

Installation

AfiAct II™



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AfiAct II™

Installation

Product: Reader 2.0

Manual P/N 9440311

Version 2.8

Date Completed – Jan 2020

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Federal Communications
Commission, USA



Conformité Européenne
(European Conformity)



Standards Institute
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Ministry of Internal
Affairs and
Communications, Japan



Industry Canada

Preface Material

About this Manual and Scope

This manual describes the installation of AfiAct II, either as a standalone system or as part of the larger Afimilk system. For a description of the features and usage of the AfiAct II system, refer to AfiAct II UM.

Intended Users

This manual is intended for Afimilk authorized technicians, experienced in installing electrical systems in non-protected environments, for dealers-technicians and farm technicians.

Contacting Technical Support HelpDesk

Afimilk technical support contact information:

email: support@afimilk.co.il

Tel: +972-4-675-4824.

Notes and Certifications

This device complies with FCC Rules Part 15 and with Industry Canada license-exempt RSS standard(s). Operation is subject to two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference that may be received or that may cause undesired operation.

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.*

NOTE: The digital circuit of this device 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 into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications to this equipment not expressly approved by the party responsible for compliance (Afimilk Ltd.) could void the user's authority to operate the equipment.



Warning

To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

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By:

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Zevenaar, 6902 PK
Netherlands

Date of
Grant: 10/28/2013

Application
Dated: 10/24/2013

SAE Afikim
S.A.E Afikim
Kibbutz Afikim, 15148
Israel

Attention: Haray Neer , RF Engineer

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: JER4256000

Name of Grantee: SAE Afikim

Equipment Class: Part 15 Low Power Transceiver, Rx Verified

Notes: Wireless reader

Grant Notes

FCC Rule Parts

15C

Frequency
Range (MHZ)

906.0 - 927.5

Output
Watts


Frequency
Tolerance

Emission
Designator

Certificate No: 13218804/AA/00	W.J.M. Jong Manager Product Certification	<i>E.O. B1</i>
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FCC IDENTIFIER: JER4009600

Name of Grantee: SAE Afikim

Equipment Class: Part 15 Low Power Transmitter Below 1705 kHz

Notes: Wireless tag

<u>Grant Notes</u>	<u>FCC Rule Parts</u>	<u>Frequency Range (MHZ)</u>	<u>Output Watts</u>	<u>Frequency Tolerance</u>	<u>Emission Designator</u>
	15C	0.08 - 0.08			
	15C	0.2 - 0.2			

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SAE Afikim
S.A.E Afikim
Kibbutz Afikim, 15148
Israel

Attention: Haray Neer , RF Engineer

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: JER4009600


Name of Grantee: SAE Afikim

Equipment Class: Part 15 Low Power Transceiver, Rx Verified
Notes: Wireless tag


<u>Grant Notes</u>	<u>FCC Rule Parts</u>	<u>Frequency Range (MHZ)</u>	<u>Output Watts</u>	<u>Frequency Tolerance</u>	<u>Emission Designator</u>
CC	15C	906.0 - 927.5			

CC: This device is certified pursuant to two different Part 15 rules sections.

Certificate No: 13218806/AA/00	W.J.M. Jong Manager Product Certification	<i>E.O. B1</i>
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The software and the system design is the property of Afimilk Ltd.

It is supplied to the user to be used solely for its stated purposes. It is strictly forbidden to make copies of the software or transfer it in any way, for any purpose, to any third party.

In addition to application software specifically developed by Afimilk Ltd., the system makes use of certain third party utilities and system software. These are licensed for a single user. They must not be copied in any way, for any purpose, by the user, its employees, or anybody else.

The license to use the software is granted to the user only for the specific system it is installed on by Afimilk Ltd., or its authorized distributors and representatives.

The purchaser shall not modify the software in any way.

It is strictly forbidden to use this product for any purpose other than originally designated for or stipulated by Afimilk Ltd.

Conventions

Important information is highlighted in a frame, as explained below:



Warning

*Actions requiring special attention to avoid serious bodily injury;
For example, working with high voltage components*



Caution

*Actions requiring special attention, to avoid possible damage to equipment
or livestock*



Note

Hints and recommendations for working efficiently



Environment

Environment notice

Safety Instructions and Notice



Warning

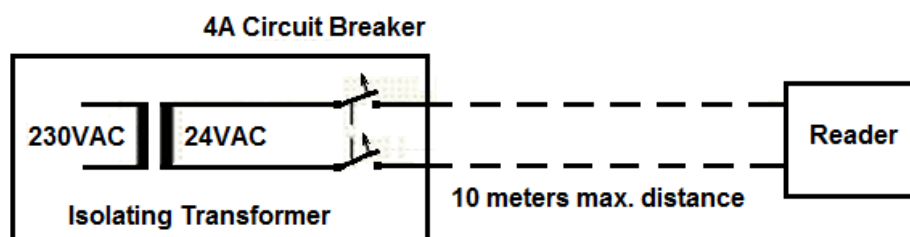
*Electrical connections must only be performed by a certified electrician.
The installation must be performed in accordance with current norms and regulations as well as local and national rules.*

Before installing and operating any equipment, review the safety instructions for any hazards associated with installation and use of the device. Also, review standard and local practices for preventing accidents.

The system and its components are powered by electricity from main power supply. This power supply is sufficient to cause serious personal injury or even death.

Only a (local state) licensed electrician should install power cables and power supply units.

Use only a correctly rated power cable that is certified, as appropriate, for the country of operation.



The AfiAct II must be powered by an external isolating transformer (output 21.6 - 27.5Vac, 75 VA maximum, certified as LPS according IEC 60950-1 clause 2.5) with an accessible circuit breaker and double isolated from mains.

- Read this manual carefully. Proper handling of the equipment is the basis for correct functioning.
- Only technicians who are skilled and authorized by Afimilk, dealer technician together with the farm staff may carry out installation of the equipment.
- The customer is fully responsible for any changes made, either in the system configuration or in the software application data, by the customer or by the customer's agent.
- Afimilk will not be held responsible directly or indirectly for any damage caused to the customer and/or to a third party and/or to the animals, by an action and/or change and/or omission performed in the AfiAct II™ system, either by the customer or by the customer's agent, directly and/or indirectly.

- Afimilk recommends that the customer call for a full system inspection by a qualified technician authorized by Afimilk every six months.
- It is the responsibility of the operator to install, operate, and maintain the system in accordance with all applicable laws, codes and regulations.
- The equipment must be used only for the described purpose.
- This system has been checked for viruses prior to supply. If in the course of a service call, a virus is detected, removal of the virus, and any software or hardware repairs resulting from it, will be charged to the purchaser.

The system and its components are powered by electricity from a main power supply. To avoid personal injury, danger of fire, and possible damage to equipment and materials, all work on electrical and electronic circuits should be done following these basic safety procedures:

- Power to all Afimilk devices must be supplied through an accessible, well-marked circuit breaker (usually placed on the power transformer).
- Before conducting work on any Afimilk device, make sure power to devices is switched off at the circuit breaker (usually placed on the power transformer).
- Remove power from the circuit or equipment prior to working on it. Never assume the circuit is off; check it with a multimeter.
- In case of electrical fire, switch off the circuit and report it immediately to appropriate authority.
- Stay away from live circuits. Do not work on or make adjustments when the power switch is on.
- Never switch on equipment in the presence of water leakage.
- Work in clean, dry areas. Avoid working in damp or wet locations because this increases the chance of electrical shock.
- Wear only nonconductive shoes to lessen the possibility of electrical shock.
- Remove all rings, wristwatches, bracelets, and similar metal items. Avoid working in clothing that contains exposed metal zippers, buttons, or other types of metal fasteners. The metal can act as a conductor, heat up, and cause a bad burn.
- High voltage surges and other power irregularities can cause extensive damage to a system. It is the responsibility of the operator to provide a power protection system.



Do not dispose of WEEE as unsorted municipal waste!



List of Terms and Abbreviations

Term/Abbreviation	Description
RPU	Tag Reading/Programming Unit
AfiAct II	AfiFarm module for generating cow database and providing general fertility reports.
DIM	Days in Milk
ID	Identification
PC	Personal Computer
PD	Pregnancy Diagnosis
RF	Radio Frequency
LR	Long Range radio i.e. 916/868 MHz, communication between Reader and tags
SR	Short Range radio i.e. 200/80 KHz
RT	Real Time system
RTMS	Real Time Setup module
RTG	Real Time GUI module - AfiControl
RTC	Real Time Station Controller module
RPM	Revolutions per Minute
Opcode	Operation Code
AP	WiFi Access Point (antenna)
WLAN	Wireless Local Area Network - links two or more devices using wireless distribution, providing a connection through an access point to the Internet.
Tx	Transmit
IM	Installation Manual

Referred Documents

PN	Document Name
9140233	Tag Reader& Tag RPU user guide
9040946	SR Opcodes (for RPU programming)
9040953	AfiFarm Installation Manual
5096003	AfiFarm Configuration Manual
9040954	AfiFarm Integration and Prerequisites
9440312	AfiAct II User Manual
9040952	AfiAct II Software Upgrade Instructions (R1 → R2)

Revision History

Version	Date	Description
1.00	Oct 2013	Revision one.
1.2	Oct 2013	Add FCC Approvals
2.0	Feb 2014	Update WIFI spec 2.2 PC requirements 2.3.1 re-locate RT quick-start (after RT installation) 4.2 add tag-activation runtime 6.1 correct troubleshooting flow for disconnection, 7.1 Update antenna names 1.3.1 update location of RID label, correct wifi settings 4.4, remove tag survey section (covered by other sections), add backup setup, add db backup and restore.
2.1	Mar 2014	Correct supported Windows version, section 2.4.1
2.2	Mar 2014	Add Japan radio regulation certification (preface).
2.3	Sep 2014	Add Circuit Breaker warning, see Safety instructions on page ix Replace reader mounting plate and rod
2.4	May 2015	Installation and configuration - screens and process updated. RPU flow updated New template implemented
2.5	Sep 2015	Comply with safety regulations (updates in section 1.5)
2.6	Dec 2015	Replace Reader's blue wire + extension by the new white wire Correct names (RT Studio → AfiControl) Update screens and flow Update safety instructions to suit new regulations Update AfiTag arrow pictures
2.7	May 2016	New Reader version 2.0, with internal antennas
2.8	Dec 2019	Updated to support AfiCollar. Updated to work with Windows 10.

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1 Introduction

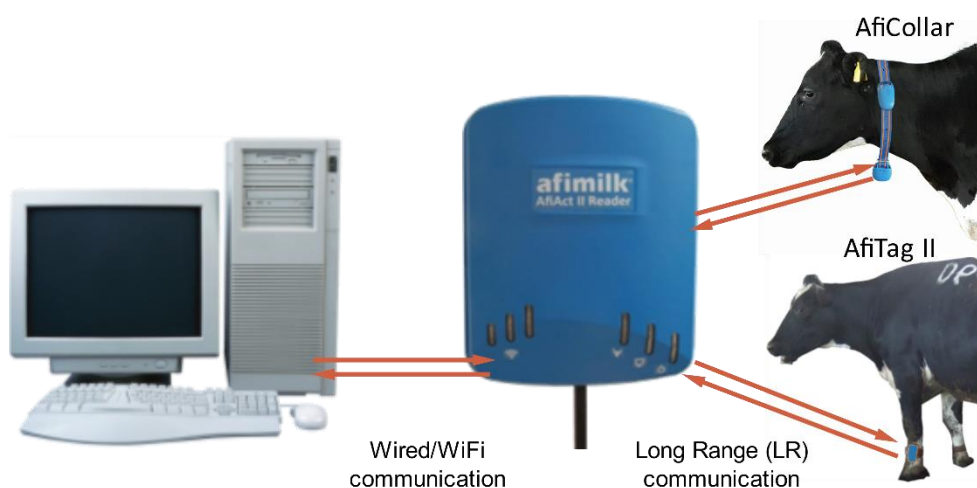
AfiAct II is an estrus and fertility monitoring system that provides at a glance full picture of cows and heifers in estrus. The monitoring system provides thorough tracking of the fertility-related data for the dairy farm herd. It can be implemented either as a standalone system or as part of a comprehensive Afimilk system.

This is done by collecting cows' physical behavior and aggregating them with events information to generate heat lists, fertility reports, and fertility disorder alerts.

1.1 Principle of Operation

The following diagram shows the data flow in the AfiAct II system.

Figure 1: AfiAct II system data flow



AfiAct II uses Long Range (LR) communication to collect data from cow tags (AfiTag II sensors or AfiCollar sensors) and transfers the information via a standard network (IP based Wi-Fi or wired communication) to a PC based analysis.

Tags are placed on the cows. Each tag contains the unique ID of each cow, and records different aspects of its activities, as follows:

- AfiTag II leg tags – records the cow's number of steps, standing time, rest time and bout.
- AfiCollar neck tags – records the cow's eating and rumination times.

The tags use LR (Long Range) RF (Radio Frequency) communication to send this data periodically (every pre-defined time-interval, default is 15 minutes) to an antenna located inside the AfiAct II Reader device (two antennas that provide optimal coverage).

AfiAct II Reader collects data from the cows' tags which are within its receiving range. The Reader uses either wired or Wi-Fi communication to send the data to the PC for analysis (2 internal antennas are for Wi-Fi, when used).

The AfiAct II software, located on the PC, uses the collected activity data of each cow to calculate when the cow is in estrus and find the best time for breeding. The application generates reports and alerts the farmer.

The communication used by the entire system complies with local regulations and safety tests, corresponding with the 'home appliance' category.

1.2 Supported Scenarios

This document describes the following scenarios:

- Installation
- Upgrade from R1 – see AfiAct II software upgrade instructions

Both scenarios use a single computer (no custom installation)

1.3 AfiAct II Components

The following table provides a list of the basic AfiAct II system elements. For specific part numbers, refer to the detailed tables of each element.

Table 1-1. System Components



Picture	Name	Description	PNs – see:
	AfiAct II Reader 2.0 (including mounting brackets)	The Reader is the interface between the tags and the AfiAct II Software. Internal antennas allow Reader-tag communication, & Reader-PC Wi-Fi communication.	1.3.1
	AfiAct II software program (AfiFarm 5.4 + AfiControl module)	CD with PC software to control the system: AfiFarm 5.4 for user interface; AfiControl module for data collection from the Reader.	4196000A2

Table 1-2. AfiTag II Components





Picture	Name	Description	PNs – see:
	AfiTag II (40096xx)	Afimilk's leg-tag, including the attachment strap. A tag should be attached to every cow participating in the AfiAct II group.	1.3.3

Table 1-3. AfiCollar Components

Picture	Name	Description	PNs – see:
	AfiCollar	Afimilk's neck-tag, including attachment strap and weight. A tag should be attached to every cow participating in the AfiAct II group.	1.3.3





1.3.1 Reader Box Components

Table 1-4. Reader Box Components

Picture	Name	Description	PN
	AfiAct II Reader 2.0	International (907-928 MHz)	4256200 ; Backward compatibility Reader 4256000
		Europe (868 MHz):	4256201 ; Backward compatibility Reader 4256001
	Bracket arm	<u>Bracket</u> (screws for wall connection – not supplied. The fasteners must be determined by the installer, according to conditions: surface (e.g. concrete vs wood vs steel, etc.) and other specific variables.	9030050

1.3.2 Electricity Box Components

Table 1-5. Electricity Box Components

Picture	Name	Description	PN
	Screws and nuts	<i>Not provided!</i> <i>To be supplied by installation technician.</i>	
	Electrical connection box for AfiAct II Reader	<i>Not provided!</i> <i>To be supplied by installation technician.</i>	4085851
	Electrical terminal block	Arrives connected to Reader's blue cable.	9020201
	Cable ties	<i>Not provided!</i> <i>To be brought with technician kit.</i>	

1.3.3 Tag Types

Table 1-6. Tag Types



Picture	Description	PN
	AfiTag II, Type A, 200 KHz SR, 916 MHz LR	4009600
	AfiTag II, Type A, 200 KHz SR, 916 MHz LR, Israel	4009680
	AfiTag II, Type B, 80 KHz SR, 868 MHz LR	4009610
	AfiTag II, Type E, 200 KHz SR, Japan 922.4 MHz LR	4009650

Image	Primary P/Ns		Secondary P/Ns	
	Description	PN	Description	PN
	AfiCollar 907MHz_200KHz - ASSY.*	8002020*	AfiCollar 908.1MHz_200KHz - ASSY	8002070
	AfiCollar 868.1MHz _ 80KHz - ASSY.*	8002030*	AfiCollar 868.3MHz _ 80KHz - ASSY	8002040
	AfiCollar 868.1MHz _ 200KHz – ASSY*	8002050*	AfiCollar 868.3MHz _ 200KHz – ASSY	8002060
	AfiCollar 915.5MHz_80KHz – ASSY*	8002080*	AfiCollar 915.7MHz_80KHz - ASSY	8002090

By default, dealers should order the primary P/Ns; however, if there is a problem with the primary sub-g frequency (such as a nearby farm/s, known RF noises, etc.), then dealers should order their secondary sub-g frequency.

1.4 AfiAct II Reader – Indicators and I/Os






The following sections describe the Reader's indication LEDs, input and outputs.

1.4.1 Front Panel - LED Indications

The following image shows the Reader's fault and indication LEDs.



Table 1-7. External LED Indications

Item	LED Label	Description
1	Tag Comm 	Communication with tags: Blinking Yellow – good communication Off – No communication <i>Note: This LED blinks for a short period every time a tag message is received in the Reader.</i>
2	PC comm 	Communication with the PC AfiAct II application Yellow – The Reader is communicating with the AfiAct II Off – Reader could not connect with AfiAct II
3	Power 	GREEN – ON (no faults detected) RED – a FAULT is detected
4	Signal strength 	Indicates Wi-Fi communication strength, after the WLAN LED shows successful association between the Reader and the AP.  Low signal strength (between -80 and -90 dbm) Medium signal strength (between -60 and -80 dbm) Good signal strength (> -60 dbm) <i>Note: When no strength LED indication is on and the WLAN LED is on, the signal strength is below -90</i>

1.4.2 Back Panel – Inputs and Outputs

The following image shows the Reader's **Back panel** inputs and outputs.



Note: when the communication is not in use, close the connection using the cap!

1.4.3 Reader box - Attributes Label

On top of the Reader's cable cavity you will find the following label, indicating the Reader's attributes



1.5 AfiAct II Reader Power Specifications

The AfiAct II Reader power connection must comply with the following specifications:

Table 1-8.Power Specifications

Item	LED Label
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)

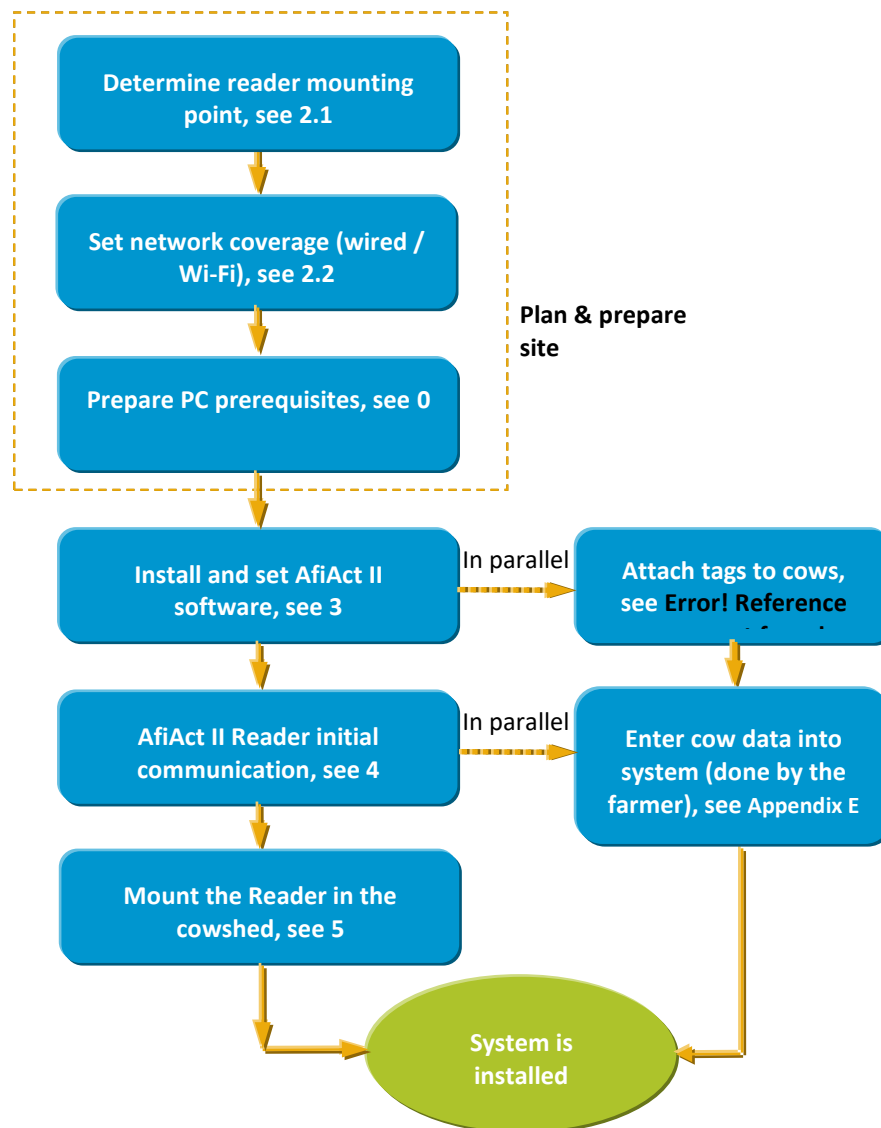


Note

To avoid unacceptable electrical power reduction, the cable length and diameter must be validated, to ensure the cable is not too long per its diameter.

1.6 System Installation Overview

To fully install AfiAct II system, pre-installation preparation is needed; some preparations are done by the Dealers' technicians, and others are the farmer's responsibility. The following flowchart presents the preparation and installation phases and the responsible party per phase.



2 Prerequisites and Site Planning

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

1. Identify Reader mounting point location: Identify a proper location for AfiAct II Reader, see 2.1.
2. Verify network coverage in the required area, see 2.2
Note: We recommended that the network technician be present during the Reader installation.
3. Verify system deployment: If using a standalone system side-by-side with AfiFarm, you may want to restore the initial animal database to the system after the installation.
4. Validate AfiAct II PC corresponds with the requirements, see 2.3



Note

To determine the system sampling sessions during the installation, investigate the specific site needs. This can be performed during the preparations phase, or during the installation, see 4.2.2.

2.1 Determine Reader Mounting Location

Determining optional Reader mounting points is done by the Dealer technicians. To do this, either get a scheme of the shed dimensions from the farmer (including poles, electricity outlets, distance from the office, etc.), OR visit the farm before the installation to perform a site survey.

The farmer receives from the dealer a list/scheme showing the optional mounting points, and the required coverage radius. It is the farmer's responsibility to provide coverage in these points.



The Reader mounting location is based on the cowshed size and location, and should comply with the following conditions:

- Height: The Reader is mounted on a pole about 3.5 meters high from the ground.
- Coverage (tags and Wi-Fi/wire): Fine-tuning is performed while mounting.
 - The mounting pole location must allow tag-coverage range for the whole defined area. This is determined according to the shed scheme, and will probably be around the center of the required 80 meters coverage radius, also covering the feeding and water trough areas.

**Note**

The final coverage and corresponding location determination must be done during a site survey and could vary according to specific farm environment.

- The Reader should have a line of sight towards cow tags, with minimal interference from other sheds/poles/buildings, etc.
- The Reader should have WiFi / Wired connectivity to the Access Point / office.
- Power access: The pole has near access to a power outlet (to be provided by the farmer).
- Accessibility: The Reader and power box can be easily viewed and accessed for maintenance (if possible – accessible from the passage).
- Weather protection: The Reader and power box must be located under a roof with minimal exposure to weather conditions, according to the following specifications:
 - The structure may be made of metal or wood.
 - The roof should be at least 4 meters high; If possible, the roof should be made of a plastic material (rather than aluminum or sheet metal).
 - The roof must be large enough to prevent any direct sun or rain exposure to the device.
 - If the sides are closed, this siding material should not be metal either.
 - If metal fencing is used to keep animals out, it should be a large opening Australian-type fencing material (at least 30 cm) (otherwise the communication signals may be reduced).

**Note**

*The Reader must be fixed to a static connection point.
Do not fix the reader on a connection point that vibrates or moves as a result of ventilating fans, blowers, motors and machinery.*

2.2 Setup Network and Power Coverage

The customer may determine the type of network communication used between the PC and the Reader; either wired or Wi-Fi can be used. However, it is the customer's responsibility to ensure power point and network coverage in the office and in the Reader-determined mounting point (in the cowshed – according to the Dealer's technicians). In either case, the office and Reader network coverage setup must be completed and tested before starting the Reader installation (e.g. via a laptop computer, smartphone, or in future releases, via tag-indicator).

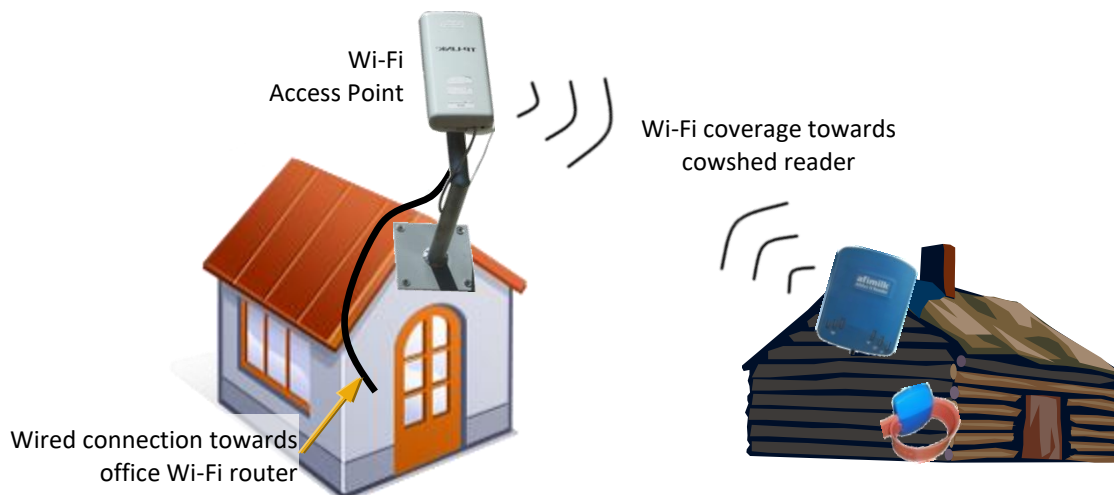
Note: The Wi-Fi network must, in turn, provide an IP to the Reader's MAC address.

Office Wi-Fi Coverage

The office Wi-Fi coverage is a recommendation, and it is required when configuring the Reader to work with the AfiAct II software.

PC to Reader Wi-Fi coverage

The Reader's network coverage is set after determining the Reader installation point in the cowshed. The following figure shows an example of network coverage in the office and cowshed.



Wi-Fi Specifications

Item	Value
Network	TCP/IP protocol network Network shall have an operative DHCP server Any commercial access point Carrier grade (99.999% service).
Access Point	Any commercial access point In case of an OUTDOOR installation – outdoor weatherproof grade according to the installation environment and lightning protection design. Carrier grade (99.999% service)
WiFi certification supports	802.11g (802.11n is supported only if it can be set to work with 2.4 GHz bandwidth).

Item	Value
Encryption method default	Preferable: WPA-PSK/WPA2-PSK The following methods are also supported: WEP, WPA/WPA2, WPA-PSK/WPA2-PSK and IEEE 802.1X standard.
Preferable SSID	afiact2
Preferable password	afimilk123
Signal and Noise	<ul style="list-style-type: none"> • The SNR at Reader mounting point must be greater than 15 dB. • RSSI must be higher than -80dBm. <p><i>Note: Preferred RSSI is -65 dBm to -55 dBm in the designated Reader mounting point</i></p>

2.3 Prepare the PC Environment

Before starting to install AfiAct II software, verify that your PC corresponds to the following set of requirements:

- The computer uses a **supported operating system, Processor and Memory** see 2.3.1
- **Network connections** comply with the requirements, see 2.3.2
- **Additional Windows OS preparations**, see 2.3.3
- **Verify the PC is prepared**, see 2.3.4

These requirements are detailed in the following sections.



Note

Verifying that you are using correct computer settings is essential for performing the installation correctly, allowing correct operation of AfiFarm 5. For systems where there is a network administrator, they must be present during the installation.



Note

We recommend having an internet connection, to allow efficient support when needed.

2.3.1 Verify Operating System, Processor & Memory

The supported operating systems include:

- Windows10 PRO (64-bit)

Caution: Change the Windows Update to **Manual** (instead of Automatic) to avoid automatic updating during milking sessions, causing session data to be lost.

2.3.1.1 PC Requirements

Farm Category	Number of Animals in Herd	Maximum Number of Parlors	Maximum Number of Yard Sites	Maximum Number of Parlor Stalls	Minimum Number of PCs
Small to Medium	Up to 1,000 Animals	1	2	30	1
Medium to Large	1,000-3,500 Animals	1	4	80	3
Very Large	3,500-5,000 Animals	12	32	120	PC per parlor PC per 2 sites
Mega Farm	Over 5,000 Animals	Contact Afimilk for a tailored PC recommendation.			

2.3.1.2 Server, Controller, and Reporter Requirements

The following table lists system requirements for server, controller, and reporter according to farm size.

