

Instruction Book

ALPRO ver 6.60/DeLaval

activitymeter system

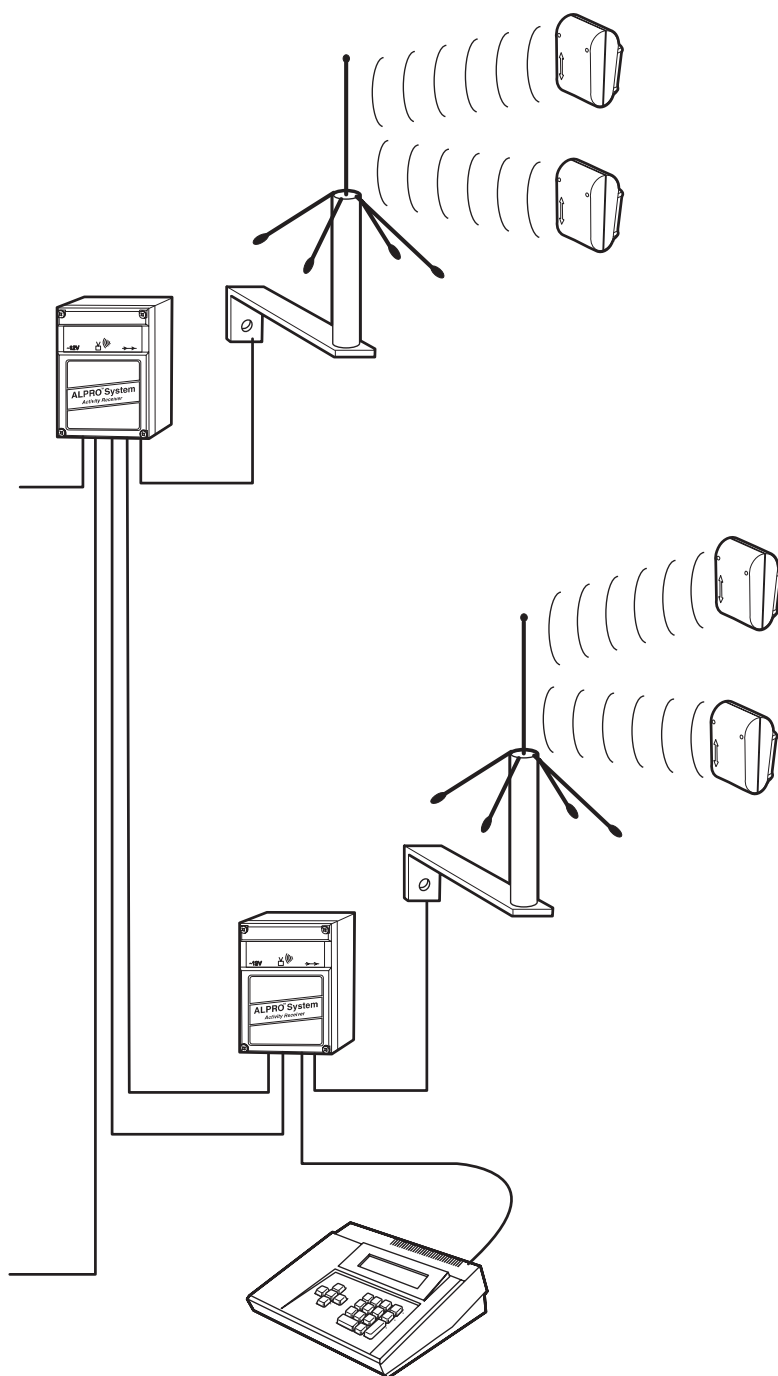




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ALPRO Activitymeter with RF interface

ALPRO Activitymeter with RF interface

EC Declaration of Conformity

Name of product: **ALPRO activity meter with RF interface**

Type: 90650080
90651080

Other identifying data:

The product complies with requirements of the following directives:
89 / 336 / EEC

Harmonized standards which have been used:
EN 50081-2
EN 50082-2

References:
SP Report No: 97F51867A (MA 9806-011)

Date: 1998-05-01

Signed:

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Position: General Manager
Business Unit: Milking Automation & Management

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P.O. Box 39
SE-147 21 Tumba
Sweden



ALPRO Activitymeter with RF interface



ALPRO ver 6.60/ Activity meter system

FCC and IC Compliance Statement

This device complies with Part 15 of the FCC Rules and RSS-210 of the IC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Information to user

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment 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.
-

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





ALPRO ver 6.60/ Activity meter system

General description

Introduction

The activity meter is a part of the ALPRO system. ALPRO is an integrated, computerized management system for feeding and milk yield recording, in a loose housing. Also breeding control is made easy as the system includes a cow calendar. The system is built up by modules and so are the Instruction books.

ALPRO ver 6.60:

Instruction books

General
Program description
Milking
Feeding
Tandem
Rotary
Midline
Calf feeder
Feed wagons
Identification
Sort system
In parlour feeding
Activity meter system

The first two books deal with information, that is common for the whole system. ALPRO/General contains the chapters: Safety precautions, General description, Start up and Routines.

ALPRO/Program description presents a program overview and describes all displays in the order of address numbers. The part 1:3 Breeding is of particular importance for the use of the Activity meter system, as it describes how to manage and update the Cow calendar and breeding states. A cow calendar in good order is of great importance, when it comes to supervising fertility.

The other books deal with information,



General description

specific for each particular module.

In this instruction book "Activity meter system", there will be references to the books "General" and "Program description".

