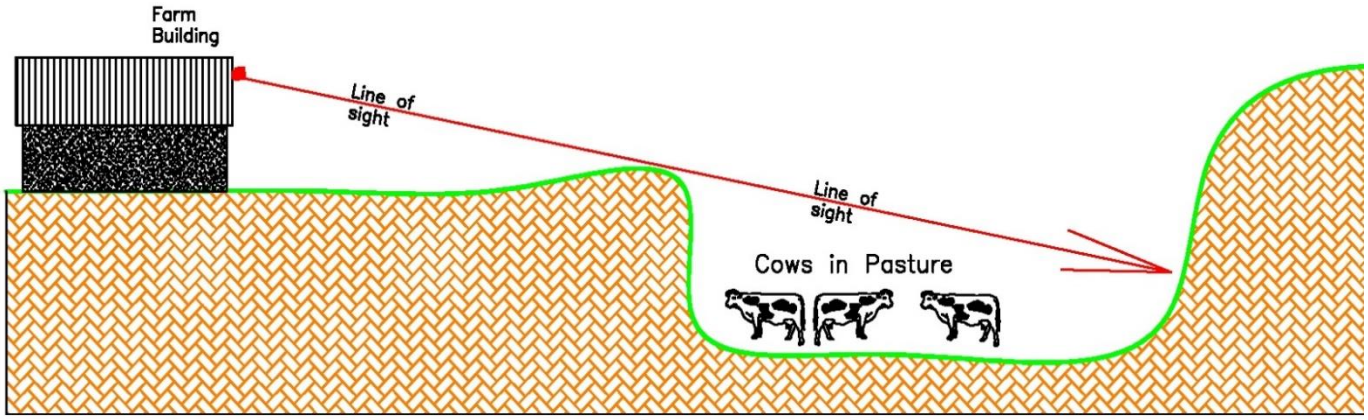


**Figure 7 - Sending a signal to a pasture in a valley causing obstructions**

**Line of sight lost**

Buildings are not the only obstacle an installer may face. In some cases the pasture may be in a step valley. As shown above the line of sight to the animals and the MooMonitor+ is broken by the land itself meaning signal from the base station may be blocked causing loss of data.

**Important Note:**

**In all cases the installer is advised to conduct a range test to ensure that the monitors will communicate with the base station.**

#### 4.2.2.1 Carrying out the Range Test

A range test must be carried out to confirm a sufficient signal exists around the complex / pasture area to allow for data upload to the Base Station from the MooMonitor+ on the cows collar.

Note: When conducting a MooMonitor+ Range test with a second Basestation on a live farm be aware that existing tags on the farm may start to connect to this second Basestation. In order to eliminate this use the existing farm Basestation to do the range test or change the FarmID for the second Basestation and Range Tag.

The Green LED flashes on the Range Tag when the Base Station is in range.

The Red LED flashes while the Base Station is out of range. For further information on conducting a range test please refer to section 7.1 Range Tag Test 7-1.


**Figure 8 - MooMonitor Range Test Tag**
**Part No: 10401610**


**Figure 9 - Green LED will flash on when Range Tag is in range of the base station**


**Figure 10 - Red LED will flash on when Range Tag is in range of the base station**

### 4.2.3 Wall Mounting the base station and Antennas

The installation kit provided by Dairymaster will supply equipment for wall mounting the antenna.

The wall mounted brackets provided are for use on a masonry structure with suitable bearing capacity to carry to the base station, ancillary antennas and clamp them onto the 51.7mm (2”) stainless steel pipe provided with the installation kit.

Begin by drilling four holes in a suitable masonry wall with an M10 drill bit.

The holes should be marked on the wall using the base station / basestation mounting kit as a template for the hole locations.

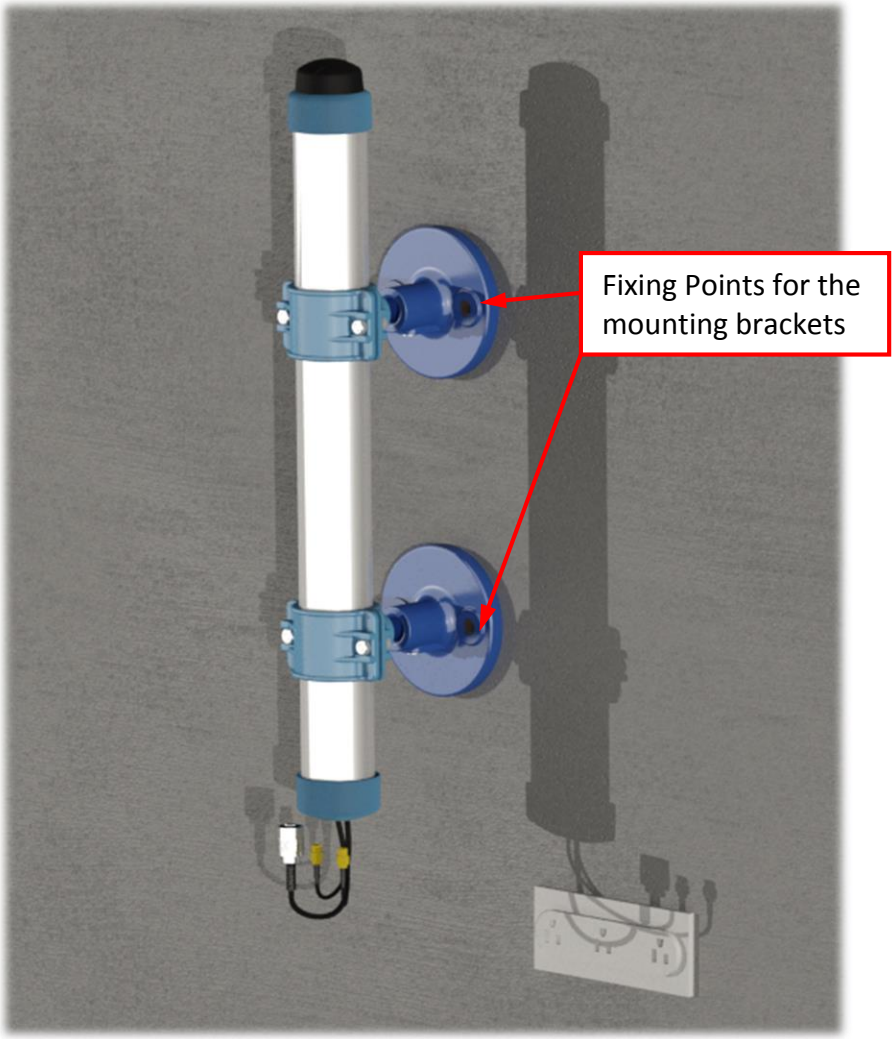


**Figure 11 – Mounting kit for base station onto a masonry wall (Base station and antenna removed for clarity)**

Once the holes are drilled secure each bracket to the masonry structure using 2no M10 X 70mm coach screws with a suitable wall plug.

