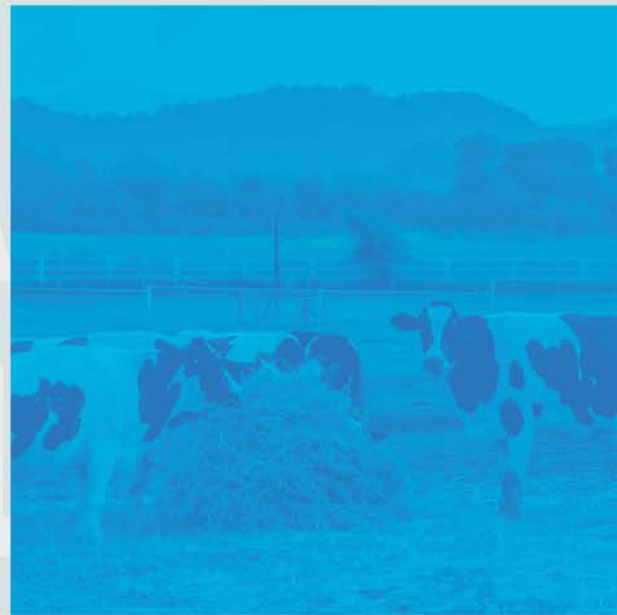


Afimilk Reader H

Afimilk Reader H Installation Guide

INNOVA
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afimilk®
Automating dairy farms

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1. About this Guide

The Afimilk Reader system is an essential component of AfiFarm. It is required for reading and analyzing animal behavior (heat detection and health monitoring via rumination or rest).

The Afimilk Reader downloads animal behavior data from each Afimilk tag and then transmits this to the AfiFarm PC, where it is translated into useful information (such as alerts, sort, reports, etc.).

This data is used to manage cow health and fertility, and sort cows that require treatment.

From AfiFarm, parlor configurations are used only to identify the cows' presence in the parlor or sort. The Afimilk Reader is required for monitoring animal behavior and detecting heat and health events.

This guide describes the process for installing and configuring Afimilk Readers, either as a standalone system or as part of the larger Afimilk AfiFarm system.



FCC

This device is only authorized for use at fixed locations. At least 20 cm of separation distance between the Reader device and the user's body must be maintained at all times.

The FCC Wants You to Know

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 to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician.

Note: Afimilk has not approved any changes or modifications to this device by the user. Any changes or modifications could void the user's authority to operate the equipment.

Intended Users

This guide is intended for Afimilk™ dealers, technicians, and qualified personnel with knowledge and experience installing the Afimilk Reader.

The installation instructions in this guide are written under the assumption that the technicians have extensive knowledge and experience installing wireless networks.

Abbreviations

Below is a list of abbreviations found in the guide:

Abbreviation	Full Name	Description
PTMP	Point to Multi Point	Describes the wireless network communication system that works with a single Access Point antenna, and multiple Client Bridges.
PTP	Point to Point	Describes the wireless network communication system that works with a single Access Point antenna, and single Client Bridge.
AP	Access Point Bridge	A wireless access point (WAP), or more generally just access point (AP), is a networking hardware device that allows other Wi-Fi devices to connect to a wired network.
CL	Client Bridge	Client Bridge (CL) is a networking hardware device that connects the Afimilk Reader to the controller PC, via the Access Point (AP).
DHCP Server	Dynamic Host Configuration Protocol	A DHCP Server is a network server that automatically provides and assigns IP addresses, default gateways and other network parameters to client devices. It relies on the standard protocol known as Dynamic Host Configuration Protocol or DHCP to respond to broadcast queries by clients.
NIC	Network Interface Card	Connects the computer to other networks.
SSID	Service Set Identifier	Local Wi-Fi network name.
RSSI	Received Signal Strength Indicator (measurement unit for wireless signal quality). We recommend a value above: -80dbm	
LOS	Line of sight	A straight line along which an observer has unobstructed vision.

Environmental Requirements

The following operating conditions are required:

Temperature: -20°C to 50°C

Safety Instructions and Notice

- Read this guide carefully before installation. All installation steps must be followed to ensure safe and proper system operation.
- Do not expose electronic equipment to water or any other liquid.
- Only authorized Afimilk technicians are permitted to install and test the devices described in this guide.

Technician responsibility:

- Installation must comply with all applicable local codes, regulations, and safety requirements.
- Only certified electricians must connect the system to mains power.
- Make sure power is disconnected before assembling electrical components.
- Some system components are heavy and may cause injury if lifted or dropped. Make sure enough personnel are present to lift and secure each component safely. Any component left standing must be firmly secured to prevent falling.
- Do not use Afimilk systems for any purpose other than those specified in this guide.
- The customer is fully responsible for any changes made to the system configuration or software application data, whether by the customer or an agent.
- Afimilk is not responsible for any damage caused to customers, third parties, or livestock due to unauthorized actions, modifications, or omissions in the Afimilk system.

High Power Safety Precautions

- High voltage transients, surges, and lightning pose risks to equipment, personnel, and livestock. The installer must make sure proper power protection is provided.
- All electrical connections, including metal structure grounding, must be performed by a local, certified electrician.
- Compliance with FCC standards is conditional upon system installation under the same conditions in which the product was tested and certified. Any unauthorized changes or modifications invalidate compliance.
- Operate the system under conditions that comply with the declaration of conformity, the T.C.F., and test reports.
- Transformer requirements:
 - The transformer is not provided with the equipment.
 - Installation must be performed by a certified electrician in compliance with the National Electric Code (NEC) and local regulations.

- The installer must make sure the system is powered by an external UL/CSA-certified transformer of appropriate rating.

2. Prerequisite Considerations

Before starting the installation, verify that the following pre-requisites are fulfilled:

2.1 Software Requirements

This guide refers to AfiFarm 5.7 and above. See [AfiFarm 5.7 Installation Guide](#) for more details about AfiFarm requirements.

Note: Afimilk Reader H is only compatible with AfiFarm 5.5 and above.

2.2 Tag Requirements

Afimilk Readers work with all active Afimilk ID tags. All animals on the farm must have their tags properly attached and assigned. For specific instructions regarding attaching, assigning and storage, see the appropriate user guide.

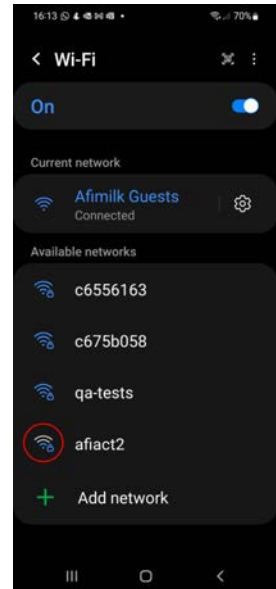
2.3 Communication Network Requirements

In both existing and new farms, the following components in the communication network require specific configurations, some of which must be done by certified IT specialists.

Component	Requirements
Wireless bridge devices	Prior configuration by IT specialist: see Afimilk Reader Configuration Guide for full instructions.
DHCP server (optional)	
New afiact2 Wi-Fi SSID	
Dedicated NIC	See Set Dedicated NIC Addresses on page 54 .
Afimilk Readers	See Configure the Afimilk Reader in AfiControl on page 40 .

2.4 Wireless Network Coverage

To test the Afimilk Reader's wireless network strength at the mounting points open your the Wi-Fi option on your smart phone, scroll down until you find afiact2, and make sure the strength indicator shows at least 2 bars coverage



2.5 Site Survey Conditions

A survey of the farm site and its peculiarities is required before any Afimilk Reader order or installation occurs.

The survey is used to determine the number of Afimilk Readers required and their optimal locations.

To ensure all animals are consistently monitored and their data is downloaded, it is crucial to maximize the amount of time the tags are within the Afimilk Reader's coverage. This is done by selecting optimal locations for the Afimilk Reader, and where necessary, using multiple Afimilk Readers.

An initial survey of the farm must consider the following:

- **Farm type:** the type of farm set up determines the number of Afimilk Readers required:
 - **Closed Barn** – requires a minimum of 1x Afimilk Reader for each barn.
 - **Open Sheds** – the number of Afimilk Readers required is determine by the size of the area that needs to be covered.
 - **Paddocks** – refer to Afimilk Reader Extended Range Installation Guide for Pasture Environments for instructions regarding installation on grazing farms.
- **Power source:** The Afimilk Reader requires access to a power outlet (provided by the farmer – 220/110).

Warning: Afimilk Reader transmission does not pass through chicken wire fences, concrete, metal, wood, water and other liquid (including tanks). The presence of any of these materials will limit the AfimilkReader's coverage.

- **Coverage** - each Afimilk Reader has a potential coverage of 150m radius. However, environmental factors, such as mechanical and radio interference can reduce effective range.
- **Height** - the Afimilk Reader and its components require direct line of sight to all the cows within its range with minimal interference from sheds/poles/buildings, etc. Therefore, its normal location is high above the ground. Afimilk Readers are mounted on a pole at 3m—5m from the ground, where it is accessible for servicing, but cannot be reached (or damaged) by the animals. The Afimilk Reader must be mounted at least below the ceiling – if installed in a shed.
- **Coverage** - Mounting locations must maximize tag coverage. The feeding and water trough areas should be within this radius, the lane to the milking parlor is also optimal.
- **Distance to the office** – The distance to the AfiFarm PC determines the type of network connection used (LAN or Wi-Fi). LAN can be used up to a maximum distance of 100m

2.6 Neighboring Afimilk Farms

Determine if any neighboring farms are using Afimilk Readers with Wi-Fi network connections.

Antennas from neighboring farms can interfere with one another.

Survey the area to determine if reception of any other afiact2 Wi-Fi SSID is detected.

Note: If another afiact2 is detected, the Wi-Fi system must be configured to work on a different afiact2 Wi-Fi SSID, to prevent Afimilk Readers on neighboring farms from connecting to the local system network.

2.7 Power Specifications

The Afimilk Reader power connection must comply with the following specifications:

AC power supply installation

Item	Specification
Voltage	Nominal voltage of 24VAC (minimum 21.6VAC to maximum 27.5VAC)
Current	0.6A max 50/60Hz
Power per unit	16.5 Watts (i.e. a VA rating of at least 20 VA for the transformer)

DC power supply installation

Item	Specification
Voltage	Nominal voltage of 12VDC
Current	1.5A - 2.0A

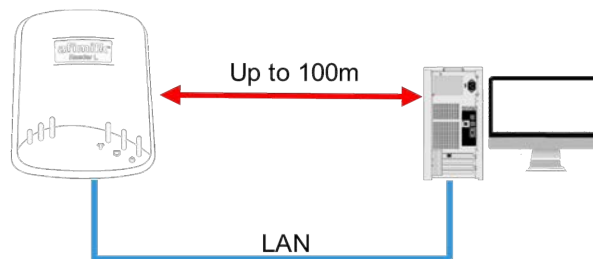
Note: Cable length and diameter can affect the Afimilk Reader's transmission power. Therefore, we recommend only using cables supplied by Afimilk.

3. Select Communication Network Options

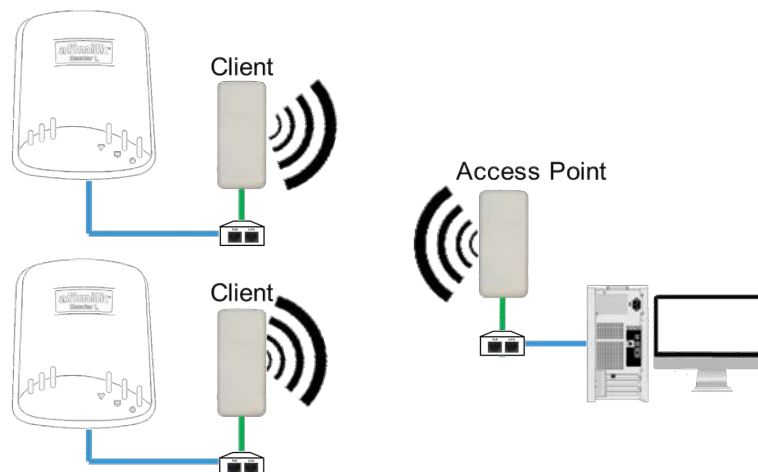
Legacy Afimilk Readers had a built-in Wi-Fi device to transmit data to the AfiFarm PC wirelessly (via local Access Point). All new Afimilk Readers are built without integrated Wi-Fi capabilities. New Afimilk Readers are LAN-only communication controllers that rely on external devices to transmit their data to the AfiFarm PC.

Installations of Afimilk Readers require one of the following network connections:

- **LAN** – LAN cables can be used for distances up to 100m from the office AfiFarm PC.



- **Point-to-Multipoint (PTMP) wireless bridge** - for networks requiring one or more Afimilk Readers, and where direct cable connection is not possible.