ALPRO Windows is a PC program for ALPRO and its applications. Most functions are presented more clear at a PC monitor than in the processor display and it is also possible to build reports which considers several factors at a time. OBS Aktivitetsmätaren

High activity could be a heat indication among cows

Some cows are tranquil, some are lively. Each cow has her individual motion pattern and it does not differ much from day to day. In a loose housing barn the motion pattern includes walking to the milking parlour and to the feeding area as well as a lot of ruminating and resting.

However, during pre-heat and heat the patterns differ. Most cows becomes more restless and move around more than usual when they are close to heat and also when they are in heat. Some cows are very restless. They sometimes permit other cows to mount them or they mount other cows. Other cows are just a little more active than usual. The increased activity is often more apparent during night.

The activity meter is observant 24 hours a day. It helps you to detect cows in heat by the fact that cows are more active than usual during the pre-heat and heat period.

The activity list

The activity list presents all cows with increased activity. Many, but not all of them, will be close to heat. The others show high activity due to other reasons. Pregnant cows are often active and cows in heat might influence other cows to be more active. Different incidents in the barn might also affect some cows.

Increased activity is a good indicator of probable heat. But consider also the





General description

following questions:

- Is the cow pregnant?
- Are there other reasons for an increased activity?
- Is the time from the last observed heat right?
- Is the current milk yield lower just now?
- Is the feed consumption reduced?

If the answers indicate an approaching heat, it's time to take a look at the cow, to find out if she is in heat.

Checking the heat symptoms is still very important!

Preheat

Red and swollen vulva

Thin mucus, not clear

Mounts other cows but doesn't stand when other cows mount

Increasing activity

Heat

Red and swollen vulva

Thick mucus, clear

Stands when other cows mount

High active in the first part, then decreasing activity

Postheat

Swelling and redness of vulva decreases

Bleeding

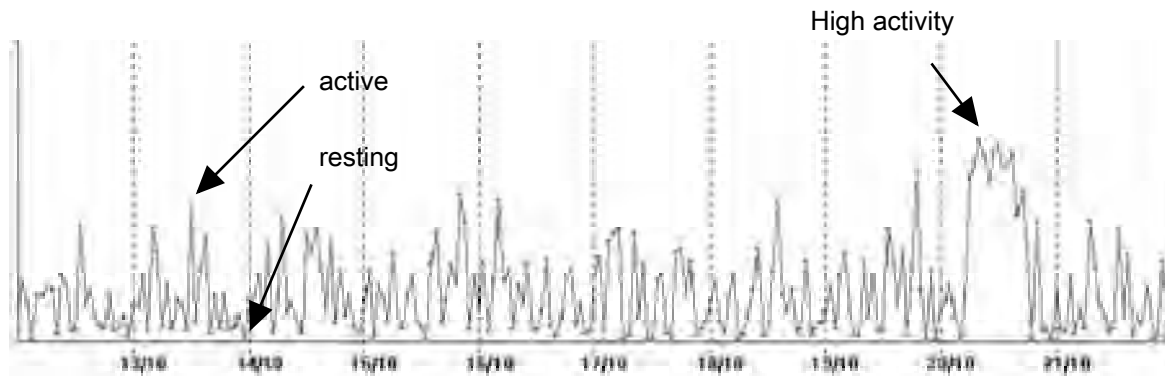
Does not stand when being mounted

Normal activity



The daily activity - and high activity

Number of movements

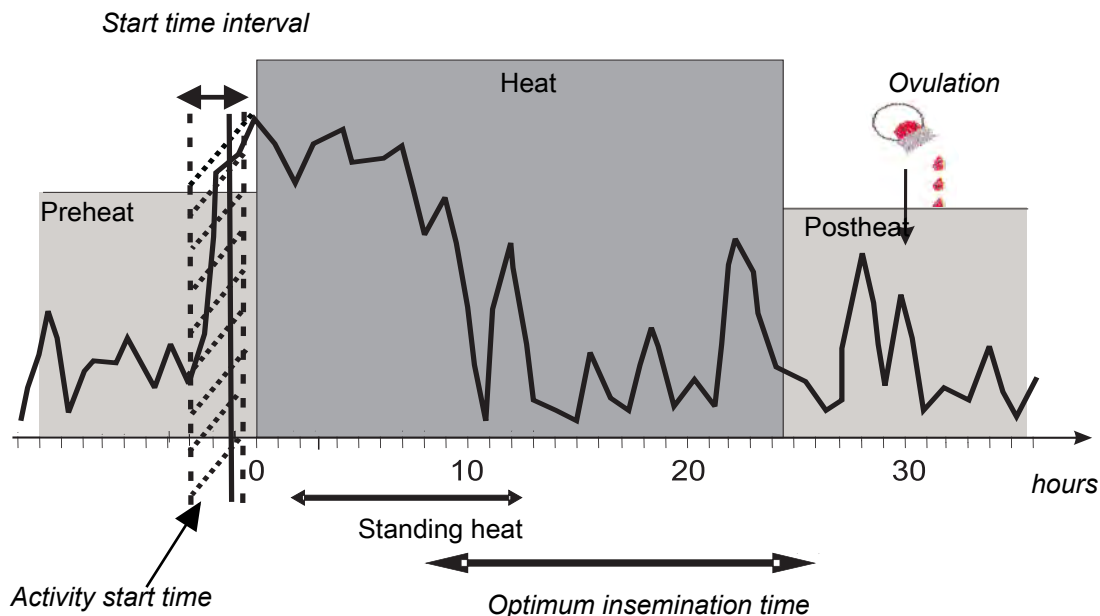


The picture shows a cow's daily activity for ten days. The cow alternates between activity and rest in a similar way day after day. But then, on the 20/10 her motion pattern differs. She doesn't rest as usual, she is active for 18 hours through. This lack of resting hours is typical for the high active periods.