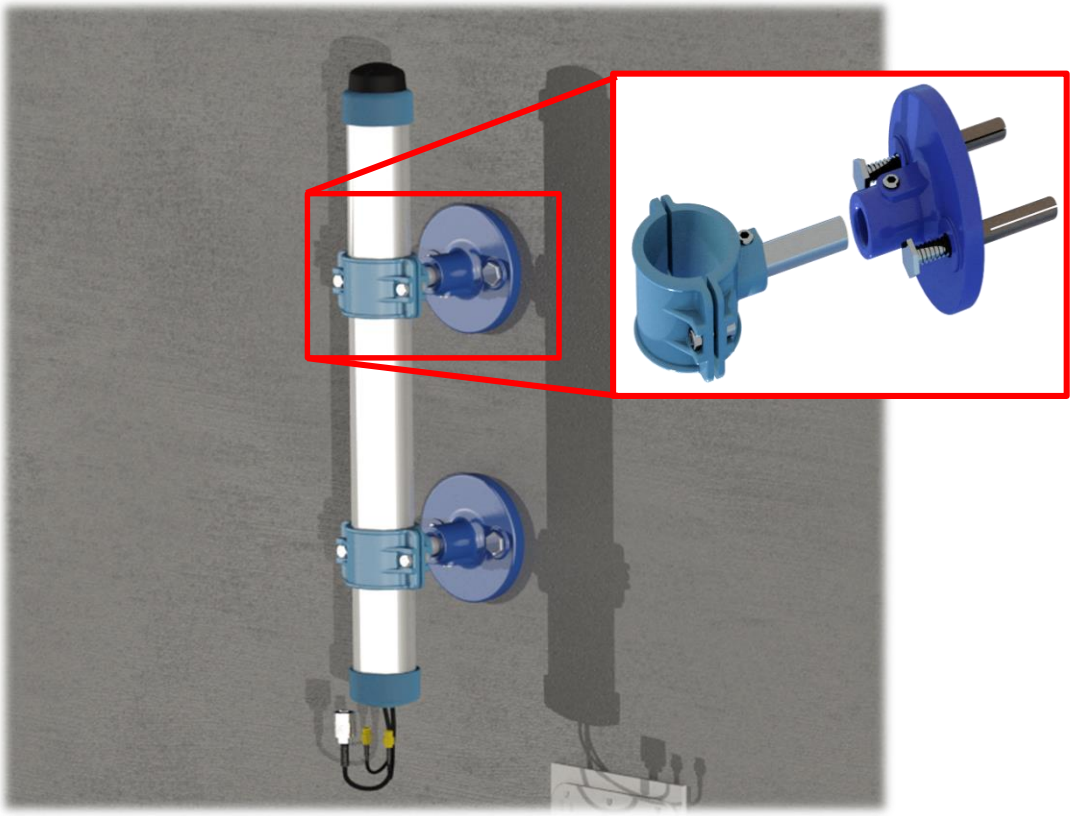

**Figure 12 – Mounting kit for base station onto a masonry wall (Base station and antenna removed for clarity)**


**Figure 13 – Basestation mounted using the wall mounting kit.**

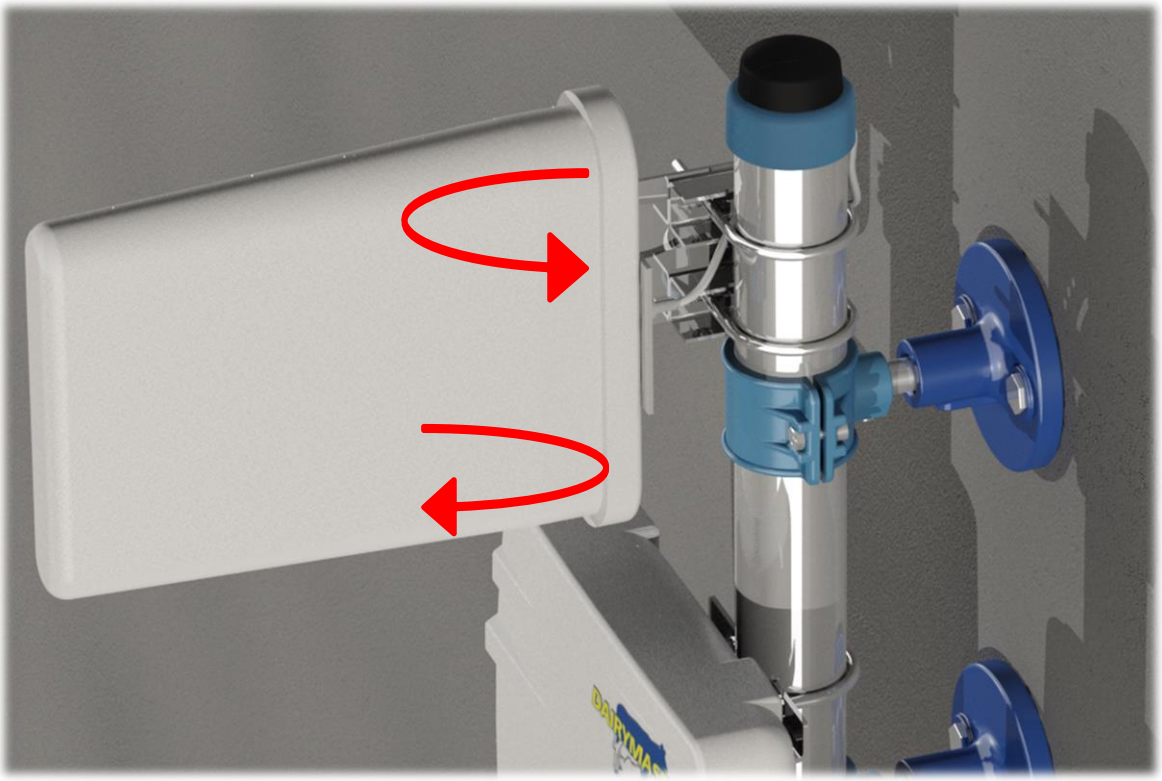

**Figure 14 – Direction of the antenna may be adjusted using the ISM pole mounting bracket.**

## Important Notes:

**When installers are mounting the MooMonitor+ base station they must ensure the following:**

1. **The structure used to mount the kit is suitable to carry the basestation.**
2. **Routing of the cable must be done in a way which will ensure that the cable is safe from the environment of installation and possible animal interference.**
3. **When extending the cables for the equipment that the connections are protected from the environment and are fully weather resistant.**
4. **The base station is installed at a height which will ensure animal interference will not be an issue (i.e. in excess of 2m above ground).**

### 4.2.4 Pole Mounting the Antennas

If pole mounting the antenna the installer will need to ensure that the pole is secure enough to carry the antennas. The installer must ensure that the antenna is stable and not subject to excessive movement by wind or animal contact.

The ISM antennas are supplied with mounting brackets to allow the installation of the units to a 51.7mm (2”) stainless steel pole.

Installers must ensure that the antenna is accurately pointing in the direction of the animals wearing the MooMonitor+ units.