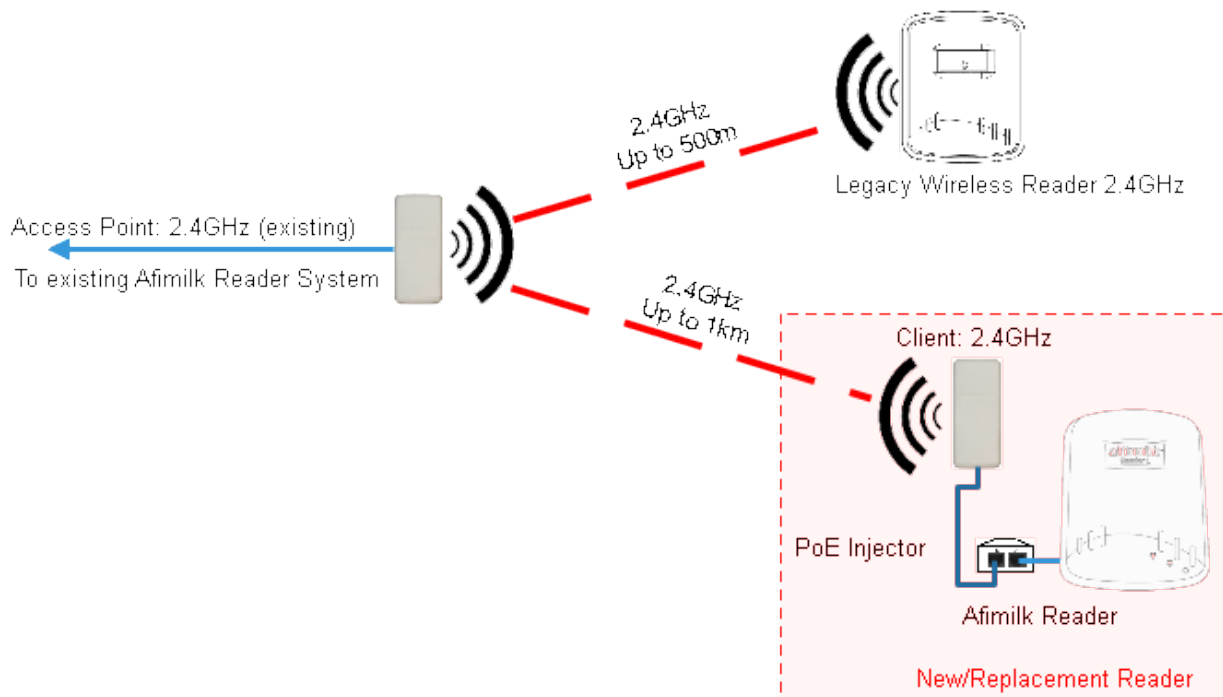
3.1 Wireless Network Design Options

The wireless network of Access Point and Clients needs an operative DHCP server on the network to assign automatic IP address to every connected device. Two configuration options are available for connecting the Afimilk Reader network to the office PC:

- **Existing office Router** - an existing office router can be used for DHCP if it meets all the following conditions:
 - The router has enough free LAN ports for each AP connected.
 - The router has an active DHCP server to assign automatic IP addresses to devices on the network,
 - The router works properly and is in a protected, clean environment.
- **Dedicated DHCP server** - if no office router is available, or the existing router does not meet the above conditions, we recommend using a dedicated DHCP server, connected to the AfiFarm PC via a dedicated, second network card (NIC 2).

3.2 Scenario 1 - Add/Replace Afimilk Reader on an Existing Farm

The new Afimilk Reader can be installed on existing Afimilk farms that have legacy wireless Afimilk Readers already installed. The new Afimilk Reader can be installed to replace an old Reader, or added to increase the farm's existing coverage. The legacy Afimilk Readers and their Access Points work on 2.4GHz, therefore the client antenna for the new Afimilk Reader must also use this frequency.

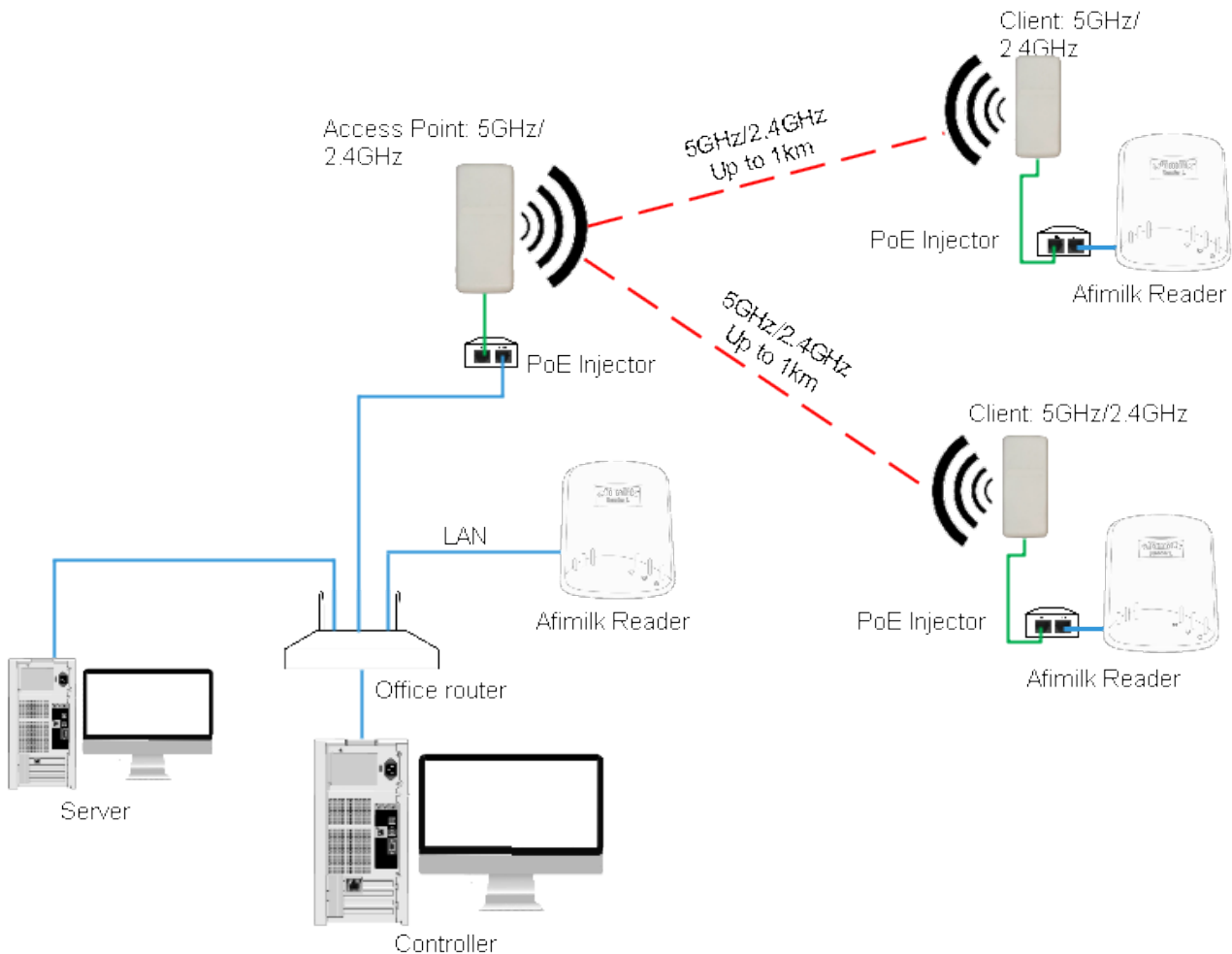


3.3 Scenario 2 - New Afimilk Farm

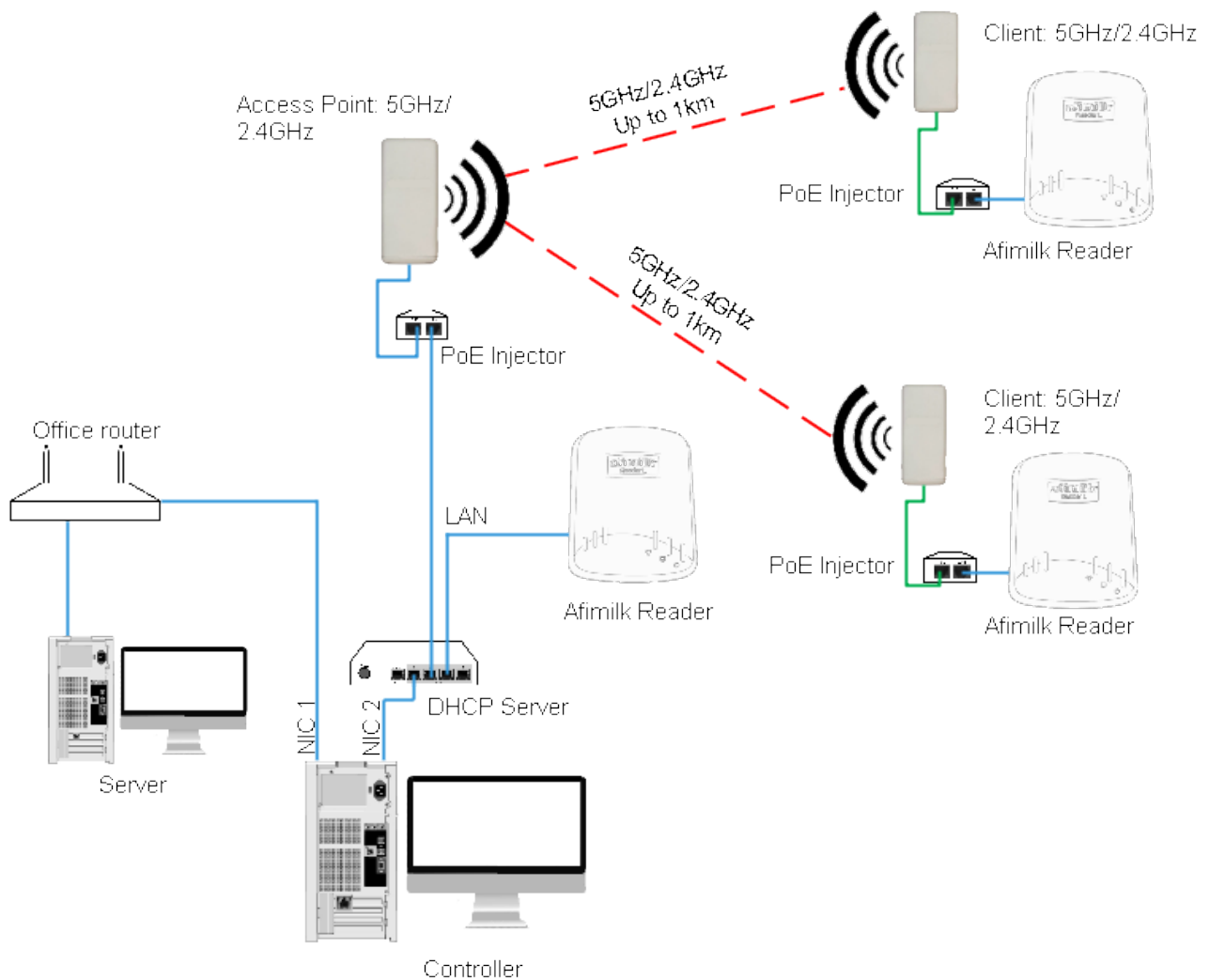
On new Afimilk farms, we recommend installing PTMP antennas that work on 2.4GHz/5GHz. This goes for both types of antennas: Access Point and Client.

The Afimilk Reader network can be connected to the AfiFarm PC via the existing office router, or via a dedicated DHCP server and dedicated network card (NIC2)

Afimilk Reader system connected to AfiFarm via office router:



Afimilk Reader system connected to AfiFarm via dedicated DHCP server and NIC 2:



4. System Components

The AfimilkReader requires several components for mounting and connecting the device.

4.1 Order Tags

AfimilkReaders are compatible with all Afimilk active ID tags.

Every country has its own frequency requirements. The tags and AfimilkReaders ordered must match these requirements.

Please contact [Afimilksupport](#) for information of compliance for your country, and for appropriate ordering information.

4.2 Order AfimilkReaders

The AfimilkReader orders must be compatible with the frequency of the active ID tags used on the farm, as follows:

- Tags in the 800MHz range - require an AfimilkReader 8.
- Tags in the 900MHz range – require an AfimilkReader 9.

Components can be ordered separately, as needed.

The number of AfimilkReaders required depends on each individual farm.

Farms that require coverage in paddocks must purchase AfimilkReaders with extended range to ensure maximum coverage of the area.

Picture	Name	Description	P/N
	Afimilk Reader H, 9	Each AfimilkReader order includes the wall bracket assembly required for fastening the AfimilkReader onto its mounting point and the Waterproof RJ45 Connector.	5256250
	Afimilk Reader H, 8		5256240

Picture	Name	Description	P/N
	Afimilk Reader H, ER, 9 - Extended Range	Each AfimilkReader Extended Range order includes: • AfimilkReader, ER (8 or 9) • External antenna bracket assembly, • Extended range antenna, • Wall bracket assembly, • Waterproof RJ45 Connector. At least 1 AfimilkReader – Extended Range is needed in pasture installations.	5256260
	Afimilk Reader, ER H, 8 - Extended Range		5256270

The following replacement components are available:

Picture	Name	Description	P/N
	AfimilkReader H, 9, No Bracket	Includes only the AfimilkReader.	5256243
	AfimilkReader H, 8, No Bracket		5256244
	Wall bracket assembly	For attaching the AfimilkReader to the mounting point.	9030050
	Waterproof RJ45 Connector	Used to create a watertight connection between the communication cable and the Afimilk Reader.	4000416
	Cable Assembly	N-TYPE, HDF400, 1m	4256215

The validation tool below is required for testing the Afimilk Reader ranges:

Picture	Name	Description	P/N	
	Coverage Tool	Used to validate AfimilkReader coverage.	AfimilkReader 9 coverage tool	4009689
			AfimilkReader 8 coverage tool	4009686

4.3 Determine the Communication Network

Each AfimilkReader must communicate with the PC via one of the following connection types:

4.3.1 LAN Cable

LAN is the preferred connection type to AfimilkReaders. The LAN cable should be Outdoor Cat5 Ftp Shielded Cable and above, with a T-568B termination, and no longer than 100m from the PC to AfimilkReader.

When only one AfimilkReader is used, set the dedicated NIC for AfimilkReaders to static IP:
172.20.1.10 / 255.255.0.0

4.3.2 Wireless Communication Network

The following antenna and DHCP options have been tested and approved by **Afimilk**.

Antenna

Select one of the following antenna options:

Note: We strongly recommend selecting the same antenna types for both the AP and Client functions.