*When examined that day the cow was found in heat and she was then successfully inseminated.
(The picture comes from ALPRO Windows)*



Connection between high activity and heat



The graph shows how the activity starts and increases during the pre-heat period. The actual activity start time is shown. If the increase in activity is less obvious than in this specific case, the activity meter will need some time to establish the increased activity. Experience has shown that the Activity start time will be set between 1 and 4 hours before the standing heat (activity start interval)

Standing heat is the period when the cow allows mating (natural service)

The optimum insemination time is late in heat. It starts in the middle of the standing heat and lasts to the start of the post heat.





ALPRO ver 6.60/ Activity meter system

Function

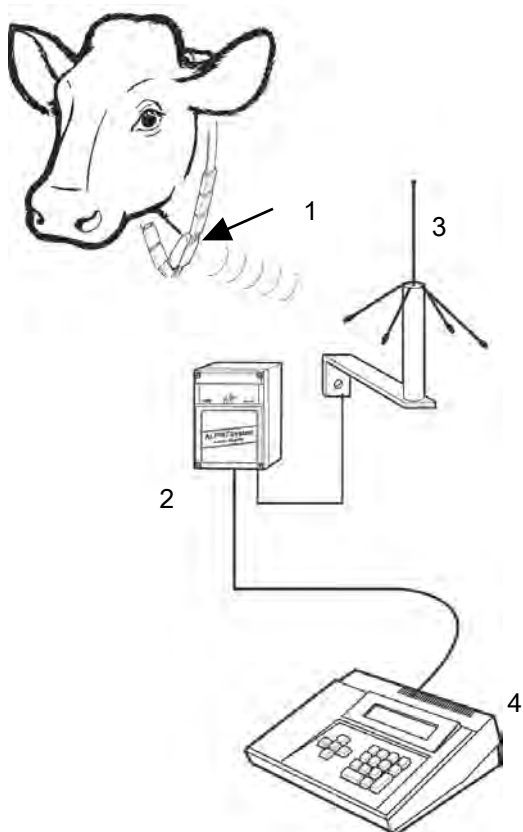
The activity meter system

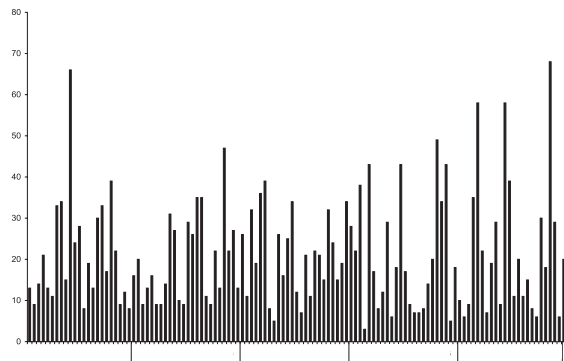
The main components in the activity meter system are:

- an activity tag (1) placed on a band around the cow's neck
- a receiver (2) with an antenna (3)
- a processor (4)
The processor can be connected to a computer in order to run the program ALPRO Windows.

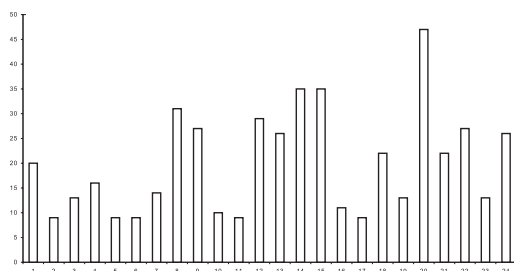
The activity tag contains a sensor which detects movements. The movements are registered and transmitted to the receiver every hour. Every transmission contains data from the latest 24-hour period.

The processor collects and stores all in-coming data. Its main task - for activity purposes - is to process activity data and produce the activity list. Data for 24 hours can be shown on the screen as activity data or for 48 hours as an activity graph.





A cow's movements, hour by hour for 5 days



A calculated motion pattern for 24 hours

How the activitymeter works

Step1, Watching the cow

The first five days the activity meter is in use, the processor records the cow's movements to learn how she usually moves.

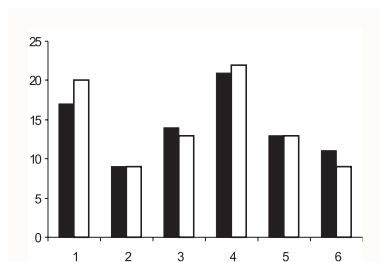
During these days high activity attentions are reported, but only after 5 days such a report should be considered reliable.

Each bar in the diagram represents the number of movements the cow has made during one hour.

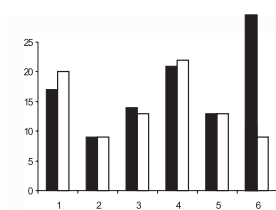
Step 2, Identifying a motion pattern

The processor now uses the data from all the days of recording to make an advanced statistical calculation. For each hour of the day, the movements of every single cow are considered. The calculation results in a motion pattern, which shows the cow's motion and resting periods during a normal day.

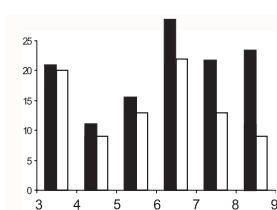
The motion pattern is continuously updated. Every hour new data are included in the calculation. The latest sending will always have the greatest effect on the calculation and earlier data will gradually lose importance. In this way the motion pattern will follow any changes in the cow's normal way of behaviour.