2.3.1.2.1 Server Requirements:

Operating System: Windows10 PRO (64 bit)

No. of Animals	Up to 1000	1001-5000	More than 5001
RAM(GB)	Min: 32	Min: 32	Min: 32
Processor	i7	i7	i7
Primary HD	500GB Enterprise or Commercial Level SSD	500GB Enterprise or Commercial Level SSD	1000GB Enterprise or Commercial Level SSD
Recommended secondary non-SSD HD for backup	500GB 64MB cache / 7,200 RPM	500GB 64MB cache / 7,200 RPM	1000GB 64MB cache / 7,200 RPM
Additional required items	<ul style="list-style-type: none"> • UPS unit – mandatory (Server without UPS may suffer irreversible loss of data) • Secondary network interface card for AfiAct II reader is recommended 		

2.3.1.2.2 Controller Requirements:

Operating System: Windows10 PRO (64 bit) or Windows Server 2012R2

No. of Animals	Up to 5000	More than 5000
RAM(GB)	16	32
Processor	i7	i7
HD type	Enterprise or Commercial Level SSD	Enterprise or Commercial Level SSD
Primary HD free space	500GB	500GB
Additional required items	<ul style="list-style-type: none"> • UPS unit – mandatory (controller without UPS may suffer irreversible loss of data) • Secondary network interface card for AfiActII reader is recommended 	
Monitor	<ul style="list-style-type: none"> • Supported resolution: 1920X1080 • Size: 21.5 inch and larger 	

2.3.1.2.3 Reporter Requirements:

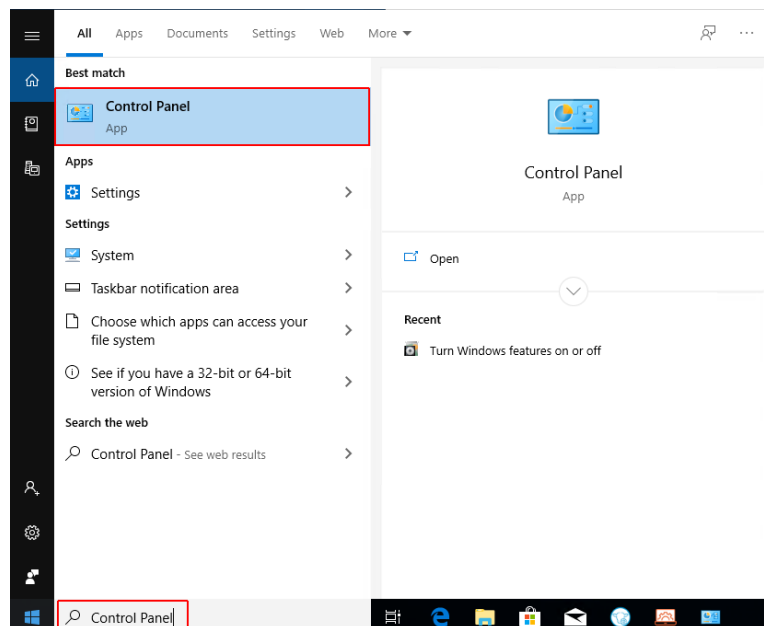
Operating System: Windows10 PRO (64 bit) or Windows Server 2012R2

No. of Animals	Up to 5000	More than 5000
RAM(GB)	16	16
Processor	Min: i5 Recommended: i7	i7
HD type	7200 RPM	7200 RPM
HD free space	500 GB	500GB
Monitor	<ul style="list-style-type: none"> • Supported resolution: 1920X1080 • Size: 21.5 inch and larger 	

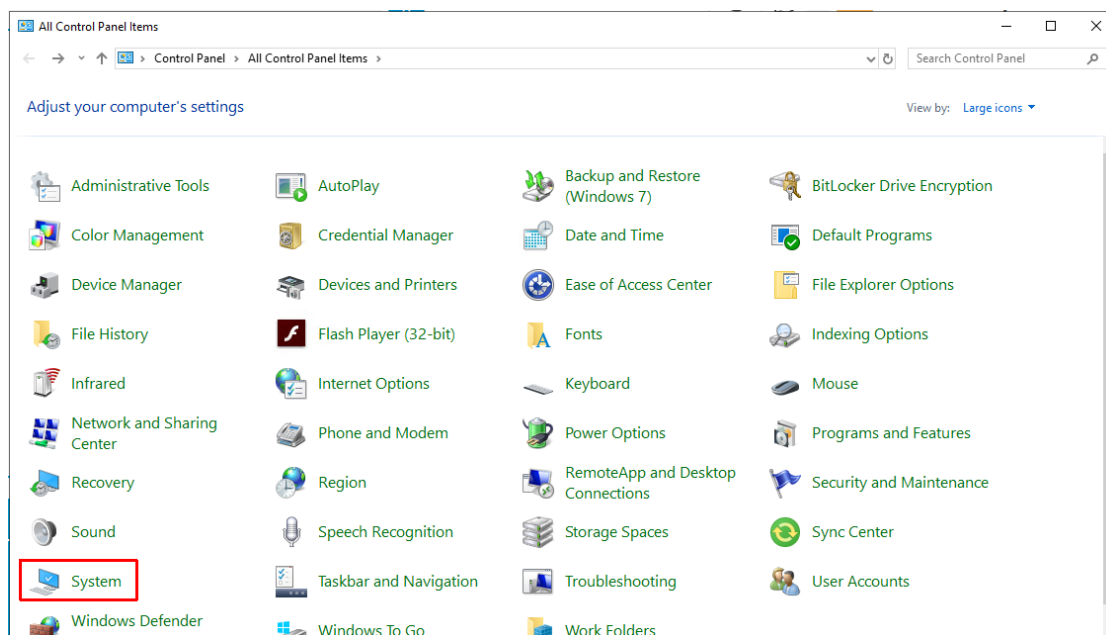
2.3.1.3 Verify RAM and Processor

To verify required RAM and Processor:

1. Open the Control Panel: In the Taskbar, in the search box, type **Control Panel**, and then select the **Control Panel** option displayed in the results.



2. Click **System**.



3. Verify the following attributes are in accordance with requirements (see 2.3.1):

- **Windows edition**
- **Processor**
- **System Type**
- **RAM**

View basic information about your computer

Windows edition

Windows 10 Pro

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System

Processor:	Intel(R) Xeon(R) CPU E5-2673 v3 @ 2.40GHz 2.39 GHz
Installed memory (RAM):	16.0 GB
System type:	64-bit Operating System, x64-based processor
Pen and Touch:	No Pen or Touch Input is available for this Display

Computer name, domain, and workgroup settings

Computer name:	Afifarm54Demo	Change settings
Full computer name:	Afifarm54Demo	
Computer description:		
Workgroup:	WORKGROUP	

Windows activation

Windows is activated [Read the Microsoft Software License Terms](#)

Product ID: 00331-10000-00001-AA947 [Change product key](#)

2.3.1.4 Verify HD Free Space and Type

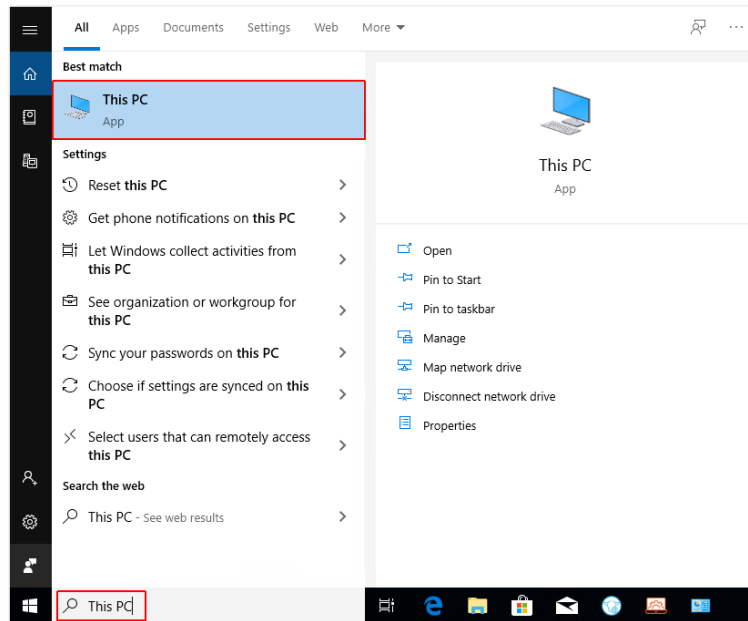


Note

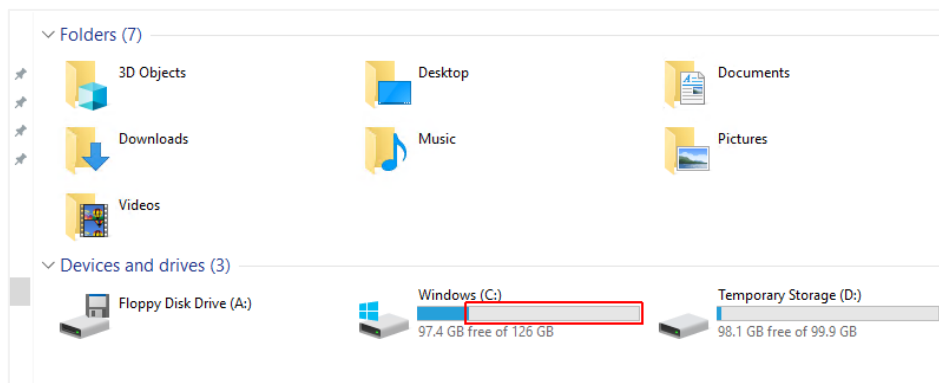
If the installation is done in a folder that is not the installation folder – verify that there is enough disk space in BOTH disks.

To check your HD free space

1. In the Taskbar, in the search box, type **This PC**, and then select the **This PC** option displayed in the results.



2. Check free space on your hard drive.



2.3.2 Network Connections

AfiFarm 5.4 Network connections must comply with the following conditions:

- The network is supported by Windows.
- The network supports TCP/IP.
- The network must be transparent for a UDP broadcast.
- The LAN must have a minimum speed of 100 MBps.

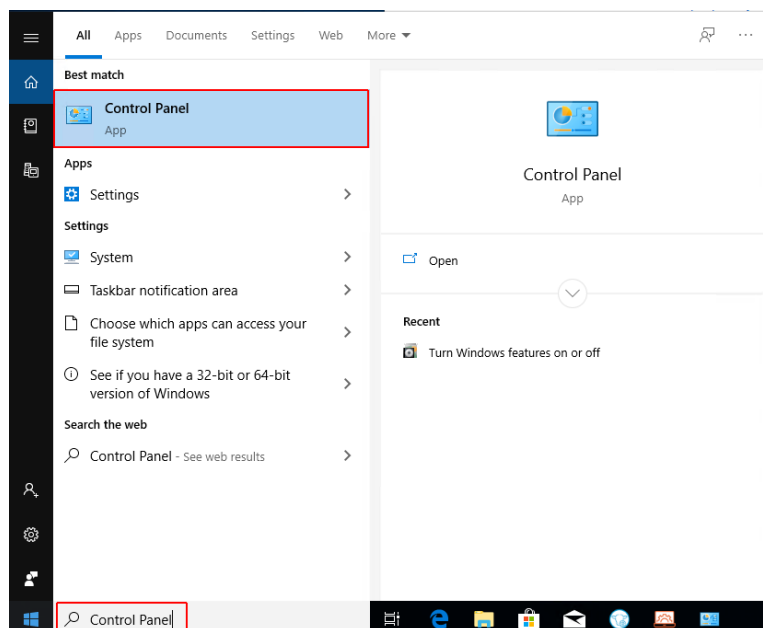


Note

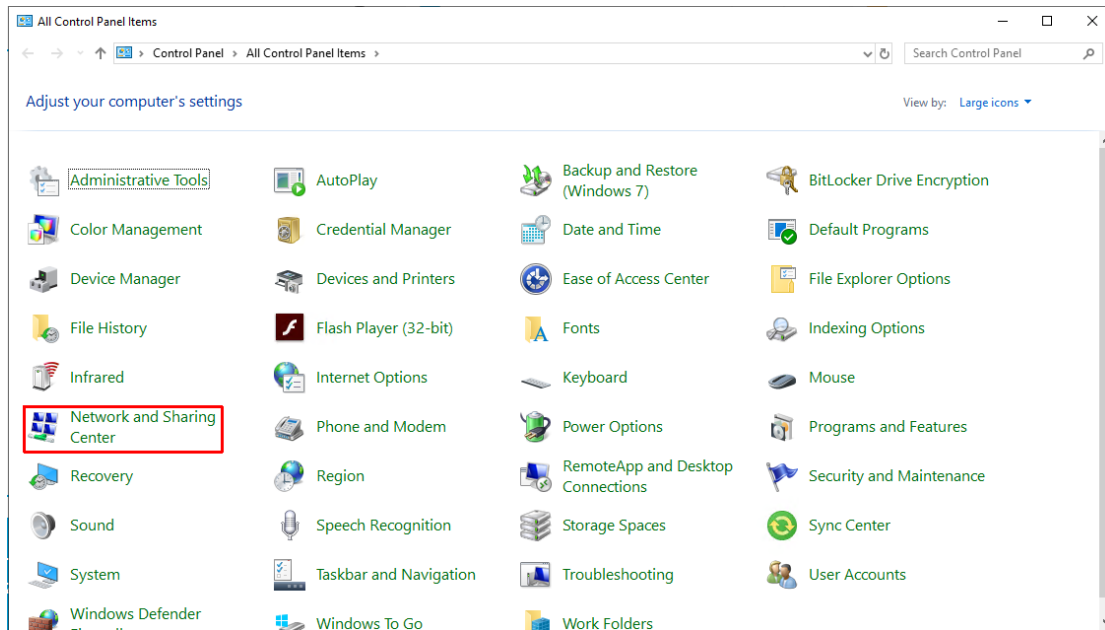
In order to print reports, the system must have a printer, connected either directly to the PC or via the network.

To verify your system has correct network connections

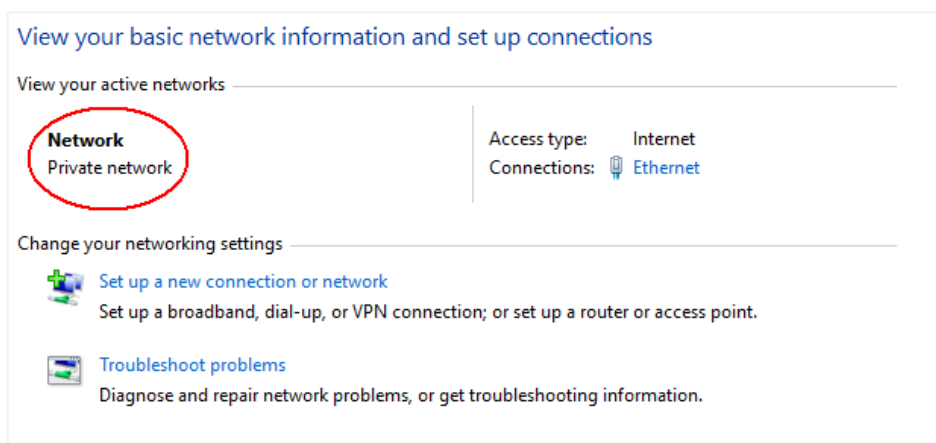
1. Open the Control Panel: In the Taskbar, in the search box, type **Control Panel**, and then select the **Control Panel** option displayed in the results.



2. Click **Network and Sharing Center**.



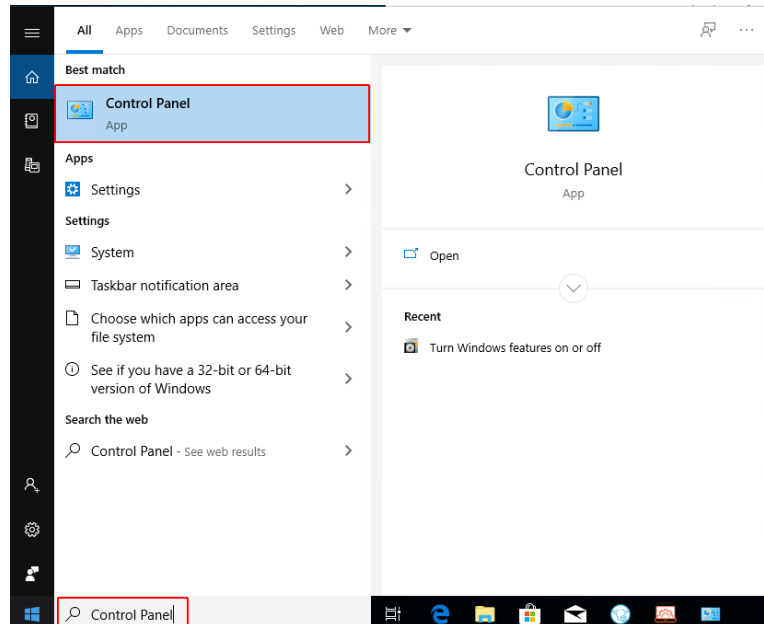
3. In the **Network and Sharing Center** dialog box, verify that **Network** is set to **Private**.



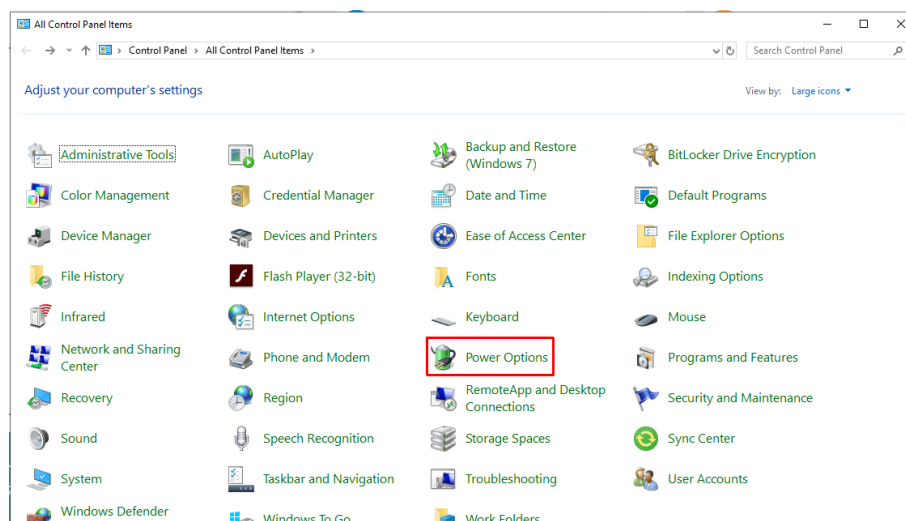
2.3.3 Additional Windows OS Preparations

2.3.3.1 Configure Power Settings

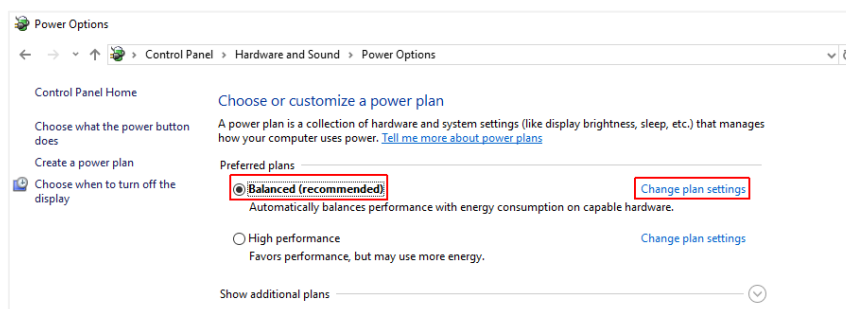
1. Open the Control Panel: In the Taskbar, in the search box, type **Control Panel**, and then select the **Control Panel** option displayed in the results.



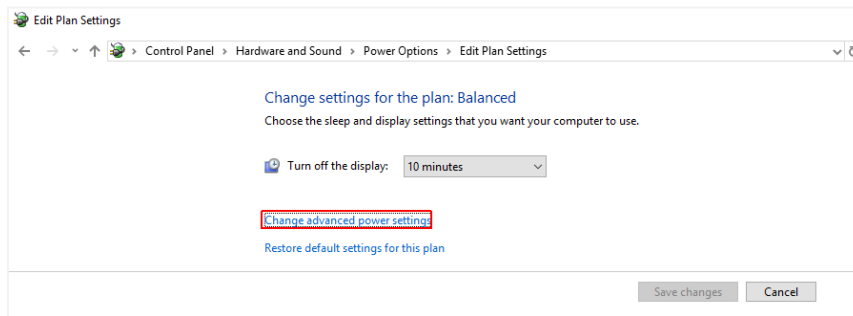
2. Click **Power Options**.



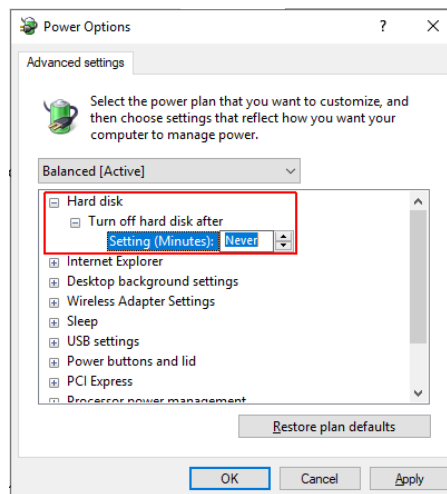
3. Check **Balanced**, and then click **Change plan settings**.



4. Click **Change advanced power settings**.



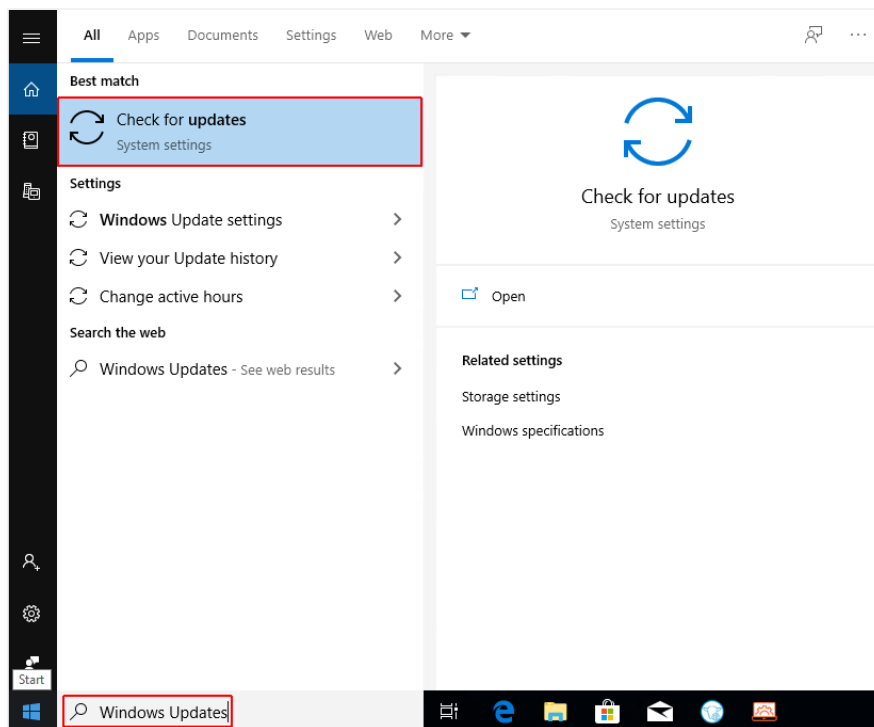
5. Expand the **Hard disk** option, expand the **Turn off hard disk after** option, and then change the value to **Never**.



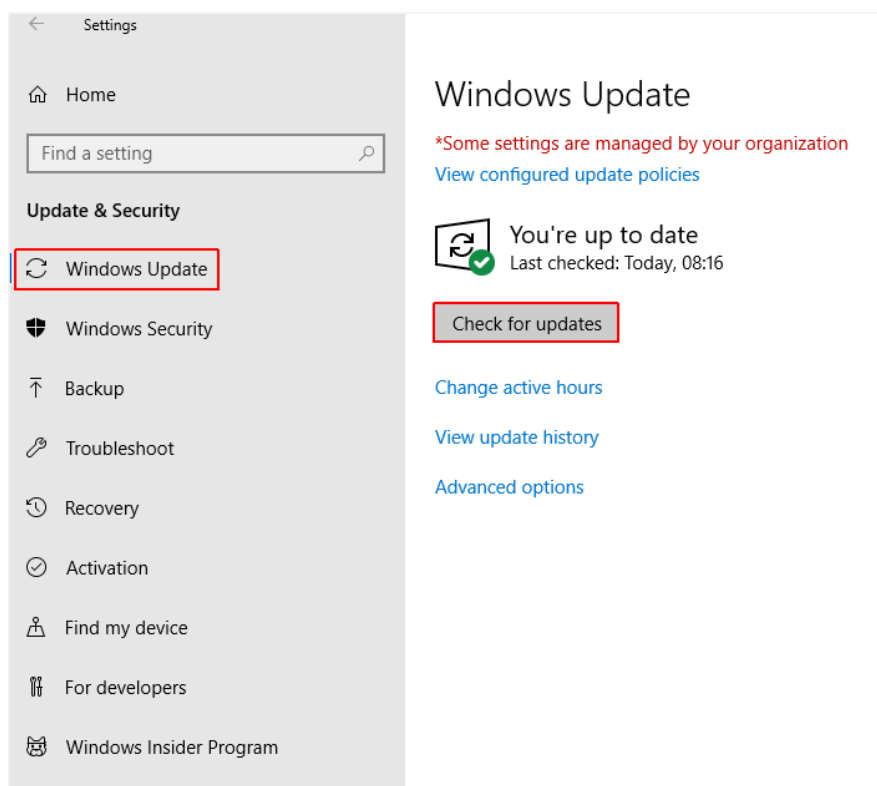
6. Click **Apply**, and then click **OK**.

2.3.3.2 Install Windows Updates

1. In the Taskbar, in the search box, type **Windows Updates**, and then select the **Check for updates** option displayed in the results.



2. Click **Windows Update**, and then click **Check for updates**.

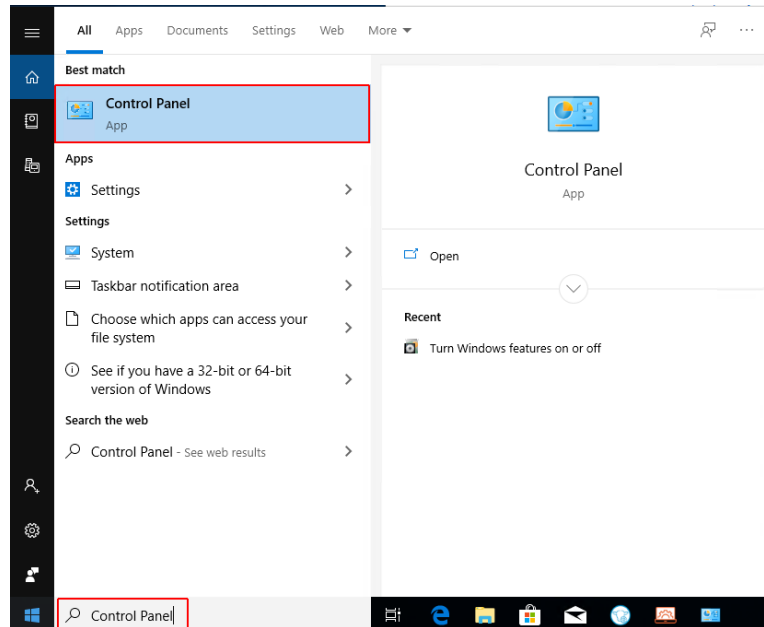


3. Click **Download** to install updates.

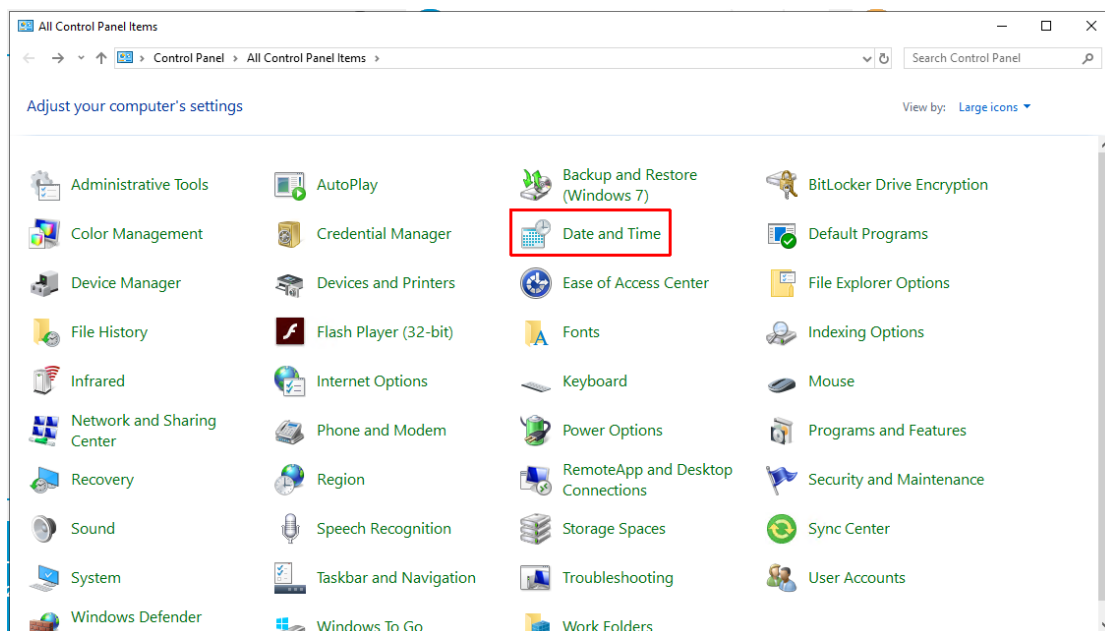
2.3.3.3 Set the Time and Synchronization

Disable the synchronization with the internet time server and check the time zone settings as follows:

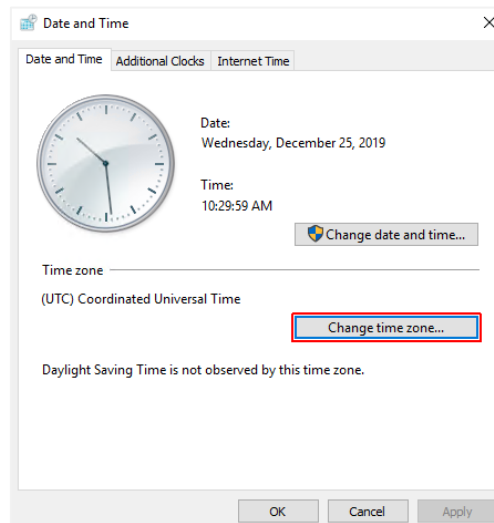
1. Open the Control Panel: In the Taskbar, in the search box, type **Control Panel**, and then select the **Control Panel** option displayed in the results.



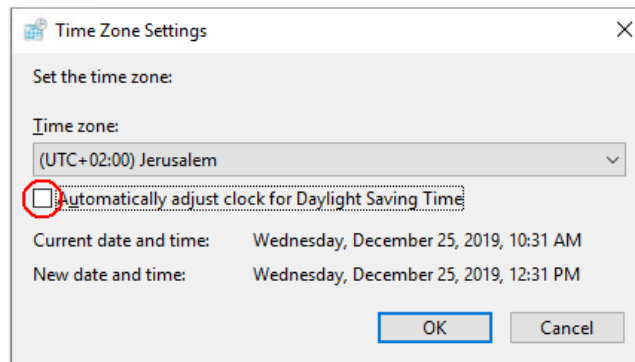
2. Click **Date and Time**.