Installation On Existing/New Farms 2.4GHz Client/AP Antenna	Installation On A New Farm 5GHz Client/AP Antenna	Quantity Required
EnGenius ENS202	Ubiquity NanoStation 5AC LOCO	AP - as many as required to cover the Afimilk Readers. CL - 1x antenna per Afimilk Reader.
EnGenius ENS202 EXT		
TP-Link CPE210		
Ubiquity NanoStation LOCO M2		

DHCP Server (optional)

The DHCP server is sourced locally. Select one of the following:

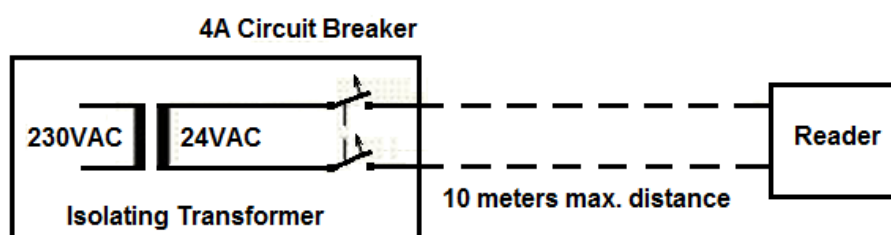
DHCP Server	Quantity Required
MikroTik hEX Lite	1
Ubiquity Edge Router X	

4.4 Determine Power Requirement

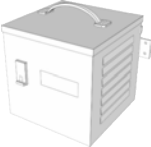
Afimilk Readers can be powered by either AC or DC power supply. Select from one of the following options:

AC power supply

- Power supply should be 23-27VAC, 75 VA maximum.



- Each AfimilkReader requires a power supply of 20VA.

Picture	Name	Description	P/N
	Power transformer	The Afimilktransformer is suitable for countries compatible with 220VAC power supplies. The Afimilk transformer is suitable only for sheltered or indoor areas. Outdoor installations will require an appropriate transformer. Transformers can be sourced locally, with the following specifications: 24 VAC power supply of 75 VA.	5009401

DC power supply, Option #1

The following components can be purchased locally, according to the following specifications:

Picture	Name	Description	P/N
	PoE Injector	Standards Protocols: IEEE802.3af/at Interfaces: • 1 x 10/100/1000Mbps RJ45 Port(Data/PoE) • 1 x 10/100/1000Mbps RJ45 Port(Data) • Input Voltage: AC: 100 - 240V ~ 50/60Hz • Output Voltage: DC: 51V/0.8A(max) • Power consumption: 30W (max) • Certification: FCC, CE, RoHS, UL Environment: • Operating Temperature: 0°C~40°C • Storage Temperature: -40°C~70°C • Operating Humidity: 10%~90% non-condensing • Storage Humidity: 5%~90% non-condensing	

Picture	Name	Description	P/N
	PoE splitter	Standards Protocols: IEEE802.3af/at Transfer Rate: 10/100/1000M Power: Input 44-57V/600mA , Output 12V/2A+ MAX Interface Type: • 1 Input RJ45 port, • 1 output RJ45 port, • 1 DC output, Jack 5.5*2.5mm Certification: FCC, CE, RoHS, UL Environment: • Operating Temperature: -20~50°C • Storage Temperature: -30~60°C • Operating Humidity: 10%~90% non-condensing • Storage Humidity: 5%~95% non-condensing Additional Features: • Short circuit protection, overvoltage protection, overcurrent protection, overheating protection. • High-Performance Network Filter for Gigabit+1500V High voltage isolation POE transformer.	
	DC JACK-TERMINAL BLOCK	CCTV DC Power Female Jack to Terminal Block Adapter • Internal diameter 2.1mm • External diameter 5.5mm	
	Female To Female CAT6 Network Ethernet LAN Connector		

DC power supply, Option #2:

The following components can be purchased locally, according to the following specifications:

Picture	Name	Description	P/N
	AC to DC transformer	POWER SUPPLY 12VDC 1.5A Can be sourced locally.	4087138
	CT-DCPLUG-F	CCTV ADAPTER, DC JACK- TERMINAL BLOCK	

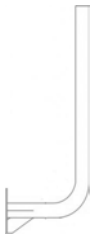
4.5 Determine Cable Requirements

Type	Spec	From	To	Additional Information
Network cable	Cat5e and above. Note: Outdoor installations require outdoor-grade cables.	PoE injector (PoE port)	Wi-Fi bridge device	Maxi: 20m
		Afimilk Reader	PoE injector (LAN port)	
		PC	PoE injector (LAN port)	Max: 100m

*Cables are supplied with the PoE injector, please confirm they are at least 1.5m long.

4.6 Additional Components

The following are also available from Afimilk for installing the antenna and its network.

	Name	Description	P/N
	20" J Pole + Fixed Wall Mount	For attaching the antenna to the mounting point. Can be sourced locally.	8021168
	Connection Box for Reader	1x Connection box is required per Client PoE Injector 1x connection box is required per AP PoE Injector 1x connection box is required per Afimilk transformer (or other AC or DC power connections).	4256271

5. Verify Coverage and Mount the Components

Verify the required network coverage and mount the devices:

Verify the network coverage:

1. Mount the office-side Wi-Fi bridge device (Access Point).
2. Test Wi-Fi network coverage using the mobile phone, to select optimal locations for the Afimilk Readers and associated Client Wi-Fi bridge devices.
 - The Wireless Network Signal Strength (RSSI) at Afimilk Reader locations must be -80dBm or higher.

Note: Smaller numbers after the minus sign indicate stronger signals.

- The Wi-Fi network must, in turn, provide an IP to the Afimilk Reader's MAC address.

Note: It is the user's responsibility to ensure sufficient network coverage at the Afimilk Readers' mounting points.

5.1 Mount the Afimilk Reader

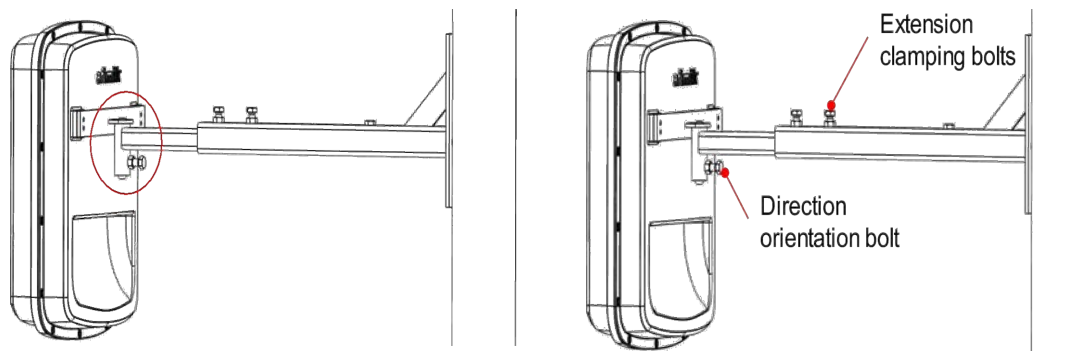
Mount the AfimilkReader on a pole with minimum vibrations or movement caused by fans, motors, or wind.

To mount the AfimilkReader:

1. Attach the Bracket onto the pole.
2. Mount the AfimilkReader onto the bracket by inserting the pin on the back of the AfimilkReader into the bracket arm's free end.
3. Adjust the extension and angle of the Reader.

Note: Set the direction of the AfimilkReader so that the LEDs on the front are easily visible.

4. Tighten the clamping and orientation bolts using a 13 mm wrench.

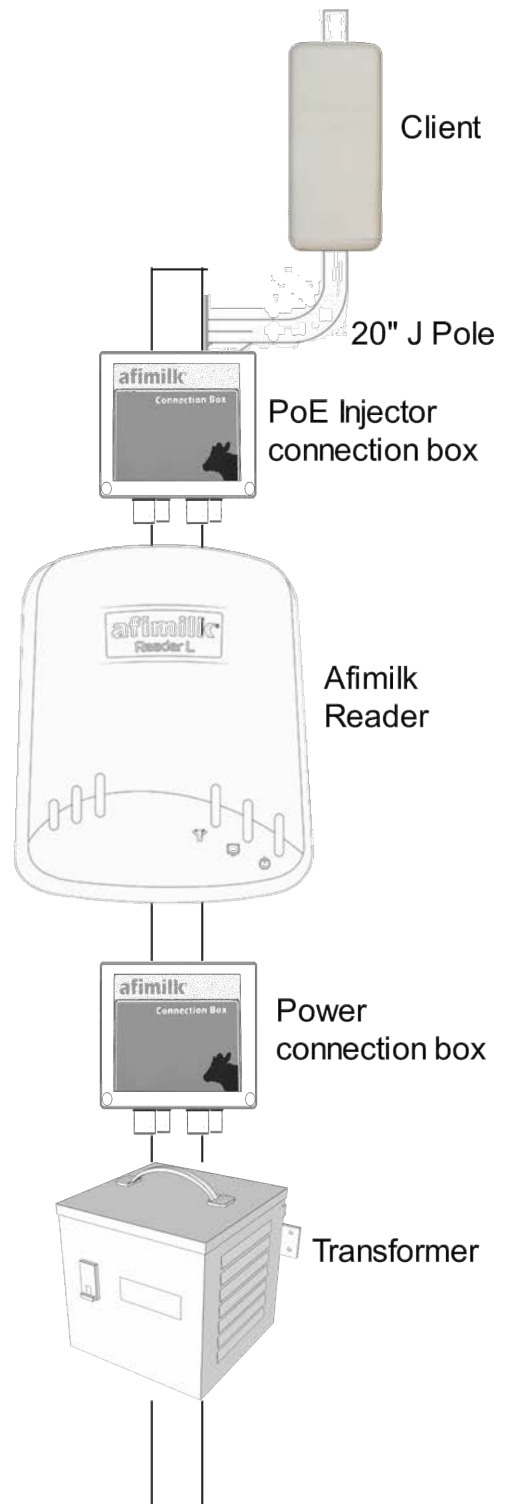


5.2 Mount the Devices

Mount the devices at the Afimilk Reader location so they are out of reach of the animals and, where necessary, protected from outdoor conditions.

To mount the devices:

1. Mount the Afimilk Reader at least 3.5m above ground level.
2. Mount the J pole and the Client Device 0.5m above Afimilk Reader height.
3. Mount the power connection box 0.5m below the Afimilk Reader.
4. Point the Client device to face the Access point location.
5. Mount the PoE Injector connection box below the J Pole.
6. Connect all network cables.
7. Connect the power to the Afimilk Reader.
8. Close all connection boxes once the system is powered up, and you have verified devices are working properly.

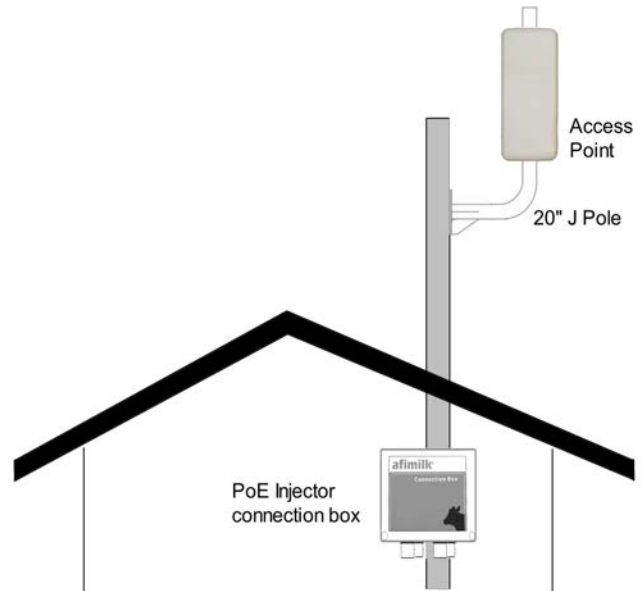


5.3 Mount the Access Point

Mount the access point(s) so they are out of reach of the animals and, where necessary, protected from outdoor conditions.

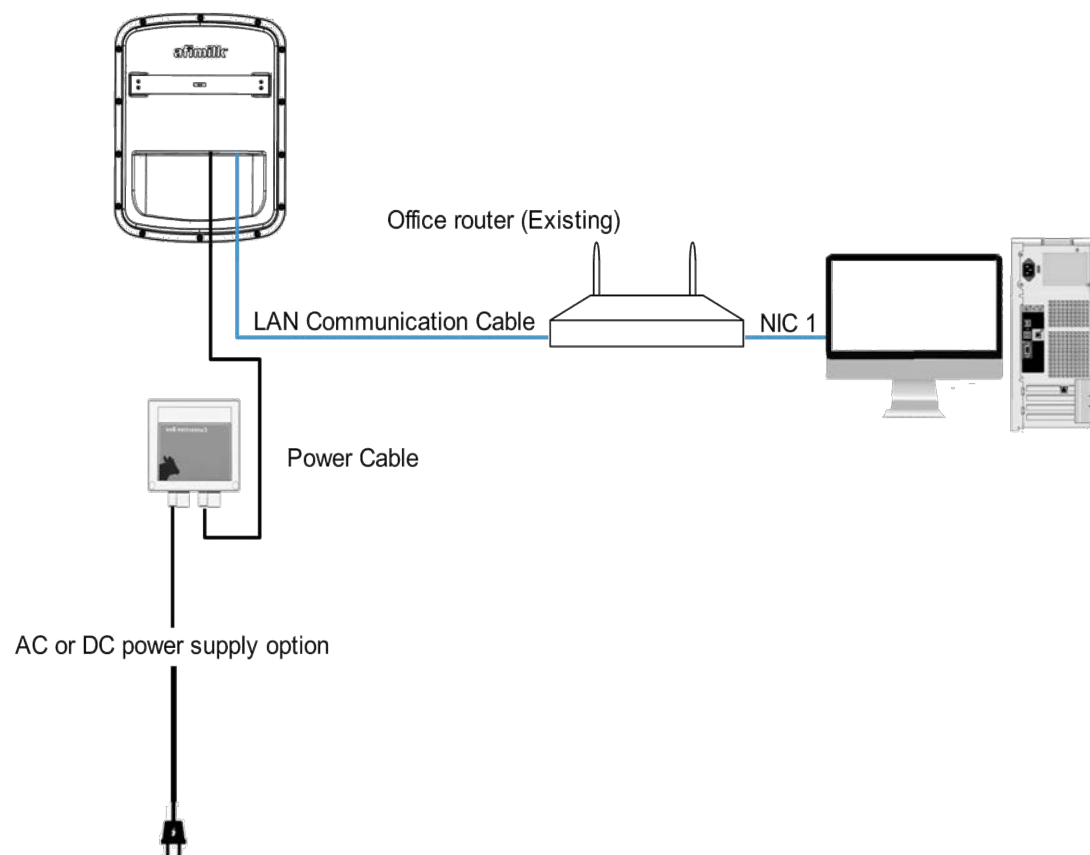
To mount the Access Point;

1. Mount the J pole and the Access Point device on a location with clean line of sight to all Afimilk Readers in the covered area.
2. Face the Access Point towards the Afimilk Reader furthest away.
3. Connect the PoE cable to the PoE injector.
4. PoE injectors mounted outdoors must be placed inside protection box.