Actual movements compared to the predictions of the motion pattern



Obvious increase in activity between 05.00 and 06.00. Activity start time will be 06.00



Steady increase in activity during the last 6 hours. The increase is certain first at 09.00. Activity start time will in this case be 09.00

Step 3, The activity meter in work

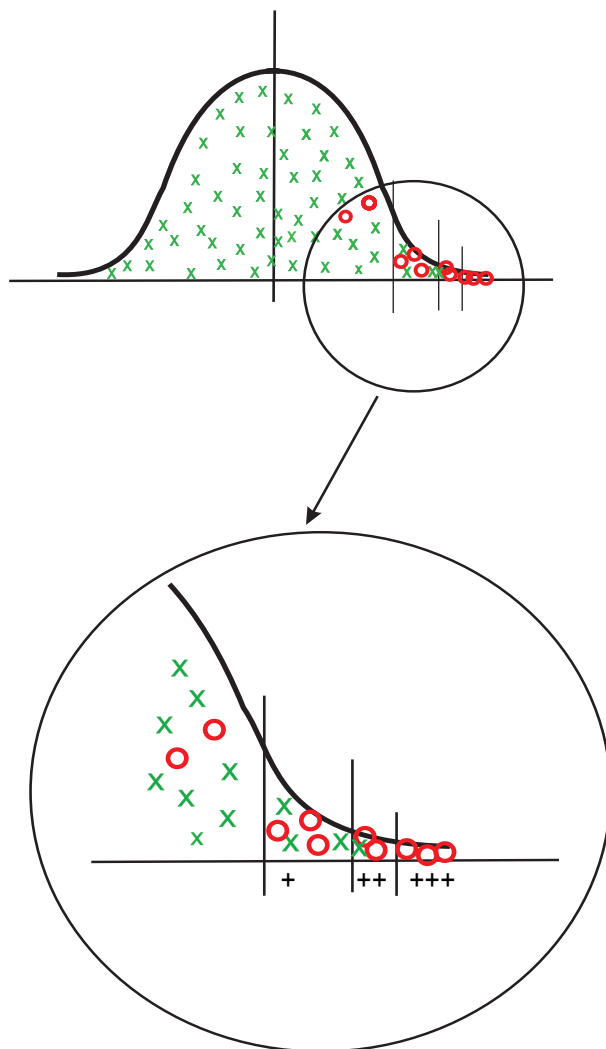
From now on, the cow's daily movements are put side by side to the motion pattern's estimation. Evaluations are made every hour and include comparisons for the last 6 hours. Any increases in activity are noticed. The increase must, however, be certain (statistically significant) before the processor reports high activity.

A significant increase can be either an obvious increase in activity during a short period or a steady increase built up during a longer period (normally 1-3 hours, maximum 6 hours).

Activity start time

Start time for high activity is set when the system detects a significant increase.

For cows with a sudden increase in activity the start time will be set almost directly. For cows with an increase that is slow but steady the alarm cannot be set until the processor has fully determined that the increase is statistically significant. This might take 2 -6 hours and the activity start time will in those case be set 2-6 hours later than the increase really began.



The statistic calculation

Note! This discussion refers only to high activity. Always remember that high activity is not the same as heat, it is only an indicator for heat.

The processor makes a statistic calculation based on a normal distribution to find the high active cows. The figure illustrates how it is done. The line curve represents the normal distribution and the crosses and circles represent cows.

All cows moving around just like they usually do are found in the middle, cows moving less than expected are found to the left and cows moving more than expected are found to the right. Among the cows moving more than expected we will find both cows which are lively by random and cows showing genuine high activity. The circles represent cows which are genuine high active this day and the crosses represent cows which are active for other reasons (false positive).

The selection of cows showing high activity is deliberately made broad by the Activity meter system. The high active cows are then grouped according to their activity level. The limit values express the probability for a value to be genuine. The default limit values (50, 60 and 70) are marked in the picture with lines.

Activity level 3 +++

Cows to the right of the limit 70 will be marked +++

This group contains only circles. It means that almost all cows in this group show genuine high activity. Sometimes - but seldom - there is a false positive cow in this group.

Activity level 2 ++

Cows between 60 and 70 will be marked ++

All but one of the markings are circles. The amount of circles indicates that most cows in this group will be genuine high active. The cross says that there might be some false positive cows in this group.

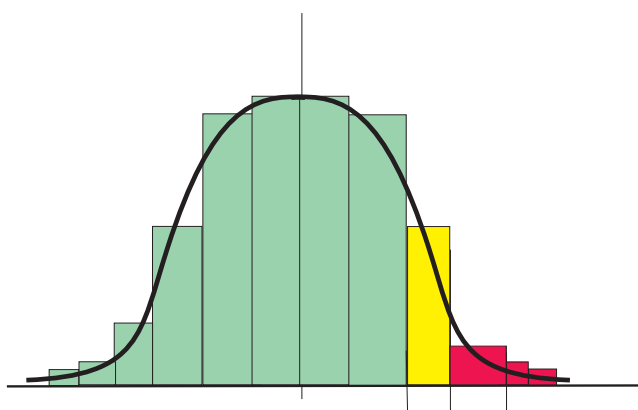


Activity level 1 +

Cows between 50 and 60 will be marked +

This group contains both circles and crosses, meaning that there is a mixture of cows showing genuine high activity and cows being false active in this group.

Also to the left of the limit 50 there are some circles. These cows are genuine active but the activity meter will not find them with the default settings.



Changing Limit values

By lowering the default limit value it is possible to find also cows which only show a small increase in activity. But then you will also get a number of false active cows to sort out.