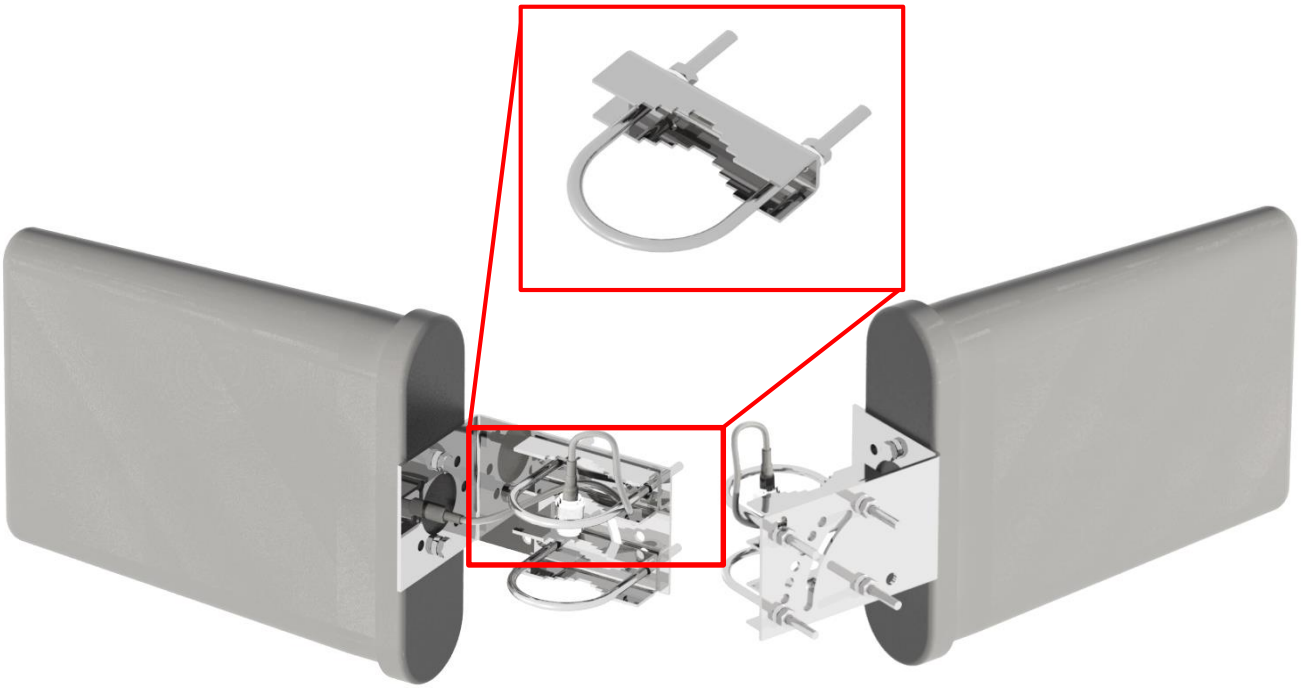

**Figure 15 – ISM antenna and mounting bracket**

**Important Notes:**

**When installers are mounting the ISM antenna they must ensure the following:**

1. **that the cable attaching the antenna to the basestation is routed to the basestation neatly**
2. **Routing of the cable must be done in a way which will ensure that the cable is safe from the environment of installation and possible animal interference.**
3. **When extending the cables for the equipment that the connections are protected from the environment and are fully weather resistant.**