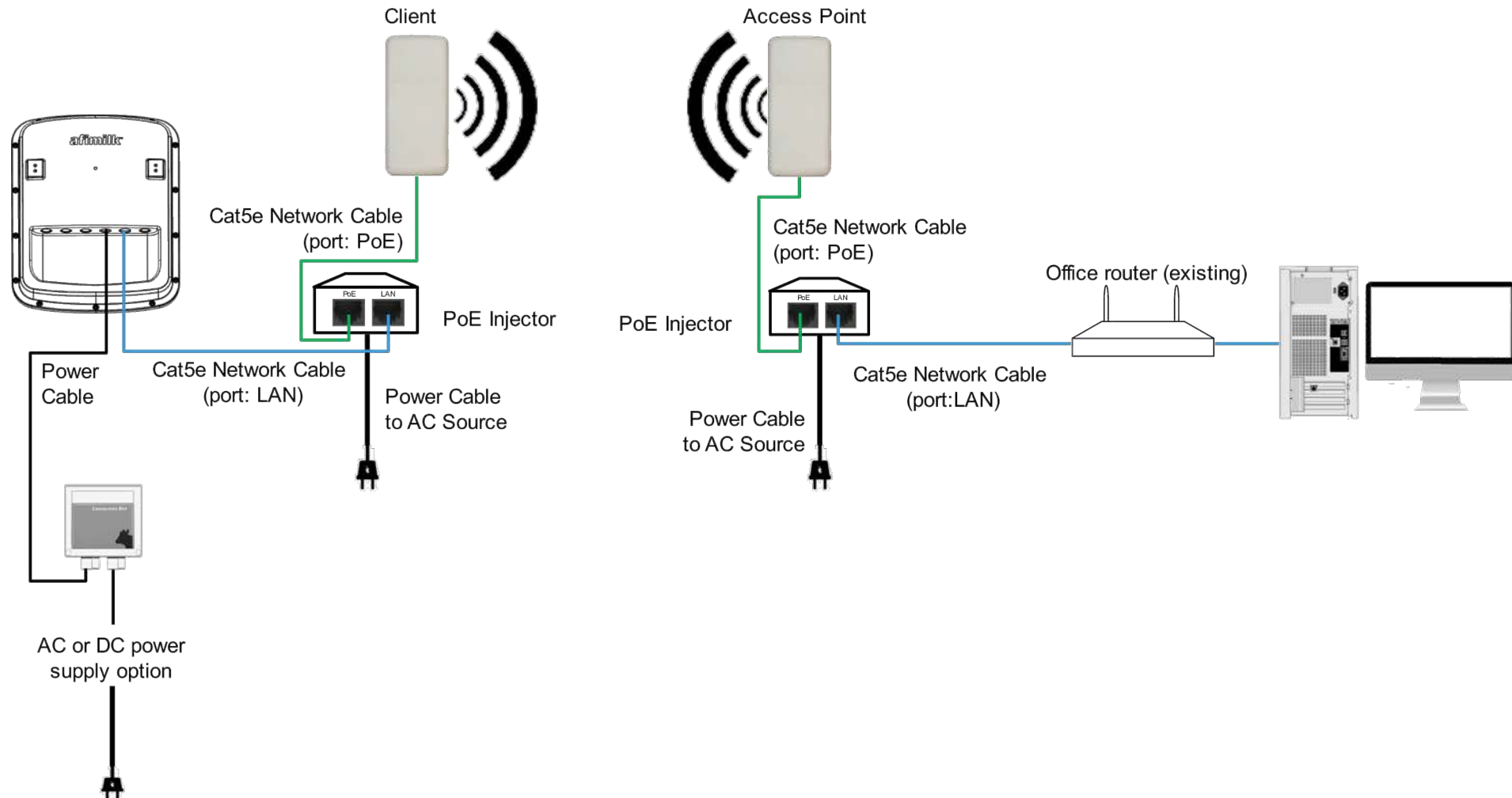


6. Cables - Layout

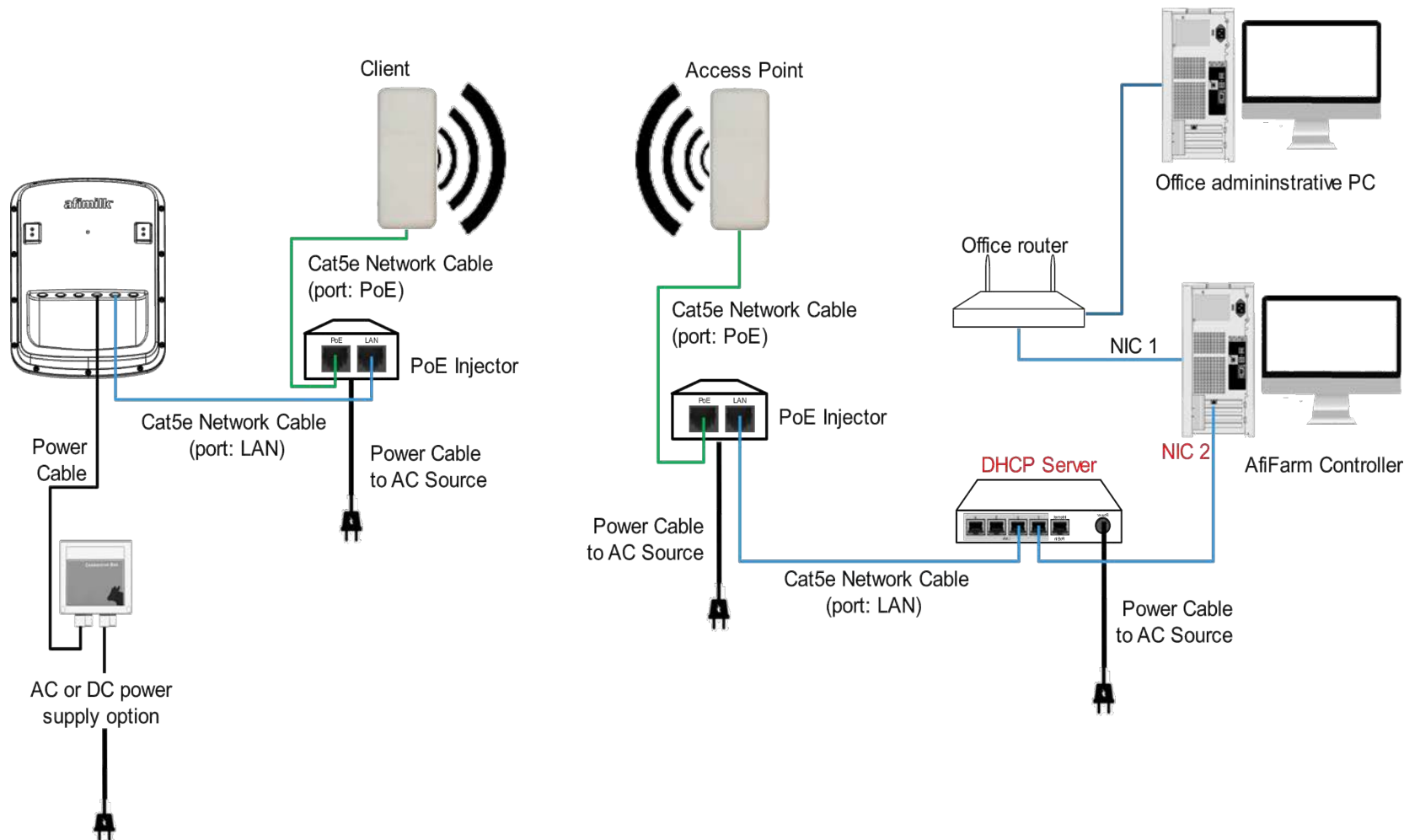
Afimilk Reader with LAN connection cable:



Afimilk Reader with wireless bridge connection with an existing office router as DHCP server:

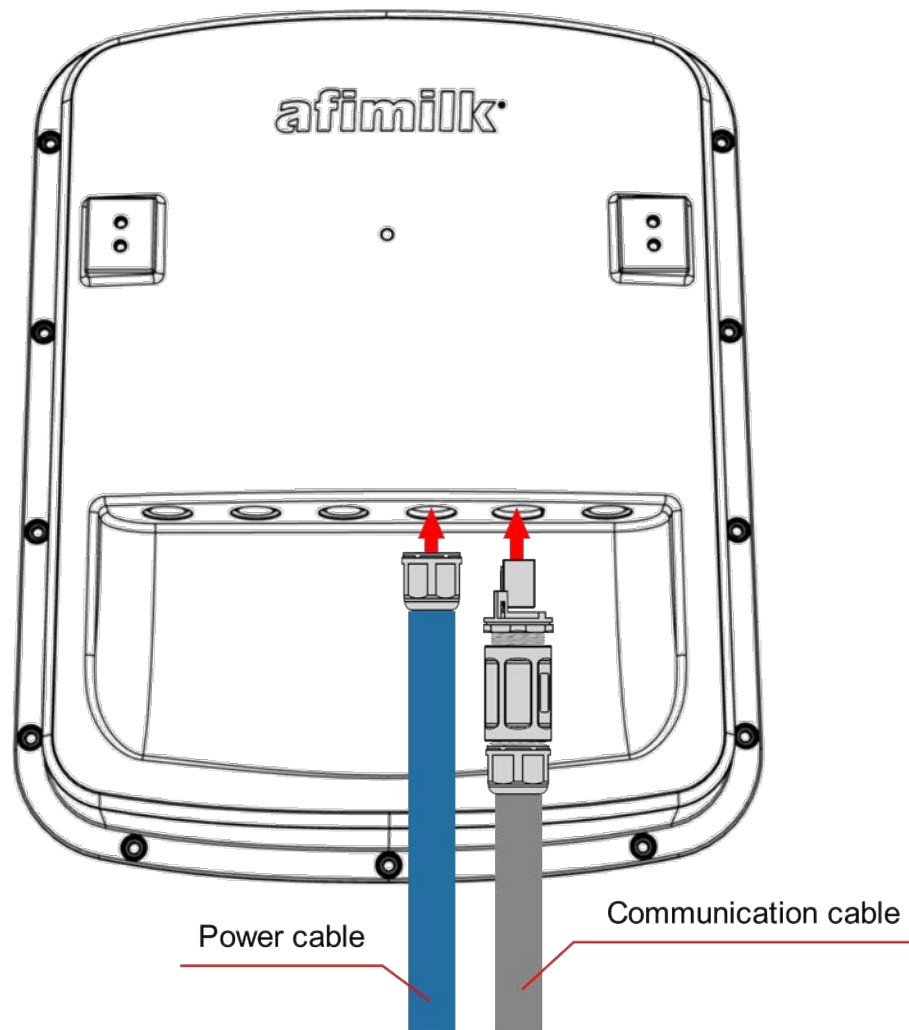


Afimilk Reader wireless bridge connection with dedicated DHCP server and NIC:



7. Wire the Components

The AfimilkReader components are wired as follows:

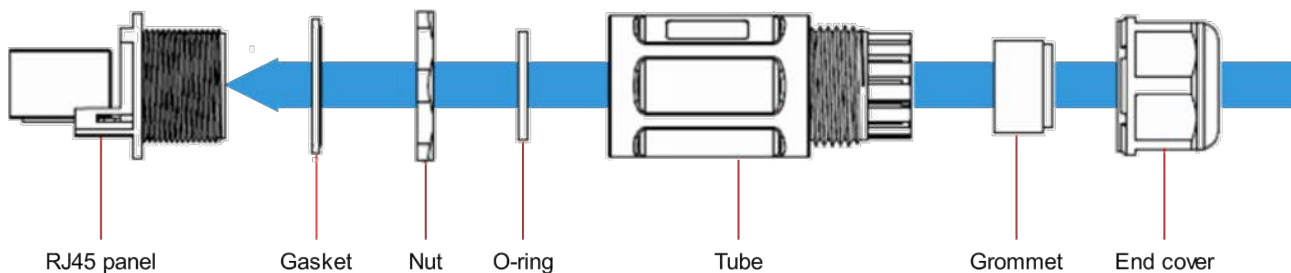


7.1 Afimilk Reader Communication Cables

Connect the communication cables from the Afimilk Reader to the one of the following options:

- PoE injector LAN port if you are using the wireless bridge.
- Directly to the office router or to the DHCP server if you are using direct LAN cable connection.