The red bars show the number of cows presented as high active (+, ++ and +++) with default settings. If the limit is changed from 50 to 40 the activity list will increase with the number of cows represented by the yellow bar.

Read about how to use this possibility in chapter Operation, "To adjust accuracy level".





ALPRO ver 6.60/ Activity meter system

Start-up

Start up the Activity meter system

A general start up including the following four steps should be done before the Activity meter system start up begins.

- Processor start up, as described in ALPRO/General, chapter Start up.
- Introduction of cows to the system, as described in ALPRO/General, chapter Routine.
- Checking breeding parameters as described in the Program description, menu 6:1:3.
- Breeding data reported to the Cow calendar, described in ALPRO Program description, chapter 1:3 Breeding

The specific Activity meter system start up includes:

- To state the antenna addresses
- To start the activity tags and hang them on the cows.

State antenna addresses

6:1:6:1 ANTENNA GENERAL

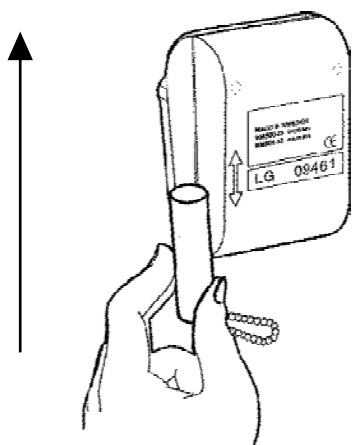
Enter the number of active antennas and the start nod address. The addresses are set in the receiver during installation. They must follow in numerical order and the start address is the lowest number.

The address range is 4 to 35 and the default value is 6.

ANTENNA GENERAL *	
NUMBER OF ANTENNAS:	2
START ADDRESS:	6
SYSTEM ALARM FOR ACTIVITY:	YES



Note! Make sure that every node in the system has an unique address.



System alarm for activity is by default set to YES. It means that the system alarm will be triggered - with sound and light - for activity alarms.

Set to NO means that the activity alarms will not be shown by sound or light. Still they can be seen in menu 8.

Set NO only for large herds where other system alarms might be drown among a great number of activity alarms.

Start up activity tags

A new activity tag is in status OFF when delivered. Through start up it is changed to status ON. The start up is done in two steps:

- Activate the tags with a magnet to make them send signals to the receiver
- Allocate the tags to the cows

Start the tags with code LG and forward, by making a quick stroke (not exceeding 1.5 seconds) with the magnet.

Start the tags with code up to LF with a stroke between 0.2 and 3.5 seconds.

When a tag has sent its first signal after being allocated to a cow, it is in status ON.

To activate tags

Activate max 200 tags at a time, and do it within the receiving range of an antenna and -if possible- close to the processor. When a tag is activated it will send out a signal once every hour. To get a good time spreading of the signals and to avoid that two tags are sending at the same time the activating procedure should take place during one hour.

- Hold the activity tag near an antenna
- Strike the magnet on the short side of the tag
- The receiver will flash red for receiving the signal from the tag and then yellow when the signal is transmitted to the processor

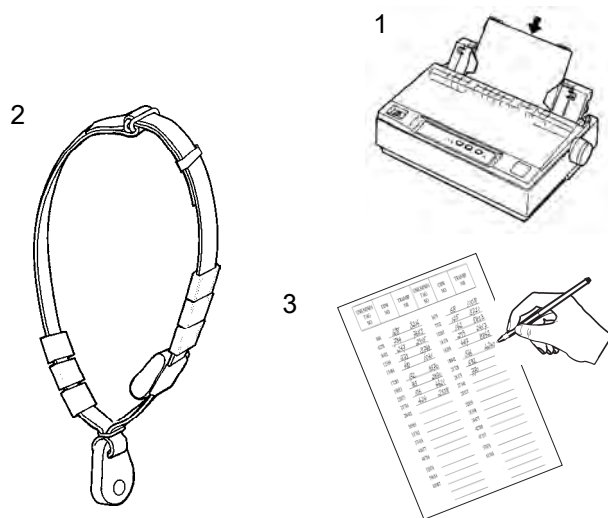
When activated the tags will appear on the



unknown tag list, from where it can be allocated to a cow.



Note! Maximum 200 unknown tags can be stored in the memory as "UNKNOWN TAGS".



To allocate unknown tags to cows

1. Print out the unknown tag list, address 5:1:7:2 UNKNOWN TAG LIST. There you will find all activity tags not allocated to a cow number.
2. Put the activity tag on the inside of the neck band with the thicker part downwards. Use only activity tags that can be found on the unknown tag list.
3. Place the neckband on the cow .
4. Write down the cow number next to the tag number on the printout.

COW/TRANSP/TAG NO *	
COW NO: 285	TRANSPONDER NO: 1285
GROUP NO: 3	TAG NO: -
ID: -	
COW/TRANSP/TAG	

UNKNOWN TAG -> COW

UNKNOWN ACTTAG: 27514

UNKNOWN TAG -> COW		12 *
COW NO: 285	TRANSPONDER NO: 1285	
GROUP NO: 3		84266
TAG NO: -	UNKNOWN ACTTAG: 27514	
ID: -		25631

- Go to 1:1 COW/TRANSP/TAG NO
- State the cow number to start with.
- Move the cursor to COW/TRANSP/TAG NO with the arrow keys.
- Toggle with any numeral key to UNKNOWN TAG -> COW.
- Press ENTER.
- On the new display, move the cursor to the UNKNOWN ACT TAG number with the arrow keys.
- Press enter to get admission to the unknown tag list.
- The number of unknown tags (12) is shown in the upper right corner.
- Toggle through the list with the up and down arrow keys.