3. Click **Change time zone**.



4. Uncheck **Automatically adjust clock for Daylight Savings Time** check box.

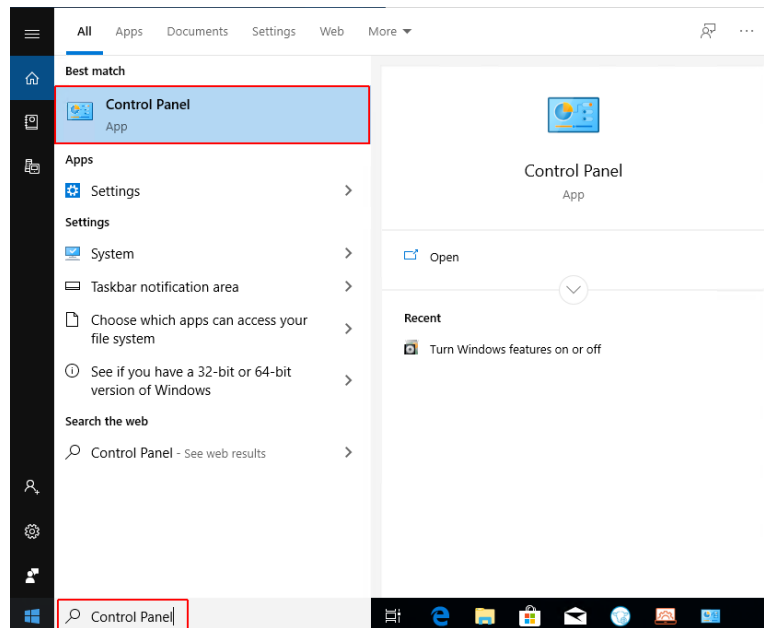


5. Verify that the **time zone** settings are identical in all the used PCs (in a multi PC system) (in the above *example*, all PCs should be set to the same time zone **UTC+02:00**)

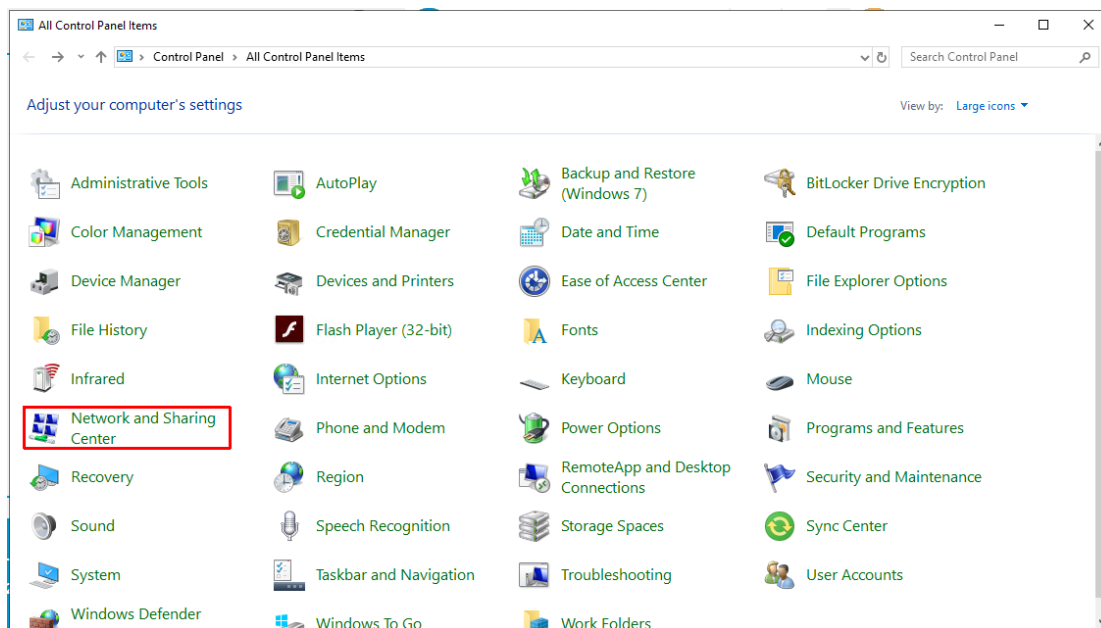
2.3.3.4 Confirm the File Sharing and Network Discovery

Verify proper file sharing setup as follows (for a multi PCs system):

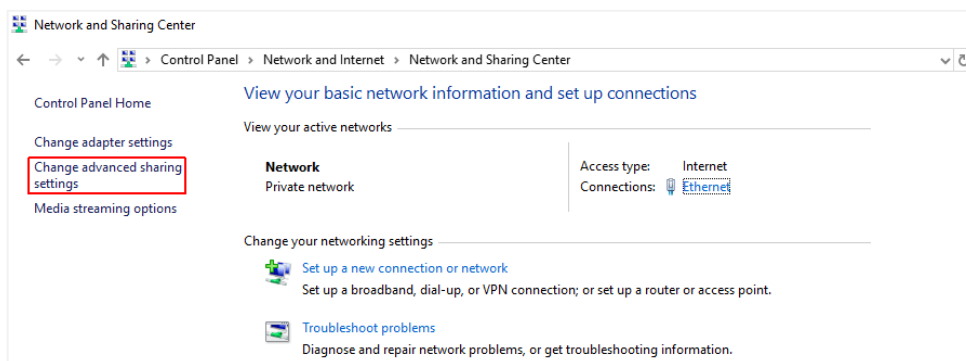
1. Open the Control Panel: In the Taskbar, in the search box, type **Control Panel**, and then select the **Control Panel** option displayed in the results.



2. Select **Network and Sharing Center**.

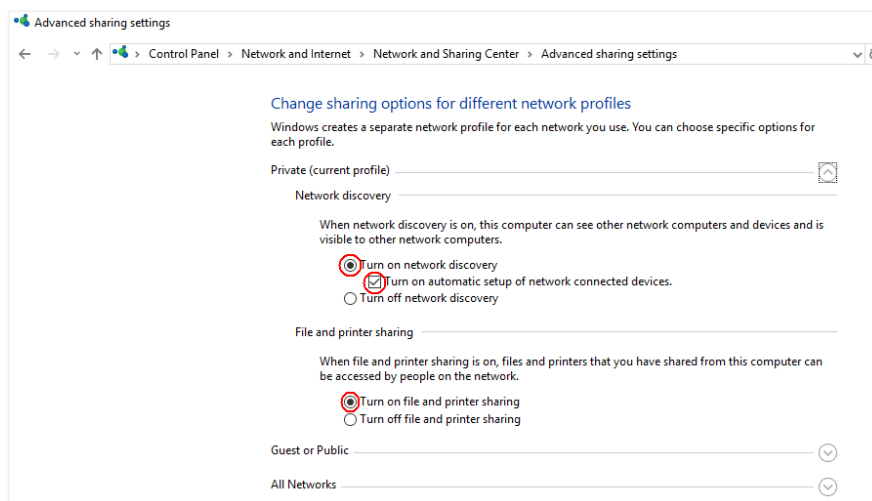


3. In the **Network and Sharing Center** dialog box, click **Change advanced sharing settings**.

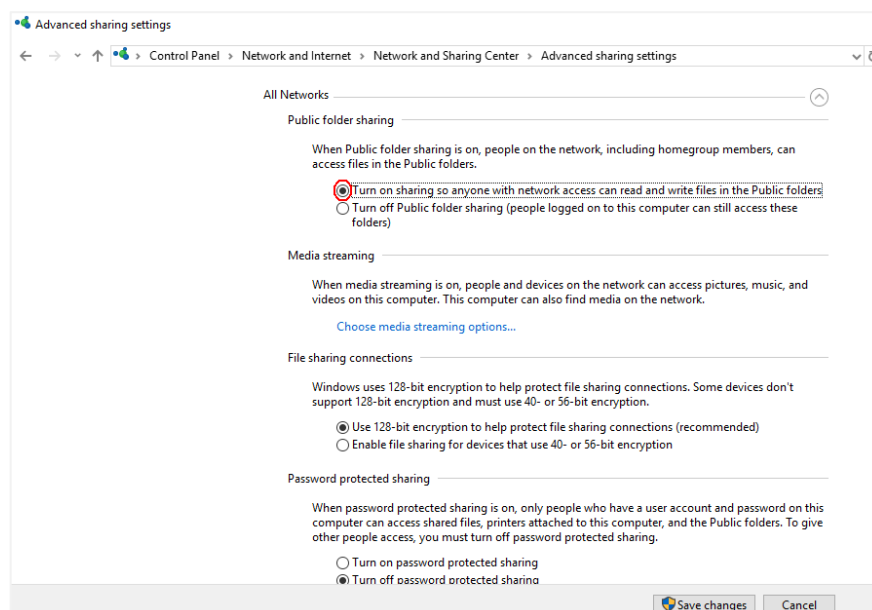


4. Expand **Private**, and then verify the following attributes are checked:

- Turn on network discovery
- Turn on file and printer sharing



5. Expand **All Networks**, and then verify the **Turn on sharing...** option is checked:



2.3.4 Verify System is Prepared

As the successful completion of the installation process is strongly dependent on the environmental preparations previously performed, it is essential at this phase, before starting to install the system, that the user performs preparations checkup.

Review the pre-requisites list and verify that all of them were implemented.



What Next?

Your system is now ready for installation.

3 Install and Set AfiAct II Software

This section details the AfiAct II installation steps, as performed by following the instructions provided by the installation wizard.

AfiAct II software is installed on a single PC, and consists of the following two modules:

- 
AfiFarm 5.4 – contains the AfiAct II program and reports. In farms that do not use other AfiFarm elements, the data entry screens and activities are also accessed through this component.
- 
AfiControl RT – this module controls and monitors the system and collects data from the animals through the Reader.

To install the AfiAct II modules :

1. Review general notes before starting, see 3.1
2. Install the HASP (software license key),
Initiate and follow the installation
wizard steps, see 3.2



3.1 General Notes

Before starting, review the following general notes.

Installation time

The installation time varies according to the specific PC characteristics and specific issues or wrong configurations. Generally: clean installations may take around 50 minutes.

Process sub-steps

During the installation, the wizard automatically performs several steps, as required by the specific scenario. These include the installation of various components (SQL, .Net 4, drivers, database operations, configurations, etc.).

Note: In AfiAct II's AfiFarm 5.4, the AfiFarm configuration is done via AfiControl RT System. While the main steps for the configuration are described in this manual (see Appendix C), an additional and more detailed description of the tool usage is provided in AfiControl configuration manual (see referred documents, page xi).

3.2 Set & Initiate the Installation Wizard

After verifying your PC is prepared for installation (see 2.3.4), initiate the installation wizard according to the following steps.



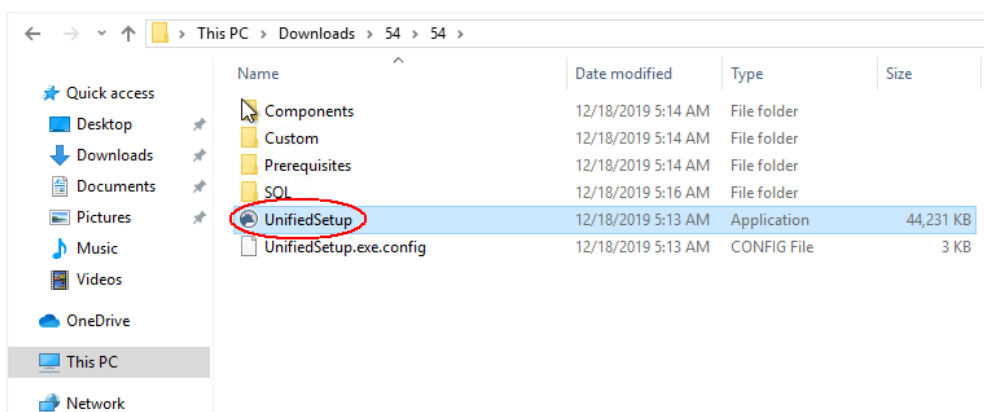
Note

*Screens that are displayed by the wizard but do not require user actions are not always presented in this section. Such screens that appear are **NOT TO BE TOUCHED**.*

1. Insert the AfiFarm 5.4 HASP USB key into the USB port of the PC.

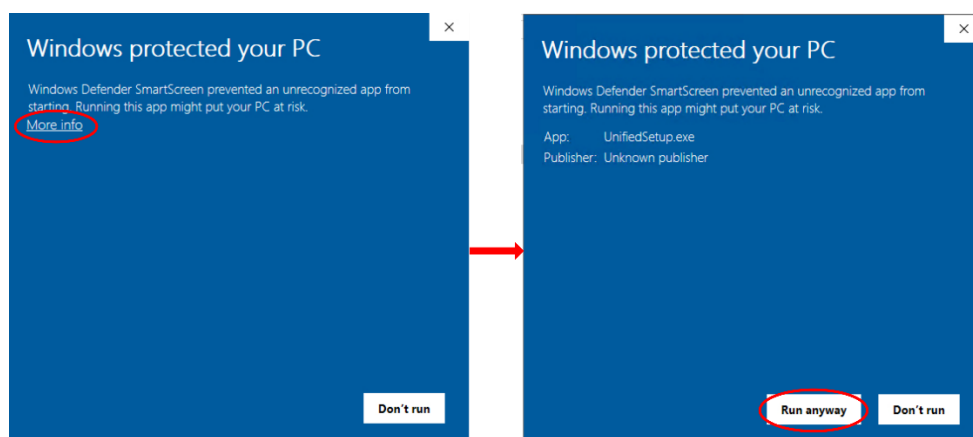


2. Open AfiFarm 5.4 DVD and double-click **UnifiedSetup**.

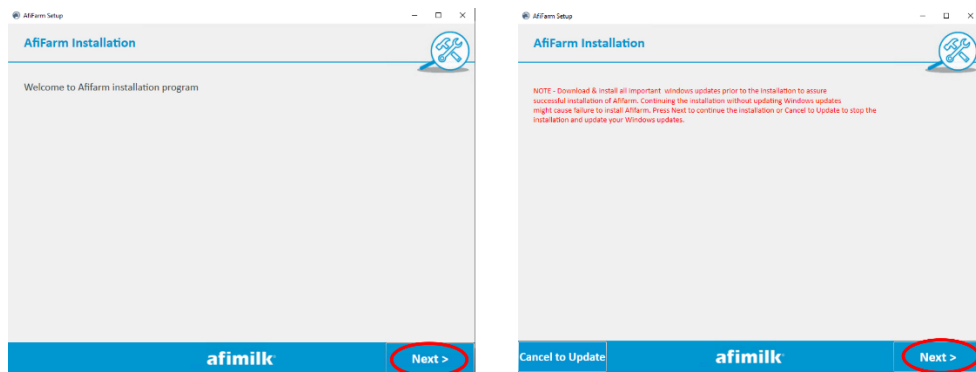


The installation wizard is launched.

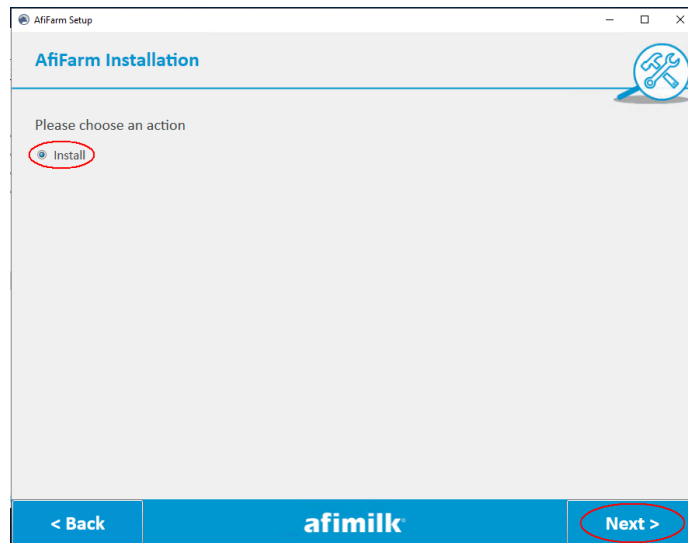
3. In the **Windows protected your PC** dialog box, click **More info**, and then click **Run Anyway**.



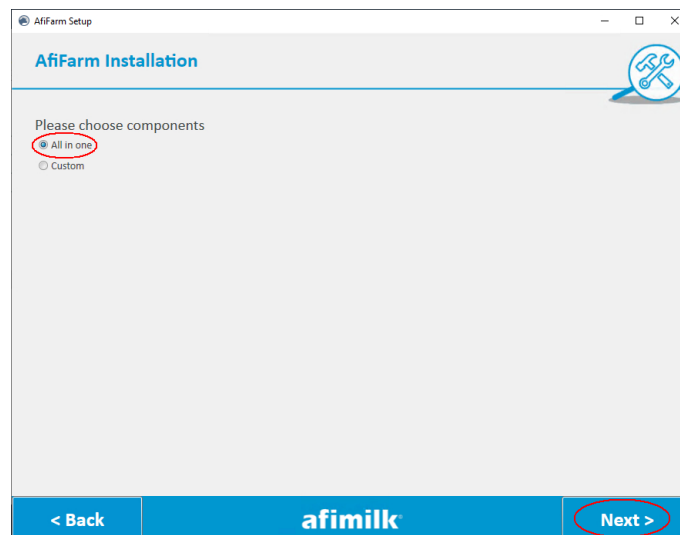
4. Click **Next** to continue through the next two screens.



5. In the **AfiFarm Setup** dialog box, select **Install**, and then click **Next**.



6. Select **All in one**, and then click **Next**.

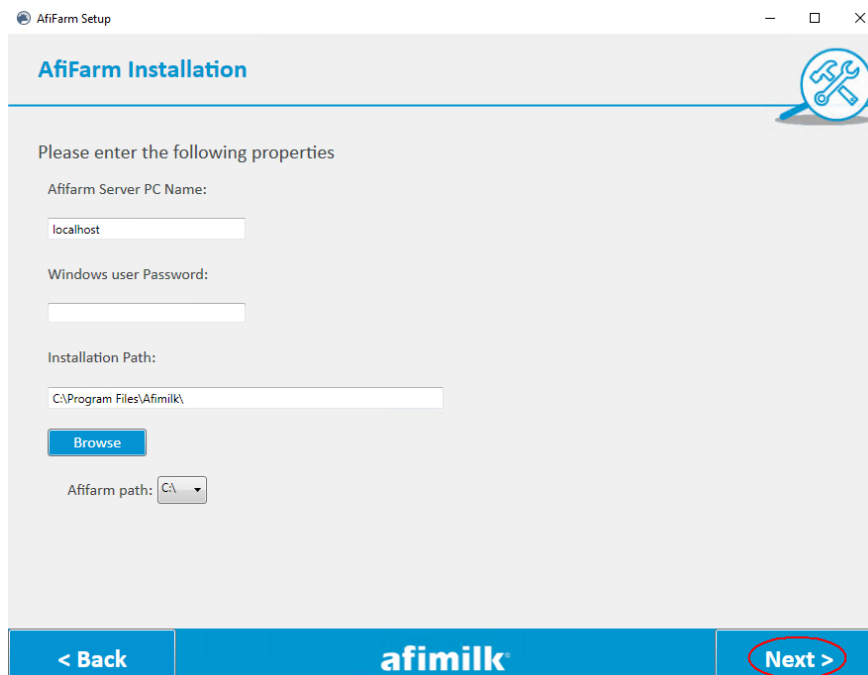



Note: **Custom** installation applies user-selected components for installation on the current computer and is not relevant to AfiAct II installations.

7. Carefully read the End User License Agreement (EULA), check the **I agree to the license terms and conditions** box, and then click **Next**.

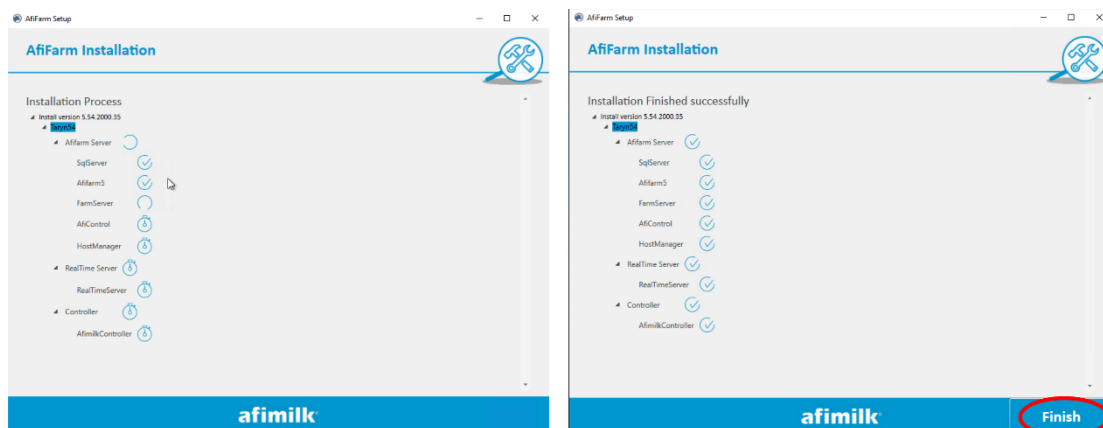


8. Type your Username and Password (if exists), and then click **Next**.



The installation is processed. A  is displayed next to each element that is successfully installed.

9. When all elements are installed, click **Finish**.



AfiFarm 5.4 automatically opens.

AfiControl installation is complete.



Note

*If using a standalone system side-by-side with existing AfiFarm 5.4, you may need to restore the initial animal database to the system at this phase. This rare scenario is detailed in **Error! Reference source not found.***

4 Initial Reader Communication



Note

It is recommended that the AfiAct II Reader initial connection is performed immediately after the AfiAct II SW was installed.

Before mounting the Reader, connect the Reader to the local network (same network as the computer) via a network cable, and verify connectivity with the AfiControl RT system. AfiControl locates the Reader's MAC and IP to perform a handshake (RT sends a broadcast message searching for the Reader unique ID; then the Reader replies to the sender (RT) providing its IP address).

Setting the Reader initial communication includes the following steps:

1. Connect the Reader to the wired network, see 4.1
2. Configure AfiControl mandatory parameters (quick start), see 4.2
3. Verify communication (handshake) via AfiControl, see 4.3
4. *If Wi-Fi is used*, connect the Reader to the Wi-Fi network, see 4.4

4.1 Connect the Reader to the Wired Network

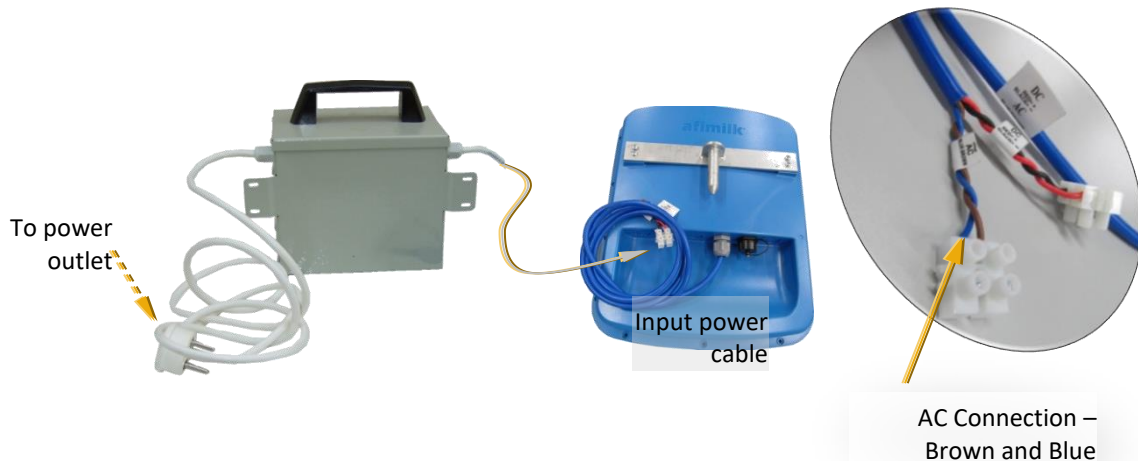
A network cable is used for connecting the Reader to the PC. Then the Reader is connected to the power source, and the connectivity is verified via AfiControl.

To connect the Reader to the network and obtain an IP address

1. **Connect network cable:** connect a network cable to the Reader's back-panel network connector. Connect the other side of the network cable to the PC USB connector.



2. **Connect to power (temporary connection):** Use the power supply transformer box to power the Reader on:
 - a. Use the AC terminal block (Brown and Blue) at the edge of the reader's power cable and connect it to the power transformer box white cable. If needed – strip the insulation to expose cable edges.



- b. Connect the transformer box to the power outlet.

- c. Turn on the transformer box switch and verify that the Reader's LEDs are on.



3. If a DHCP exists and is configured to provide a dynamic IP to the Reader, the Reader will automatically obtain an IP. If not, the Reader will use the factory IP address 172.20.1.1.



Note

If the Reader does not show correct network connection, restart the reader by turning the power off and on again.



Warning

Ensure taking all precautions when working with the high voltage components.

4.2 Set AfiControl (Quick Start)

AfiControl manages the communication between the various components (AfiAct II software, Reader, etc.), while AfiAct II components are connected via the network (wired or wireless).

AfiControl's client-server architecture involves the following types of computer functions, all running on the same PC for AfiAct II:

- **Server** (manages herd database, system configuration, and licensing).
- **Controller** (manages the real-time processes, includes a small database to control the stations, and collects data when the communication with the server is interrupted).
- **Client** (for user access to herd data).

To allow basic system functionality and overall system communication, the following basic parameters must be set in AfiControl for quick-start:

- **HW system layout:** PCs, devices (e.g. Reader(s) Unique ID), adaptors, ports, etc.)
- **Logical system definitions**, reflecting the stations (i.e. AfiAct, AfiSort, milking-parlors,...), sites (aggregation of all the stations with the same identification system – usually geographically close to each other), tracks (monitored animals; heifers/milking cows) and required sampling sessions.
- Deployment of the software to support the previously defined site(s) (in this case: AfiAct II via the tray configurator).

The following sections provide an overview of AfiControl navigation, session-definition requirements, and explain how to set up the mandatory system fields via AfiControl.



Note

For better system monitoring, it is recommended to define a user report that detects tags not assigned to animals), see Appendix C.



Note

The setup done via the RT System interface is checked at a later stage, when the whole system is connected (including the Reader, see 4.2).



Note

The AfiFarm RT system is a powerful tool, allowing the technician to perform Reader settings, tags identified by the system, view map of connected network elements, station reports, etc. For a summary on the AfiFarm RT System capabilities refer to Appendix C.

4.2.1 Navigating AfiControl Tool

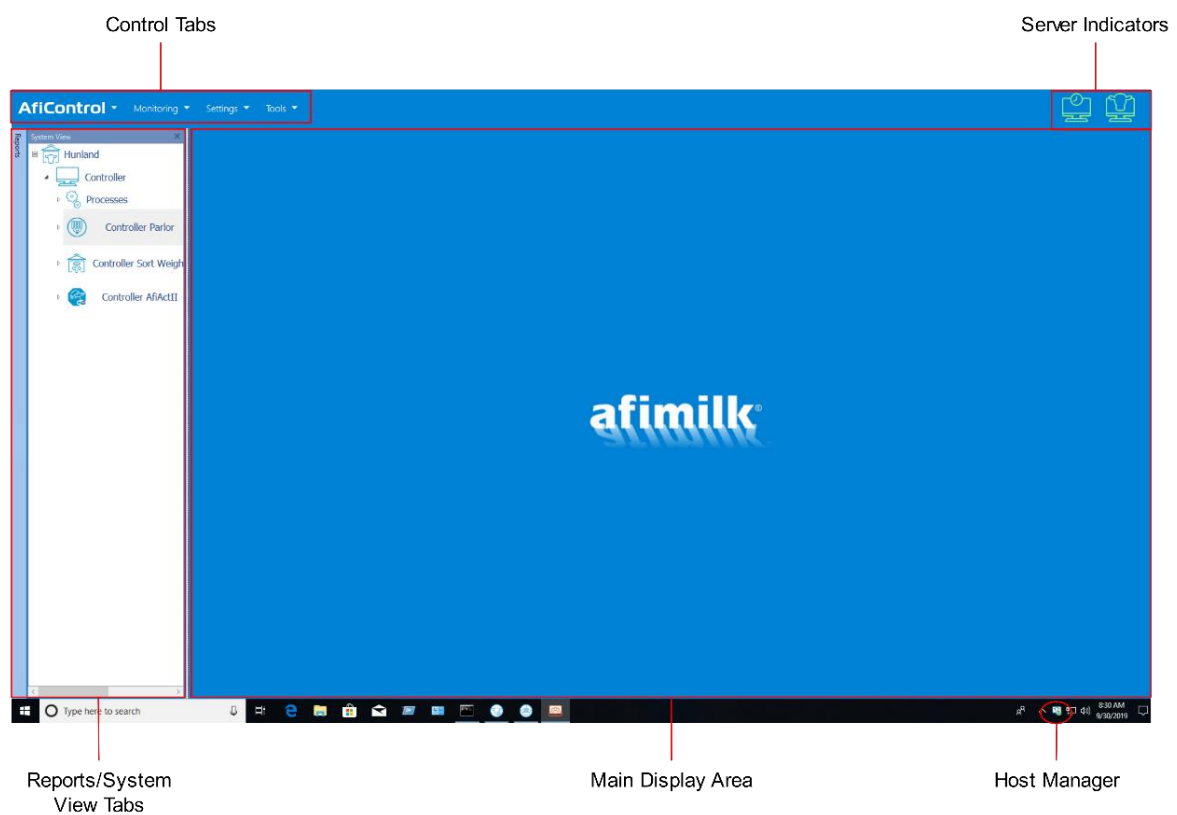
AfiControl is used by both farmers and technicians.

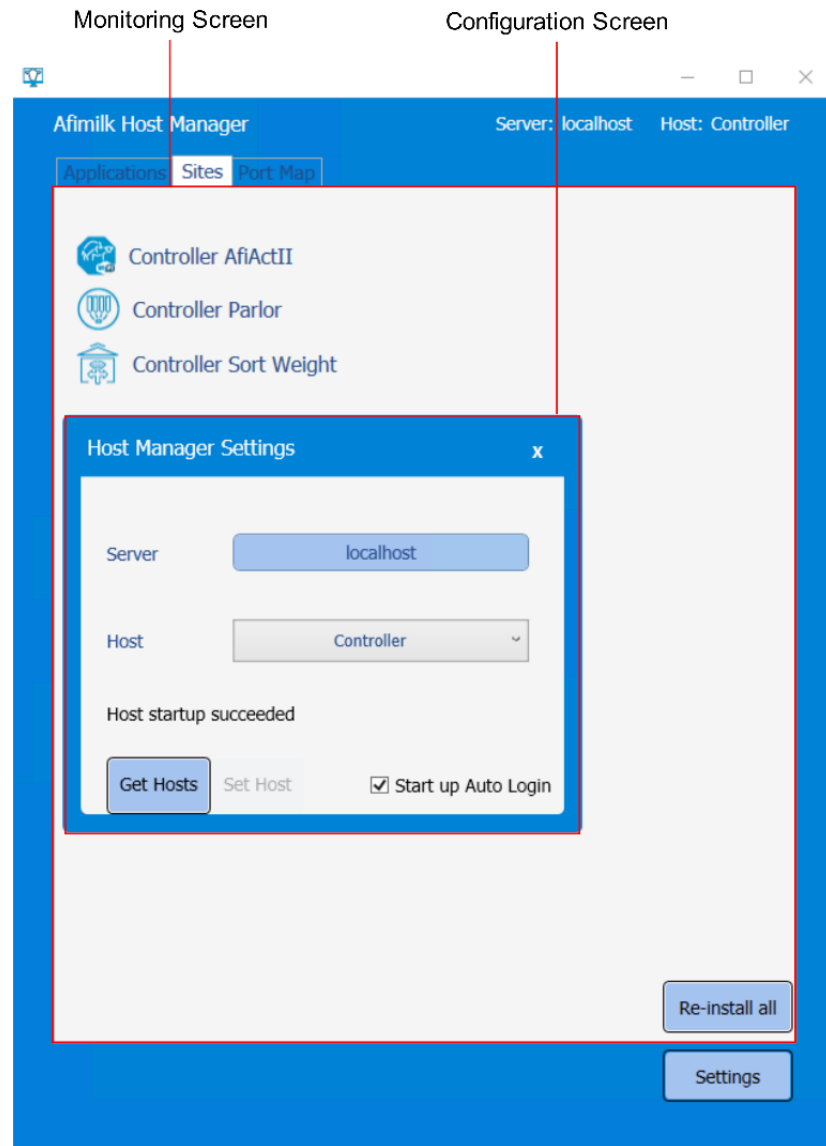
Technicians use AfiControl to access the following GUI elements:

- **AfiControl** screen – used for configuring the system and managing reports.
- **Host Manager** screen – used for:
 - Deploying specific-site-type supporting software (here: AfiAct II).
 - Monitoring connections with the defined system sites.

See Appendix C for details about the AfiControl screen and Host Manager screen.