To ensure the communication cable connection to the Afimilk Reader is watertight, make sure to thread the ether cable through the Waterproof RJ45 Connector, then connect this to the port in the Afimilk Reader.



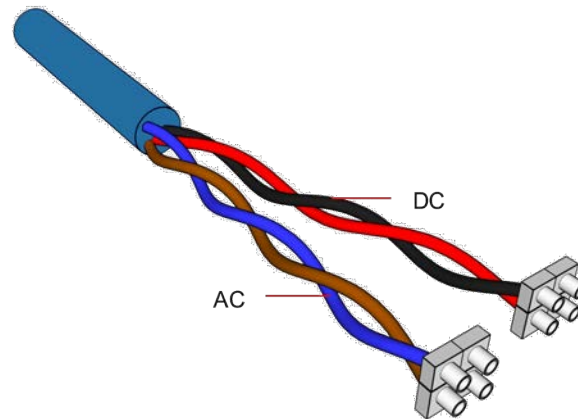
7.2 Wi-Fi Bridge Devices

1. Connect the network cables from the Access Point and/or Client to the PoE port.
2. Connect the supplied PoE power adapter to the PoE Injector then connect its power cord to a compatible AC outlet (220/110 VAC).
3. For the Access Point: Connect the communication cable from the PoE LAN port to the office router or DHCP server, according to your configuration.

7.3 Afimilk Reader Power Cables

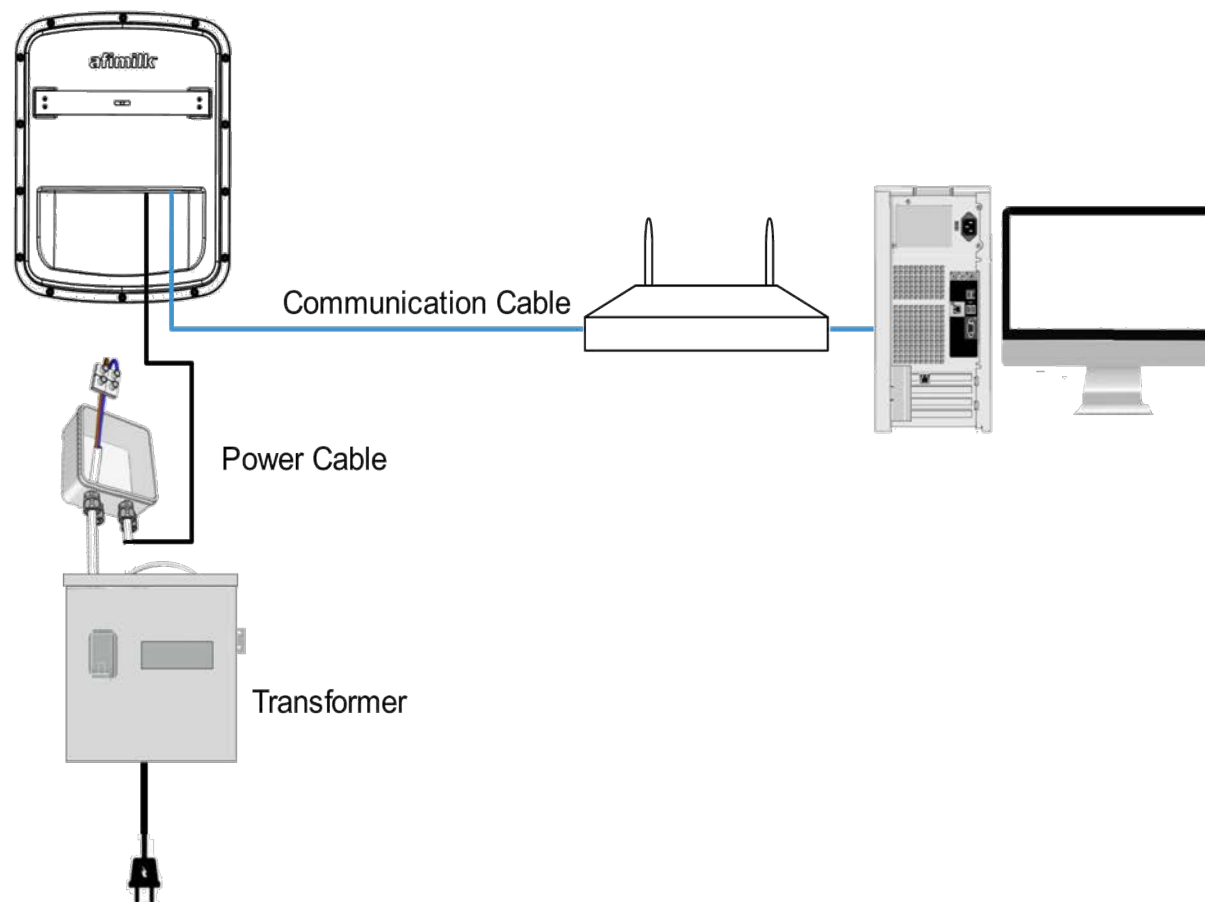
The AfimilkReader is supplied with two optional power input cables already connected. They should be connected, as follows:

Note: Please ensure that both input wires are connected to their terminals (even if not used) to avoid short circuiting the inputs.



AC power supply option:

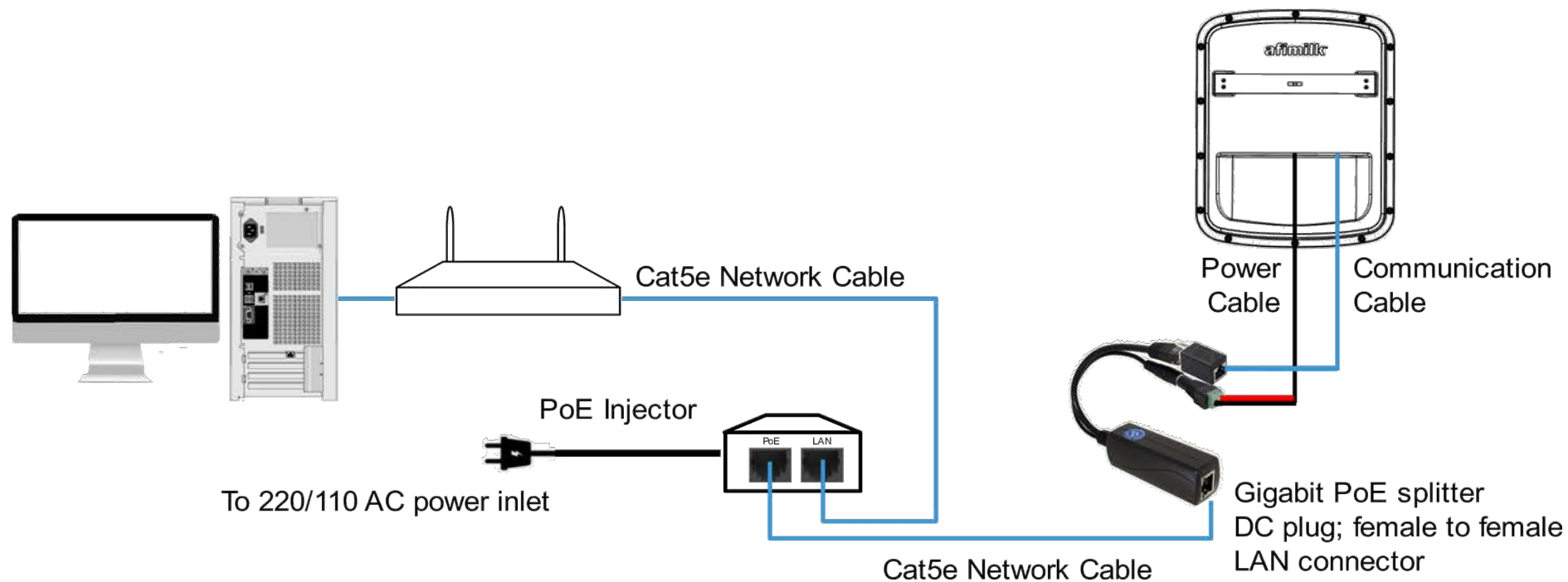
- 24VAC (Blue and Brown) input from local transformer



Caution: The power cable connection must be placed in a protection box to protect the connections from the elements.

DC power supply option #1:

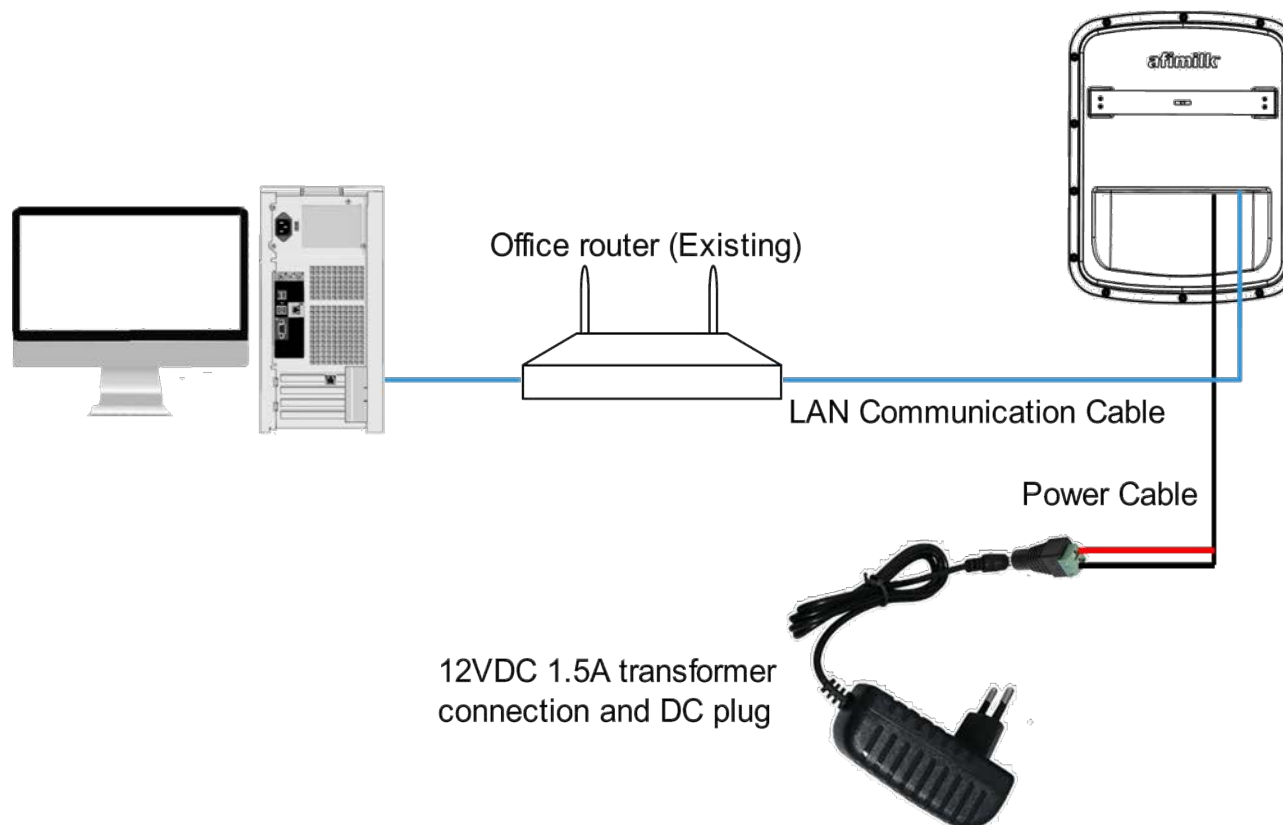
- 12VDC (Red and Black) cable for connecting with a PoE splitter



Caution: The PoE splitter assembly must be placed in a protection box to protect the connections from the elements.

DC power supply option #2:

- 12VDC (Red and Black) cable for connecting with a 12VDC transformer



Caution: The 12VDC DC JACK- TERMINAL BLOCK and the 12VDC DC PLUG - TERMINAL BLOCK must be placed in a protective box to protect the connections from the environment. The AC to DC transformer must be in a place protected from rain and sun.