Start-up

REPLACE TAG NUMBER *	
COW NO: 21	
REPLACE TAG NO: 91924	
WITH TAG NO: 25631	NO

- Press enter for the tag number to allocate it.
- Choose another cow to go on allocating activity tags.

If a cow already has a tag no, you will be asked to confirm or reject the change.

- Toggle between NO and YES with any numeral key. Press ENTER to confirm.

BREEDING ATTENTION ON MPC	
FIRST HEAT	LED NO: 0
HEAT-> INSEM	LED NO: 0
INSEM CHK	LED NO: 0
PREG CHK ATT	LED NO: 0
HIGH ACT	LED NO: 0
DRY OFF ATT	LED NO: 0
RELATIVE ACTIVITY	LED NO: 0
COW IN WRONG GROUP	LED NO: 0
NO RF SENDING	LED NO: 0
MPC DISPLAY MODE:	COW AND YIELD
PULSATOR TYPE:	EP100
HIGH VACUUM DELAY:	5.0 S

Part of display 6:3:2:1

To set breeding attentions (remind codes) for activity

It is possible to set breeding attentions (Remind codes) for activity parameters. The parameters are: High activity, No RF sending and Relative activity.

The breeding attentions are set on the processor in menu 6:3:2:1 or in the MPC unit. The LEDs on the MPC unit will then be lit when a cow, reported with the attention in question, enters that cow place.

BREEDING ATTENTION ON MPC *	
HIGH ACT:	
ACT. LEVEL	>= +
DAYS SINCE INSEM	> -
HOURS SINCE HIGH ACT	< 20
HOURS SINCE HIGH ACT	> -
DAYS IN MILK	> 10
PREGNANT	EXCLUDE
CULL	EXCLUDE

The attentions are defined in menu 6:1:6:6:1 - 3 and follows the same pattern. First the breeding attention is defined and then max and min values are set to define the time periods when reporting shall take place. The sign "-" always means that the parameter is ignored.

6:1:6:6:1 HIGH ACTIVITY

The picture shows the default values.

High activity is defined by the Activity level; i. e. one or more plus signs, two or three plus signs or three plus signs during the last 24 hours.

The time period when the system shall look for active cows is defined by:



- A time period after insemination. Setting range: 1 and 99 days. By setting for example >12 days, the system will start to look for high activity when 12 days has passed since insemination.
- The hours shortly after the high activity start. This time period is set on the two rows HOURS SINCE HIGH ACT. For the first row the value < 20 means that the reporting time will end 20 hours since high activity started. Settings between 10 and 48 are possible.
A value set on the next row will give a start time for the reporting time. Values between 0 and 16 can be set. *Note that this value must be lower than the previous otherwise no reporting will take place.*
- Days in milk > 10 means that reporting will start 10 days after calving. Setting range: 0 -200 days.
- Pregnant and cull cows respectively can be excluded (default) or included.

Recommended settings

The default values will make the system work in the same way as the settings in ALPRO 6:50, when parameter high activity was used as breeding attention (=Remind code). In ALPRO version 6.60 it is possible to define more exactly the cows to be noticed by the breeding attention LED. This means that high active cows, which are not supposed to be inseminated, will be sorted away by the system. This, in turn means, that the LED will bring attention to fewer but more relevant cows.

The recommended settings are:

ACT. LEVEL	<= +
DAYS SINCE INSEM	> 12
HOURS SINCE HIGH ACTIVITY	<24
HOURS SINCE HIGH ACTIVITY	>0
DAYS IN MILK	>50
PREGNANT	EXCLUDED
CULL	EXCLUDED



BREEDING ATTENTION ON MPC			*
NO RF SENDING			
HOURS SINCE SENDING	>	8	
DAYS FROM HEAT	>	-	
DAYS IN MILK	<	40	
DAYS SINCE INSEM	>	-	
PREGNANT		EXCLUDE	
CULL		EXCLUDE	
+ / + + / + + + /		EXCLUDE	

6:1:6:6:2 NO RF SENDING

No RF sending is defined by the numbers of hours since last sending. Setting range: 4 - 48, default is 8.

- Reporting can be set to start close to expected heat, setting range is 0-4.
- Days in milk > 40 means that reporting will start 40 days after calving. Setting range: 0-200 days.
- Days since insemination is by default "-". Setting range: 0- 200

Pregnant, cull or high active (+ / ++/ +++) cows can be excluded (default) or included.

BREEDING ATTENTION ON MPC			*
RELATIVE ACTIVITY			
REL. ACTIVITY (%)	>	-	
REL. ACTIVITY (%)	<	60	
HIGH ACT PROBABILITY	>	-	
HIGH ACT PROBABILITY	<	1.5	
DAYS SINCE INSEM	>	-	
DAYS SIN MILK	>	-	
+ / + + / + + + /		EXCLUDE	
PREGNANT		EXCLUDE	
CULL		EXCLUDE	

6:1:6:6:3 RELATIVE ACTIVITY

The picture shows the default values.

The relative activity is expressed by the % value of the animal's actual activity divided by expected activity. In this display it can be defined between 0 and 250 %.

The relative activity is defined on the first two rows. > - means that the parameter is neglected. A value between 0 and 250 % can be set, meaning that cows showing an activity lower than the preset value will **not** be reported.

On the second row the value < 60 means that cows showing a relative activity less than 60 % will be reported.

The high activity probability gives an estimation on how valid the relative activity value is for the cow. The probability is calculated from the variation of the cow's normal activity. The lower the high activity probability is, the more likely is it that the cow is showing a true low activity.