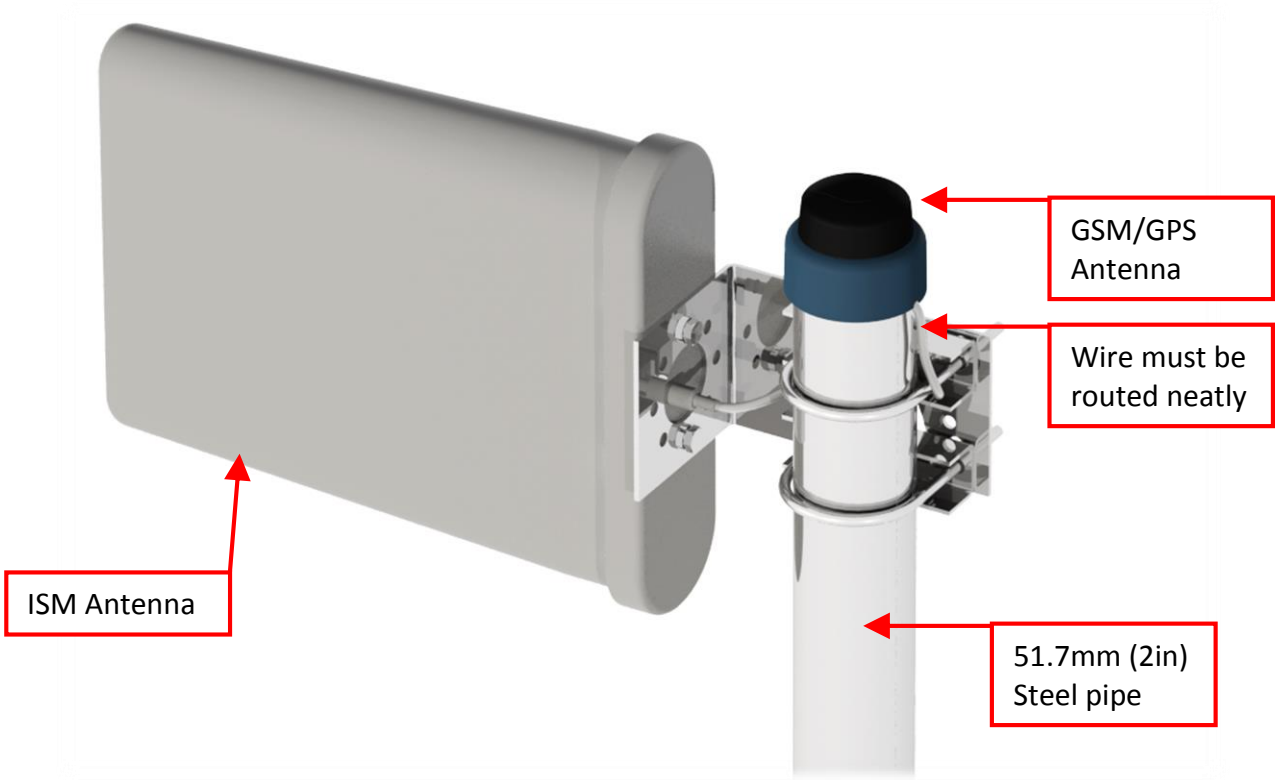


**Figure 16 – Typical arraignment for the ISM antenna & GPS/GSM antenna installation**

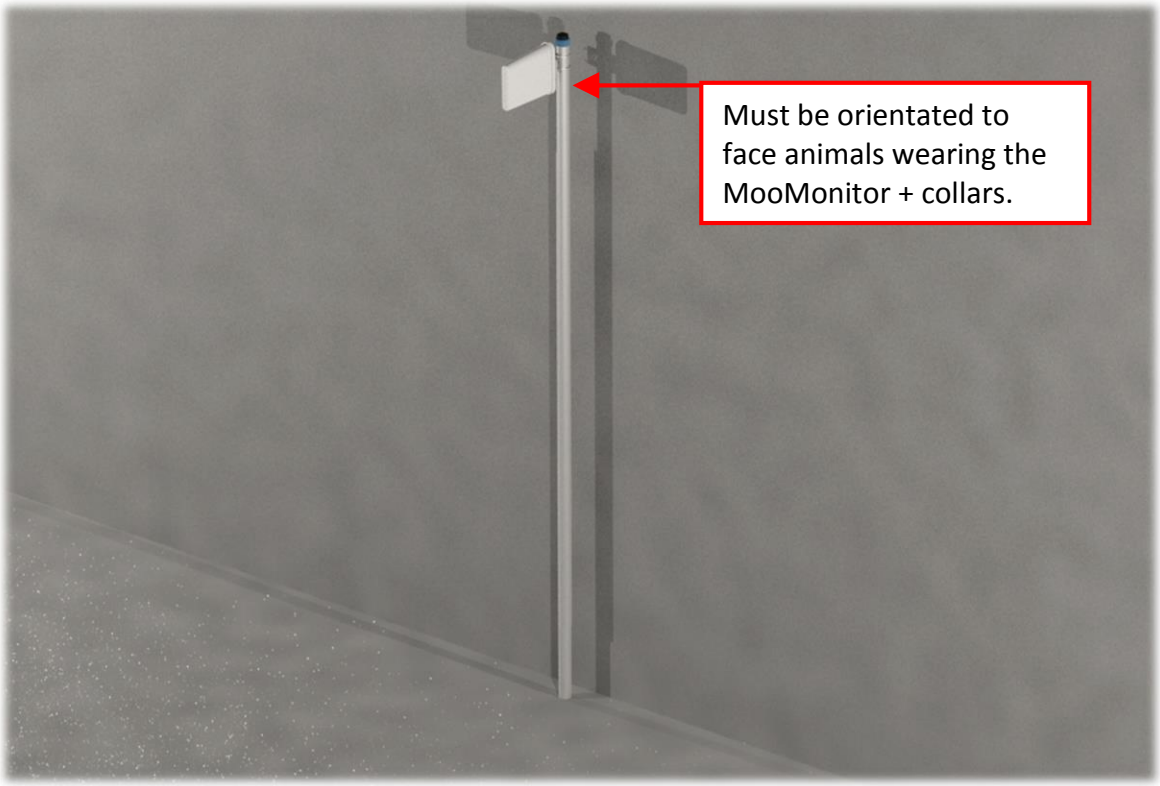


**Figure 17 typical View of the Antennas pole mounted.**

The GSM & GPS antenna is mounted to the top of the steel pole using a rubber fitting which allows the wiring for the antenna to run down inside the tubing to the base of the base station.

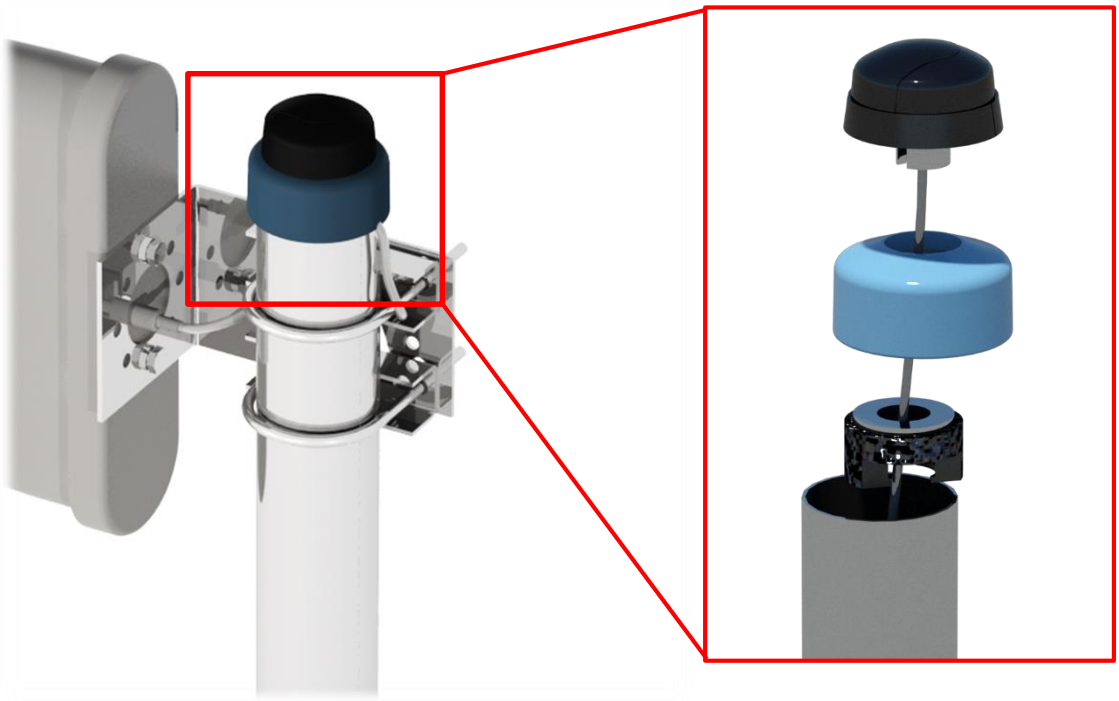

**Figure 18 – GPS / GSM Antenna in place.**

The base station may be mounted to the mounting pole in the same manner as the ISM antenna.

The base station comes with a pole/wall mounting bracket. This bracket is can be mounted onto the 51.7mm (2”) stainless steel pole using 2no M6 U-bolts which clamp the unit in place.