8. Configure the Afimilk Reader in AfiControl

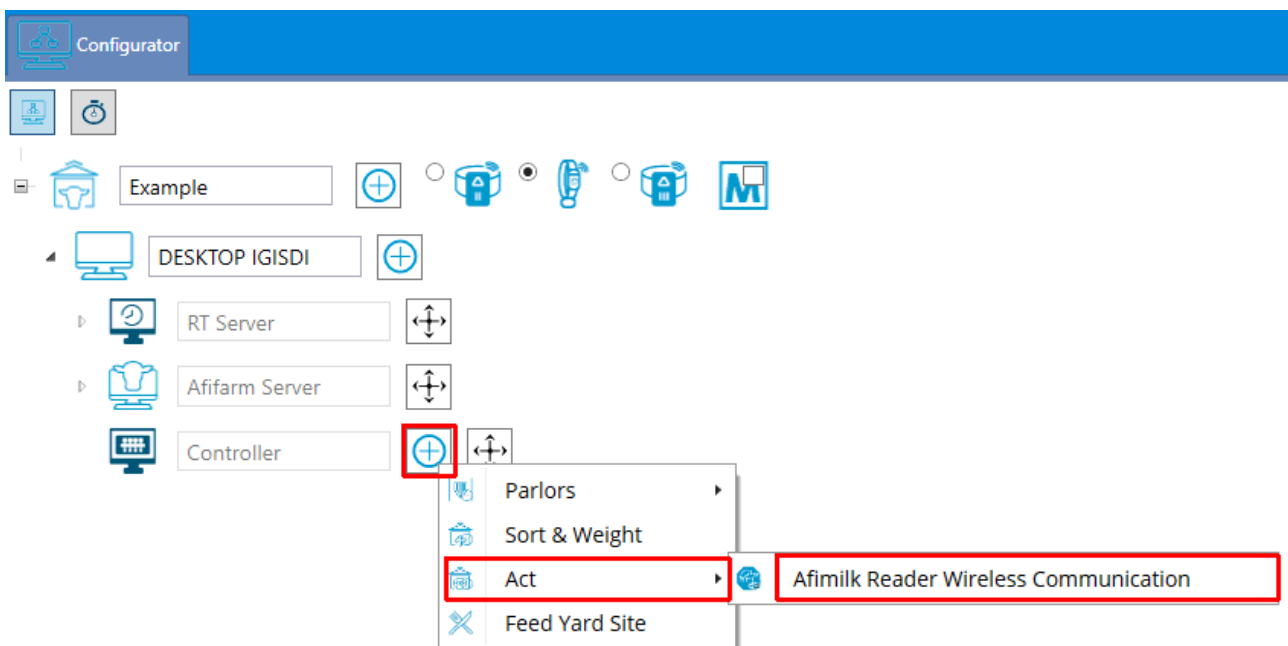
The Afimilk Reader is connected to a PC that is defined as a Controller in AfiFarm (see [AfiFarm 5.5 Installation Guide](#)). This connection is configured In AfiControl, in the Technician View:

To configure the Afimilk Reader

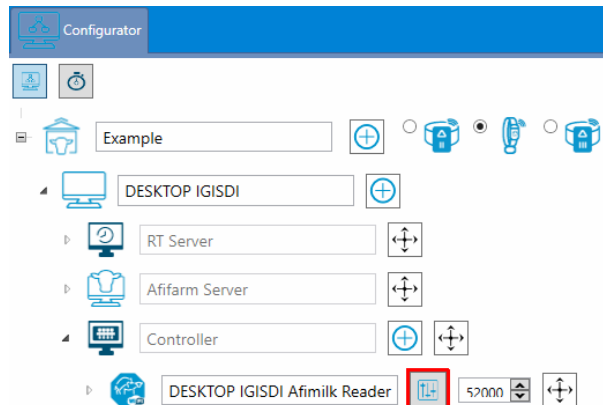
1. Click the **Settings** tab, and then click **Configurator**.



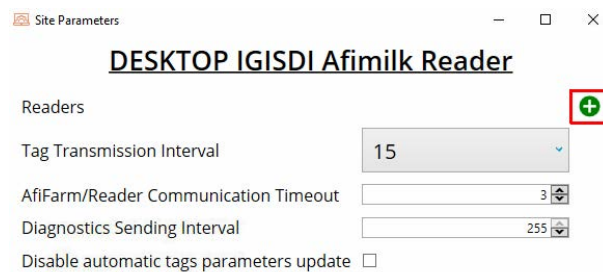
2. Add the device to the Controller PC to which the Afimilk Reader is connected:
 - a. Next to Controller, click **Add** .
 - b. In the menu that opens, click **Act**, then click **Afimilk Reader Wireless Communication**.



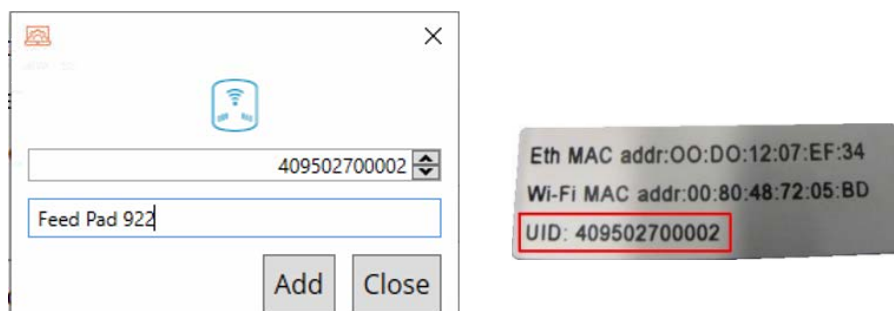
3. Open the Afimilk Reader parameters: Click **Parameters** .



4. In the Site Parameters dialog box, click  to add another Afimilk Reader.



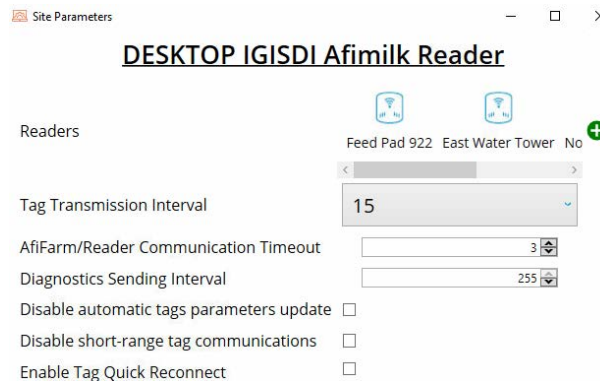
5. Set the Afimilk Reader ID (displayed on the Reader label as UID) and name (the name should help you identify the Afimilk Reader (for example, by its location), then click **Add**.



Note: Multiple Afimilk Readers can be added by adding a new ID number and name, then clicking **Add** after each additional AfimilkReader.

6. Once all the Afimilk Readers are added, click **Close**.

The AfimilkReader names appear in the Site Parameters dialog box.



7. Set the following parameters, as required:

Item	Values
Tag transmission interval	Sets the interval in which the tags data is retrieved by the AfimilkReader (default 15). Warning: Do not change unless instructed by AfimilkSupport
AfiFarm/Reader Communication Timeout	Do not change (default 3)
Diagnosis Sending Interval	Do not change (default 255)
Disable automatic tags parameters update	Do not change (default – empty)
Disable short-range tag communications	Select the check box for standalone farms with both passive ID and AfiCollars. When selected, short range communication with the tag is disabled, saving battery life and preventing interference during identification of the passive ID in the milking parlor.
Enable Tag Quick Reconnect	AfimilkReader by default connects to and transmits data from the tags every 15 minutes. Select this check box to ensure all tags that failed to connect and transmit at the 15-minute transmission interval attempt to transmit at 5-minute intervals until transmission is successful. This is selected only in pasture farms.

8.1 Set AfimilkReader Frequency

The AfimilkReader transmission frequency must match the country's regulations **and the frequency of the tags supplied to the farm**. Installers are required to manually set the required transmission frequency.

To set the AfimilkReader frequency:

- In the Site Parameters dialog box, open the **Country** drop-down list, then do one of the following:
 - Select your country's default frequency** – Select your country from the list. The default Frequency for your country is displayed.
 - Define a customized frequency** - scroll down to the bottom of the list, select **Custom**. Set your customized channel, then select **Add Frequency**.

The new frequency is added to the list of channels available. Multiple frequencies can be added.

- Select the Channel/Frequency your AfimilkReader will use, then click **Close**.

Site Parameters

Controller PC Afimilk Reader

Afimilk Readers

Tag Transmission Interval: 15

AfiFarm/Reader Communication Timeout: 3

Diagnostics Sending Interval: 255

Disable automatic tags parameters update: ☐

Disable short-range tag communications: ☐

Enable Tag Quick Reconnect: ☐

Country: Custom

Select Channel

Channel	Frequency
☐ 1	907.2
☒ 2	907.5

908.5 Add Frequency

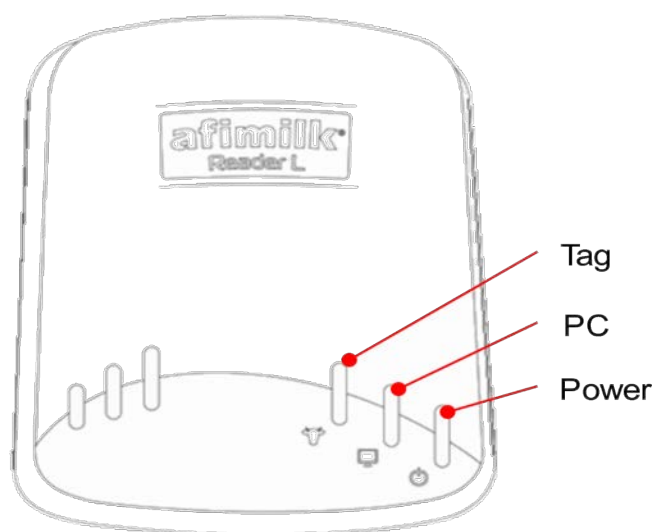
Close

9. First Time Operations

The following procedures are required once the AfimilkReader is mounted, connected to AfiFarm and powered up:

9.1 Verify AfimilkReader Reception

Once all the devices are powered up the technician must verify the PC LED is ON (green) and the Afimilk Reader communicates with the PC. See the table below to determine if there are any faults in the AfimilkReader functioning.



LED	Name	Description
	Tag Communication	Indicates communication status with tags, as follows: Blinking yellow LED – good communication, Off – No communication. Note: This LED blinks for a short period every time a message from a tag is received by the AfimilkReader.
	PC Communication	Indicates communication status with the AfiFarm application, as follows: Yellow – AfimilkReader is communicating with AfiFarm, Off – AfimilkReader cannot connect to AfiFarm.
	Power	Green LED – On (no faults detected), Red LED blinking – AfimilkReader did not receive any tag transmissions for more than 30 minutes. Red LED – fault detected.

9.2 Verify Wireless Client Reception

The technician must verify the wireless signal reception quality on the Client antenna is above -80dbm.

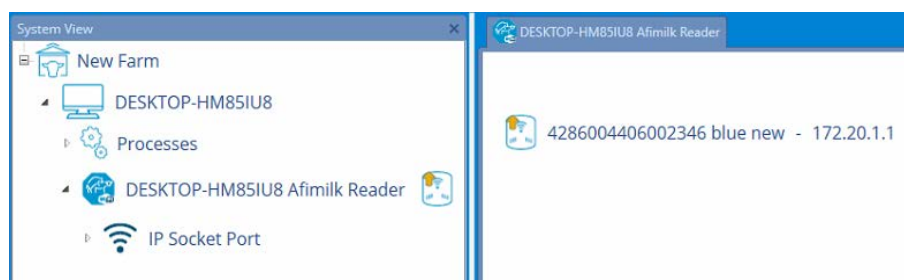


9.3 Verify AfiControl Connects to the AfimilkReader

Verify the AfimilkReader - AfiControl connection is successful.

To verify the AfiControl-Reader connection:

In the **System View** tab, click the site. If the site is connected the AfimilkReader name and IP Address are displayed.



The connected elements (AfimilkReaders) are most likely to appear as disconnected (with a red sign: ) during the first few seconds.

Wait a few seconds for the AfimilkReader-controller connection to be established. When the connection is established, AfiControl will show the AfimilkReader as connected, with its relevant IP address, indicating that the AfimilkReader and AfiControl Controller are now communicating.

In addition, the AfimilkReader's PC Comm LED will show that the Afimilk Reader and PC are communicating.

Make sure to record the Afimilk Reader's dynamic IP address.

9.4 Verify AfimilkReader Perimeter Coverage

Use the coverage tool to confirm the AfimilkReader-tag transmission range extends throughout the required area.

Note: Make sure to use the coverage tool at the same height of the tags on the cows (either leg height or neck height).

To verify the AfimilkReader coverage is sufficient:

1. In AfiControl, set the AfimilkReader frequency to match the frequency of the coverage tool (see [Set Afimilk Reader Frequency on page 43](#)).
2. Position the coverage tool at the furthest required location (we recommend testing at least each corner of the coverage area).
3. Hold the coverage tool at the approximate height of the tag, then confirm 5 communication cycles (1 cycle takes 5 seconds), as follows:
 - Full coverage = 3 blinks during each cycle.
 - No coverage = 1 blink during all cycles OR in some cycles 1 blink and some cycles 3 blinks.
4. In AfiControl, set the AfimilkReader frequency back to its required frequency.

View the full video of this process by [following the link](#) or scanning the code below:



9.5 Perimeter Coverage Validation

Once the tags are activated, it is important to validate their coverage. Use the AfimilkCoverage Tool for completing the validation process.

Note: See [Serial USB Terminal Installation on page 56](#) for further details about installation and use of the Serial USB Terminal in Android 11.

To validate tags' perimeter coverage:

1. Place four tags in four corners of the area the AfimilkReader must cover.

Note: Tags MUST be in standing position and at a height of no more than 30cm above the ground for AfiAct leg tags or at a height of 1.5 meters above the ground for AfiCollars!

2. Verify that the tags have been identified by the AfimilkReader.
3. Follow this process twice, to ensure the AfimilkReader reads every tag at least twice (two transmissions).

9.6 Confirm Tag Activity

Open the **Activity Log Report** to confirm it is updated with tag messages to confirm tag activity is transferred via the AfimilkReader to AfiFarm.

Note: You may set the AfimilkReader's transmission interval to 5 minutes (via AfiControl) to quickly check that the tags transmit. Make sure to change it back to 15 minutes.

To access the tag activity log:

1. In AfiControl, open the **Reports** tab.
2. Expand System Reports, click **Tags**, then click **Tags Activity**.

The screenshot shows the AfiControl interface. The top navigation bar includes 'Monitoring', 'Settings', and 'Tools'. The left sidebar shows 'System View' with 'Deegan' and 'DESKTOP-8OAPK9B' under 'Processes', and 'Afimilk Reader' under 'Reports'. The 'Reports' section is expanded, showing 'System Reports' and 'Tags' under 'Device'. The 'Tags Activity' report is displayed, showing a list of tags with columns: Site Name, Reader Name, Tag, Animal Number, Group, End Time, and Server Time. The report shows activity for various tags, including 'Afimilk Reader' and 'Pump Shed Reader'.