AfiControl - Technician's Entry:



AfiControl – Host Manager:

4.2.2 Determine the Required Sampling Sessions

To allow AfiAct II algorithms to analyze the data correctly, the system must be set to reflect the specific farm monitoring needs. These are set by the following parameters:

- **Tracks** – Determine the type of animals that are monitored (i.e. heifers/cows), and the times in which they are monitored (i.e. sessions, see below).
- **Stations** – Determine the specific monitored activity: milking, AfiAct II, AfiSort, etc.
- **Sites** – The group of stations in the same geographical area, using the same identification system
- **Sessions** – The sessions are set to reflect the specific farm's daily scheduled activities. (E.g. milking times, breeding times, pasture times, feeding times, and other activities done in the farm).

To determine the above parameters correctly, the dealer personnel together with the farmer must collect and consider the relevant information. The following items provide guidelines for determining the farm's sessions via AfiControl. Fine tuning may be done after running the system for a test period.

To determine the sessions, refer to the following criteria and guidelines

1. To reflect the **specific animals** monitored (milking cows/heifers/both), check what **types of animals** will be carrying tags.
2. Check when **breeding** is done during the day.
3. **Session times** are set according to the tracked animal as follows:
 - For milking cows: the session times are set based on milking times:
 - Check what are the **milking times** (i.e. when is the first group brought to the milking parlor; when does the last cow leave the milking parlor)
 - Start the session 1-1.5 hours before each milking time, and at least one hour after the preceding milking. If the gap time between milking is not long enough, configure the beginning time of the sessions to 1/2 an hour after the last cow of the preceding milking leaves the parlor.
 - For heifers: Configure one session of 24 hours.

Check the heifers' data after 3-4 days. If there is very high activity during part of the day – configure two sessions: one for the high activity and one for lower activity. Configure the high activity session for 1.5 hours before the high activity occurs, and up to 1.5 hours after the high activity occurs.
4. The recommended number of sessions per day is between 1 and 3.
5. The session times must be continuous, ensuring 24 hours coverage

**Note**

If the session intervals or schedules are changed, contact Afimilk representative to re-configure the system. For TieStall sessions refer to Appendix D

4.2.3 Set Mandatory System Parameters


Setting the mandatory system parameters includes the following main stages:

1. Accessing AfiControl (Technician), see 4.2.3.1.
2. Defining system type, see 4.2.3.2.
3. Setting the controller and reader, see 4.2.3.3.
4. Setting tracks, see 4.2.3.4.
5. Deploying the software, see 0.
6. Verifying the defined site, see 4.2.3.7.



Note


The first time AfiControl Technician is opened, it must be accessed from the folder: C:\Afirmilk\Tools\AfiControlTechnician.

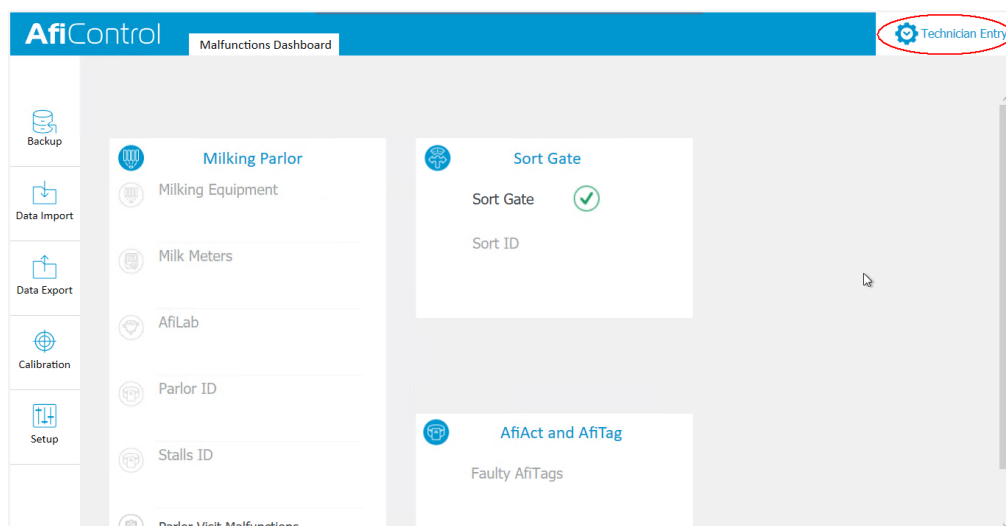
Once AfiControl has been configured, it can be opened from directly the AfiControl Technician icon  on the desktop.

4.2.3.1 Access AfiControl

Setting the system parameters is done from the AfiControl Technician entry.

To Access AfiControl:

1. Open AfiControl by doing one of the following:
 - **First-time access:** Navigate to C:\Afirmilk\Tools\AfiControlTechnician.
 - **For all subsequent access:** on the desktop, double-click **AfiControl** , and then in the AfiControl Dashboard, click **Technician Entry**.



2. Enter your password, and then click **Login**.

The image shows the AfiControl login interface. At the top, the 'afimilk' logo is displayed with the tagline 'Vital know-how in every drop'. Below the logo is a stylized illustration of a milk processing tower. The title 'AfiControl' is centered below the illustration. There are two input fields: 'Server' with 'localhost' selected in a dropdown menu, and 'Password' with a masked password represented by dots. A blue 'Login' button is at the bottom.

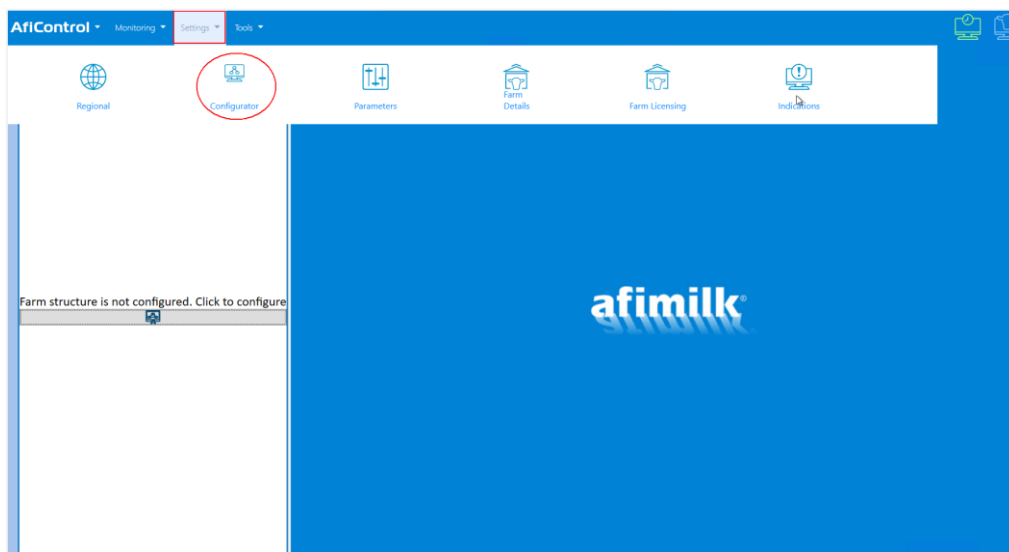
The AfiControl (technician) dashboard opens.

4.2.3.2 Define System Type



Set the system to support either AfiTag II or AfiCollar.

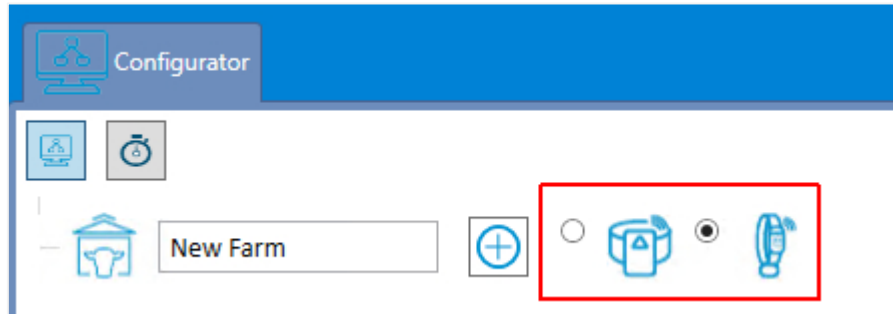
To define the system type

1. In the displayed AfiControl dashboard, under the **Settings** tab, select **Configurator**.



- In the **Configurator** screen that opens, select the system type required for the farm from one of the following, and then click **Commit**:

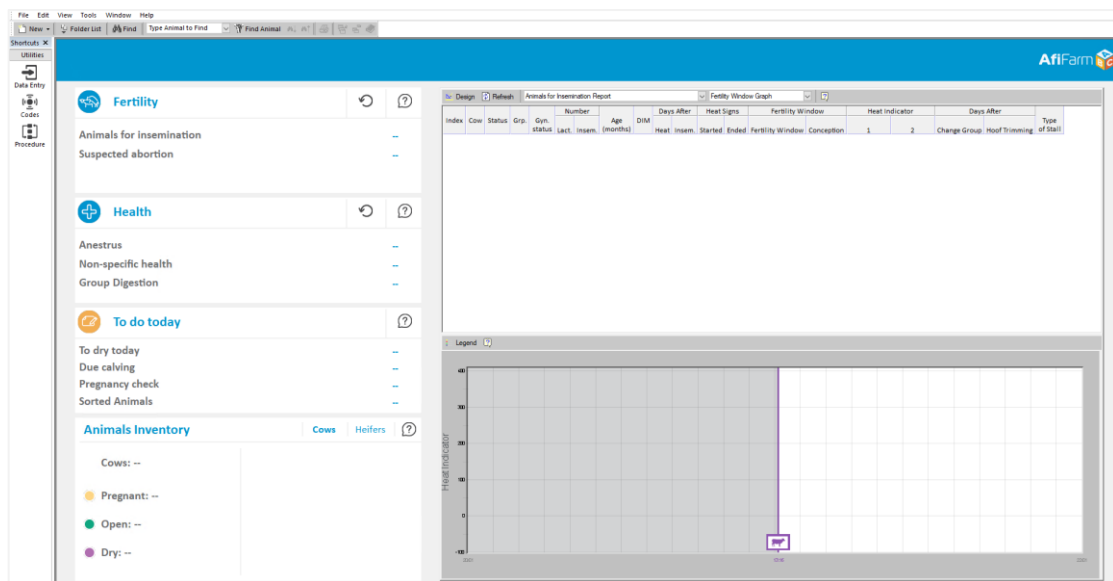
-  - for AFiTag II systems – continue to section 4.2.3.3.
-  - for AfiCollar systems – continue to step 3.



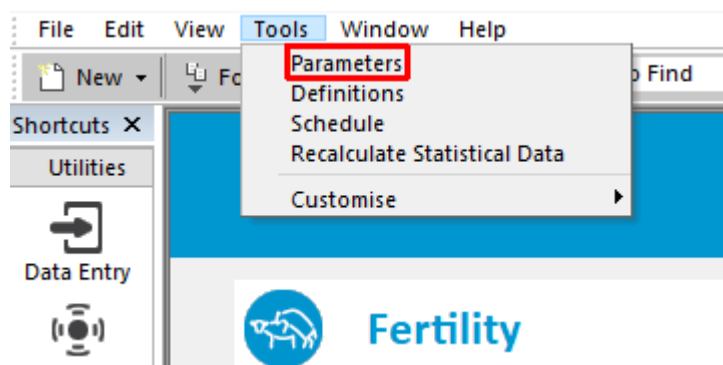
The system automatically shuts down and then restarts.

- Set the system to accept nine digits in the Animal Collar ID (for AfiCollar System installations only):

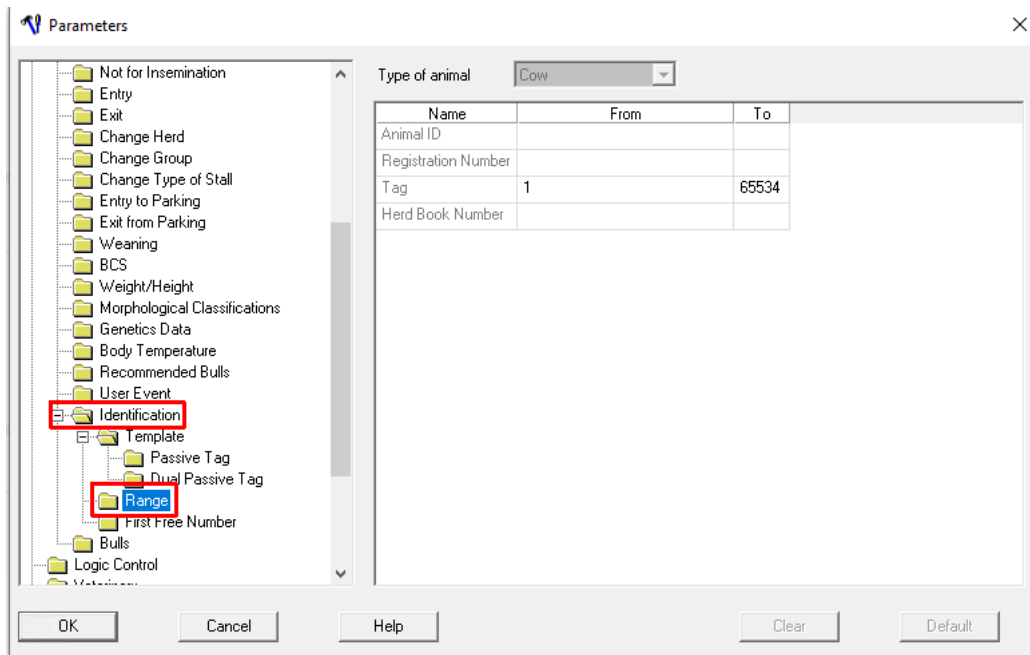
- Open AfiAct II



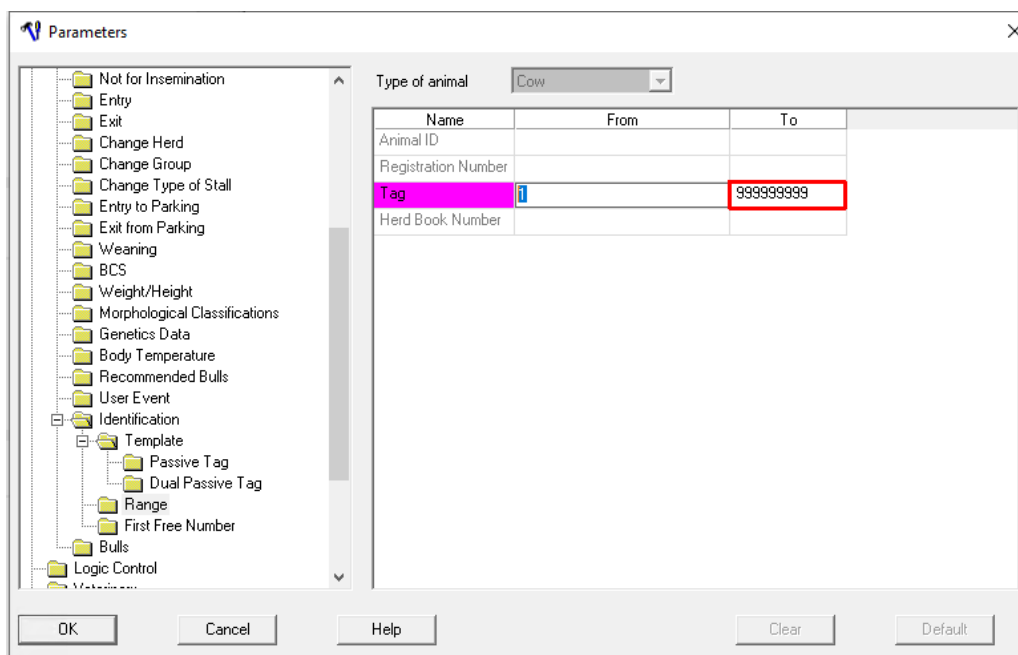
- Click **Tools**, and then select **Parameters**.



- c) In the **Parameters** dialog box, scroll down to the **Identification** folder, and then open the **Range** folder.




- d) In the **Tag** row, change the existing number to '99999999', and then click **OK**.

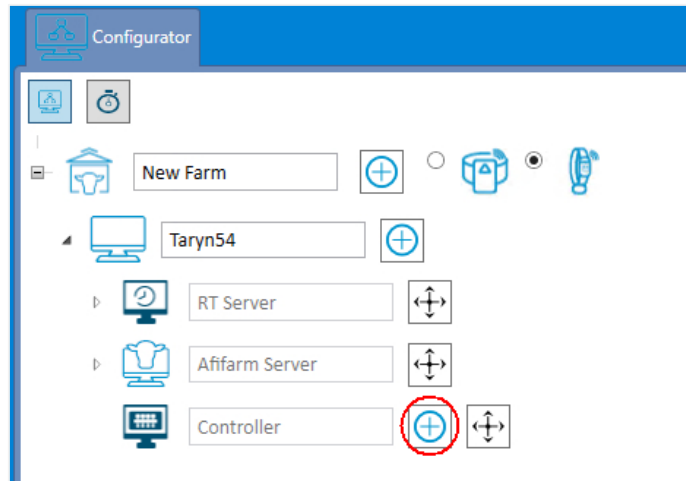


4.2.3.3 Set the Controller and Reader

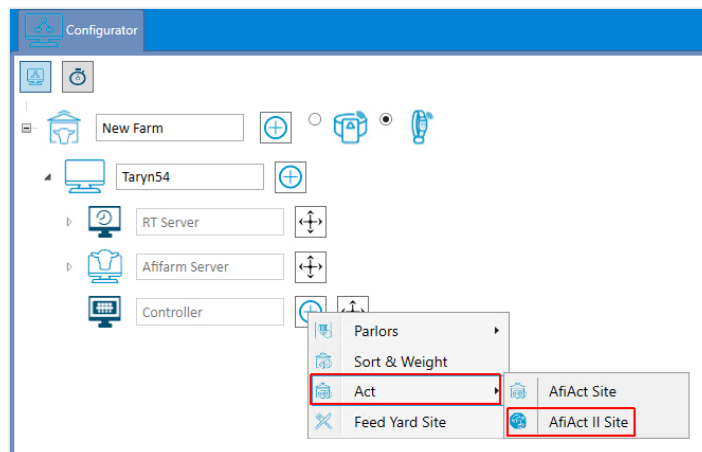
Set AfiAct II as the system controller and set the Reader parameters.


To define system controller and reader

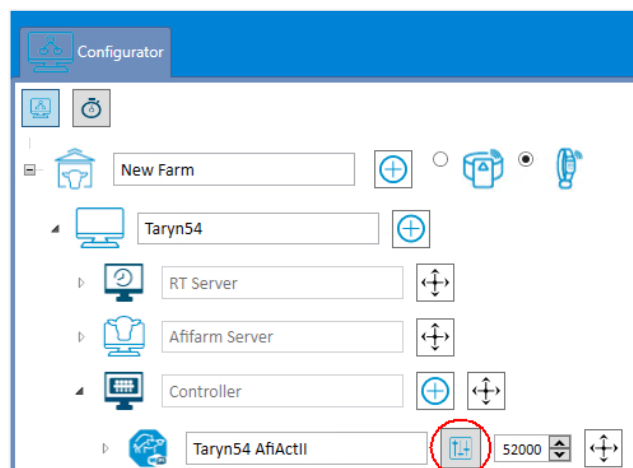
1. In the **Configurator** screen, add a new Controller by clicking  next to the Controller field.



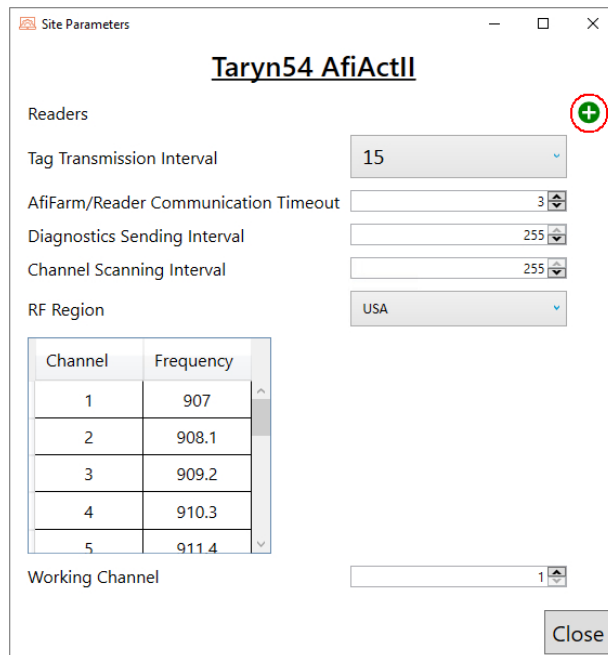
2. In the menu that opens, click **Act**, and then click **AfiAct II Site**.



3. Click  next to the **AfiAct II** field.




4. In the Site Parameters dialog box, click  to add a reader.



Site Parameters

Taryn54 AfiActII

Readers 

Tag Transmission Interval: 15

AfiFarm/Reader Communication Timeout: 3

Diagnostics Sending Interval: 255

Channel Scanning Interval: 255

RF Region: USA

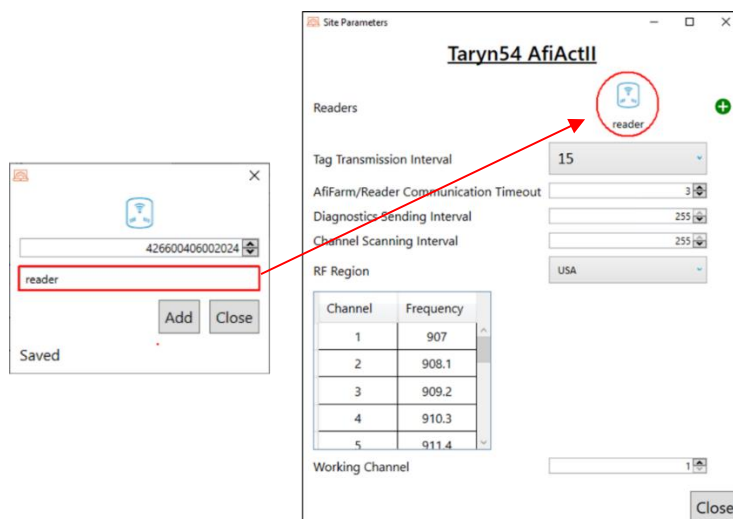
Channel	Frequency
1	907
2	908.1
3	909.2
4	910.3
5	911.4

Working Channel: 1

Close



5. Set the Reader ID (displayed on the Reader label, see 1.4.3).and name, and then click **Add**.

The Reader name and icon appears in the **Site Parameters** dialog box.



Site Parameters

Taryn54 AfiActII

Readers:  reader 

Tag Transmission Interval: 15

AfiFarm/Reader Communication Timeout: 3

Diagnostics Sending Interval: 255

Channel Scanning Interval: 255

RF Region: USA

Channel	Frequency
1	907
2	908.1
3	909.2
4	910.3
5	911.4

Working Channel: 1

Close



Note

If the system includes more than a single Reader, enter all the Readers' IDs and names.

6. Set the following parameters, as required:
- **Tag transmission interval** - sets the interval in which the tags send their data to the Reader (default 15)
 - **AfiFarm/Reader Communication Timeout** – do not change (default 3)
 - **Diagnosis Sending Interval** – do not change (default 255)
 - **Channel Scanning Interval** – do not change (default 255)

- **RF Region** – opens a menu for selecting the transmission region. Selecting a region automatically updates the corresponding **Channel/Frequency** table.
- **Working Channel** – Indicates the working channel selected (default 1). Your tags are factory-set to the same default channel as the Reader.



Warning

Frequencies 868.8 and 869 must not be used for Europe



Warning

The reader and the tags must be set to the same frequency channel. Do not change the channel! If the channel is changed, the Tags' channels must also be changed. Technicians may manage frequency via the Tag Reading/Programming Unit (RPU). For tag channel update see Appendix B

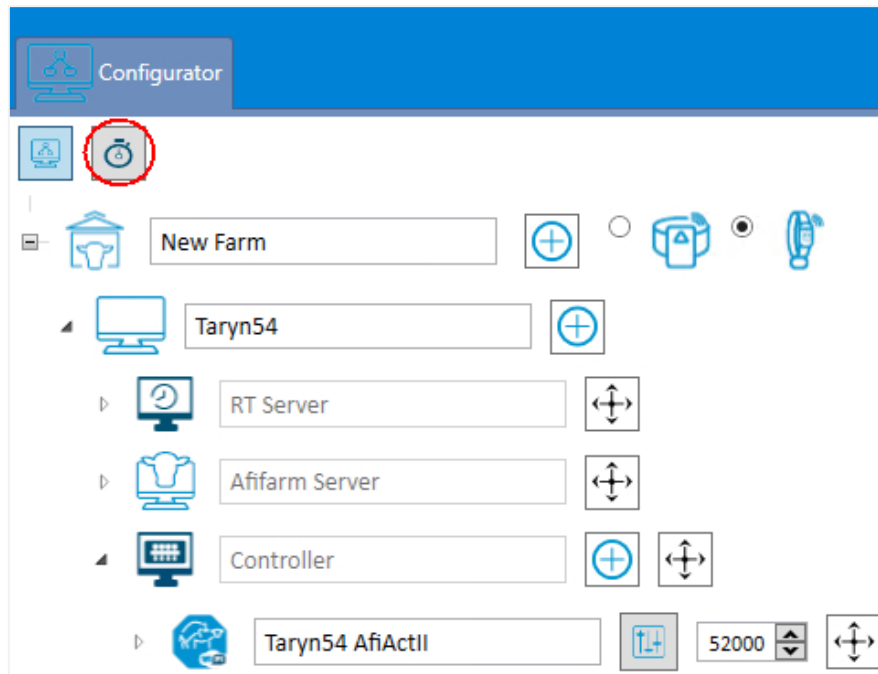
7. Click **Close** to close the **Site Parameters** dialog box.


4.2.3.4 Set Tracking Sessions and Station

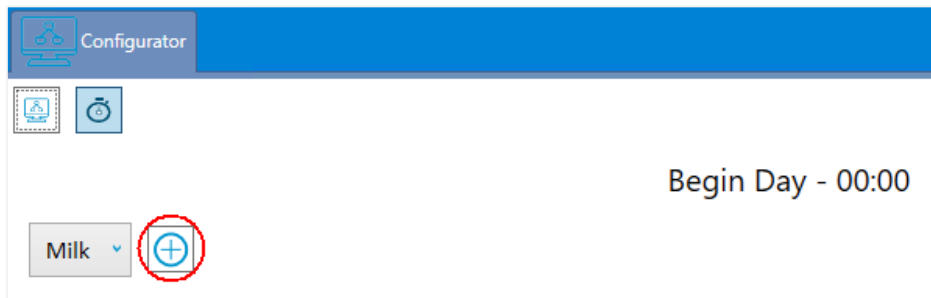
Set the required track(s) (tracking sessions and tracked animals) for the defined station.


To define the tracks

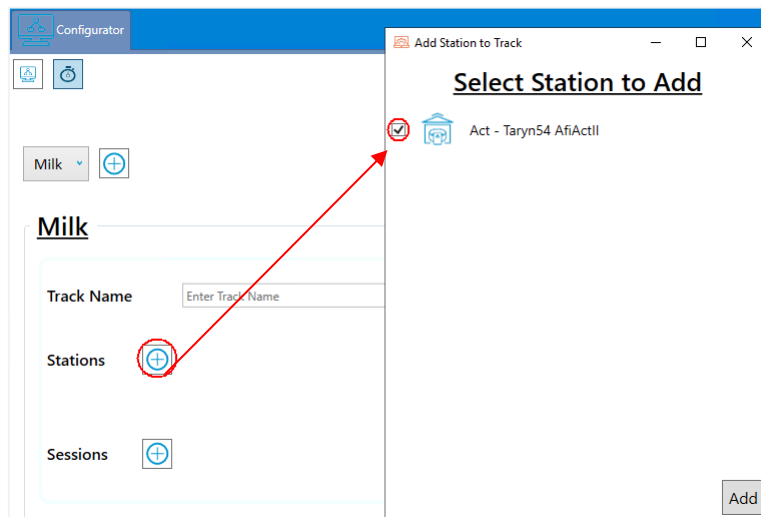
1. In the **Configurator** screen, click **Manage Tracks**




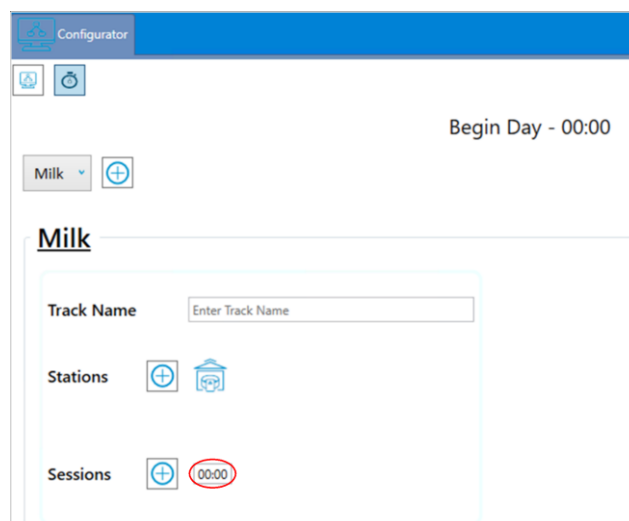
2. Add a track for the milk cows: Click .




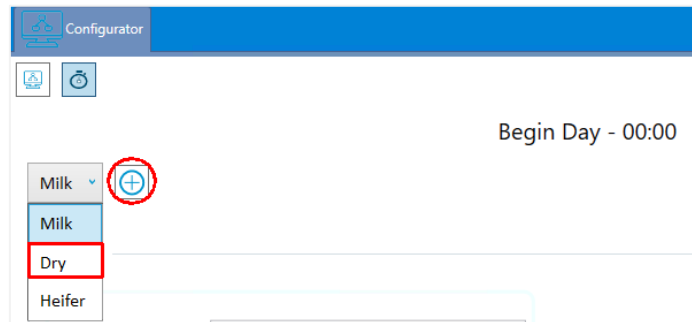
3. Add AfiAct II station to the Milk track:
 - a. Next to **Stations**, click .
 - b. In the **Select Station to Add** dialog box, check the AfiActII option.
 - c. Click **Add**.





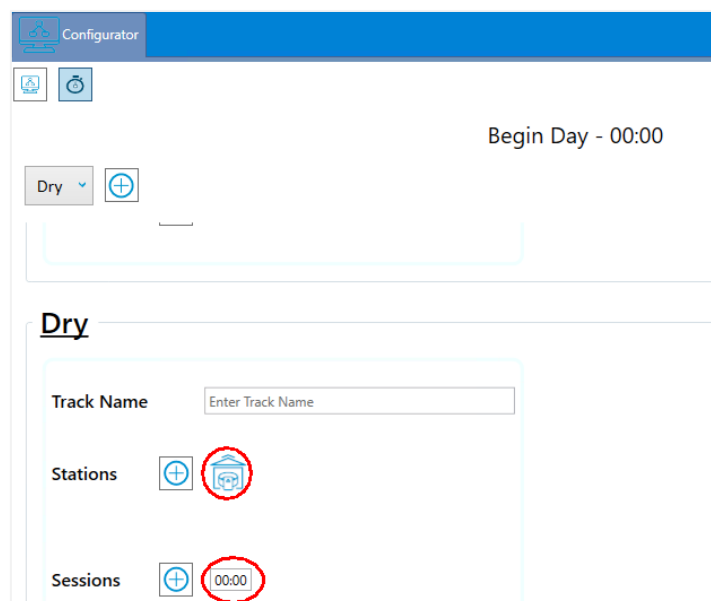
4. Add a session to the Milk track: Next to **Sessions**, click .