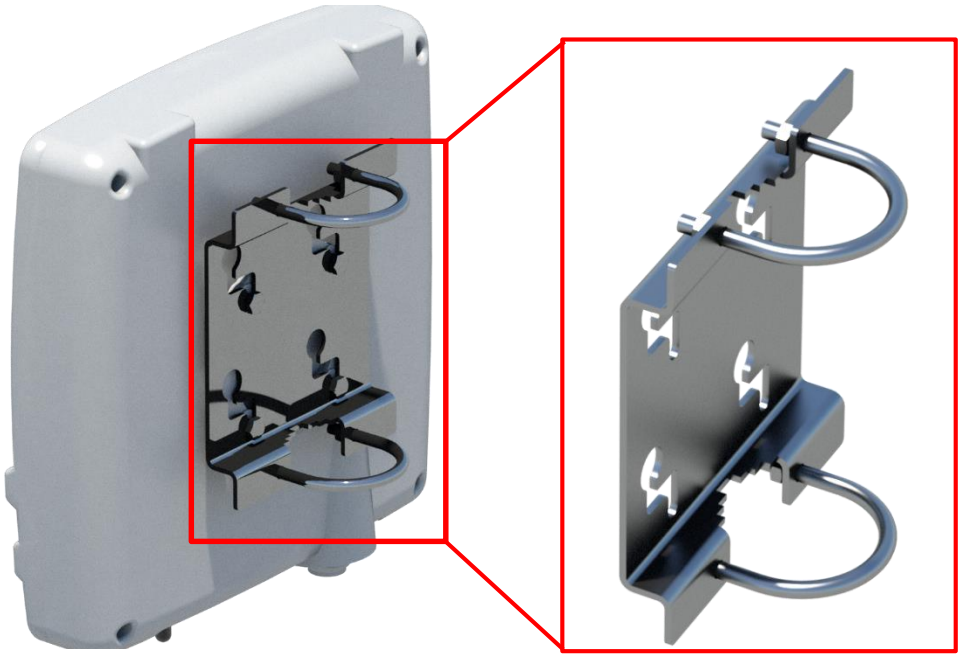

**Figure 19 – View of the mounting bracket on the back of the base station**

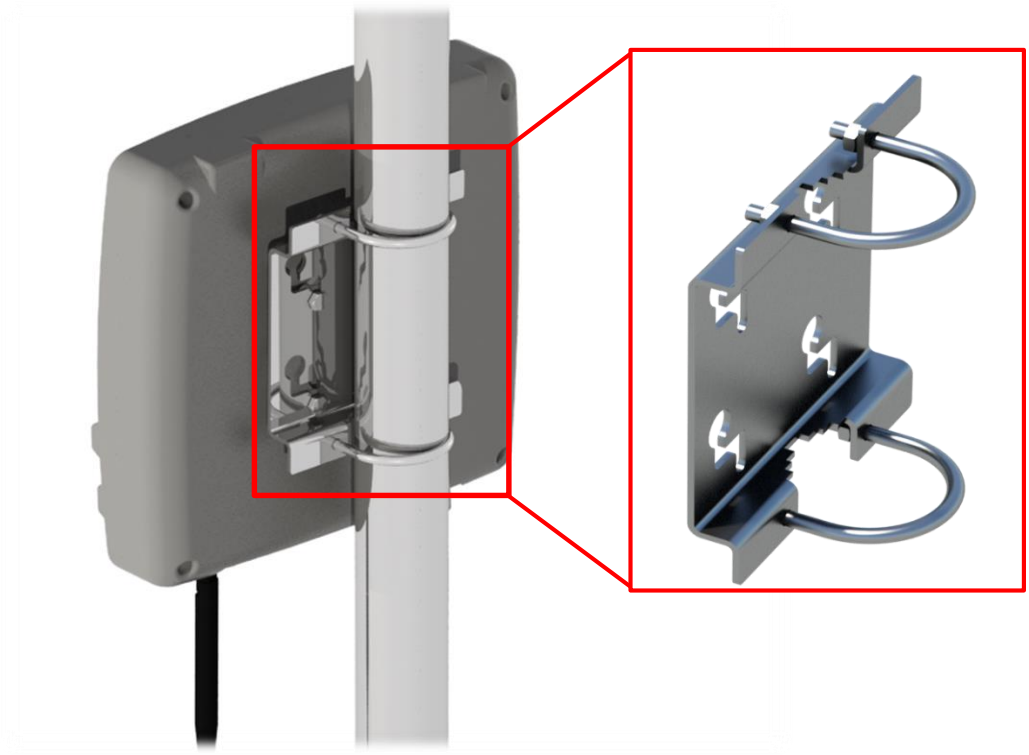

**Figure 20 – View of the base station mounted in place on the pole.**

In certain cases the base station can be mounted on a wall. This may occur if the ISM antenna is to be located outside of the building and the base station is located internally.


**Figure 21 – Typical view of the base station and wall mounting bracket**

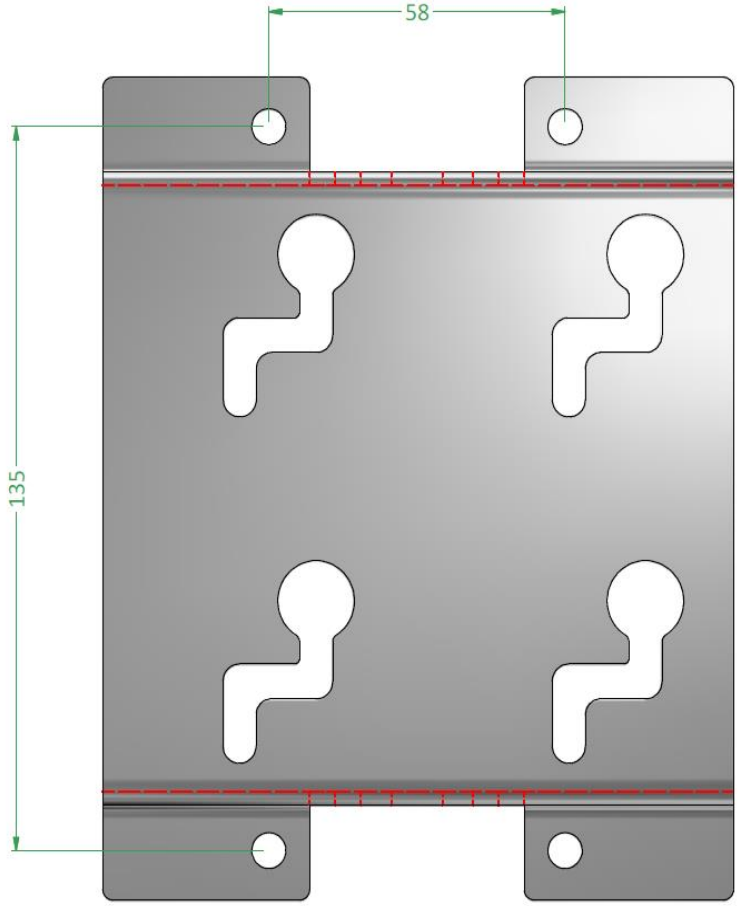


**Figure 22 – Hole centres for the base station mounting bracket**

Using the wall mounting bracket as a guide set out the drill hole positions and drill out the holes for the M6 coach screws and wall plugs used to secure the bracket in place.

In either a pole or wall mounted application the base station can be quickly released from the mounting bracket by loosening the 4 No M6x10 bolts, pressing up, then right, and up again on the base station, and lifting the unit off the mounting bracket.

It is recommended that the installer tighten the locking bolts at the rear of the base station if there is a risk of the base station being accidentally knocked off the mounting bracket.