High activity probability is defined just like relative activity. Setting range: 0 - 99,9.

Days since insemination is by default "-". Setting range: 0 - 999

Days in milk is also by default set to "-". Setting range is 0-200.

Pregnant or cull cows can be excluded (default) or included.



Start-up

High active (+ / ++/ +++) cows can be excluded (default), included or mandatory.

Recommended settings

The relative activity is in the first place designed for identifying cows with low activity. The recommendation is to include all cows in the selection; also pregnant, cull and high active cows.

Check the start up

Check that all tags are sending properly 24 hours after the start up. If a tag is not sending, this will be shown on the ACTIVITY ALARMS display, address 1:2:4.

ACTIVITY ALARM *	
ALL	
48 HOURS NO ACTIVITY	COW NO: 5342
CLEAR THIS ALARM: NO	
CLEAR ALL ALARMS: NO	
	FIRST ALARM





ALPRO ver 6.60/ Activity meter system

Operation

The program overview and how to handle the processor is described in detail in the Program description book.

The activity meter will assist you when looking for cows in heat, but to get a good result you have to update the system and notice the alarms the system gives you. The system is set to function with default settings, but to make it suit your way of working, you can adapt it by making some own settings. In this chapter the following topics will be described:

A. How to work with the activity meter system

- to detect cows in heat among the high active cows
- to notice and act on alarms
- to study activity data and graphs
- to make printouts

B. How to keep the system updated

- to update the cow calendar
- to keep up the tag numbers

C. How to adapt the system

Note! Adaptions of the system should only be done after counselling a DeLaval representative!

- to increase or lower the number of cows on the activity list
- to make the system pay extra attention to the cows at expected heat
- to avoid undesired alarms
- to set the tags in appropriate mode



To work with the activity meter system

To detect cows in heat among the high active cows

The activity list is the main tool when working with the activity system. It lists the high active cows and tells when the high activity started. The activity list also includes valuable information from the cow calendar.

The activity list is found among the printouts, 5:1:7:1 ACTIVITY LIST.

The high active cows are also shown in display 4:4 High active cows. This display can be useful if you look for data on a single cow, but mostly the activity list is more clear to work with.

BREEDING	HEAT-->INSEMINATE	*
COW NO: 285	99.06.30 99.07.21	
GROUP NO: 3	*CHANGE* 15 (+++)	
SIRE:	FERDINAND	
LAST INSEM:	99.07.12	
NO OF INSEM:	01	
LAST CALVING:	99.04.27	
CULL:	NO	

- + activity level 1, last 24 hours
- ++ activity level 2, last 24 hours
- +++ activity level 3, last 24 hours
- (+) activity level 1, 24-48 hours ago
- (++) activity level 2, 24-48 hours ago
- (+++) activity level 3, 24-48 hours ago

On the activity list the active cows are marked by one, two or three plus signs according to their activity level. As discussed in the Function chapter the number of plus signs doesn't say much about how likely a certain cow is in heat. There will be some cows close to heat also among the one plus cows!

Plus signs in paranthesis means that the activity start time is from yesterday, it is older than 24 hours.

How to read the activity list

It is important to remember that the activity list does not point out cows in heat but it makes a selection of cows among which you will find almost all cows in heat. This means:

- Cows with high activity due to heat will be on the list
- Cows with high activity due to other reasons than heat will also be on the list
- Cows not showing increased activity,



when they are in heat, will not be on the list

- Note also that the number of plus signs tells only the level of certainty according to high activity. It does not tell you how likely the cow will be in heat.

Check activity twice a day!

As the optimum insemination time is 10-28 hours after the activity start time, we recommend you to print out and go through the activity list twice a day.

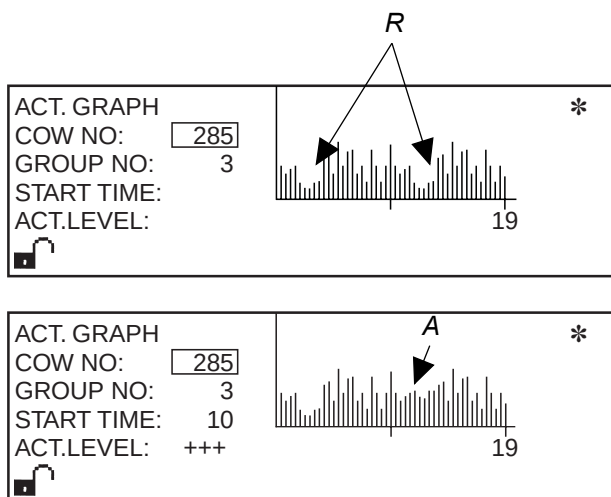
To study activity data and graphs

1:2:1 ACT. GRAPH

This function shows the activity for the last 48 hours in an activity graph. It also displays the hour for current time.

For example: Assume there is a resting period (R) each day. After 24 hours there is an increased activity (A). The activity is set to + + + . Start time is set to 4–5 hours after we have detected the first hour of high activity.

If the activity data is older than 24 hours, no activity graph will be shown. Instead the message will be: ACT DATA TOO OLD.



To use breeding attentions to detect high or low active cows when milking

Breeding attentions (Remind codes) on the MPC units can be used to detect high and/or low active cows in the parlour when they are being milked. The settings are made at start up and includes setting of the LED(s) to use in menu 6:3:2:1. High or low activity are then defined in menu 6:1:6:6:1 and 6:1:6:6:3 respectively.