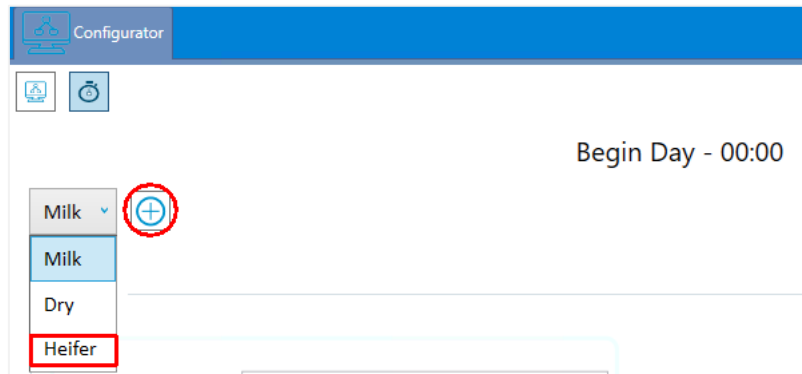
5. Add a track for dry cows:
 - a. Open the drop-down list, and then select **Dry**.
 - b. Click .





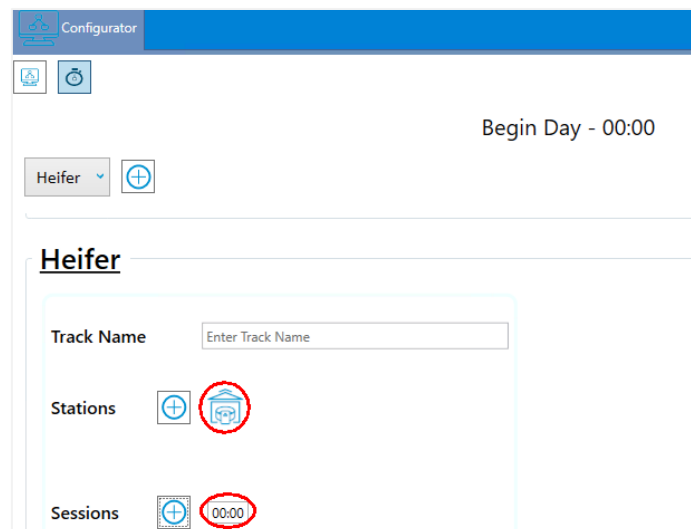
6. Add AfiAct II station to the Dry track:
 - a. Next to **Stations**, click .
 - b. In the **Select Station to Add** dialog box, check the AfiActII option.
 - c. Click **Add**.
7. Add a session to the Dry track: Next to **Sessions**, click .



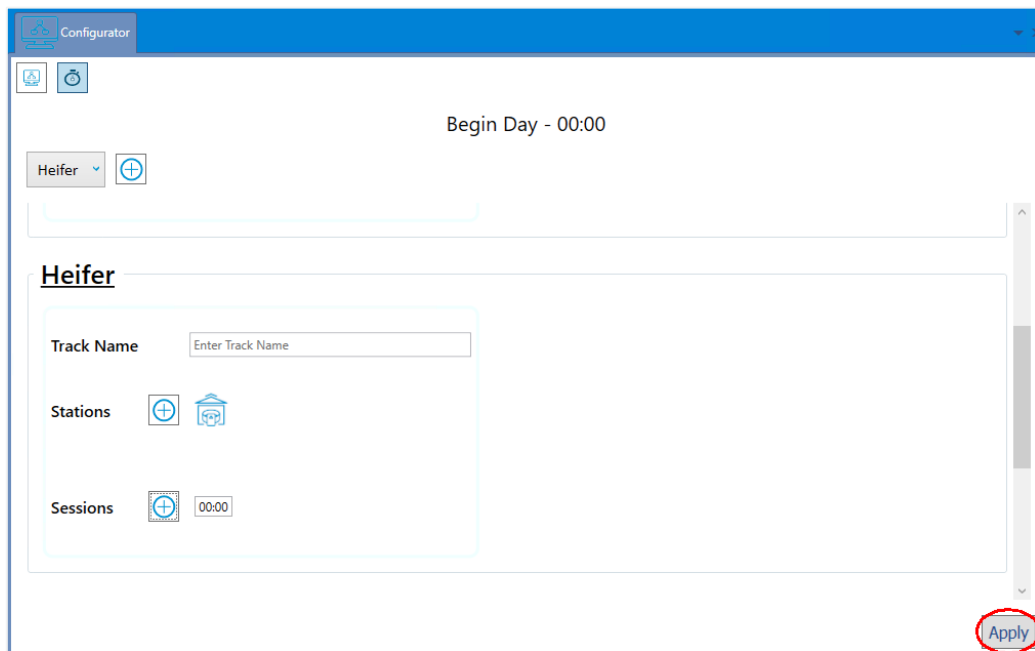
8. Add a track for heifers:
 - a. Open the drop-down list, and then select **Heifer**.
 - b. Click .



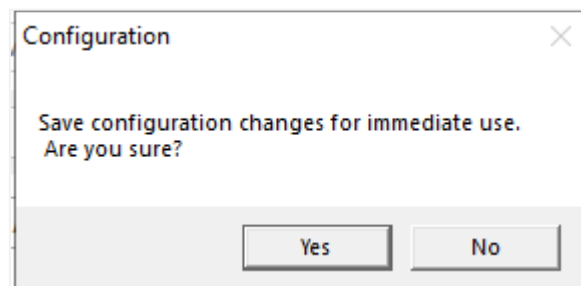
9. Add the AfiAct II station to the Heifer track:
 - a. Next to **Stations**, click .
 - b. In the **Select Station to Add** dialog box, check the AfiAct II option.
 - c. Click **Add**.
10. Add a session to the Heifer track: Next to **Sessions**, click .



11. Click **Apply**.



12. Click **Yes** to accept the configuration changes.



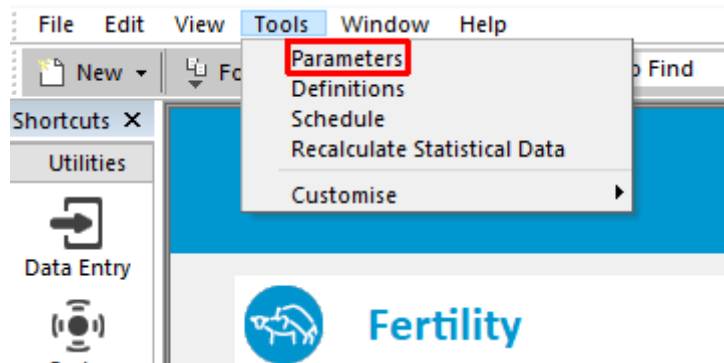
Wait a few seconds while AfiFarm 5.4 restarts, and until all the processes are up and running.

4.2.3.5 Import Tag IDs from Third Party Protocols

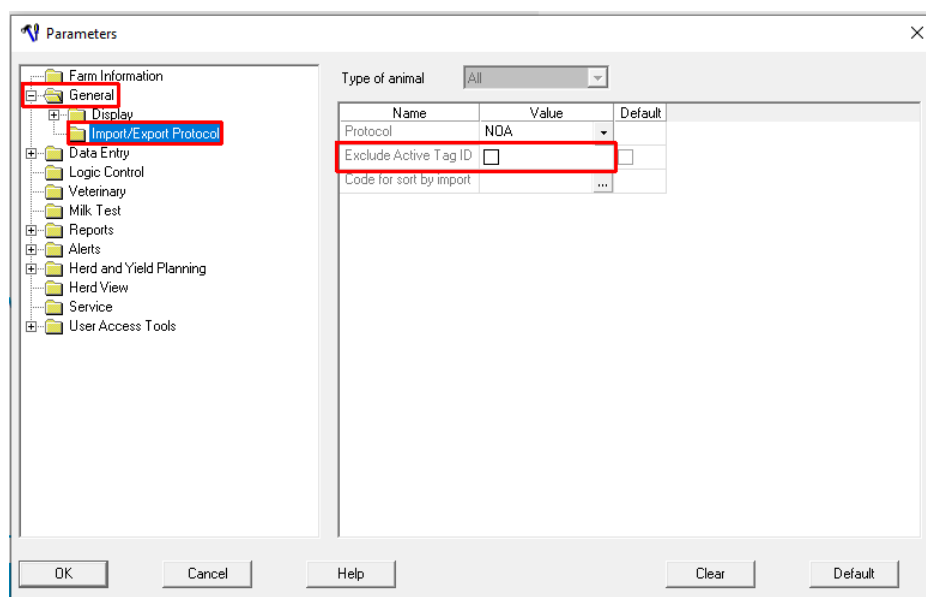
Tag numbers are automatically excluded when importing cow data to AfiFarm from a Third-Party protocol. Follow the process below to include the tag number during data transfers.

To include Tag IDs when importing data to AfiFarm:

1. On the dashboard, click **Tools**, and then select **Parameters**.



2. In the Parameters dialog box, expand the **General** folder, and then select **Import/Export Protocol**.
3. Un-select the **Exclude Active Tag ID** check box.



4. Click **OK**.

4.2.3.6 Deploy Software

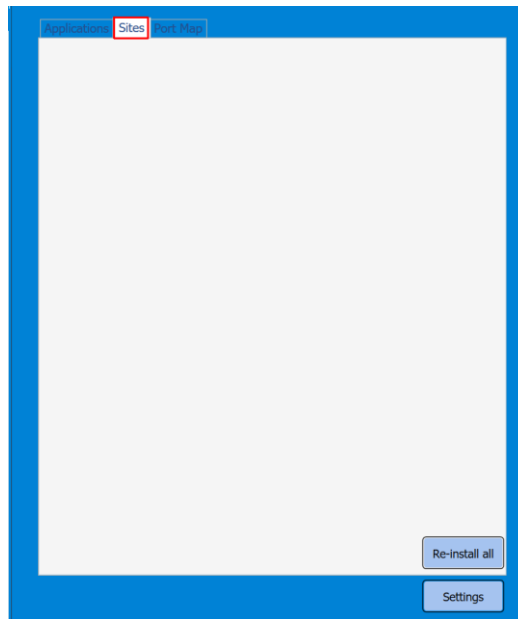
Deployment of the software according to the defined station is done in the Host Manager.

To deploy the software according to the AfiAct II station

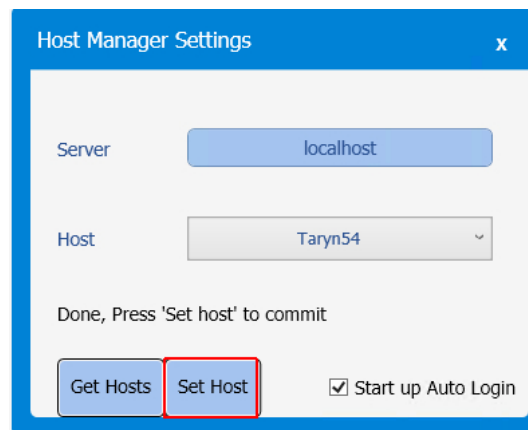
1. In the System Tray, right-click **Host Manager** , and then click **Afimilk Host Manager**.



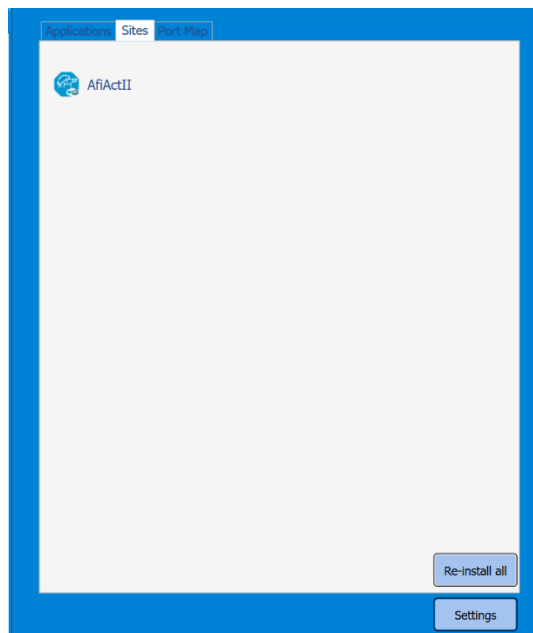
2. In the **Host Manager** window, open the **Sites** tab, and then click **Settings**.



3. In the **Host Manager Settings** dialog box, set the following:
 - a. Set the Server field to localhost.
 - b. Click **Get Hosts**.
 - c. In the **Host** field, open the drop-down menu, and then select a host.
 - d. Click **Set Host**.



The software configuration corresponding to the selected-defined track-station is now installed, and the above settings window is auto-closed. The following monitoring information appears.



You can now monitor the software that manages the defined Reader. (If the defined controller is not displayed, you may click **Re-install all**).



Note

After configuring the Host Manager, when connecting the Reader, the Reader's PC comm. LED should indicate communication between the Reader and PC.

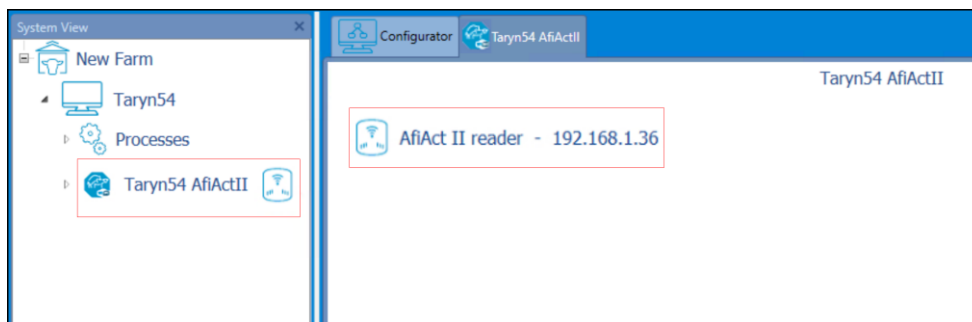
4.2.3.7 Verify AfiControl Connects to the Reader

Verify that the Reader-AfiControl connection is successful, see 4.3 for more information.

To verify the AfiControl-Reader connection:

1. Open the **System View** tab, click the AfiAct II site.

If the site is connected the Reader name and IP Address are displayed.



4.2.4 Faulty Tag Check

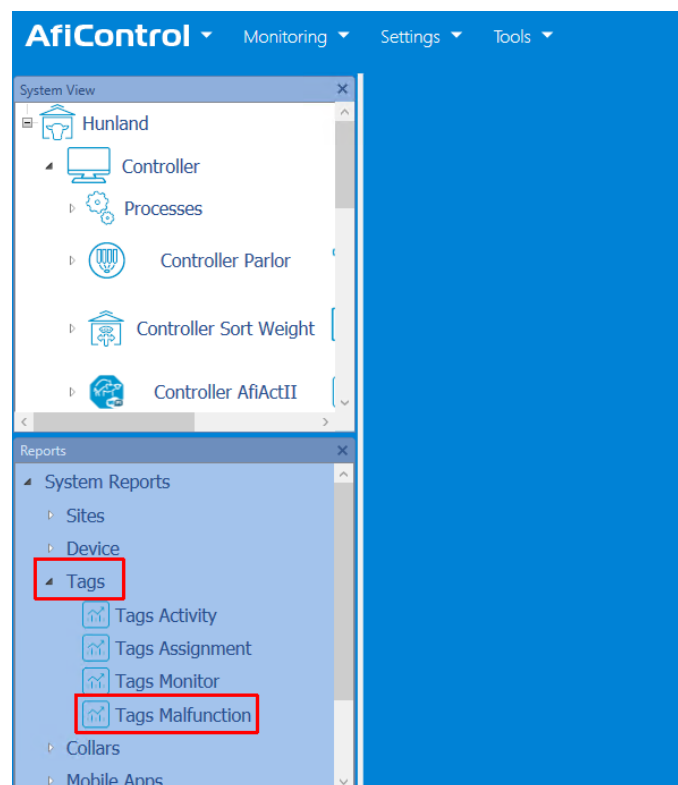
Check for any faulty tags.

- For AfiTags, see 4.2.4.1.
- For AfiCollar, see 4.2.4.2.

4.2.4.1 Faulty AfiTag Check

To check for faulty AfiTags II.

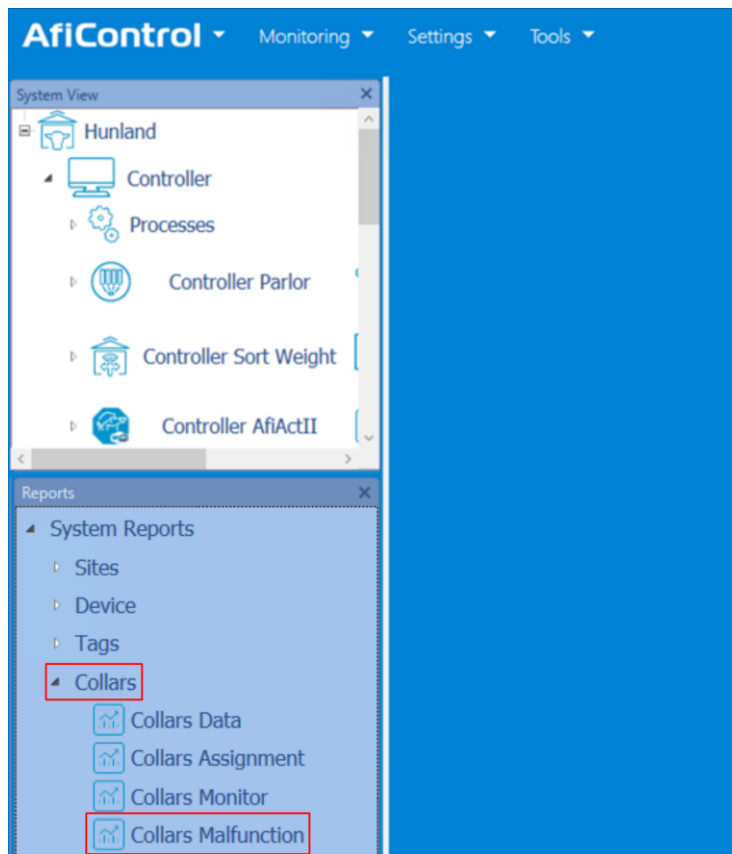
1. In AfiControl, open the **Reports** tag.
2. Expand **Tags**, and then click **Tags Malfunction**.



4.2.4.2 Faulty AfiCollar Check

To check for faulty AfiCollars.

1. In AfiControl, open the **Reports** tag.
2. Expand **Collars**, and then click **Collars Malfunction**.



- Customize the system to your specific farm.

These setups may be fine-tuned or updated at any time after mounting the Reader. For details on system configurations and maintenance via AfiControl, refer to Appendix C.




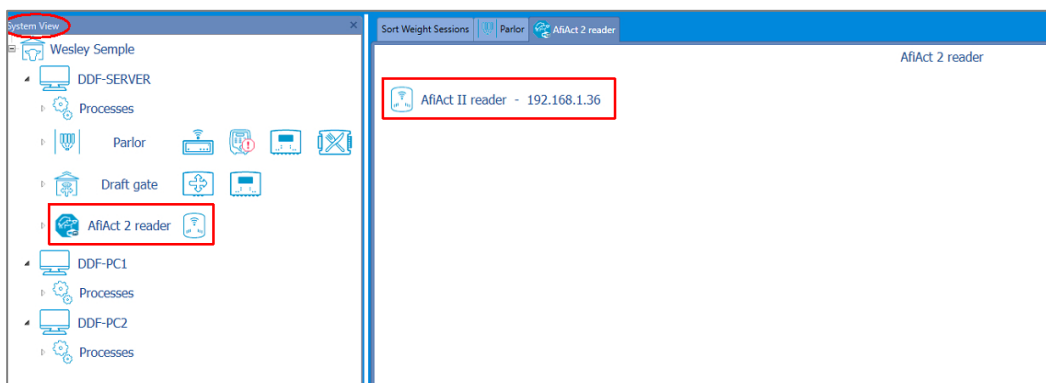
Note


Before the system may be used for detecting cows in heat, average behavior performance baseline should be generated by the application. This can take 5 to 6 days.

4.3 Verify Reader & AfiControl Communication

To ensure that the Reader handshake has been successful

1. (If not already open), open AfiControl (click the  icon).
2. Click on the **System view** tab → Click on the AfiAct site to verify that it is connected. If the site is connected the Reader name and IP_Address are displayed.



3. The connected elements (readers) are most likely to appear as disconnected (with a red sign: ) during the first few seconds.
4. Wait a few seconds for the reader-controller connection to be established. When the connection is established, AfiControl will show the reader as connected, with its relevant IP address, indicating that the Reader and AfiControl Controller are now communicating. In addition, the Reader's PC Comm LED will show that the Reader and PC are communicating.

Write down this reader's dynamic IP address.

Note: When there is no DHCP mechanism, you may use the Reader's default static IP address 172.20.1.1 for back-to-back connection, see 7.5



Note

For troubleshooting - The Reader 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 Reader, by using a standard IP/MAC scanner application (e.g. ip-scanner).

4.4 If Needed: Set Wi-Fi Communication

If the Reader is to use Wi-Fi communication, the Reader should be connected to the Wi-Fi network at the office, before proceeding with the Reader mounting.

By default, the reader uses credentials detailed in section 2.2 (also listed below); therefore, it is recommended that – if possible – the Access Point wireless settings are set according to these defaults. In this setup, the Reader automatically connects to the wireless network.

To use default reader credentials

Set the Access Point wireless to the following:

- SSID (access point name): **afiact2**
- Encryption method: **WPA-PSK/WPA2-PSK2**
- Password: **afimilk123**

If, for some reason, the Access Point cannot be set according to the above defaults, set the reader to use different credentials (refer to 4.4.1)



Note

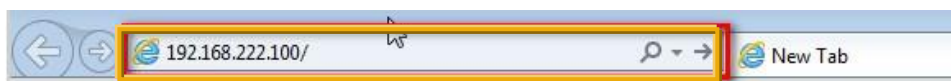
If there is NO Wi-Fi coverage in the office, the Wi-Fi network assignment will be set in the office as shown below, and the verification will be performed in the shed (Wi-Fi communication LEDs).

4.4.1 Set Reader to use Wi-Fi settings different than Default

When Access Point setup differs from default credentials, setup the Wi-Fi communication via the Reader's direct **Wi-Fi networking GUI application (LuCI)**, (accessed via the PC browser), which allows manual management and troubleshooting of the connection between the Reader's main board and the local network (for example: entering the Wi-Fi network SSID (Service Set Identifier) manually).

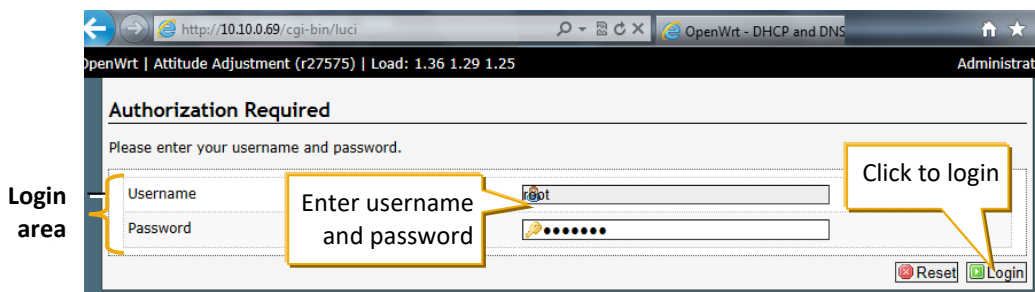
To set the Reader Wi-Fi credentials (not as in default) via LUCI interface

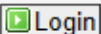
1. Open your PC browser and access the Reader interface by typing in the browser's navigation bar the IP address obtained from the Reader's map:
http://reader_ip_address



(Note: If there is no automatic address (DHCP), and the default factory address is used, you may also enter the following IP address: <http://172.20.1.1>)

The login screen appears:



2. Enter the Reader username and password (default: user: *root*, password: *afimilk*), then click the  button.

3. In the displayed Reader communication options, select the **Network** tab from the navigation options and choose **Interfaces**

Navigation-
tabs



Select to access
network options



4. To ensure that the connection to the wireless network is generated with the correct parameters, clear the default **wwan** interface as follows:

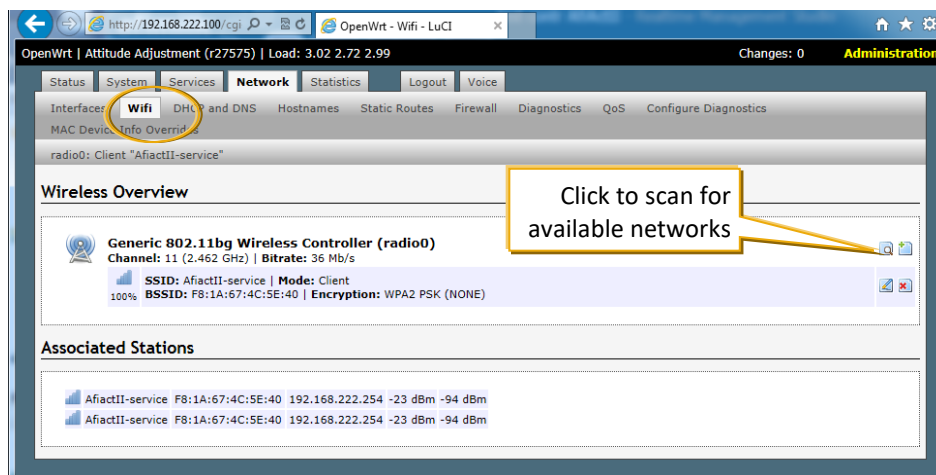
Scroll to the




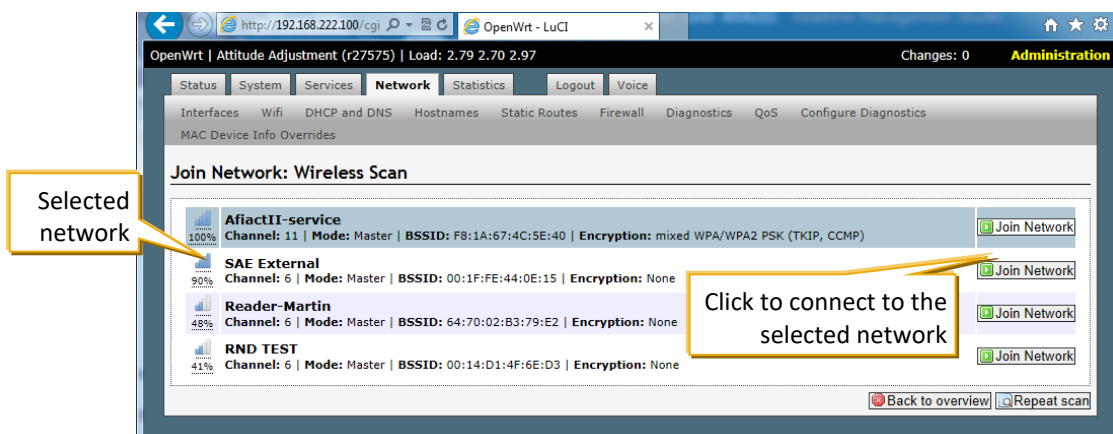
row, and click the



5. Under the Network tab sub-options select **Wi-Fi** and click the  (OR  Repeat scan) button at the bottom of the page to obtain the list of available Wi-Fi networks.



6. From the displayed list of available networks, select the requested network and click the  **Join Network** button.



7. If the network is secured, the system will wait for the user to enter the protocol used and the password. Type the Wi-Fi Network password in the correct place:

Specify the secret encryption key here.

OpenWrt | Attitude Adjustment (r27575) | Load: 2.91 2.74 2.97

Changes: 0 Administration

Join Network: Settings

Replace wireless configuration ☒ An additional network will be created if you leave this unchecked.

WPA passphrase Specify the secret encryption key here.

Name of the new network The allowed characters are: A-Z, a-z, 0-9 and _

Create / Assign firewall-zone

☐ lan: lan:

☒ wan: (empty)

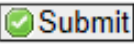
☐ unspecified -or- create:

Choose the firewall zone you want to assign to this interface. Select unspecified to remove the interface from the associated zone or fill out the create field to define a new zone and attach the interface to it.

Back to scan results Submit



It is the user's responsibility to verify that the correct password had been entered. Entering a wrong password will end with no network connection, and the whole process will need to be performed again (starting at phase 1 above).

8. Click  at the button to submit the new configuration.

OpenWrt | Attitude Adjustment (r27575) | Load: 2.60 2.63 2.85

Unsaved Changes: 12 Administration

radio0: Client "AfiactII-service"

Wireless Network: Client "AfiactII-service" (wlan0)

The Device Configuration section covers physical settings of the radio hardware such as channel, transmit power or antenna selection which is shared among all defined wireless networks (if the radio hardware is multi-SSID capable). Per network settings like encryption or operation mode are grouped in the Interface Configuration.

Device Configuration

General Setup Advanced Settings

Status

Mode: Client | SSID: AfiactII-service
BSSID: F8:1A:67:4C:5E:40 | Encryption: WPA2 PSK (NONE)
Channel: 11 (2.462 GHz) | Tx-Power: 27 dBm
Signal: -21 dBm | Noise: -94 dBm
Bit Rate: 36.0 MBit/s | Country: US

Enable device ☒

Channel

Transmit Power

Interface Configuration

General Setup Wireless Security MAC-Filter Advanced Settings

ESSID

Mode

Network

☐ lan: lan:

☐ wwan: (no interfaces attached)

☒ wwan1:

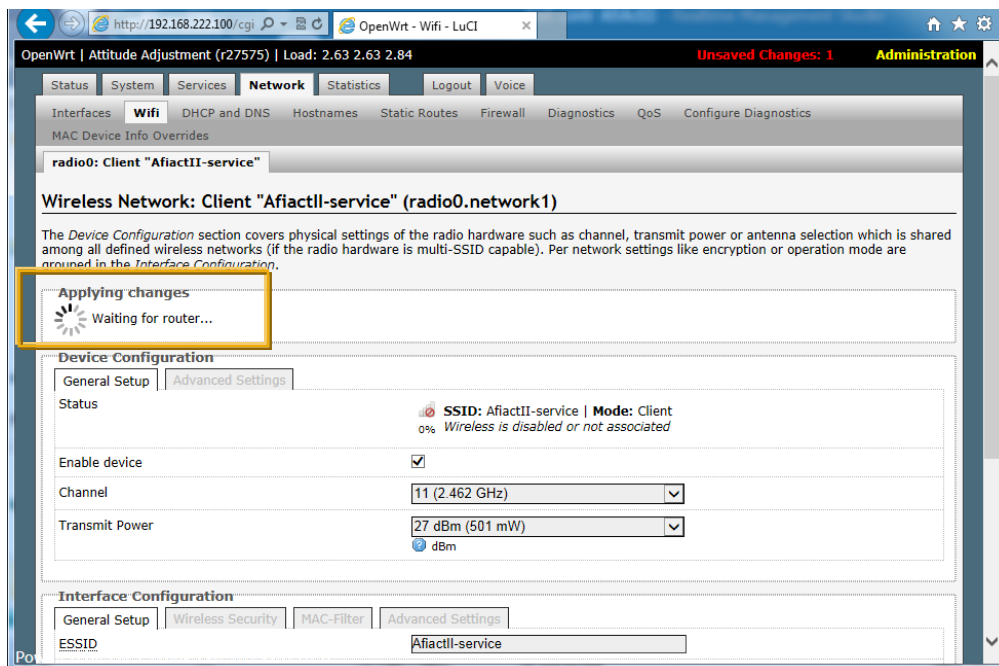
☐ unspecified -or- create:

Choose the network you want to attach to this wireless interface. Select unspecified to not attach any network or fill out the create field to define a new network.