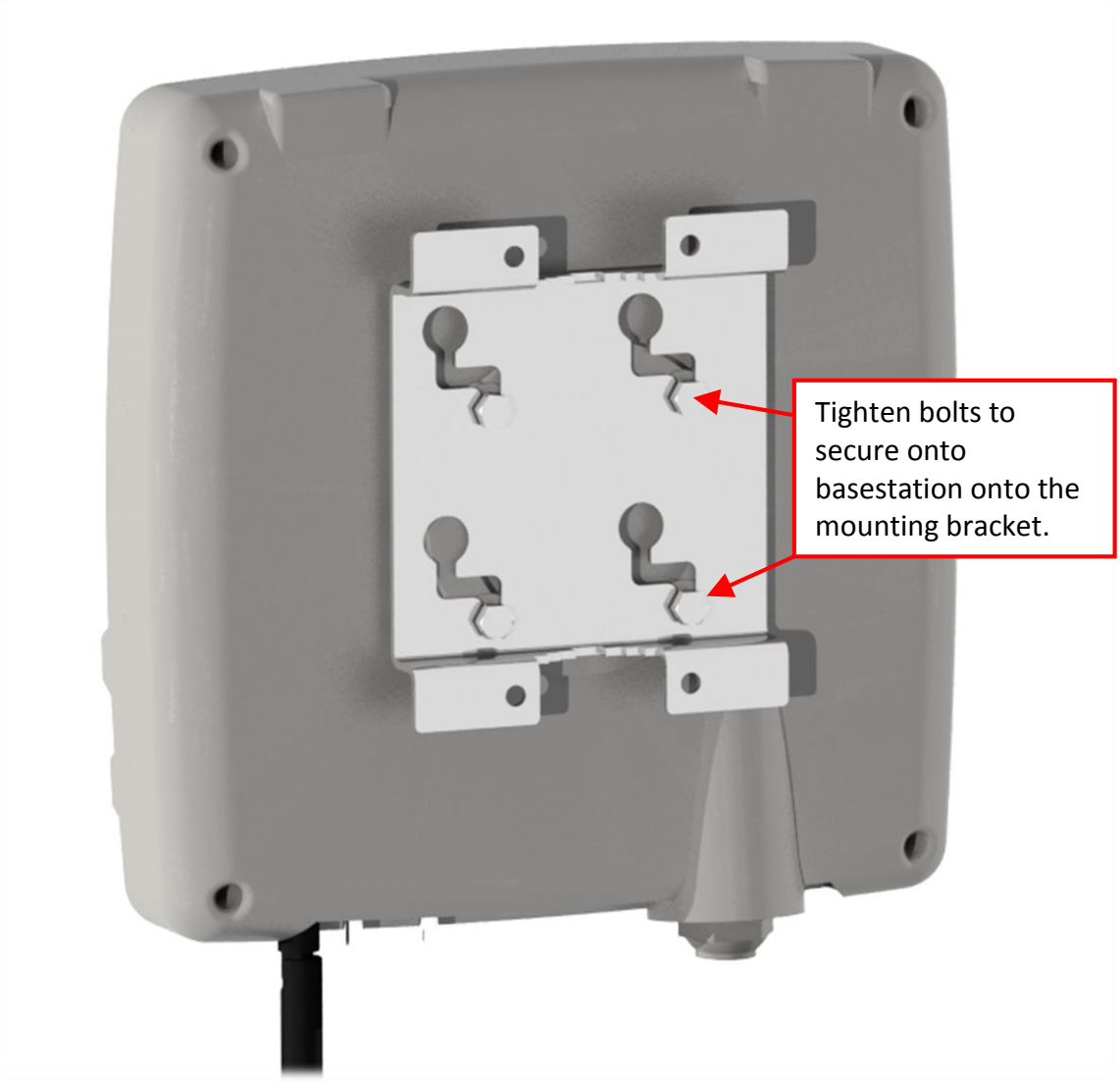


**Figure 23 – View of the mounting bracket on the base station**

**Figure 24 – Typical MooMonitor + Mounting kit assembly**

### 4.2.5 Fitting the MooMonitor+ Collars to the Cows

**Important Note:**
**Note: Always keep track of the MooMonitor+ serial number and CowID pairings. The MooMonitor+ serial number is located on the rear of the Tag.**

The MooMonitor+ collar comprises of the strap, the collar sleeve, the retainer/locking ring, the collar weight, and the MooMonitor+ activity unit.

Fitting of the collar is vital to ensure the MooMonitor+ is giving accurate readings. The collar must be a snug fit to ensure that all movements are recorded.

A loose fitting collar may increase the risk of the collar snagging on an obstruction and/or become a choke hazard.

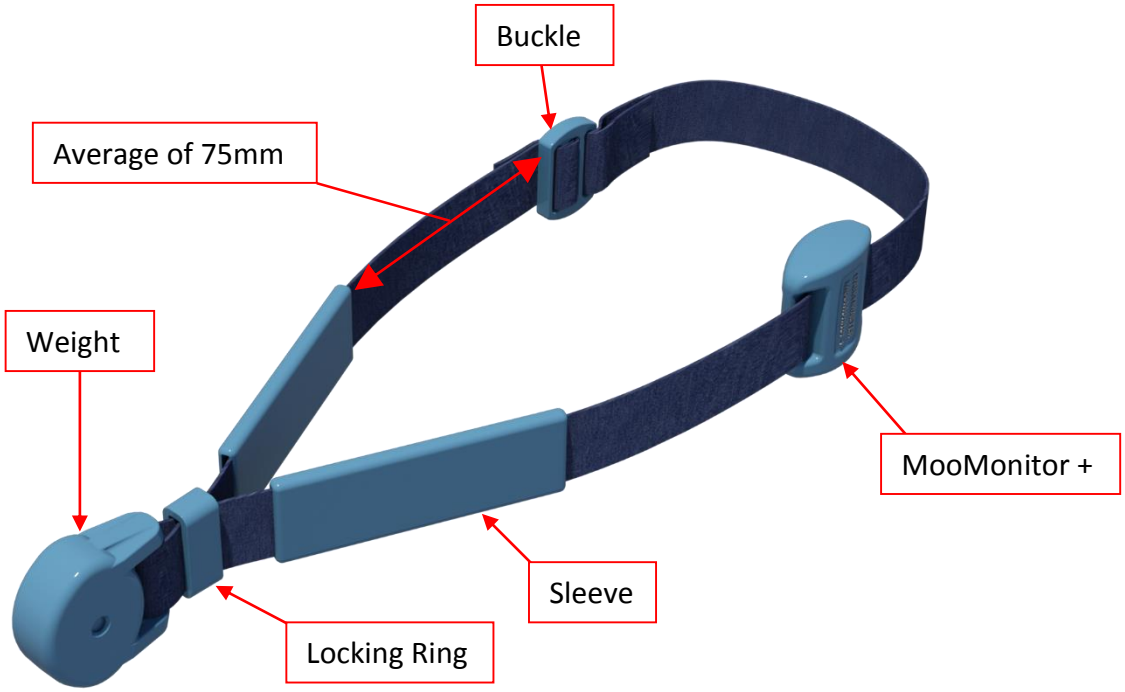


**Figure 25 – Typical MooMonitor+ Activity unit collar**

**Important Notes:**
**Only staff adequately trained in procedures for handling livestock should secure the MooMonitor to the cows.**

When fitting the MooMonitor+ to the cow, thread the collar through the weight to the midpoint of the collar strap. Thread the locking ring into place over the weight. Add the buckle on to one side of the weight and the MooMonitor+ to the opposite side of the collar strap.