	Site Name	Reader Name	Tag	Animal Number	Group	End Time	Server Time
1	Afimilk Reader	Deegan Dairy Barn	221005836	7471	3	Tuesday, 2 November 202...	Tuesday, 2 November 20...
2	Afimilk Reader	Deegan Dairy Barn	221005836	7471	3	Tuesday, 2 November 202...	Tuesday, 2 November 20...
3	Afimilk Reader	Deegan Dairy Shed	221006195	475	1	Monday, 1 November 202...	Tuesday, 2 November 20...
4	Afimilk Reader	Deegan Dairy Shed	221006195	475	1	Monday, 1 November 202...	Tuesday, 2 November 20...
5	Afimilk Reader	Deegan Dairy Shed	221006195	475	1	Monday, 1 November 202...	Tuesday, 2 November 20...
6	Afimilk Reader	Deegan Dairy Shed	221006195	475	1	Monday, 1 November 202...	Tuesday, 2 November 20...
7	Afimilk Reader	Deegan Dairy Shed	221006195	475	1	Monday, 1 November 202...	Tuesday, 2 November 20...
8	Afimilk Reader	Deegan Dairy Shed	221006195	475	1	Monday, 1 November 202...	Tuesday, 2 November 20...
9	Afimilk Reader	Deegan Dairy Shed	221006195	475	1	Monday, 1 November 202...	Tuesday, 2 November 20...
10	Afimilk Reader	Deegan Dairy Shed	221006615	7495	1	Tuesday, 2 November 202...	Tuesday, 2 November 20...
11	Afimilk Reader	Deegan Dairy Shed	221006615	7495	1	Monday, 1 November 202...	Tuesday, 2 November 20...
12	Afimilk Reader	Deegan Dairy Shed	221006615	7495	1	Monday, 1 November 202...	Tuesday, 2 November 20...
13	Afimilk Reader	Deegan Dairy Shed	221006615	7495	1	Monday, 1 November 202...	Tuesday, 2 November 20...
14	Afimilk Reader	Deegan Dairy Shed	221006615	7495	1	Monday, 1 November 202...	Tuesday, 2 November 20...
15	Afimilk Reader	Deegan Dairy Shed	221006615	7495	1	Monday, 1 November 202...	Tuesday, 2 November 20...
16	Afimilk Reader	Deegan Dairy Shed	221006615	7495	1	Monday, 1 November 202...	Tuesday, 2 November 20...
17	Afimilk Reader	Pump Shed Reader - 4286004	221004222	7185	4	Tuesday, 2 November 202...	Tuesday, 2 November 20...
18	Afimilk Reader	Pump Shed Reader - 4286004	221004222	7185	4	Tuesday, 2 November 202...	Tuesday, 2 November 20...
19	Afimilk Reader	Deegan Dairy Shed	221006906	1146	1	Monday, 1 November 202...	Tuesday, 2 November 20...
20	Afimilk Reader	Deegan Dairy Shed	221006906	1146	1	Monday, 1 November 202...	Tuesday, 2 November 20...
21	Afimilk Reader	Deegan Dairy Shed	221006906	1146	1	Monday, 1 November 202...	Tuesday, 2 November 20...
22	Afimilk Reader	Deegan Dairy Shed	221006906	1146	1	Monday, 1 November 202...	Tuesday, 2 November 20...
23	Afimilk Reader	Deegan Dairy Shed	221006906	1146	1	Monday, 1 November 202...	Tuesday, 2 November 20...
24	Afimilk Reader	Deegan Dairy Shed	221006906	1146	1	Monday, 1 November 202...	Tuesday, 2 November 20...
25	Afimilk Reader	Deegan Dairy Shed	221006906	1146	1	Monday, 1 November 202...	Tuesday, 2 November 20...
26	Afimilk Reader	Deegan Dairy Shed	221007029	7377	1	Monday, 1 November 202...	Tuesday, 2 November 20...
27	Afimilk Reader	Deegan Dairy Shed	221007029	7377	1	Monday, 1 November 202...	Tuesday, 2 November 20...
28	Afimilk Reader	Deegan Dairy Shed	221007029	7377	1	Monday, 1 November 202...	Tuesday, 2 November 20...
29	Afimilk Reader	Deegan Dairy Shed	221007029	7377	1	Monday, 1 November 202...	Tuesday, 2 November 20...
30	Afimilk Reader	Deegan Dairy Shed	221007029	7377	1	Monday, 1 November 202...	Tuesday, 2 November 20...
31	Afimilk Reader	Deegan Dairy Shed	221007029	7377	1	Monday, 1 November 202...	Tuesday, 2 November 20...
32	Afimilk Reader	Deegan Dairy Shed	221007029	7377	1	Monday, 1 November 202...	Tuesday, 2 November 20...

10. Troubleshooting

See the table below for solving AfimilkReader to tags connection problems.

Indication	Fault	Solution
Status LED blinks green PC COM LED is ON No animal activity/ rumination/eating information appears in AfiFarm or AfiControl	AfimilkReader is not receiving any tag messages	• Verify (with Afimilkcoverage test tool) that tags are in the covered area of the AfimilkReader for more than 15 minutes. • Verify working channel is set correctly according to your region. • Verify the AfimilkReader firmware version is the latest released with the official AfiFarm 5.5.
10 Days graph reflects abnormal or strange activity that is inconsistent with the animal's actual activity.	Activity, behavior data looks strange	Verify the tags are attached to the animals as instructed.
AfimilkReader appears disconnected in AfiControl	Network disconnection between the Afimilk Reader and the controller PC.	Please open a service call with Afimilksupport team: support@afimilk.com 1. Power cycle the AfimilkReader. 2. Power cycle all network devices and the controller PC.
All other problems		Please open a service call with Afimilksupport team: support@afimilk.com

Appendix A. Direct Cable Connection to AfimilkReader

Use the Back-to-Back connection procedure to connect a laptop directly to the AfimilkReader using a network cable.

This method enables you to communicate with the AfimilkReader in the field when the AfimilkReader is not connected to the wireless network for some reason, and can also be used to solve field connection/general problems, without needing to dismount the AfimilkReader and to connect it with a cable to the main computer in the office.

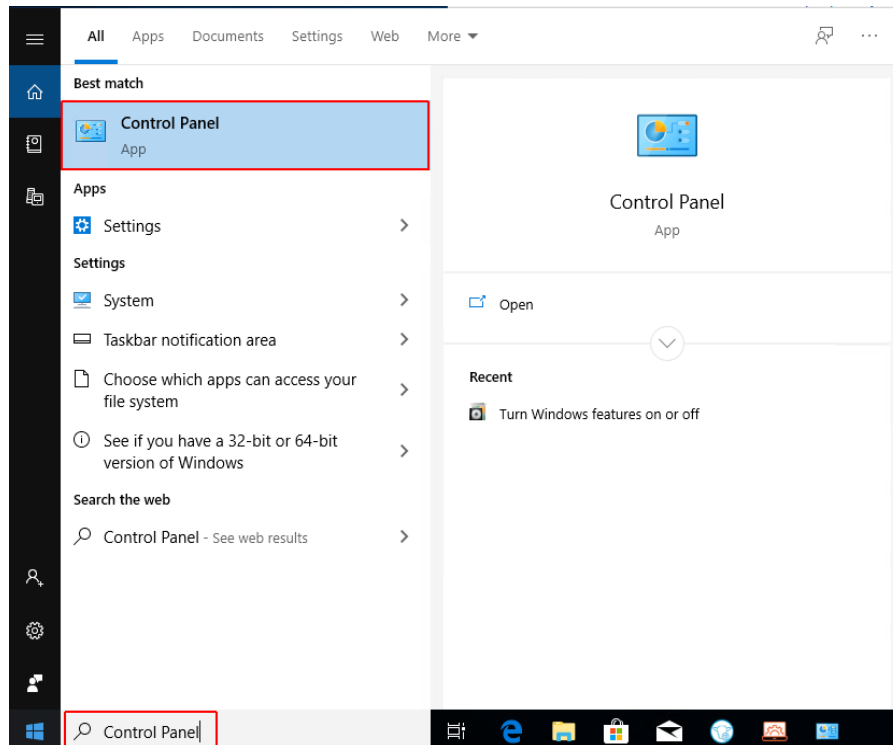
The Back-to-Back connection process is simple and requires the user to set the AfimilkReader's host static IP in the laptop NIC.

Note: For troubleshooting - The AfimilkReader is provided with a label showing its ID (and MAC), to which an IP address will be assigned during the connection procedure. You may obtain the IP address that has been assigned to your AfimilkReader using a standard IP/MAC scanner application (e.g. ip-scanner).

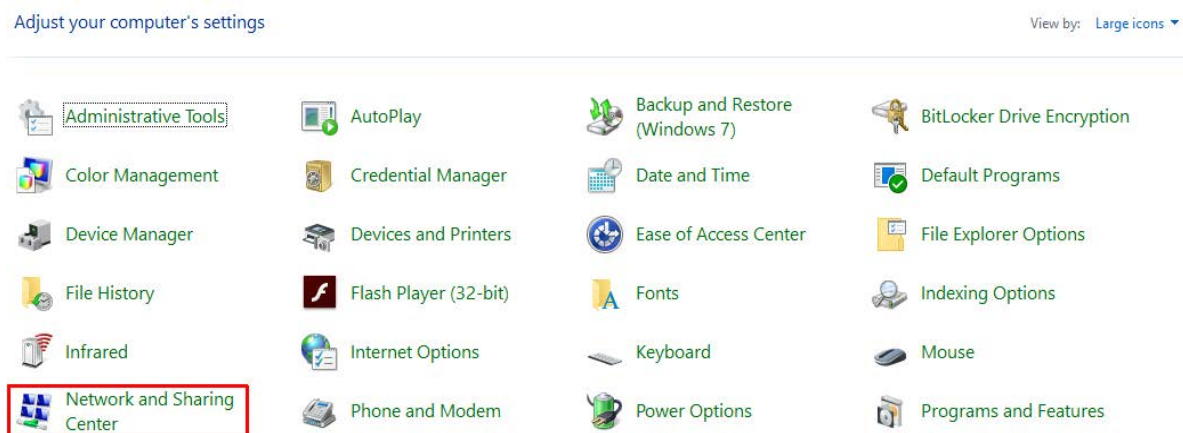
To configure the Laptop to connect to the AfimilkReader:

Note: This procedure varies according to the laptop's Operating System. Our instructions below conform to the Windows operating system.

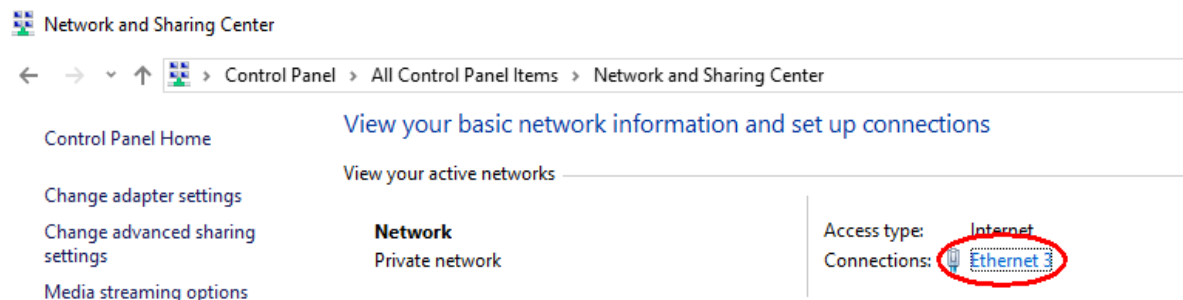
1. Connect the AfimilkReader to the laptop by connecting a network cable to the laptop.
2. Record the Laptop's original IP and Subnet Addresses: In the Task bar, in the search box, type **Control Panel**, and then select the Control Panel option displayed in the results.



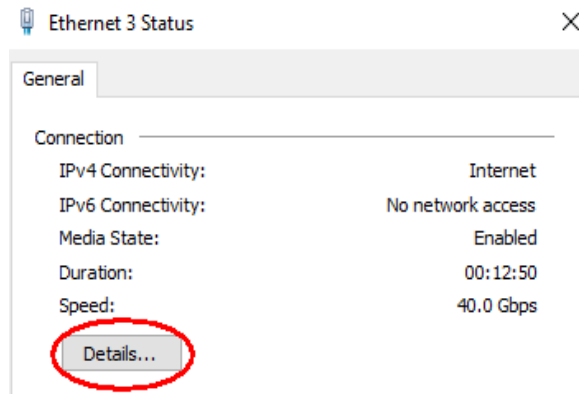
3. Select **Network and Sharing Center**.



4. In the Network and Sharing Center dialog box, click the Connections link.

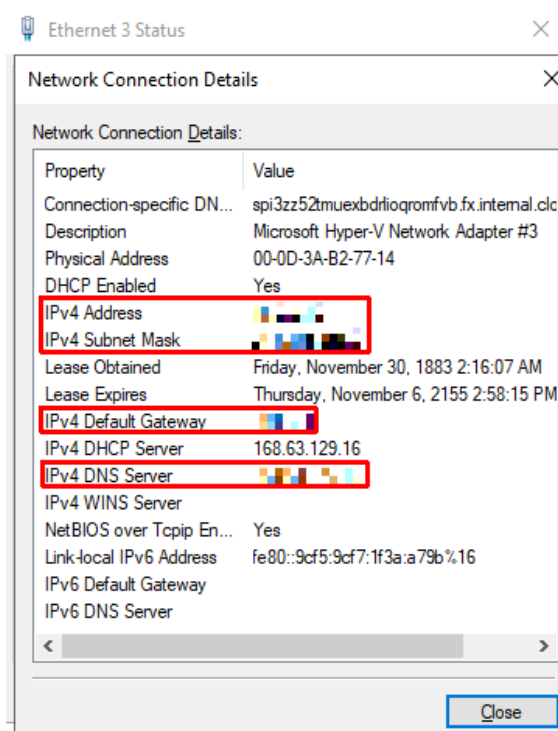


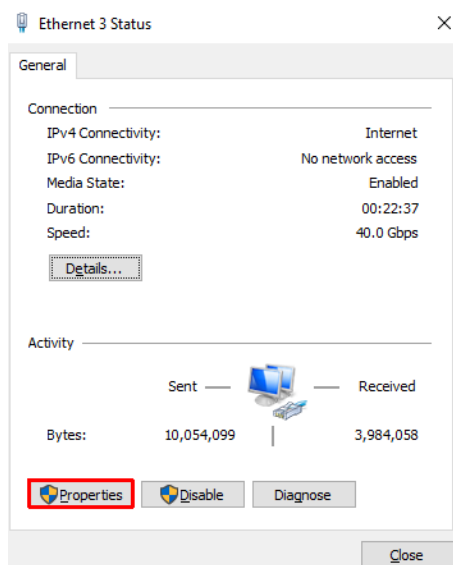
5. Click **Details**.