Click to connect to the selected network

9. In the displayed screen all the details that will be sent to the device are displayed. Roll down and click **Save & Apply**.

10. Wait until the system is connected.



Note: If the connection takes too long (more than 3 minutes), restart the Reader (POWER OFF and then back ON).

11. Verify that all the Wi-Fi LEDs (WLAN & signal strength) on the Reader are ON (see 1.4.1). If the Wi-Fi LEDs don't work, then you will have to start this stage from the beginning.
12. After connecting to the wireless network, disconnect the network cable and restart the Reader:
 - a. Use the transformer power button to turn the device off.
 - b. Disconnect the network cable.
 - c. Power the Reader ON using the transformer switch
 - d. Wait for the device to locate the network (~1 minute).
 - e. The communication verification is now done by checking::
 - At least 2 communication LEDs are ON

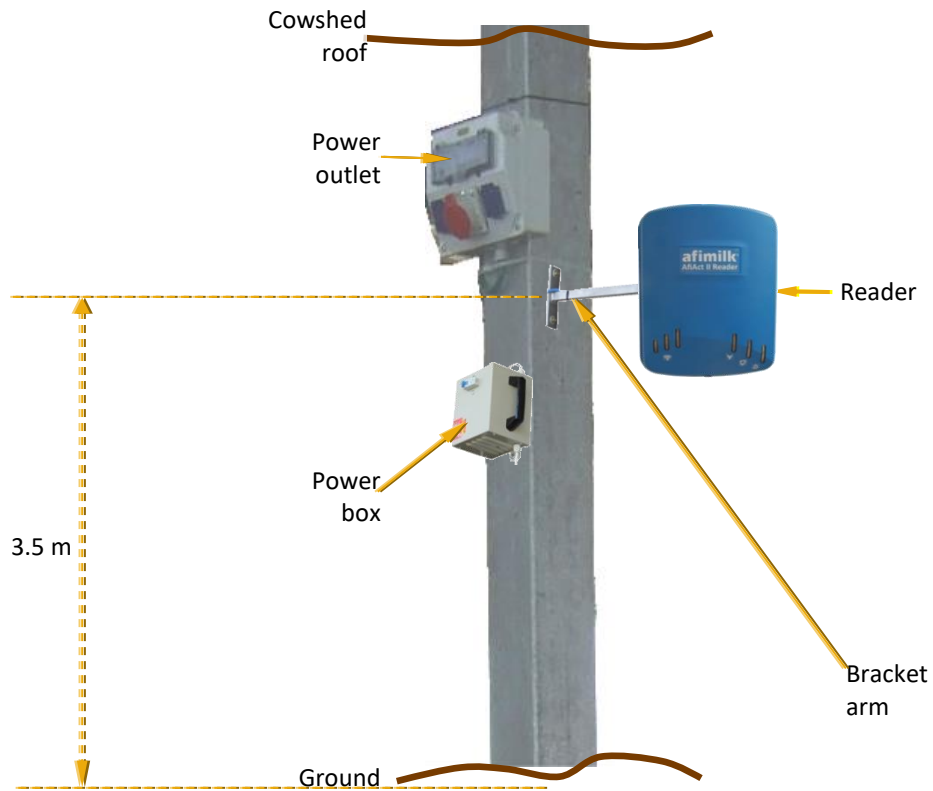


- AfiControl displays the Reader's IP, see 4.2
 - f. Close the Reader configuration interface (browser)

Initial Reader communication is complete. Disconnect and Take the Reader to the Shed.

5 Mount the Reader

After configuring the Reader, mount the Reader and its power elements in the location determined previously (see 2.1, 2.2), after verifying that there is both tag and network coverage in the cowshed (Wi-Fi or cable, as determined by the customer).



5.1 Mount the Power and Electricity Boxes



Warning

Power to all Afimilk devices must be supplied through an accessible, well-marked circuit breaker (usually placed on the power transformer).

Before conducting work on any Afimilk device, make sure power to devices is switched off at the circuit breaker (usually placed on the power transformer).

Note: for outdoor power connection, you may either use AC via the power supply unit or DC.

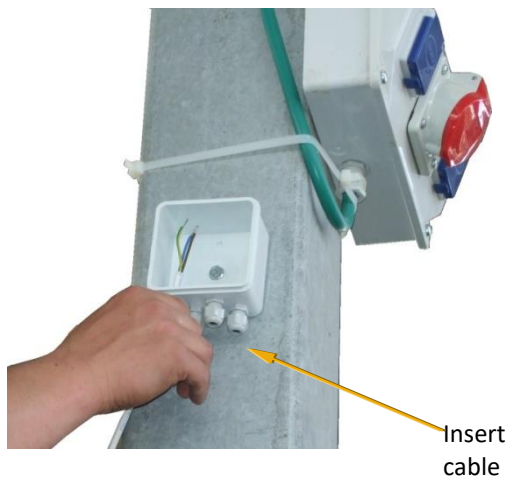
To mount the power and electricity box

1. Optional: connect the power supply unit to the pole, near the power outlet access:
 - Locate the box on the pole, higher than the cows can reach but accessible for maintenance. If necessary - bend the bracket connecting plate (bulge) manually to fit the pole.
 - Use the electric screwdriver to screw the bracket to the pole.



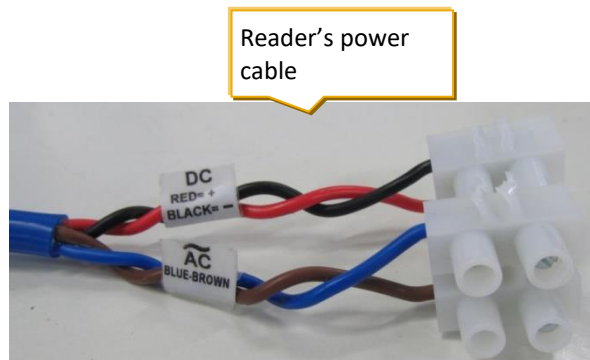
2. Connect the electricity box: Open the electricity box and screw it to the pole, preferably close above the power box, using the supplied screw and an electrical screwdriver.

Note: The electrical box connection is the local technician's responsibility



3. From the **free end** of the power cable, strip 2 inches of the insulation to expose the conductors. Then insert the cable into the electrical box through its lower connection holes.
4. Thread the exposed blue and black conductors into a cable terminal box previously removed from the reader's cable.
5. **For AC power connection:** Identify the **blue and brown** conductors exposed from the Reader's power cable's **free end**. Insert the exposed blue and brown cable-ends into the electrical box and thread the conductors into the cable terminal box.

For DC power connection: Identify the **red and black** conductors exposed from the Reader's power cable's **free end**. Insert the exposed red and black cable-ends into the electrical box and thread the conductors into the cable terminal box.



6. If the cable has loose ends, secure the cable to the power box using cable ties.
7. Close the electrical connection box.

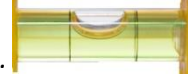


5.2 Mount the Reader on the Pole

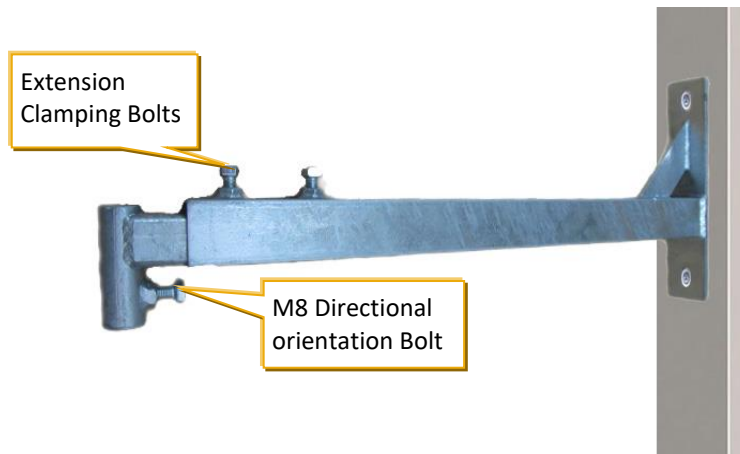
To mount the Reader on the pole

1. Attach the bracket arm to the pole using screws (*screws are not supplied*). The attachment must be done well to ensure long lasting connection of the arm to the pole.

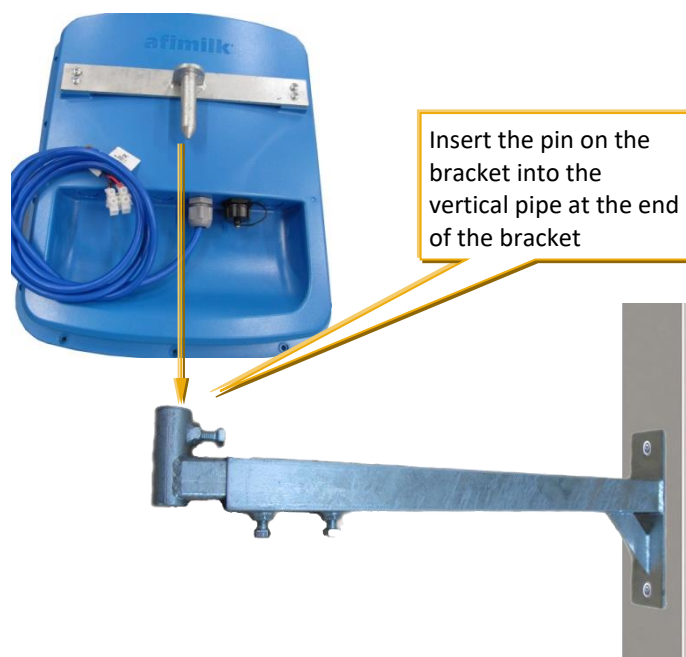
Note: Verify that the bracket arm is leveled (use a leveling device).



Note: Verify that the mounting location complies with all the requirements (height, stability, etc.)

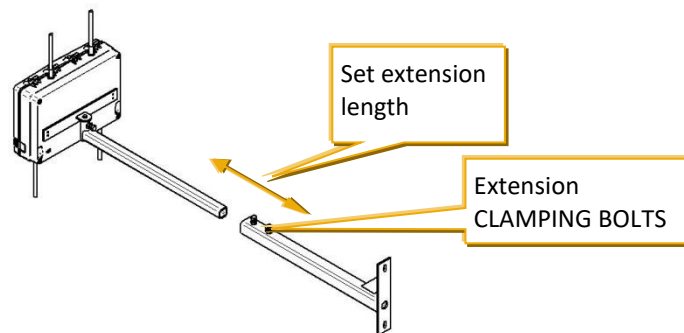


2. Connect the Reader to the bracket arm by inserting the pin on the bracket into the bracket arm's free end.

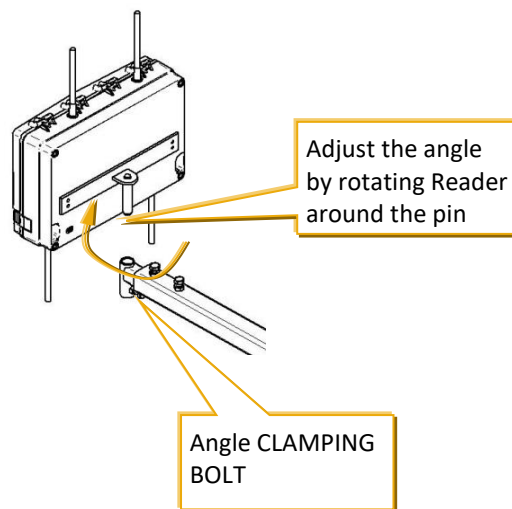


3. Adjust the extension and angle of the Reader:

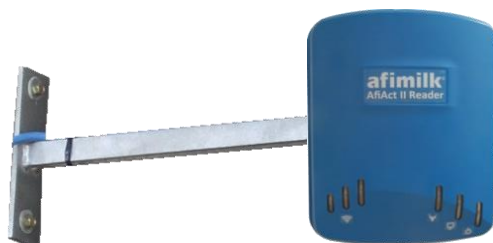
- Set the extension length by pulling the inner extension arm in and out from the bracket (Max length: 300 mm from the end of the larger profile). Then



- Rotate the Reader to its required angle. Then tighten the M8 clamping bolt using a 13mm wrench



The Reader is now mounted on the pole.



If Wi-Fi is used: test the mounting point for proper Wi-Fi coverage verification

Verify that at least two stable Wi-Fi Signal Strength LEDs (i.e. Low and Medium) are ON, indicating strong signal, see 1.4.1

Note: If the 2nd (Medium-strength) LED is not lit steadily (i.e. blinking) it is not good enough!



3 GREEN LEDs: Good signal strength

2 GREEN LEDs: Medium signal

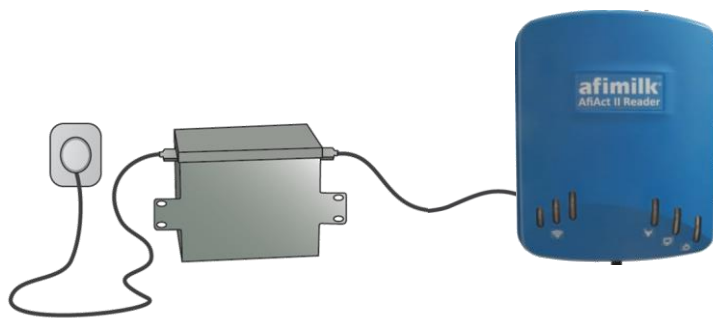
1 GREEN LED: Low signal strength



Note

For troubleshooting the connection, use back-to-back connection to your laptop, see 7.5

5.3 Connect the Reader to Power



1. Make sure that the power cable does not dangle under the Reader. Secure the connector and remaining white cable to the bracket arm using cable ties.



2. Connect the power box to the power outlet.
3. Power the Reader on, using the power switch located on the power box. Verify that the LEDs show good reception for both tags and Wi-Fi, see 1.4.1
4. When done with the installation, wait to see that the **Activity Log Report** is being updated with tag messages.

Note: You may set the Reader's transmission interval via AfiControl configurator to 5 minutes (see 4.2.3), so that you will be able to check that all tags transmit, within no longer than 15 minutes, and then change it back to 15 minutes. The tags can be viewed in the Activity log report, see Appendix C



Note

Before using the system for detecting cows in heat, average behavior performance baseline must be generated by the application. This can take 5 to 6 days.



Note

At this point, the Herd's data is entered into AfiFarm. Refer to Appendix E for guidelines on this procedure.

6 Tag Management

The tags continuously send cow data to the AfiAct II system. They are factory-set to use the specific frequency and channel corresponding to your region, as also set in the Reader. It is the farmer's responsibility to attach the tags to all cows in the group and enter their IDs into the system. Furthermore, when a cow is removed from the group, it is the farmer's responsibility to remove the tag from the cow and inform the system. A removed tag may be stored or immediately re-used on another animal.

This chapter provides detailed instructions for tag management:

- Activation of tags transmission, see 6.1
- Perimeter coverage validation, see 6.2
- Tag attachment, see 6.3
- Tag replacement (when a tag is moved from one animal to another), see 6.4
- Tag storage, see 6.5

For AfiTag II Users Only:

Technicians may read and program tag data via the Tag Reading/Programming Unit (RPU).

This includes changing channels when needed (e.g. if the pre-set factory channel does not function due to interference). In this case, the Reader's channel frequency must also be changed to correspond with the tags' channel (see 4.2.3).

For a description of the basic actions undertaken using the RPU, refer to Appendix B. For full usage instructions of RPU, refer to the RPU document (see referred documents on page xi).



6.1 AfiAct II Tags' Transmission Test

Before attaching the tags to the cows, it is important to activate them and validate their transmission.


- For AfiTags, see 6.1.1.
- For AfiCollar, see 6.1.2.

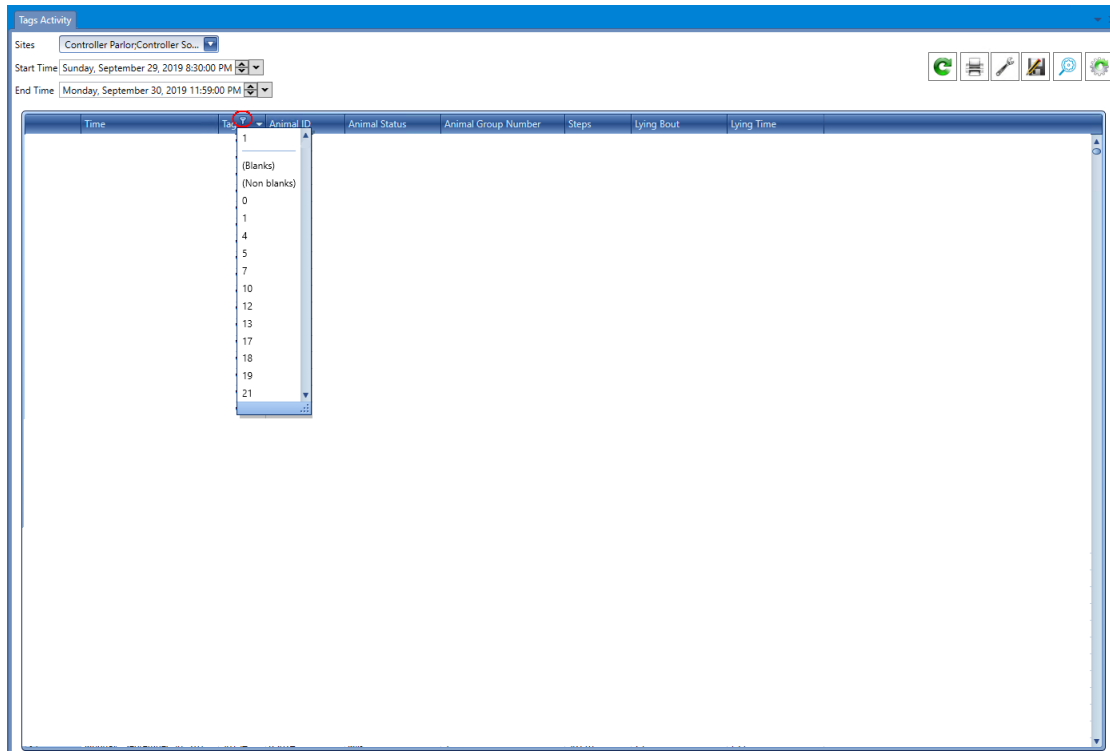
6.1.1 Activating and Validating AfiTag Transmission

To activate and validate the AfiTags transmission:

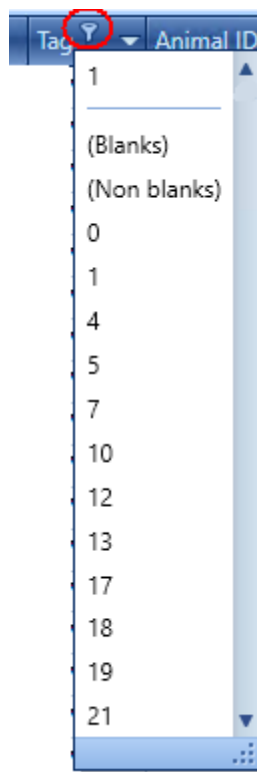
1. Place the box carrying all the AfiTags in close proximity to the reader (no more than 20 meters away). Ensure all tags are in a vertical position.
2. Keep the tags in this position for 40 minutes.
3. Verify that the tags have been identified by the reader as follows:
 - a. Open **AfiControl**.
 - b. Open the **Reports** tab.
 - c. Under **System Reports**, open the **Tags** option, and then double-click **Tags Activity**.



- d. Hover on the **Tag** column header, and then click the filter  when it appears.



- e. On the displayed drop-down list, only tags that have transmitted will be displayed. Here you can easily count all the tags that transmitted.



- f. If needed, you may **Refresh** the report or change the time/date frame using the relevant Start Time/End Time fields and the Refresh button

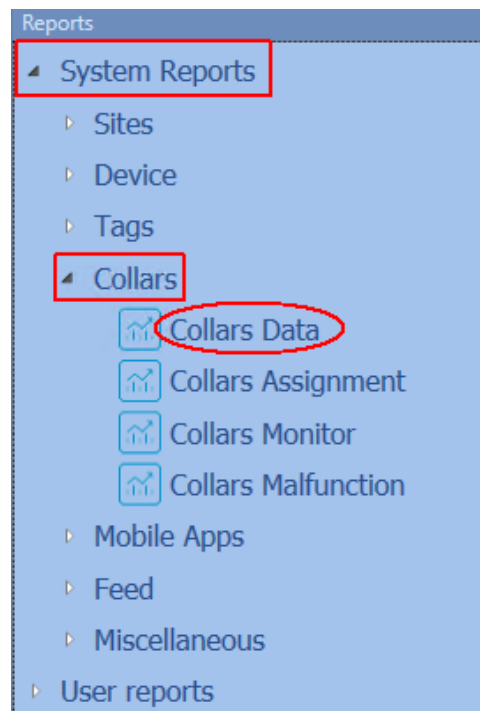



4. If a tag has not been identified after 40 minutes, leave the tag near the reader for one more hour; then re-check the **Tags Activity** report. If the AfiTag still does not appear in the report, it may be faulty.

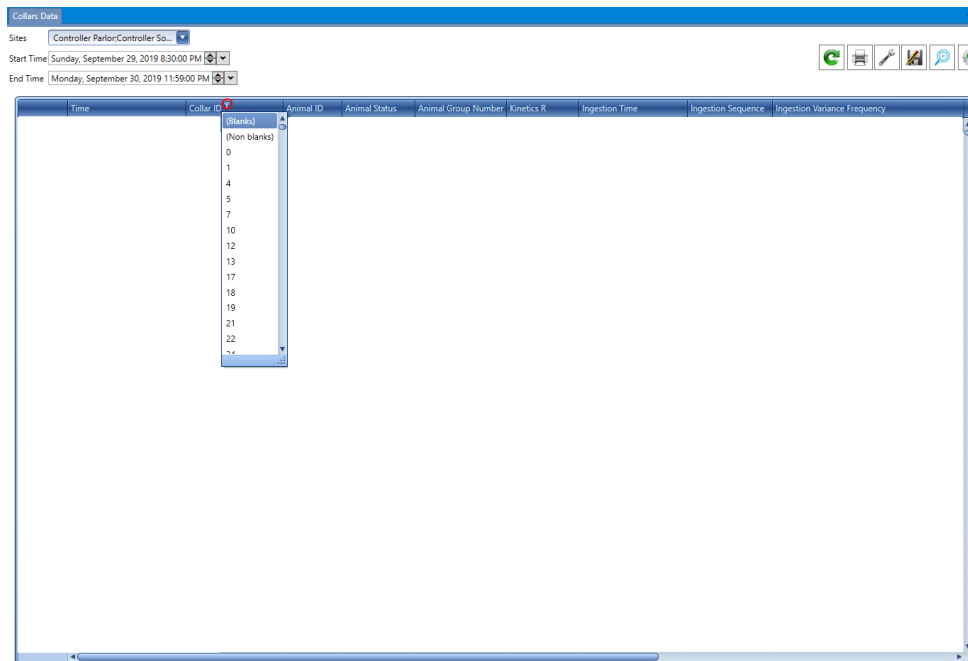
6.1.2 Activating and Validating AfiCollar Transmission

To activate and validate the AfiCollar transmission:

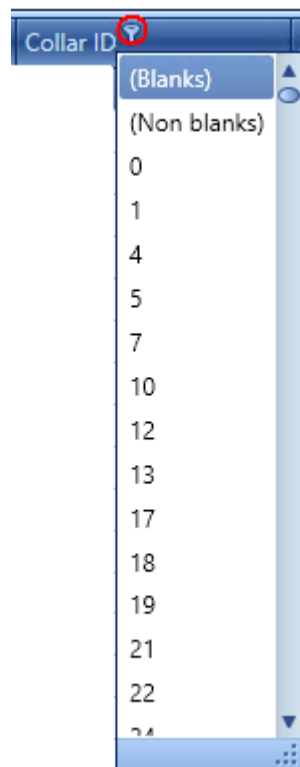
1. Place the box carrying all the AfiCollars in close proximity to the reader (no more than 20 meters away). Ensure all tags are in a vertical position.
2. Keep the tags in this position for 40 minutes.
3. Verify that the tags have been identified by the reader as follows:
 - a. Open **AfiControl**.
 - b. Open the **Reports** tab.
- c. Under **System Reports**, open the **Collars** option, and then double-click **Collars Data**.



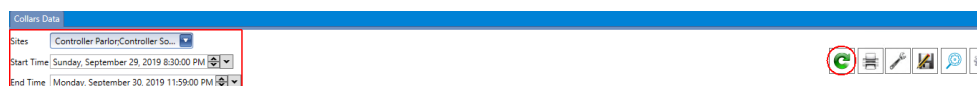
- d. Hover on the **Collar ID** column header, and then double-click the filter  when it appears.



- e. On the displayed drop-down list, only tags that have transmitted will be displayed. Here you can easily count all the tags that transmitted.



- f. If needed, you may **Refresh** the report or change the time/date frame using the relevant Start Time/End Time fields and the Refresh button



4. If a tag has not been identified after 40 minutes, leave the tag near the reader for one more hour; then re-check the **Collars Data** report. If the AfiCollar still does not appear in the report, it may be faulty.

6.2 Perimeter Coverage Validation

Once the tags are activated, it is important to validate their coverage.

- For AfiTags, see 6.2.1.
- For AfiCollar, see 6.2.2.

6.2.1 Perimeter Coverage Validation for AfiTags

1. Place four AfiTags in four corners of the area the Reader needs to cover.
NOTE: The AfiTags MUST be in standing position and at a height of not more than 30CM above the ground!
2. Verify that the AfiTags have been identified by the reader, see 6.1.1.
3. Follow this process twice, to ensure the reader reads every AfiTag at least two times (two transmissions).

6.2.2 Perimeter Coverage Validation for AfiCollars

1. Place four AfiCollars in four corners of the area the Reader needs to cover.
NOTE: The AfiCollars MUST be in standing position and at a height of 1.5 meters above the ground!
2. Verify that the AfiCollars have been identified by the reader, see 6.1.2.
3. Follow this process twice, to ensure the reader reads every AfiCollar at least two times (two transmissions).

6.3 Attach Tags

It is important to correctly attach the tags to the cows.

- For AfiTags, see 6.3.1.
- For AfiCollar, see 6.3.2.

6.3.1 Attach AfiTags to the Cows

AfiTags need to be assembled as part of the attachment process.

To attach the AfiTag around a cow's leg:

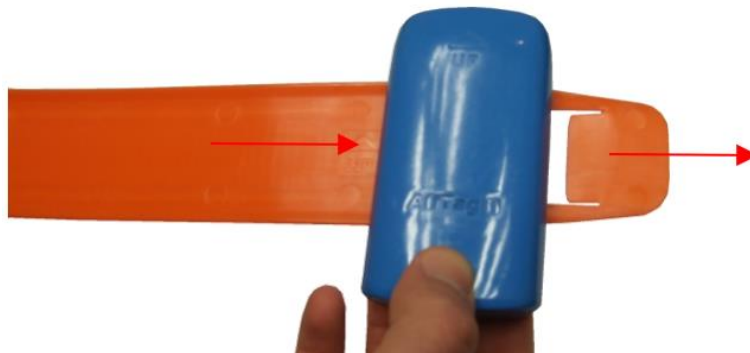
1. Identify the AfiTag elements, as shown below:



2. Connect the strap to the tag as follows:
 - a. Ensure the **tag** and the **strap** are facing the right way, with the arrows pointing upwards.



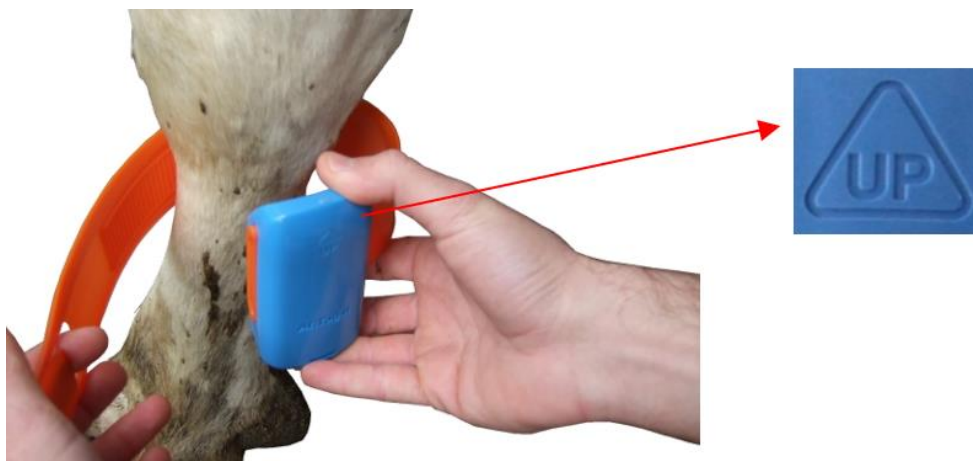
- b. Insert the narrow side of the strap through the back of the tag's socket.



- c. Pull the strap to the right, all through in the tag's socket.

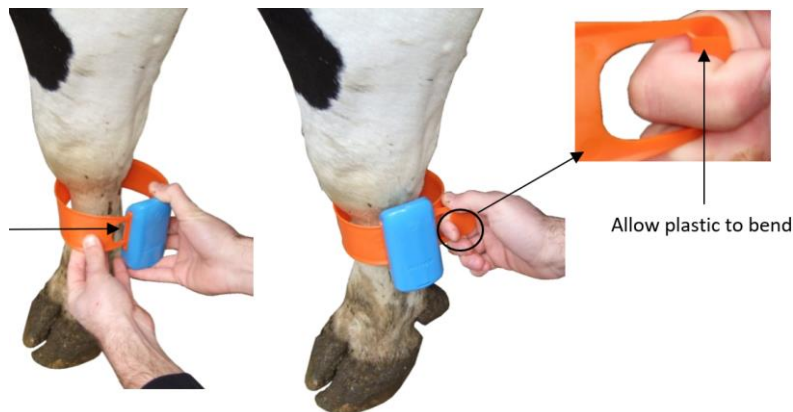


3. Prepare all tags for attachment as described in steps 1, 2.
4. Attach the tag to the cow's leg:
- a. Position the arrow of the tag upwards and wrap the strap around the cow's leg above the hoof, about 20cm/8inch above ground level.



- b. Insert the narrow end of the strap through the tag's socket. Pull the strap using a finger in the strap opening, allowing the plastic to bend under your finger to prevent injury.

Note: Do not tighten the tag around the cow's leg!



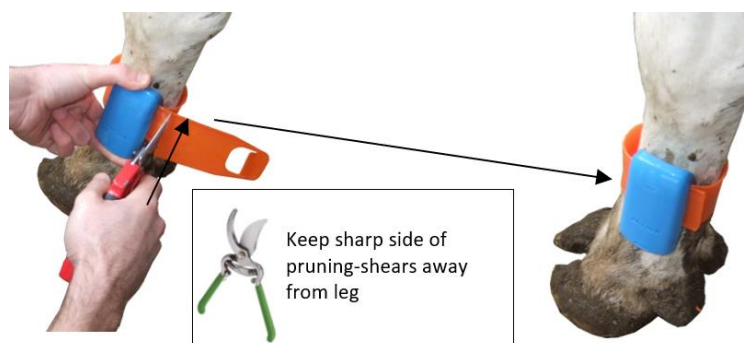
- c. Ensure the tag is not too tight: Insert the smooth side of the spacer between the strap and the cow's leg, and then pull and tighten the strap.