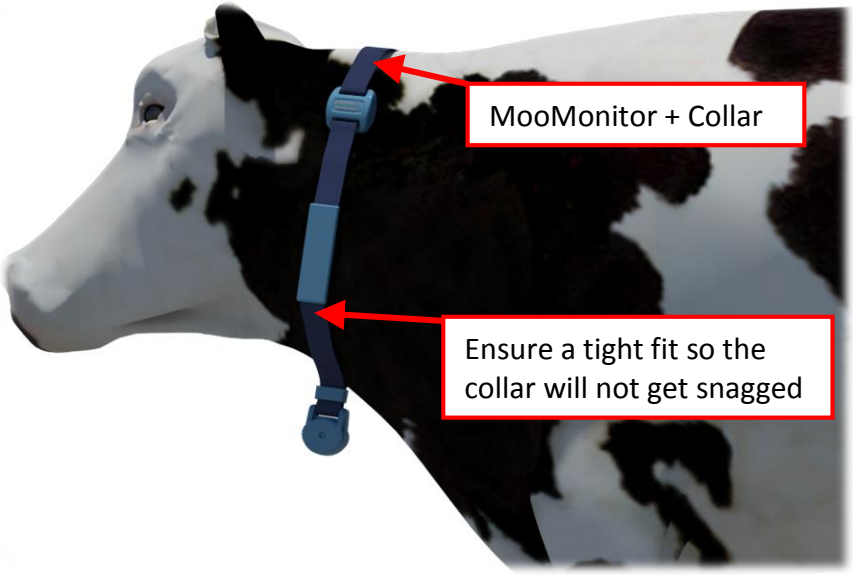


**Figure 26 - Typical view of the MooMonitor on the Cow (LHS)**

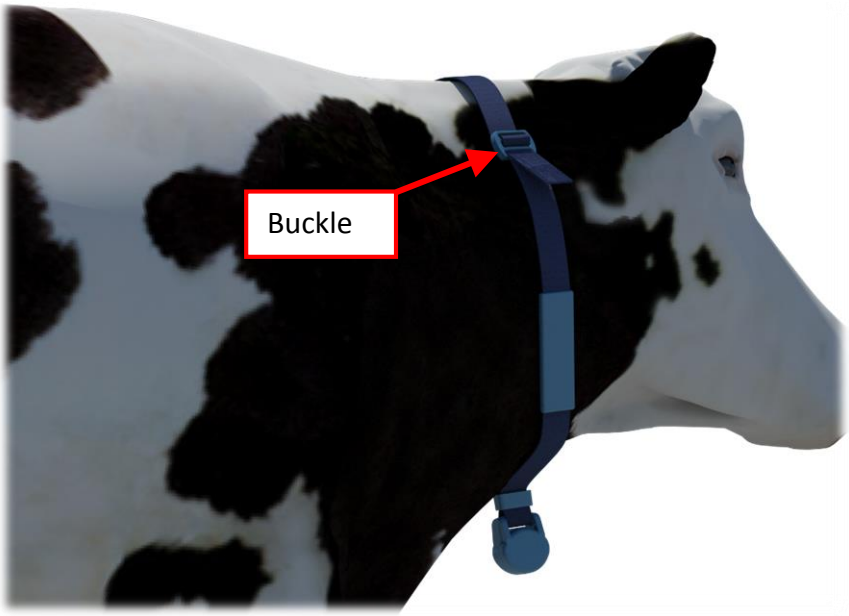


**Figure 27 –Typical View of the MooMonitor + on the Cow (RHS)**


**Figure 28 - Typical view of MooMonitor + installed on a cow**


**Figure 29 - Typical View of the MooMonitor installed on the cow.**
**(The Weight should be centred on the cow's neck to ensure the MooMonitor stays in position)**