6. Record the following original NIC values, then click **Close**.

- IPv4 Address
- IPv4 Subnet Mask
- IPv4 Default Gateway
- IPv4 DNS Servers (record the first address)





7. Follow [Set Dedicated NIC Addresses on the next page](#) for setting a new IP and Subnet Mask address to communicate with the AfimilkReader using the laptop (via the Luci interface).
You can also access and connect to available wireless networks, to set Wi-Fi communication.

Note: At the end of the laptop back-to-back usage, remember to restore the laptop to its original IP and Subnet addresses.

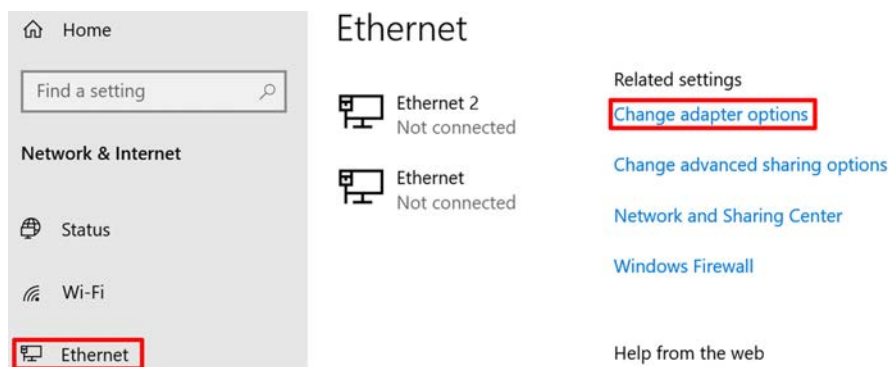
Appendix B. Set Dedicated NIC Addresses

A second, dedicated NIC is used only when a DHCP server option is also used. Assign the NIC 2 the following addresses:

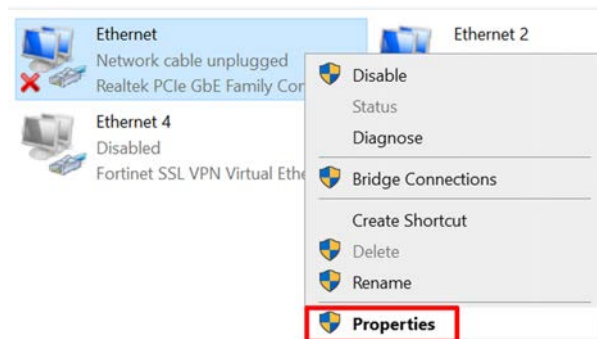
- **IP address:** 192.168.78.1
- **Subnet mask:** 255.255.255.0

To set the IP and Subnet Addresses:

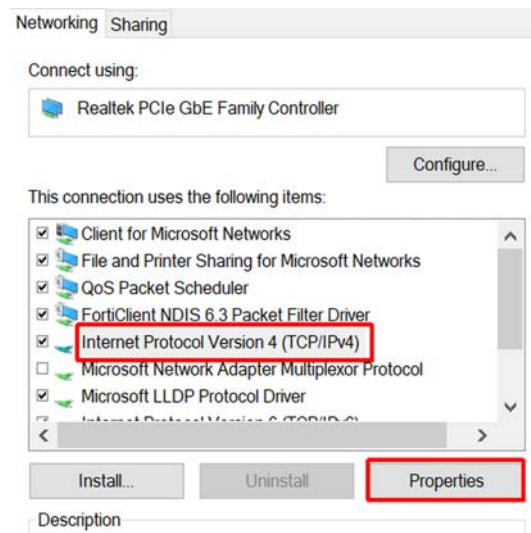
1. Open your computer's settings window to access the Ethernet Settings .
2. Click **Change adapter options**.



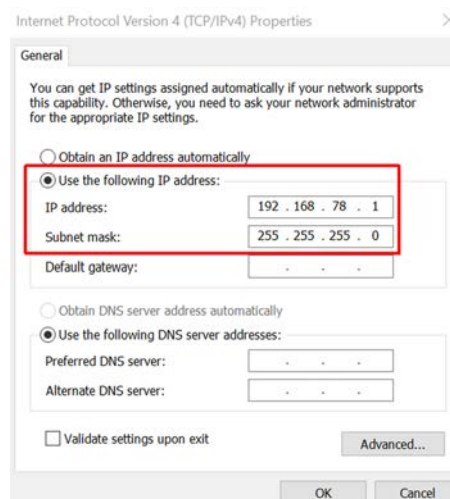
3. Right-click the Ethernet icon, then click **Properties**.



4. Select **Internet Protocol Version 4**, then click **Properties**.



5. Select **Use the following IP Address**.
6. Set the IP address and Subnet mask, then click **OK**.



Appendix C. Serial USB Terminal Installation

The coverage test tool is designed for AfiCollar configurations. It contains a sensor that transmits data to the Reader and receives the "ACK" (Acknowledgment) from the Reader. It is connected with a USB cable to the app on the phone, this displays the results of the process on screen and allows users to understand the quality of the transmission of the AfiCollar.

This instruction is intended for installation and use of the Serial USB Terminal in Android 11 (or higher) devices.

Note: This application is not the property of Afimilk. Therefore, its implementation and use are entirely the responsibility of the user.

Prerequisites

OTG adapter - USB C or micro USB (depends on the smartphone model).

Note: Afimilk tested the Serial USB Terminal on Samsung Galaxy S21, LG V40, Xiaomi Note10 Lite smartphone with OTG Adapter from Samsung and Betafpv.

USB C



Micro USB

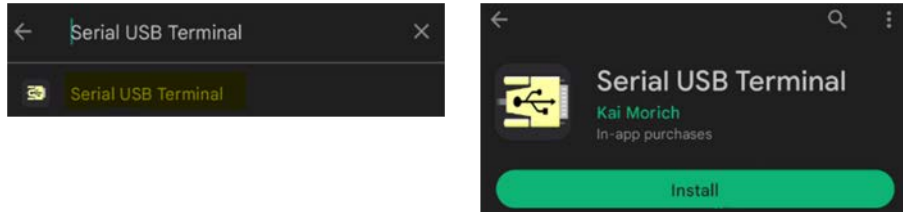


C.1 Installation Process

The Serial USB Terminal application must be downloaded from the Play Store and installed on the mobile phone.

To download and install the app:

1. Open **Play Store** on the smart phone .
2. In the Search bare, type **Serial USB Terminal**, the tap **Install**.



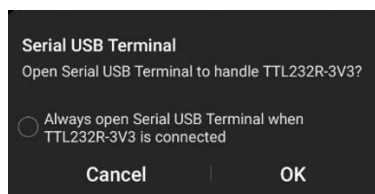
3. Copy the “[Config.txt](#)” file (click the link or scan the QR code below) to your mobile phone. Save it to the **Documents** or **Downloads** folder.



To connect the Coverage Test Tool to a mobile phone

1. Connect the OTG Adapter to the smartphone.
2. Connect the OTG cable to the Coverage Test Tool.

The following message is displayed.

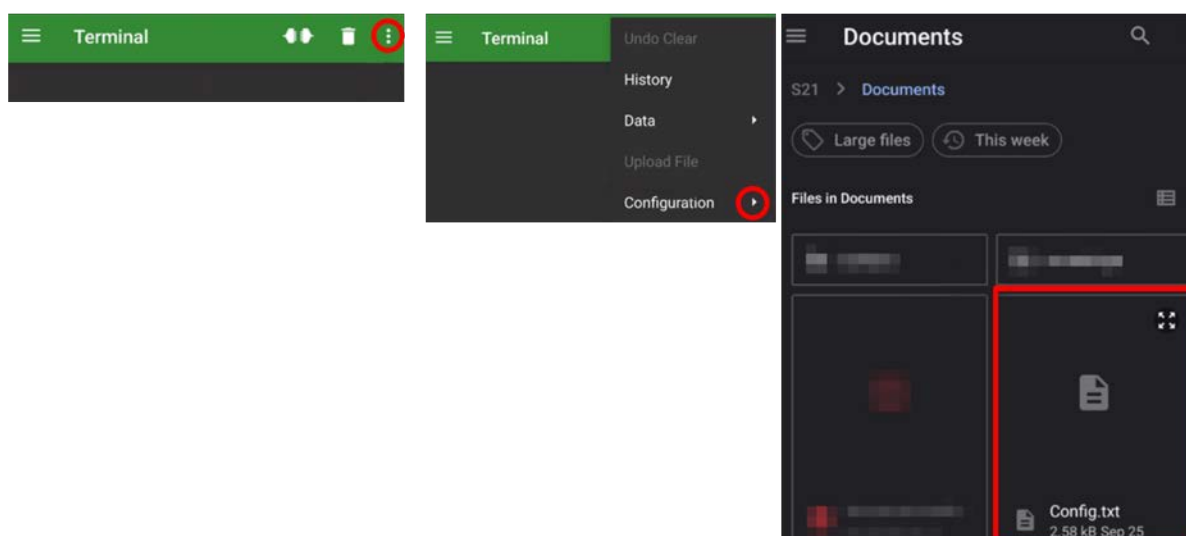


3. Tap **OK**.

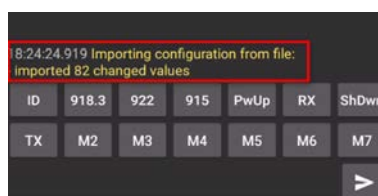
Note: The Serial USB Terminal starts automatically. If this did not happen, open the Serial USB Terminal from the list of applications .

Note: The first time the Coverage Test Tool is connected through an OTG Adapter, android displays a message about the connected device. If this does not happen, there may be a problem with the OTG Adapter or its compatibility with your smartphone (**not all smartphones support the OTG format protocol**).

4. Load the pre-made configuration file.



The following message is displayed, as is the new layout of command options.



Serial USB Terminal Function buttons

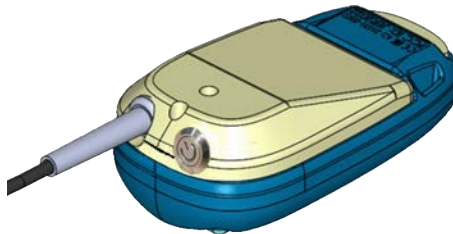
Icons	Function
908.1 - 868.9	Sets the frequency to the value displayed/selected.
PwUp	RF module activation (not needed for "Per" test)
Per	Perform "Per" test. Sends 150 packets of data and replies with the percentage of packets received without errors by the reader (desired result: above 90% is acceptable)
ID	Displays the Tag ID number
TX	Activates TX. Note: One click sends a single data packet.
M5	Empty function button
M6	

To work with the test tool on Serial USB Terminal

1. Connect to the port, then activate screen cleaning.

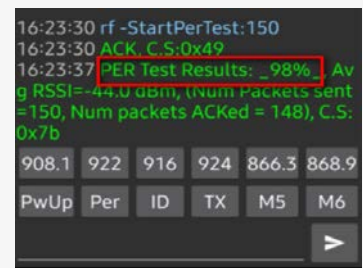


2. Activate the test tool by switching it to ON.

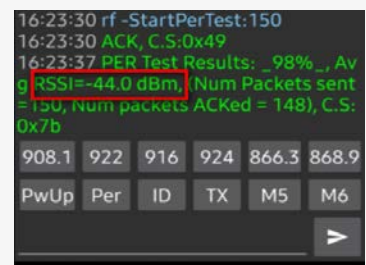


3. Perform the Per test:
 - a. Select the desired frequency.
 - b. Tap Per, then wait for the result of the test to appear.

Note: Acceptable Per test results must achieve a minimum of 90% or above good packets transmitted.



Note: We recommend an average RSSI of -90dBm or more.



Additional Information

Certification

Afimilk products have received certification in multiple countries. Please contact support should you require a copy of the certification for your region.

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Contacting Technical Support, Help Desk

Afimilk technical support contact information:

Email: support@afimilk.co.il

Tel: +972 4 675 4811

Appendix D. Revision History

Revision	Date	Performed By:	Description / Comments	Chapter / Page
	2022	Taryn Rubin		
1	11/2022	Taryn Rubin Dani Gal	Updated to include AC and DC power supply options	Determine Power Requirement on page 22 and Afimilk Reader Power Cables on page 36
2	01/2024	Taryn Rubin, Dani Gal	Updated to include RJ45 waterproof connector for Ethernet cable connection to the Afimilk Reader	Order Afimilk Readers on page 18 and Afimilk Reader Communication Cables on page 35
			Updated Connection Box requirements and PN	Additional Components on page 26
3	08/2024	Taryn Rubin, Adi Naar	Updated current value in DC Power supply	Power Specifications on page 12
4	03/2025	Taryn Rubin Dani Gal	Test antenna transmission tool	Serial USB Terminal Installation on page 56
5	05/2025	Taryn Rubin Dani Gal	Updated to reflect new product name Reader H	