Caution

The AfiTag II attached to a cow should be loose enough to rotate freely around the cows' leg, to avoid injuries or leg disease. This is especially important with heifers, where the legs are still growing.

- d. Remove the spacer from the strap.
5. Using pruning-shears, cut off the excess length of strap as close as possible to the tag.



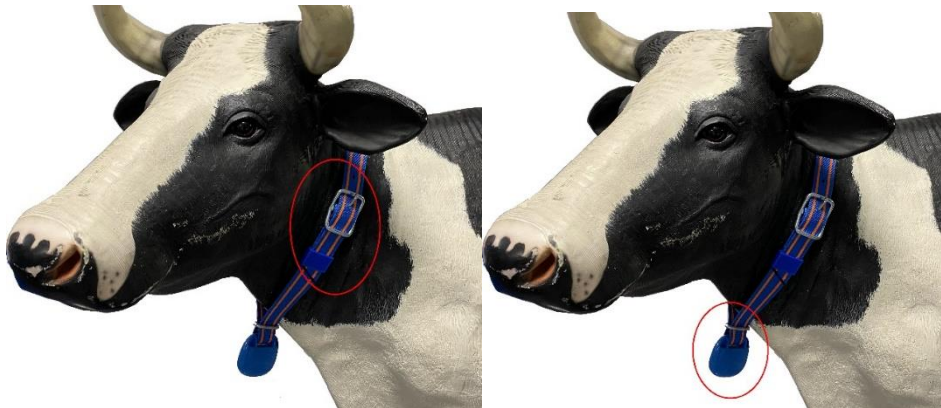
6. Keep a record of each cow with its corresponding AfiTag II number.
7. When entering a new cow into AfiAct II software, enter its corresponding AfiTag II number, see Appendix E.

6.3.2 Attach AfiCollars to the Cows

AfiCollars are delivered to you already assembled.

To attach the AfiCollar around a cow's neck:

1. Secure the cow to a stable structure (pole, yoke, chute, holding structure). Make sure the cow's neck is held without needless slack.
2. Encircle the cow's neck with the AfiCollar and insert the end of the collar through the buckle.
3. Find the best fit and close the buckle. Make sure the weight is centered below the cow's neck.



4. Position the tag (as per the image below): Ensure the tag is located in the middle to upper area on the animal's neck. This is the ideal position for the sensor to communicate with the antenna.



Note: The tag can be placed on either the right or left side of the cow's neck. The side selected depends on the location of the antenna in the milking parlor.

It is mandatory to attach the tag on the same side for each animal in the herd.

5. Ensure the collar fits correctly (neither too tight, nor too loose):
 - a. Lift the collar above the cow's neck.
 - b. Make sure you can insert two fingers between the collar and the cow.
6. Insert the remaining length of collar into the belt keeper.
7. When entering a new cow into AfiAct II software, enter its corresponding AfiCollar number, see Appendix E.

6.4 Replace and Re-Use Tags

AfiTag II and AfiCollars can be transferred from one cow to another, for example, on the following occasions:

- Removing from culled cows.
- Removing from cows that are dry until the time of their calving.
- Removing from a heifer that is ready for calving.

6.4.1 Remove AfiTag II from the Cow

Note: As the legs of a heifer grow, the straps can become too tight. In this case, it is highly recommended to remove the tag from a heifer before calving (if heifer heat detection is used). When the heifer starts its first lactation, the tag can be reattached with new straps.

To remove or re-attach a tag:

1. Use pruning-shears and carefully cut the strap of the attached tag. Ensure the pruning-shears are entered from the lower side of the leg facing upwards, with the sharp side away from the cow's leg.



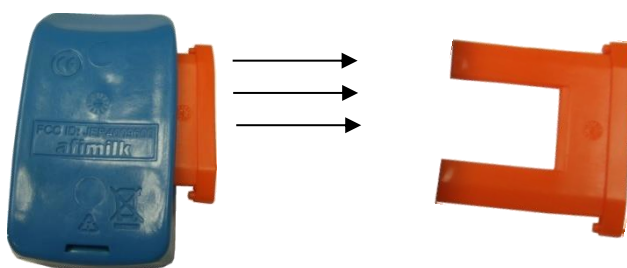
2. Hold the tag removed from the cow's leg and remove the remaining strap edges as demonstrated below:
 - a. Pull the long edge of the strap firmly until it is fully removed.



- b. Use pruning-shears to cut-off the visible edge of the remaining strap, as close as possible to the tag, so that the hole in the strap is cut. This ensures easy removal of the excess strap.



- c. Pull the strap out of the tag.



3. Your tag is now clear for re-use or storage.

Make sure to record each cow with its corresponding AfiTag number. When a tag is removed – inform the system of the removed/replaced tag and the reason (e.g. culling), see Appendix E.



Note

When removing a tag from a cow's leg, cut off the strap. Do not re-use straps.

6.5 Store Tags

6.5.1 Storage Location

Tags must be stored in a dry, protected area. Storage should be at least 1 meter (3 feet) away from any radiating devices such as main power cables, PC screens, electric crowd gates, and other high-power devices.



Caution

Radiating devices may create an electromagnetic field that energizes the tags, shortening their life expectancy.

Following all storage and maintenance recommendations will ensure smooth operation, save battery life, and maximize the tags' longevity.

6.5.2 Storage Position

AfiCollars and AfiTags only transmit when held in a vertical position. Therefore, place them horizontally when transporting or storing them.

**Active mode -
transmits data**



**Sleep mode -
no transmissions**



AfiCollar Active/Sleep modes



AfiTag Active/Sleep modes



Note

Tags are encased in sealed plastic containers. A tag can be washed under running water (warm or cold) before storage or before attaching to cows. Do Not Soak Tags: Soaking tags in water for hours may reduce their life expectancy.

7 Fault Identification and Troubleshooting

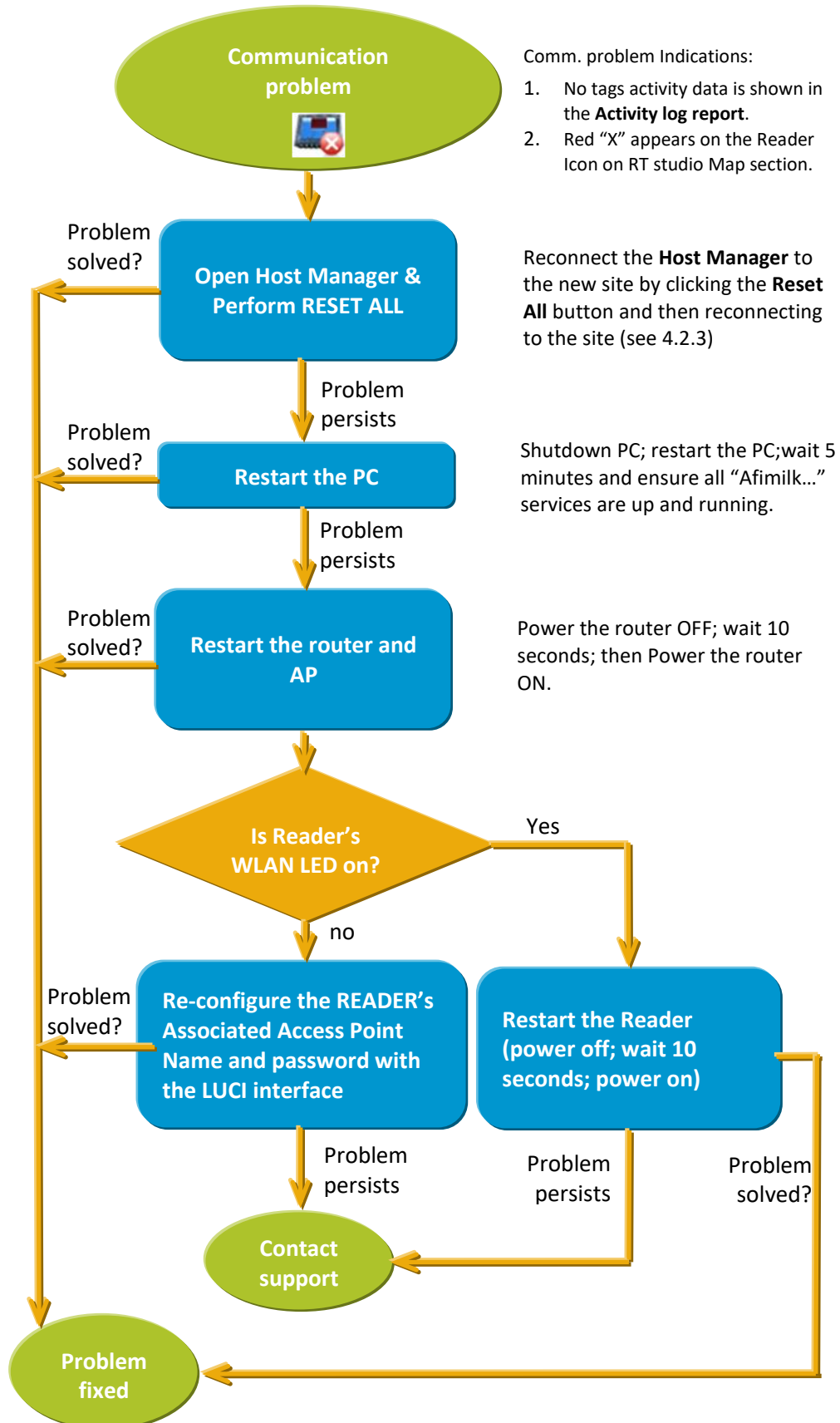
The following sections detail the most common faults, their most probable cause, and the suggested solution.

Described cases:

- Reader \leftrightarrow PC / Network communication fault, see 7.1
- Tag problems, see 7.2
- Reader \leftrightarrow Tag communication fault, see 7.3
- Reader's Luci access problem, see 7.4
- Back-to-back connection, see 7.5
- Region transmission setup, see 7.6
- AfiFarm Installation problems, see 7.7

7.1 Reader Connection to AfiControl or Network Fault

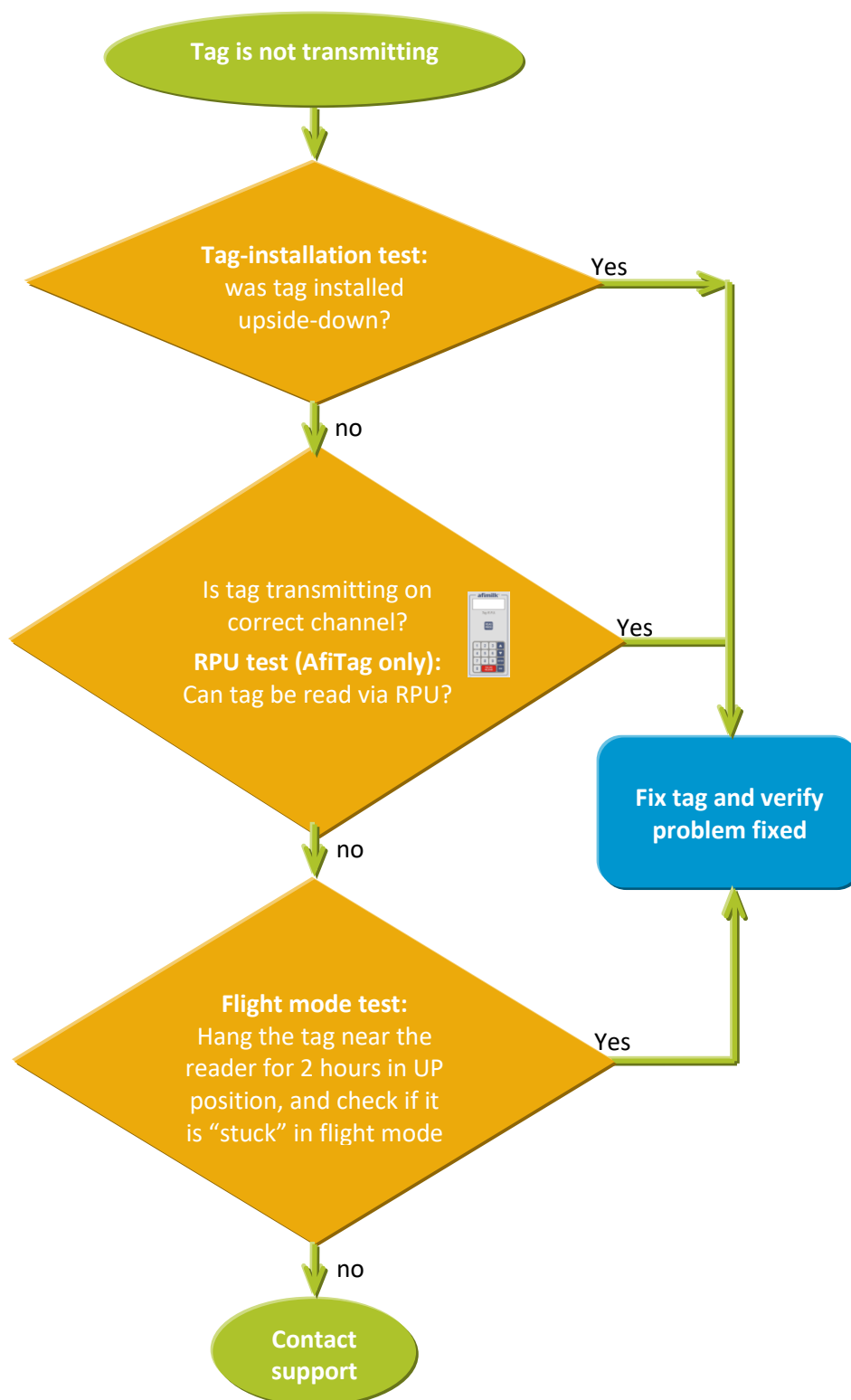
This section presents a flowchart detailing the suggested steps for solving faults related to the Reader communication with AfiControl OR with the network.



7.2 Tag Problems

Description: Tag is not transmitting

Suggested solution: refer to the flow in the following diagram



7.3 Reader and Tag Communication Faults

The following table details the most common faults related to the Reader communication with the tags.

Table 7-1. Reader to Tag Connection Problems

Description & Indication	Suggested Solution
<p>Description: The Reader is not receiving any tag messages</p> <p>Indication: The Reader's Status LED is blinking, PC Comm LED is ON, but no new messages appear in AfiControl ActivityLogReport.</p>	<p>Suggested solution:</p> <p>Verify that the tags and the reader are using the same channel. Tag channel can be verified using opcode 65468 in the RPU, see Appendix B; To verify the Reader's channel see section 4.2.3</p> <p>The tags might be in channel detection mode. This might take up to 1.5 hours. Make sure the tags are in the coverage region of the Reader.</p>

7.4 Reader's Luci Cannot be Accessed

Description:

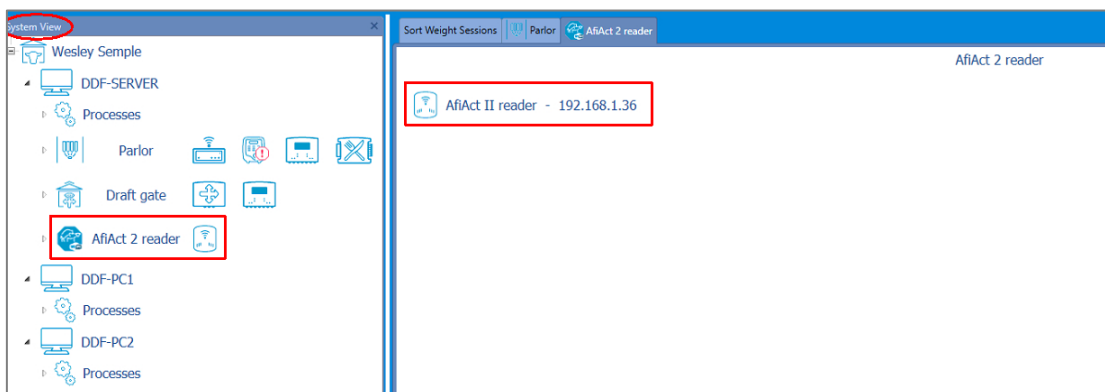
You cannot login to the Reader Management (Luci) GUI.

Most probable cause:

Wrong Reader IP address is used

Suggested solution:

1. Open AfiControl → Click on the **System View** tab → Click on the AfiAct site to confirm the current registered IP ADDRESS of the Reader.



2. Re-connect to the Reader again using this IP ADDRESS.

7.5 Back-to-Back Connection

Back-To-Back connection procedure allows the user to directly connect a laptop to the Reader using a network cable, and login to the "LuCI" management console for Wi-Fi network management.

This method allows communicating with the Reader in the field, when the Reader is not connected to the wireless network for some reason. It is a tool for solving field connection/general problems in the Reader (e.g. for switching the connection from one AP to the other), without taking the Reader into the office to connect it with a cable to the main computer.

The process is simple, and requires only that the user set the Reader's host static IP in the laptop NIC; then user may access the Luci interface.

Method:

Connect the Reader directly to your laptop:

1. Open the Reader box and connect a network cable to the NIC.
2. Connect the other side of the network cable to the laptop Ethernet port.
3. In the laptop, set the connected NIC to use static IP 172.20.1.10 and subnet mask 255.255.0.0. This procedure varies according to the laptop's Operating System. For example, instructions for the Windows 7 operating system are provided in Appendix A
4. By default the reader's network card has the initial IP address of 172.20.1.1 and subnet mask 255.255.0.0 and you can now communicate with it through this address.
5. After laptop's NIC is set to use static IP, then follow instructions on section 4.4 (you may now communicate with the Reader via the laptop, via the Luci interface. It is now possible to have access to the available wireless networks, and obtain connection).

7.6 Region Transmission Setup

Description:

Region transmission setup is wrong.

Suggested solution:

Set the Reader transmission area and channel via AfiControl, see section 4.2.3. For tag region verification refer to Appendix B.

7.7 AfiFarm Installation Problems

Description:

A problem occurs during the AfiAct software installation.

Most probable cause:

The system pre-requisites were not fully performed.

Suggested solution:

Review the system installation pre-requisites, see 2.3.

Appendix A : Set Laptop's Static IP

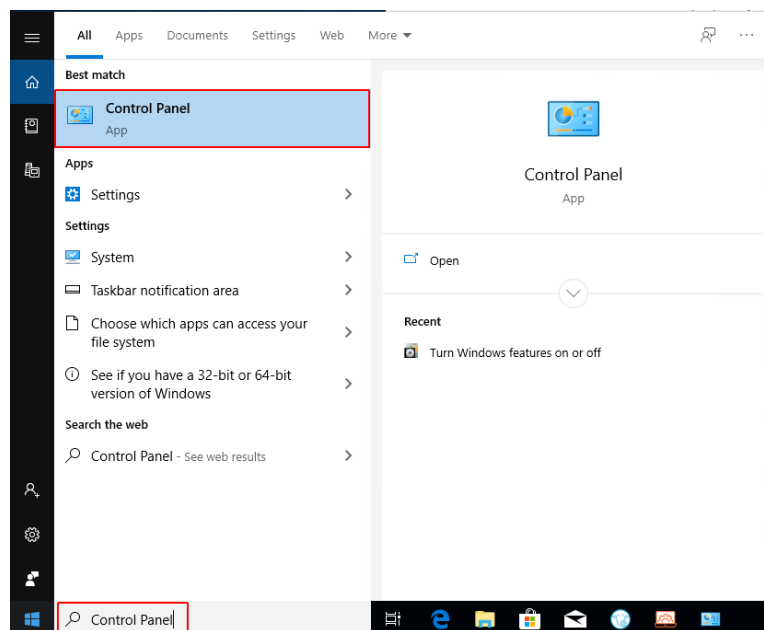
This appendix provides instructions for setting the laptop at static IP 172.20.1.10 and subnet mask 255.255.0.0, in a Windows 7 Operating System.

This procedure varies according to the Operating System being used.

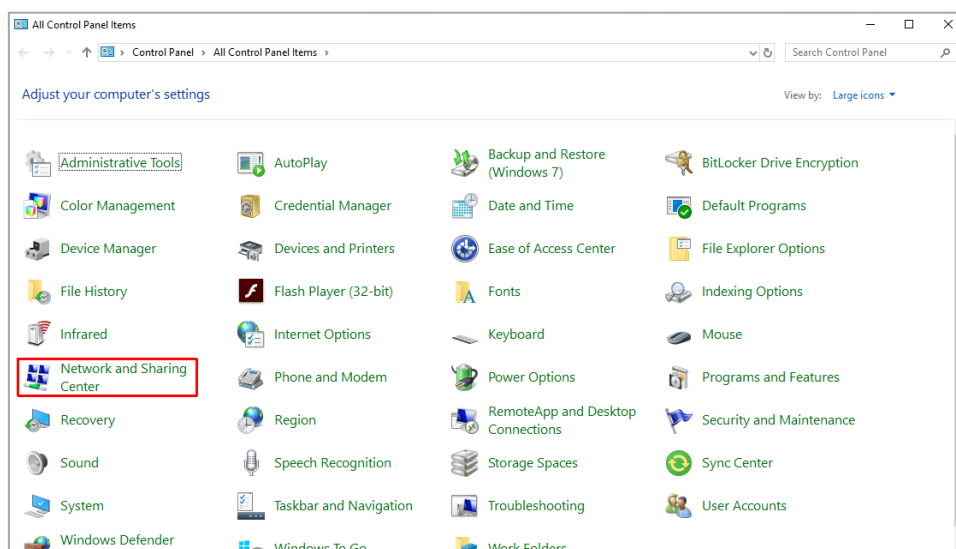
Check & Record PC Addresses

To check and record the PC addresses

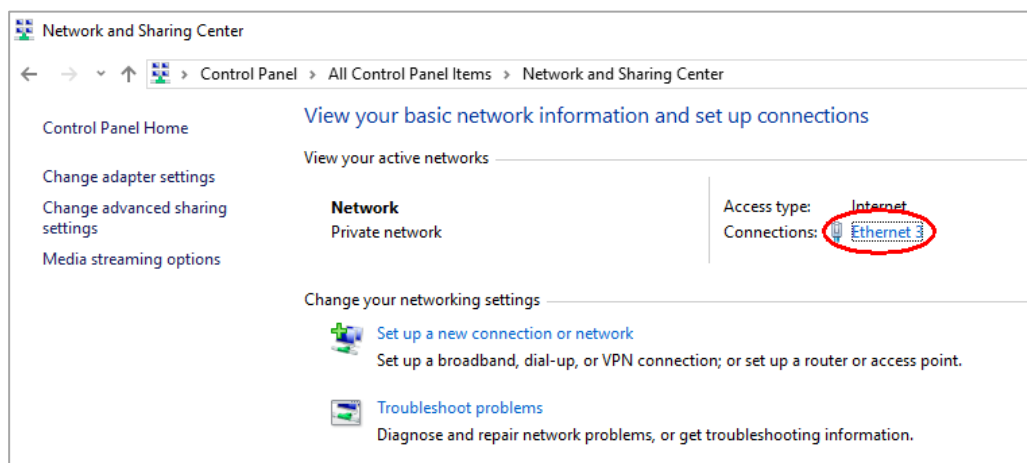
1. Open the Control Panel: In the Taskbar, in the search box, type **Control Panel**, and then select the **Control Panel** option displayed in the results.



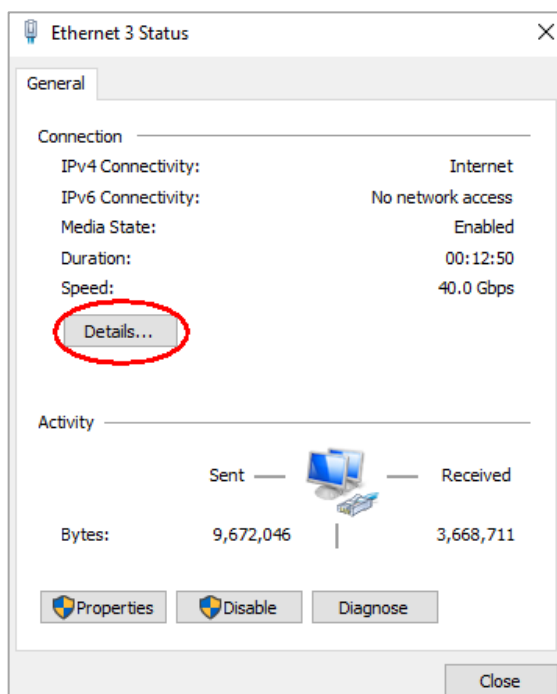
2. Select **Network and Sharing Center**.



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

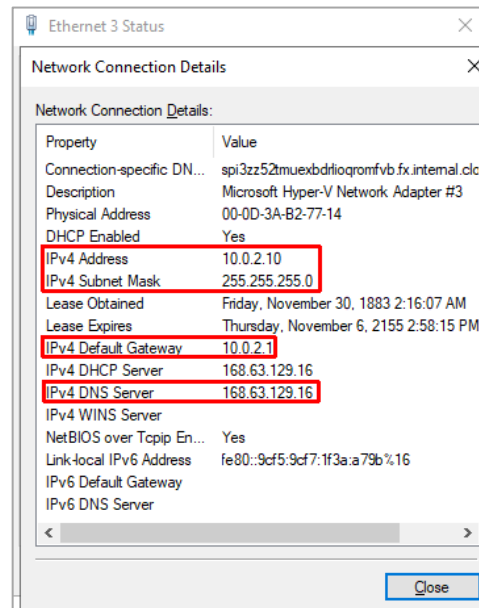


4. Click **Details**.



(Addresses in the screenshot are for illustration purposes only)

5. Record the following NIC values (marked in red in the figure below):
 - IPv4 Address
 - IPv4 Subnet Mask
 - IPv4 Default Gateway
 - IPv4 DNS Servers (record the first address)
6. Click **Close** or **OK** to close all windows.

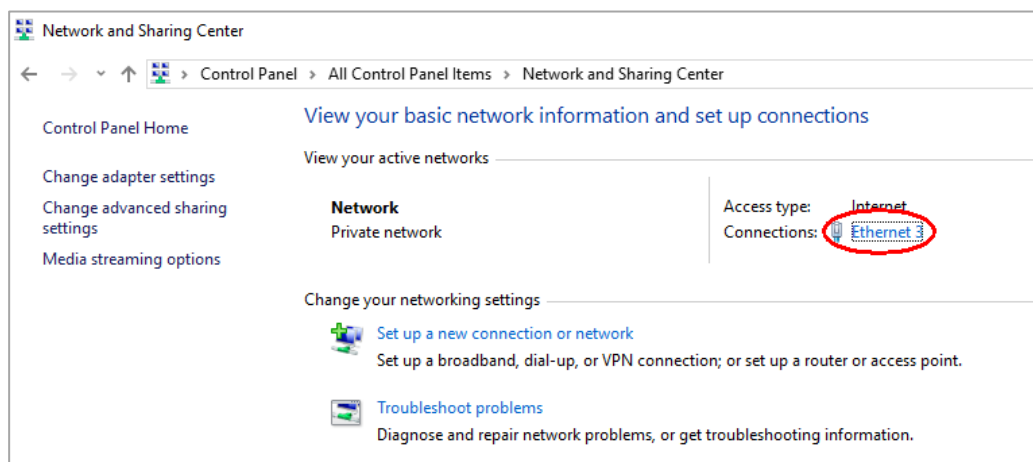


Assign NIC with Temporary IP & Subnet Addresses

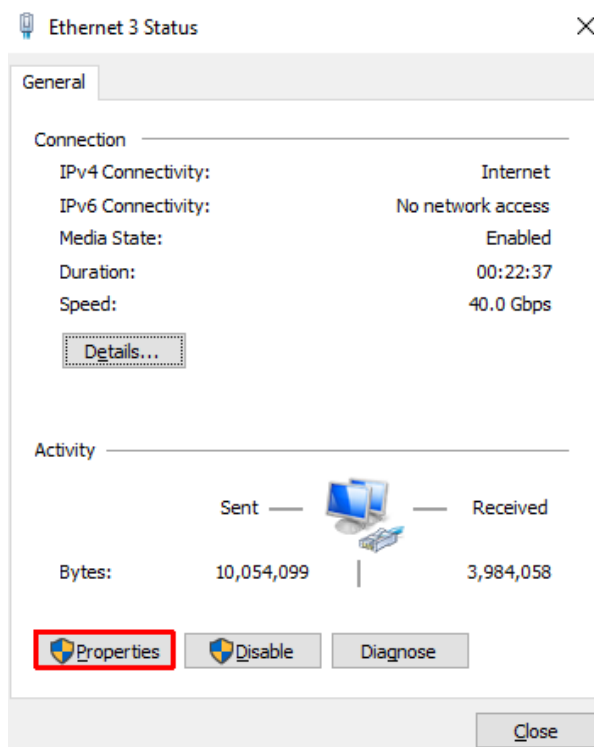
To assign NIC with a temporary IP & Subnet address

1. Open the Control Panel: In the Taskbar, in the search box, type **Control Panel**, and then select the **Control Panel** option displayed in the results.
2. Select **Network and Sharing Center**.

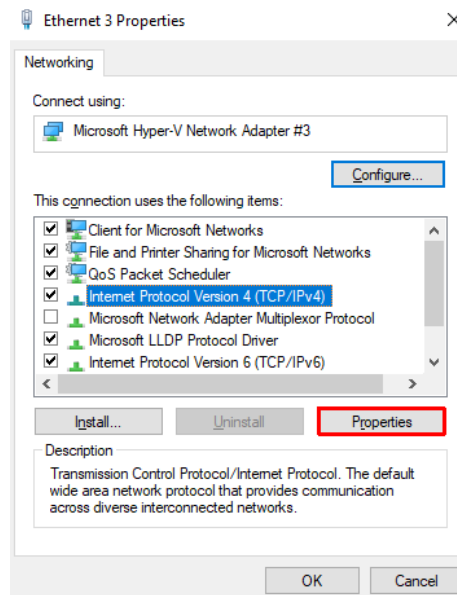
3. In the **Network and Sharing Center** dialog box, click Connections link.



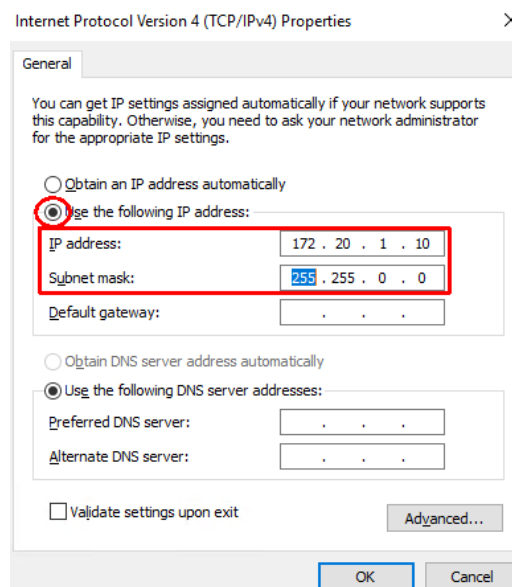
4. Click **Properties**.



5. Select Internet Protocol Version 4, and then click **Properties** to open the **Internet Protocol Version 4 (TCP/IPv4) Properties** window.