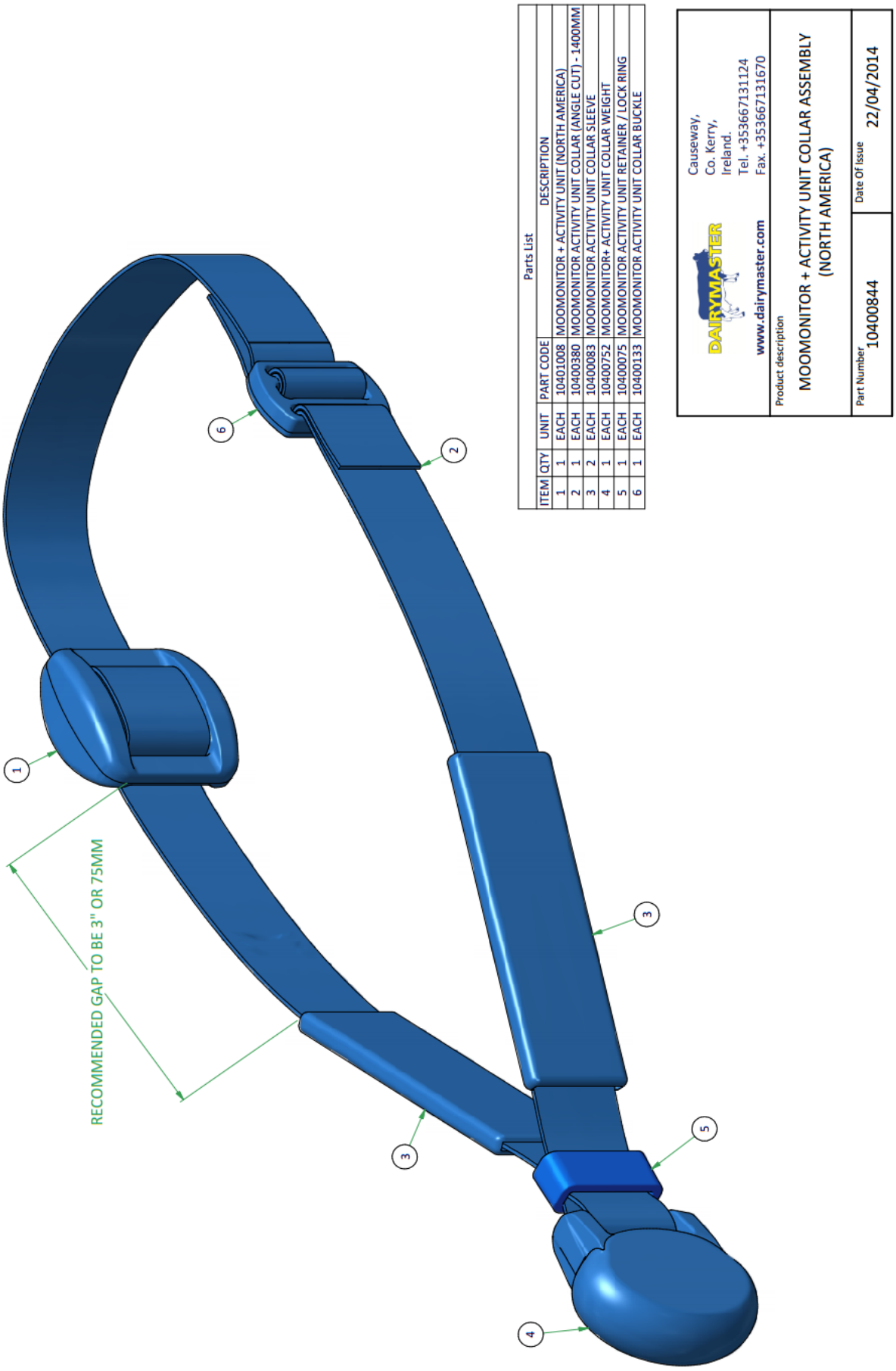


**Figure 30 – MooMonitor + Collar Assembly (North America)**

**Figure 31 – MooMonitor + Collar Assembly (Europe)**

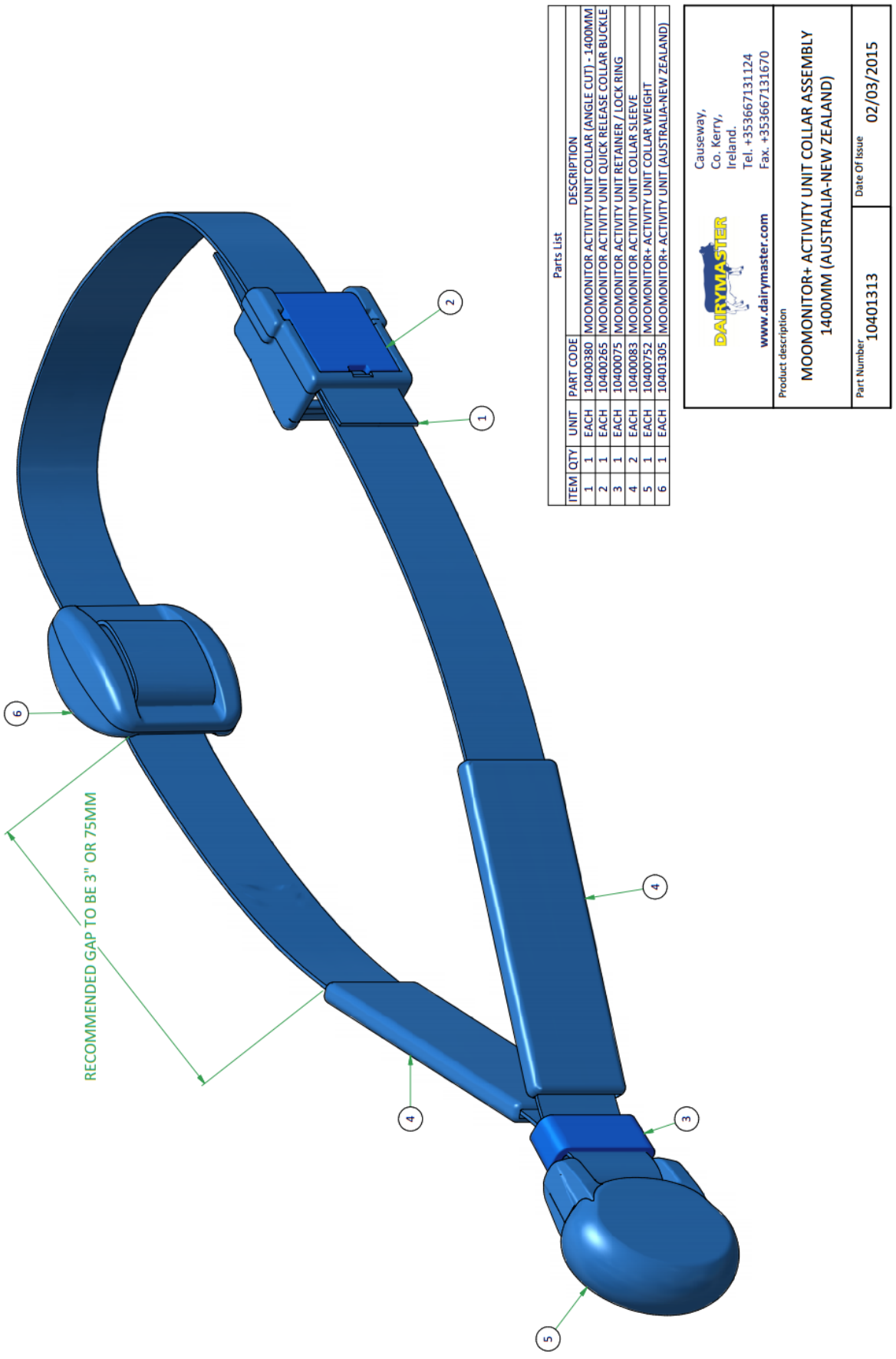


**Figure 32 – MooMonitor + Collar Assembly (Australia / New Zealand)**

# 5 Electrical

## 5.1 Pre requisites

### Important Notes

**The customer's electrical contractor must supply a power connection to the plant supplied by Dairymaster which is in accordance with the legal and statutory requirements for the region of installation.**

**Dairymaster warranties for electrical equipment require a stable power supply.**

**Always turn off the electrical supply before removing the cover of a control unit or the cover of the cable joint box on an electric motor or any other electric joint box. Use a safe means to ensure that the electrical supply is not erroneously reconnected while a cover is removed. Always replace each cover, with gaskets properly in place, as soon as possible, but always before the electrical supply is re-connected.**

## 5.2 Installation procedures

### 5.2.1 Base Station Wiring

The base station is prewired from Dairymaster.

The installer on occasion may be required to replace the PCB or the LED.

For further information on replacing a PCB please contact Dairymaster.

**Figure 33 - Typical View of the Base Station PCB**


**Figure 34 - Connections onto the Base Station**

Each base station is provided with a 12v electrical supply using a 12v transformer.

The electrical cable for the transformer is fed into the base station through the large gland at the base of the unit and into the adapter inside.

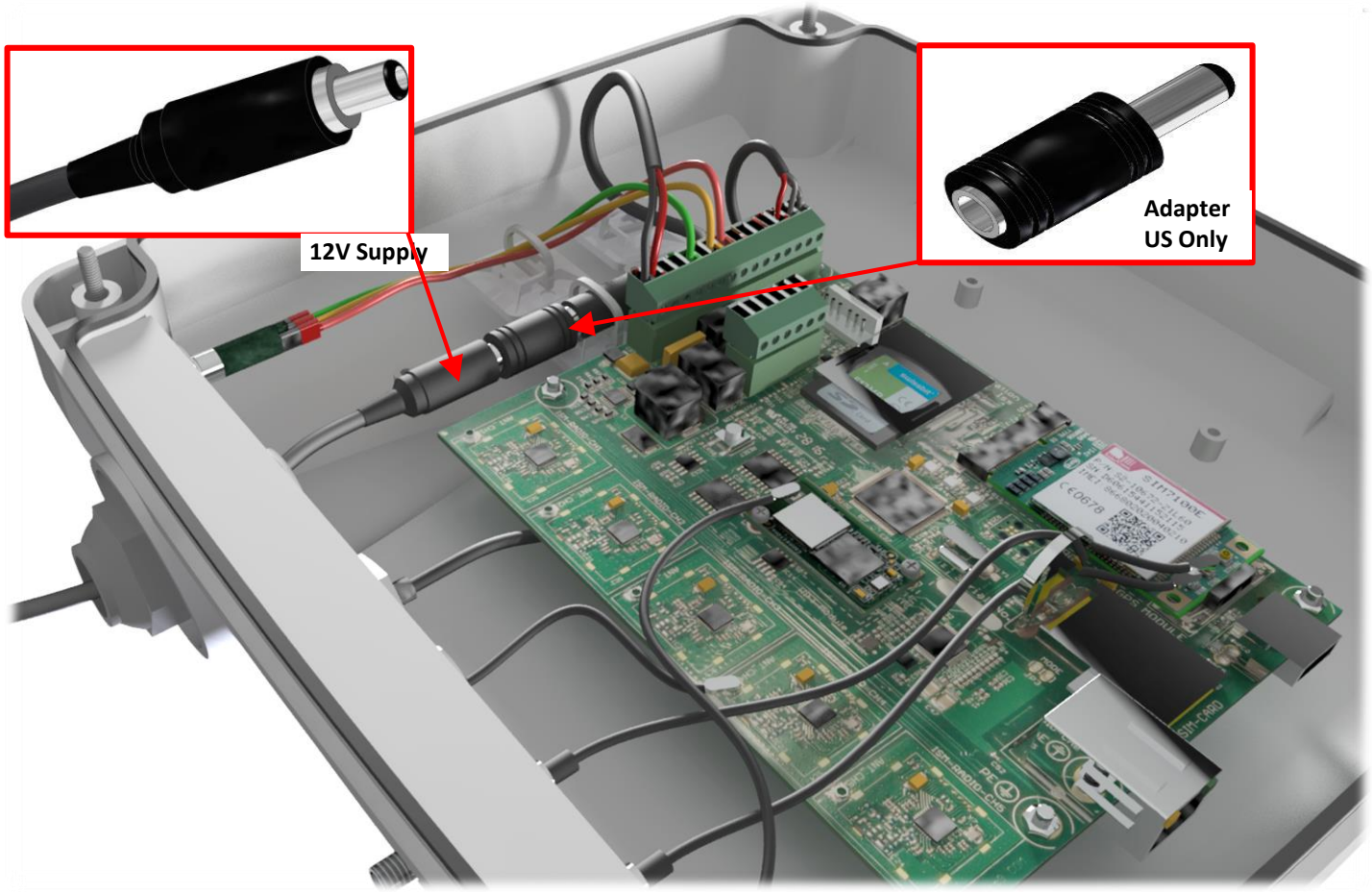


**Figure 35 - Electrical Connection into the Base Station**

**As Standard Each PCB is preconfigured with the following:**

1. SD card reader,
2. Wi-Fi module / CAT 6 Module (Model Dependant)
3. GSM-GPS module
4. GSM reader.
5. ISM radios 1-5

See Figure 36 for locations of the different PCB Components.