6. In the **IP Address** box, select **Use the following IP address**, and then set the following:
 - a. In **IP address** - 172.20.1.10.
 - b. **Subnet mask** – 255.255.0.0



7. Click **OK**.

The Reader's static host IP address is assigned to the PC NIC IP address.



Note

At the end of the laptop back-to-back usage, remember to restore the laptop original IP address, as recorded in the first phase.

Appendix B : RPU Tool for Tag Management

AfiTags contain a unique tag ID number, and record animal data, such as the number of steps taken, the number of times (and duration) the animal lay down, etc.

The Tag RPU device allows managing, reading, and programming AfiTags. This includes changing the tag IDs, changing the frequency used, etc. AfiTags can be read while still attached to an animal or while it is on a worktable. The RPU uses SR Operating Codes (opcodes) for programming tags. For the opcodes to take effect – the AfiTags must first be set to programming mode (using code 65535).

This appendix provides guidelines for using the RPU tool while installing the AfiAct II system, for reading and programming AfiTags.

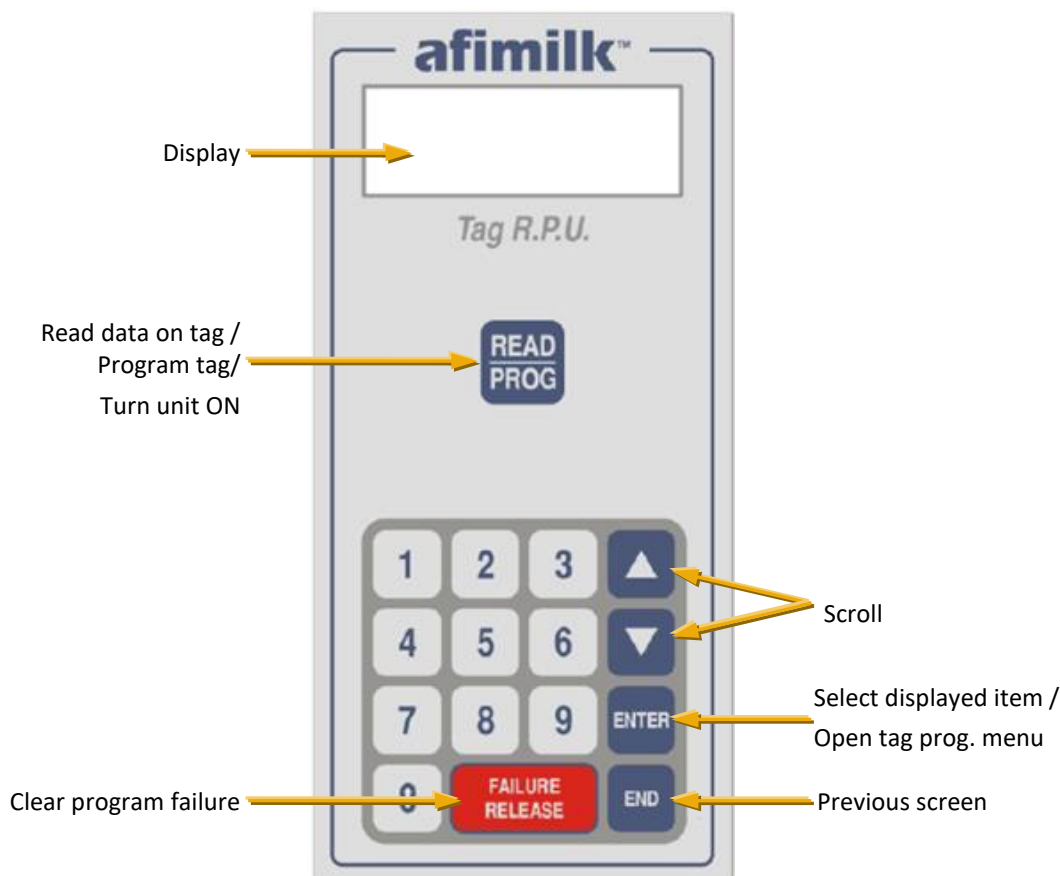


Note

The RPU only supports AfiTag. It does not support AfiCollar.

RPU Controls

The following figure details the RPU tool controls



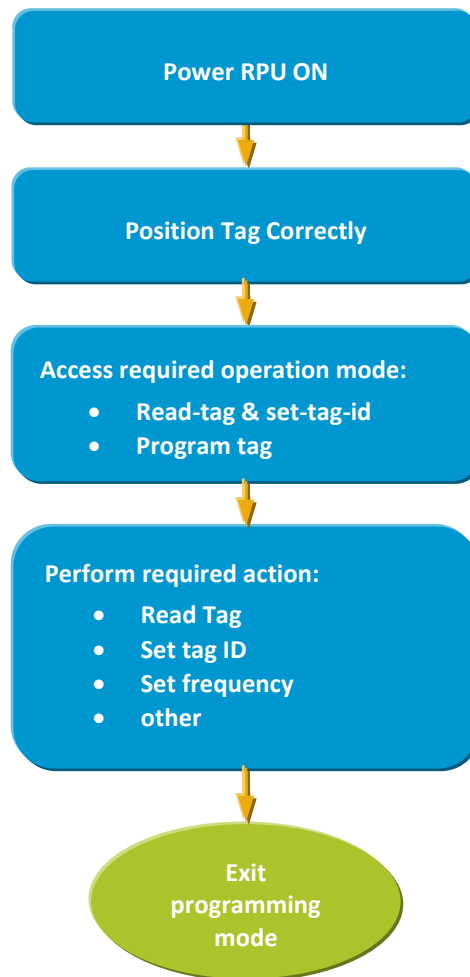


Note


The RPU uses a 9 V battery.

RPU Usage

The RPU has two *modes of operation*: **Read mode** and **Program mode**. Using the RPU involves the following steps (detailed in this appendix)



Step 1: Activate the RPU on a Tag

1. Power the RPU ON: Press . The display briefly shows the RPU version.
2. Position the tag within 1–5 centimeters of the RPU.



Note

If the RPU does not program a tag, position it closer to the tag (the reading/programming antenna is located in the head of the RPU).

3. If the tag is identified, the display shows a set of messages with the tag data:

- Tag Type
- ID: Tag ID
- S: Number of steps taken
- NL: Number of times animal lay down
- TL: Total minutes animal spent lying down
- ST: Standing Time – total minutes animal spent standing/walking

RPU Display -
Example Messages:

Tag ID

TypeTag: Lying
ID: 00053 S: 65520

TagType is
Pedometer Plus

Num of steps

NL: 005 TL: 0315
ID: 00053 S: 65520

If there is no tag in range, the following message appears:

<Enter> to Menu
Sorry, No Answer



Note

To clear the message and return to the Main screen press

END

4. Find the required menu: From the Main screen, use the arrows   to scroll

between available menus, until the **Set Tag ID** menu appears.

TAG PROG MENU
Set Tag Id

5. Press 

Step 2: Proceed with the steps relevant to the required operation:**➤ To change Tag ID**

- a. Type-in the required unique ID, then press



Set Id: [00076]
Wait for program

Note: you may also change IDs in a serial batch mode, see PRU UM for details.

➤ To change tag frequency

- Enter programming mode: set ID to 65535
- Enter frequency change mode: set ID to 65381
- Enter the required frequency in tenth of MHz (915.5 = ID 09155) as the ID and program the tag with it

➤ To validate tag data (specifically: Frequency is accepted)

- Enter programming mode: set ID to 65535
- Set ID 65468
- Read once; RPU will display ID
- Read again; RPU will display frequency in tenth of MHz in "S" section.

➤ To update another parameter (other than tag-ID)

- a. Set the tag to programming mode using opcode 65535 and press



Note: The programming mode lasts up to 1 minute!

- b. Type-in the opcode for the required operation, according to the

table below and press



- c. Exit the programming mode by pressing

**➤ To exit programming mode**

- a. Press



Note

When the second row of the display shows Program Failure, press



The second row of the display now shows —Wait for Program, and you can continue programming.

Review available Opcodes

The following table provides the available opcodes for operating the RCU to program tags. For these opcodes – when entered while in programming mode (after 65535) – the RPU replies with **OK** and does not change the ID.



Note

The table is updated to the date this document is issued. For an updated list of opcodes, refer to the relevant opcodes manual.

Table 7-2.opcodes

Opcode	Description
65381	Configure frequency
65468	VALIDATE TAG DATA <u>On 1st read: ID is displayed</u> <u>On 2nd (next) read: the following info appears</u> <ul style="list-style-type: none"> • ID field = Time in seconds until Channel Detect, or if channel active - seconds until Channel Detect (between LR transmissions). • 'S' field = frequency in tenth mHz (e.g. 915.5 = 9155) • 'ST' field = LSByte = RadioReInitCounter, MSByte = NumOfRecoveryResets • 'NL' field = SUB_G_SPI_FailCounter
65512	Reset uC
65535	Enter 'Opcode programming mode'



Note

Only the 1st read after programming a new ID (or after reset) displays the version information as follow:

- 'ID' field + 'ST' combine the version number
- 'S' field holds the version CRC
- 'TL' field holds the current region where 0 = USA, 3 = Europe, 6 = Israel.

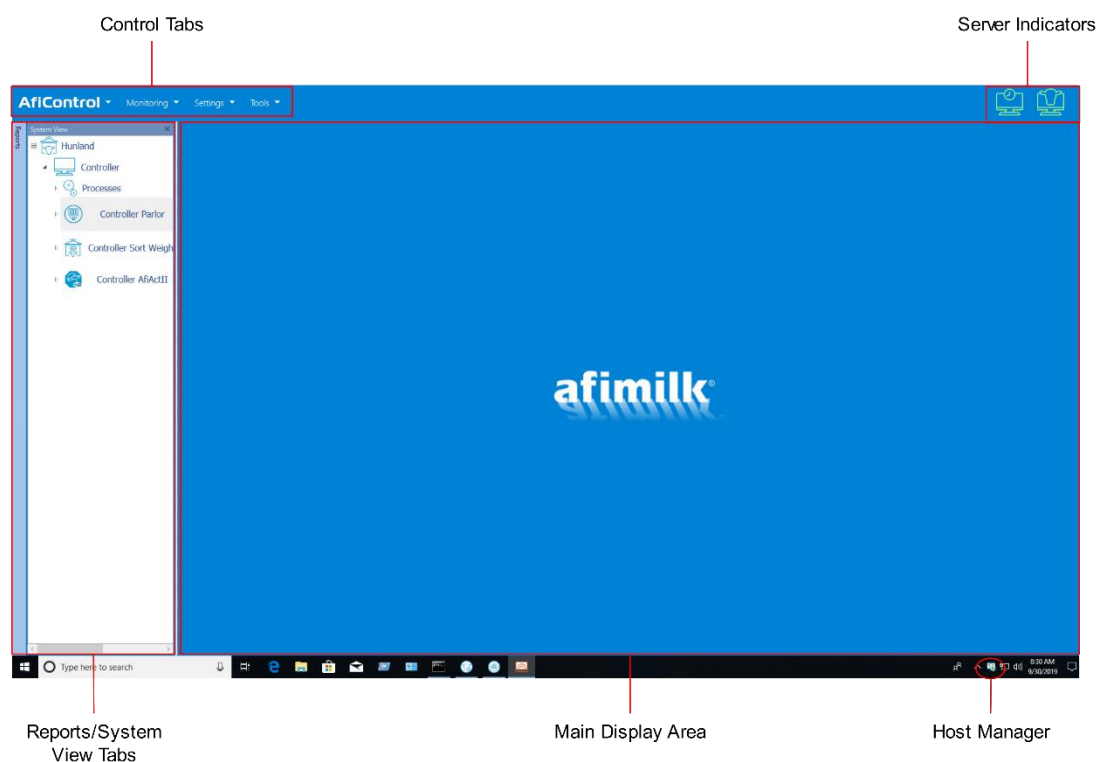
Appendix C : AfiControl Summary

This appendix provides an overview of AfiControl usage.

- Navigating AfiControl Screens
- How to use the reports
- How to define user reports
- How to check faulty tags

AfiControl Screens Navigation

AfiControl screens include the following areas and capabilities:

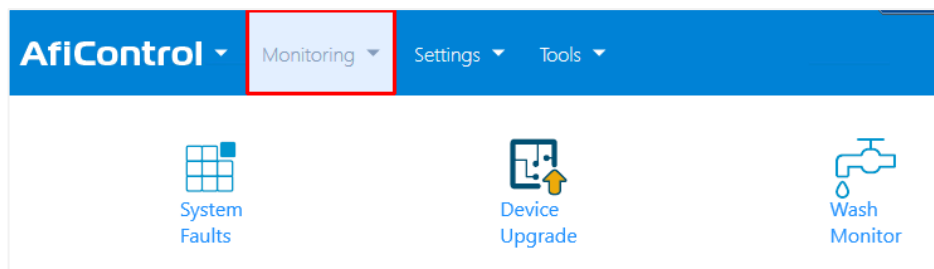


Control Tabs

AfiFarm reports management and view options are accessed via the following **Control Tabs**. Click on each option to open its corresponding menu.

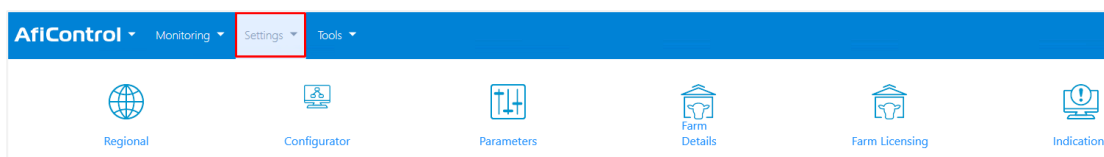


- **Monitoring** tab – for managing and monitoring the system faults, upgrades, network, stations, etc.



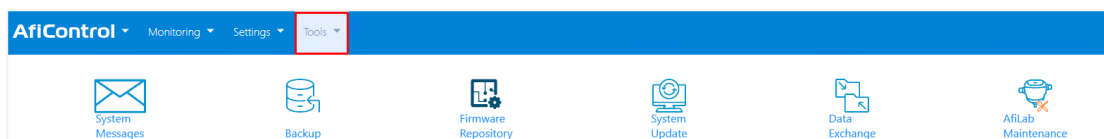
Option	Function
System Faults	Displays the current unresolved issues with the system.
Device Upgrade	Monitors device software upgrades.
Wash Monitor	Opens the Wash Monitor and Controller Parlor for monitoring wash cycles.

- **Settings** tab – for managing parameters, configurator settings and maintenance activities.



Option	Function
Regional	Sets general attributes for the system, based on regional/local parameters
Configurator	Configures farm controllers, stations, equipment, etc.
Parameters	Sets parameters per element.
Farm Details	Sets local farm details.
Farm Licensing	Displays various licensing subscriptions.
Indications	Displays notification settings.

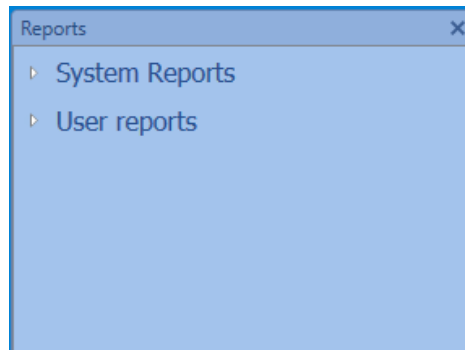
- **Tools** tab – management options, corresponding to the specific user permissions.



Option	Function
System Messages	Lists the messages sent from the system.
Backup	Sets manual/automatic backup for system data.
Firmware Repository	Lists available devices embedded in the software.
System Update	Displays current version and the option to update.
Data Exchange	Displays export/import options.
AfiLab Maintenance	Provides AfiLab calibration options.

Report/System View Tabs

- **Reports** tab – for accessing System and User reports (Tag activity log, device mapping, etc.) (for user reports – see Appendix C).











Tools sub-tab Bar – for selected reports

The tools additional tab appears when a specific report is opened. For user convenience, a quick access management toolbar appears also on the upper-right side of the display area, when opening a report. These options allow the user to directly access the setup and management options. When selecting any Reports sub-menu option, an additional Tools tab appears containing all available setup and management options.



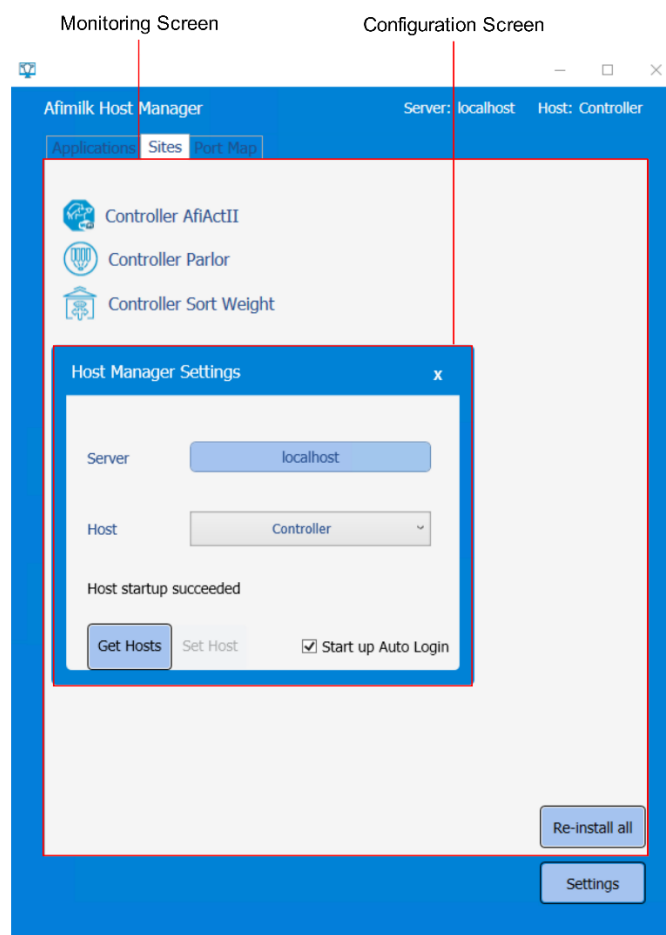
The icons and their functions are described in the following table.

Icon bar option	Name	Function
	Refresh	Refreshes data in current view.
	Print	Provides a print preview and prints the report.
	Customize	Performs advanced table layout customizations.
	Save Layout	Saves customized changes made to the window by user the user. Only displayed in User Reports.
	Save Changes	Saves layout changes for all users. Only displayed in User Reports.
	Save Layout	Saves customized changes made to the window by the user under a new name.
	Export Report	Exports the report to the selected location.
	Go Back	Returns the report to the default layout.

Main Display Area

The Main Display Area provides details according to the selected ribbon control tab option (i.e. Monitoring, Settings, and Tools), or according to the additional control tabs – System Faults / Reports. For example, when selecting **Reports**, the selected report is presented. The information is shown along with its relevant operation buttons and sub-options.

Host Manager



Option	Function
Monitoring Screen	Displays connections to applications,
Settings Screen	Displays the option for setting the Server, and selecting a Host (previously defined site type) for corresponding software deployment. Open the drop-down list to view the defined sites list.

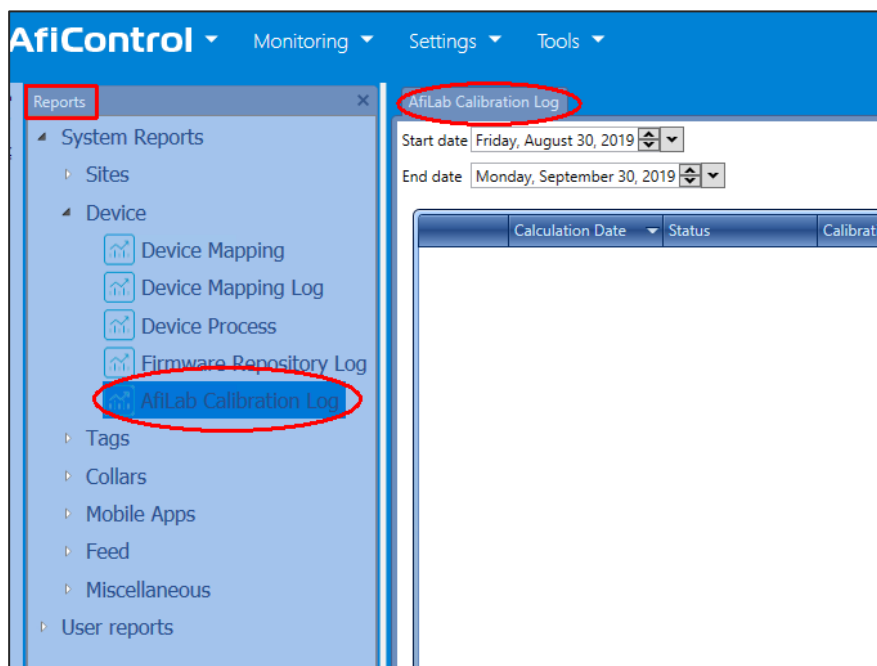
User Reports


The system allows defining and saving customized reports, where the fields are based on an existing report with specific actions performed on the original fields (e.g. filters; math operations; etc.). If such reports exist, the **User Reports** tab will appear, allowing the user to access them.

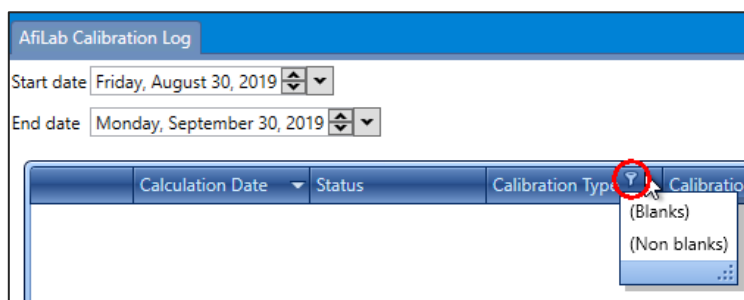
Generating User Reports

To generate a user report

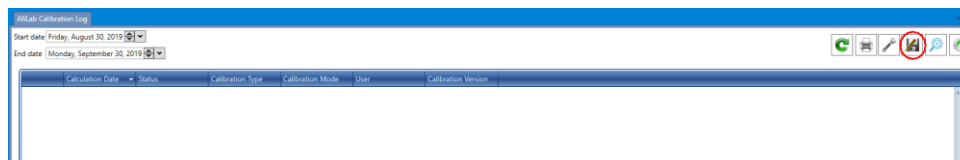
1. Select the desired report from the Reports tab (in the examples: **AfiLab Calibration Log** report)



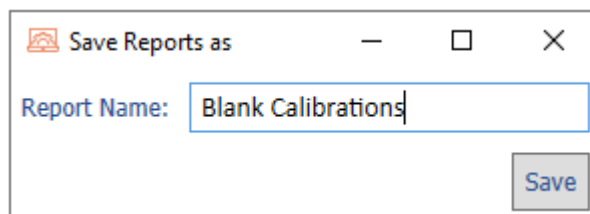
2. Perform your required field action.
e.g.: to select calibration-type that are blank:
 - a. Expand the Calibration-Type field attributes (by placing the cursor on the field header to reveal the key-sign , and then clicking on the key-sign to reveal the field-values)
 - b. Select **Blanks** from the roll-down menu options



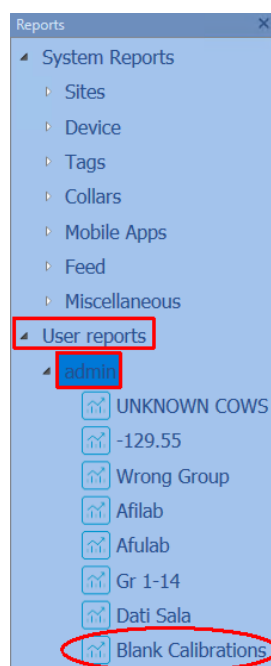
3. Click **Save** to save a new report layout.



4. In the **Report name** field, type a meaningful name, and then click **Save**.



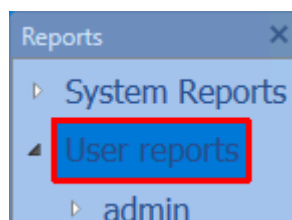
5. Your new report appears under the **User Reports**.



Accessing User Reports

To access user reports

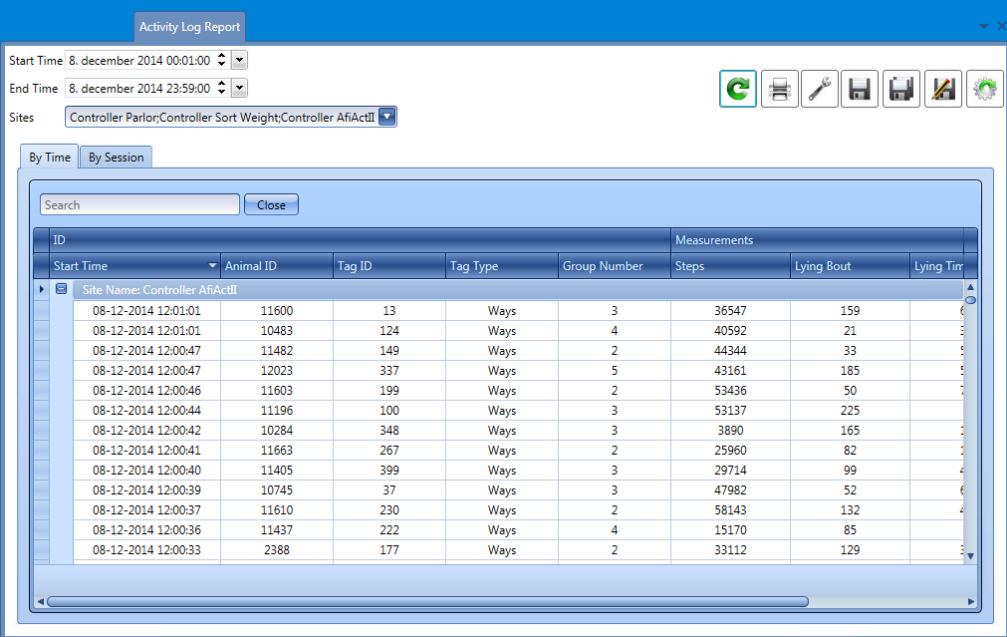
In the **Reports** tab, expand **User reports**, and then select your desired user-specific report.



Reports

The Reader provides various reports for managing and monitoring the system.

The following activity log report is shown as an example:



Activity Log Report

Start Time: 8. december 2014 00:01:00
End Time: 8. december 2014 23:59:00
Sites: Controller Parlor; Controller Sort Weight; Controller AfiActII

By Time | By Session

Search [] Close

ID	Start Time	Animal ID	Tag ID	Tag Type	Group Number	Measurements	Steps	Lying Bout	Lying Time
Site Name: Controller AfiActII									
	08-12-2014 12:01:01	11600	13	Ways	3	36547	159		
	08-12-2014 12:01:01	10483	124	Ways	4	40592	21		
	08-12-2014 12:00:47	11482	149	Ways	2	44344	33		
	08-12-2014 12:00:47	12023	337	Ways	5	43161	185		
	08-12-2014 12:00:46	11603	199	Ways	2	53436	50		
	08-12-2014 12:00:44	11196	100	Ways	3	53137	225		
	08-12-2014 12:00:42	10284	348	Ways	3	3890	165		
	08-12-2014 12:00:41	11663	267	Ways	2	25960	82		
	08-12-2014 12:00:40	11405	399	Ways	3	29714	99		
	08-12-2014 12:00:39	10745	37	Ways	3	47982	52		
	08-12-2014 12:00:37	11610	230	Ways	2	58143	132		
	08-12-2014 12:00:36	11437	222	Ways	4	15170	85		
	08-12-2014 12:00:33	2388	177	Ways	2	33112	129		

Appendix D : TieStall

For farm configurations where some or all of the animals are tied, the AfiAct II system requires special adjustments, to correctly detect animals that are in heat.

These TieStall specific adjustments are specified in this appendix:

- Setting system sessions
- Setting animals stall type

A 1 Determine TieStall Sessions

To adjust the system for TieStall configuration, the system **Logical Session definitions** must be pre-set by a local Afimilk authorized technician, to reflect the farm activities, as determined and coordinated with the farmer.

The following items provide guidelines for determining the farm's sessions via AfiControl. Fine tuning may be done after running the system for a test period.

To determine the sessions, refer to the following criteria and guidelines

1. To reflect the specific animals monitored (milking cows / heifers / both), check what **types of animals** will be carrying tags.
2. Check when **breeding** is done during the day.
3. **Session times** are set as in non-tied configurations, according to the tracked animal as follows:
 - For milking cows: the session times are set based on milking hours:
Check when milking starts, and when does milking end.
Start the session 1-1.5 hours before each milking time, and at least one hour after the preceding milking. If the gap time between milking is not long enough, configure the beginning time of the sessions to 1/2 an hour after the the preceding milking ended.
 - For heifers (not tied!): Configure one session of 24 hours.
Check the heifers' data after 3-4 days. If there is very high activity (seen as these are configured as not-tied animals!) during part of the day – configure two sessions: one for the high activity and one for lower activity. Configure the high activity session for 1.5 hours before the high activity occurs, and up to 1.5 hours after the high activity occurs.
4. The recommended number of sessions per day is 4 sessions of equal length (6 hours each);
5. The session intervals should be evenly distributed (i.e. for 2 sampling sessions - 12 hour-intervals; for three daily sessions - 8 hour-intervals between samples).
Note: the system ensures 24 hours coverage, but does not ensure that sessions are equally distributed.

A 2 Setting Heat Indicator Thresholds

The system detects animals in heat (and lists them) by identifying animals with heat indicator above the user-defined thresholds. The farmer may re-adjust the threshold parameters if the system detection rate sensitivity. See AfiAct II user manual for details.

A 3 Set Animals' Stall-Type (Tied/Free)

Animals that are tied must be marked in the AfiFarm software. Tied attribute may be assigned to specific animals, to a group of animals, or to the entire herd.

Setting an animal status (Tied/Free) is usually done when first configuring animals in the system, or when an animal's status has changed (e.g. a heifer calving for the first time). See AfiAct II user manual for details.

Appendix E : Enter Herd's Data

This Appendix describes guidelines for entering Herd's Data into AfiFarm

Animals to be tracked by the system must be entered into the AfiFarm application. The interface for entering the data depends on your specific configuration as follows:

- For standalone AfiAct II systems without any other Afimilk components (i.e. no AfiFarm application is used) – the data is entered via AfiAct II report interface.
- For a comprehensive Afimilk system (i.e. AfiFarm4 is installed) – the data is entered via the existing AfiFarm4 screens, and AfiAct II interface is only used for viewing reports.

To allow the system to perform an aggregated analysis that is based on activity and events, the following animal data is mandatory for using the AfiAct II system:

- **Tag Number** – Each AfiTag and AfiCollar has a unique number. This is engraved on the case and encoded to its internal NFC chip.
- **Cow Number** – The cow's unique ID is entered into the system manually.
- **Group Number**
- **Date of Birth**
- **Lactation Number**
- **Last calving date**
- **Last Heat/Breed date** (if the cow was in heat during the current lactation)
- Any other event that could be relevant
- **For TieStall configuration:** Tied/Free status of animal, see Appendix D

To enter the herd data via AfiAct II application, refer to AfiAct II user manual, see referred documents on page xi.

After entering the animal data, the following events must be entered regularly:

- Heat
- Bred
- PD+
- PD-
- Synch injection (drugs)
- Change group
- Hoof trimming
- Diseases (mastitis, lameness, other)

For details on entering events refer to AfiAct II user manual, see referred documents on page xi.