To notice and act on activity alarms

When an alarm comes, a flashing bell will be shown on the display. By default setting it will also be a beeping sound. The sound



stops when a key is pressed. If no beep is wanted it can be turned off in the general setup, address 6:1:1

The activity alarms inform you about cows with tags which messages have not been received for a certain time period or they have sent a zero data, meaning that no movements have been recorded.

The activity alarms can be seen in display 1:2:4 ACTIVITY ALARMS. The events causing alarms are:

48 HOURS NO ACTIVITY ALARM - the tag has reported that no movements have been registered during the last 48 hours.

- This means usually that the cow either has lost her tag or her tag has been removed.

48 HOURS NO RF SENDING - no data has been received from the tag for 48 hours.

24 HOURS NO RF SENDING - no data has been received from the tag for 24 hours.

NO RF SENDING - no data has been received from the tag for a time period set by the user.

- Those three alarms mean that the tag is out of range from the antenna or that the tag has stopped sending.
The No RF sending is by default switched off, i.e. the time is set to 00 HOURS.
Settings are made in the general setup, address 6:1:1.

Clear alarms

Set CLEAR THIS ALARM to YES and press ENTER and the displayed alarm will be removed.

Set CLEAR ALL ALARMS to YES and choose ALL on the first row to remove all alarms.

Set CLEAR ALL ALARMS to YES and choose a type of alarm in the first row to remove all alarms of this type.

ACTIVITY ALARM *	
ALL	
48 HOURS NO ACTIVITY	COW NO: 5342
CLEAR THIS ALARM: NO	
CLEAR ALL ALARMS: NO	
	FIRST ALARM

GENERAL SETUP *	
COMM. BAUD RATE:	57600
NO RF SENDING:	00 HOURS
SELECT UNIT OF WEIGHT:	KG/TON
SOUND:	YES



Operation

Note! The 24 HOURS NO RF SENDING and 48 HOURS NO RF SENDING alarms are used in Activity graph, function 1:2:1 and Activity data, function 1:2:2. Therefore it is not possible to clear these alarms. They will be cleared only by a new sending from the activity tag on that cow. If the user tries to clear those alarms the message shown to the left will be displayed.

The activity alarms will also generate a system alarm, named Activity alarms, in function 8: Alarm indication.

— ○ √

Strike, circle and tick is a way to work with the activity list to find the cows in heat. Work through the list, cow by cow and consider her status. Strike her number if you decide that she shall not be inseminated this day. Make a circle round the cow number if it is the right time to inseminate by the breeding calendar. Make a circle round the plus signs if you want to check her for heat and report her to the cow calendar.

This consideration is not easy, but there are a number of other indicators based on the cow calendar, to help you with the decision. On the activity list you can, among other things, see:

- Number of days in milk - which tells if the time period is right for insemination
- Expected heat
- Days since last heat
- Last insemination
- Pregnancy - if any

Note also the information given 4:2:1 Low feed consumption and 4:3:2 Low yield alarm.

When all cows are evaluated go out in the barn and examine all the circled cows. Tick the cow if she shows heat symptoms.

On the activity list the cows to be inseminated are now marked by a circle round her number and a tick confirmation. Now you can take the activity start time into account and decide when to inseminate her.

Do update all other cows showing heat in the cow calendar. This will give you valuable information when going through the activity list later!

α DeLaval



ACTIVITY DATA										*
COW NO:	285	12	10	12	14	8	9			
TAG NO:	5123	4	8	9	10	7	12			
LAST SENDING:	18	65	72	60	62	12	10			
STATUS:	ON	4	4	6	12	10	-			

B

A

1:2:2 ACTIVITY DATA

This function shows the activity for the last 24 hours in numbers and the last transferred activity reading. This is the same information as in 1:2:1 but with digits. The digit can be between 0 and 255.

(A) Current time sending ("—" = no sending). If there has been a sending, a time is shown.

(B) Last sending at 6 PM had activity 10, meaning that the cow's tag registered 10 movements during the passed hour.

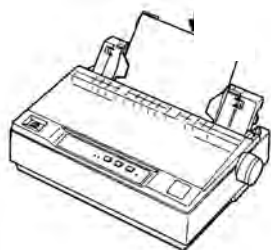
the status of the tag is also shown in the display. See section "To set the activity tags in appropriate mode", further on in this chapter.

If the activity data is older than 24 h no activity data will be shown.

To make printouts

If a printer is connected to the processor, a number of lists can be printed in accordance with the below specification.

It is not necessary to open the memory prior to printing.



PRINTOUTS		*
1: COW DATA	5: FEEDING/MILKING	
2: FEEDING DATA	6: SYSTEM DATA	
3: MILKING DATA	7: USER DEF LIST	
4: STATION DATA	8: STOP PRINTER	

Press numeral key 5 in the top level menu and the adjoining main menu is displayed.

Following lists can be printed out:

COW DATA

5:1:1 TRANSPONDER/TAG NO LIST

5:1:2 ATTENTION LIST

5:1:3 ACTION LIST

5:1:4 BREEDING LIST

5:1:5 COW DATA LIST

5:1:6 CALVING DUE LIST

5:1:7 ACTIVITY

- 5:1:7:1 ACTIVITY LIST
- 5:1:7:2 UNKNOWN TAG LIST
- 5:1:7:3 OFF TAG LIST
- 5:1:7:4 WATCH TAG LIST
- 5:1:7:5 STANDBY TAG LIST
- 5:1:7:6 ACTIVITY ALARM LIST

5:1:8 CUT REPORT



GROUP SELECTION	*
ENTER GROUP: 0	
PRESS "0" FOR ALL GROUPS	
COMBINATION: NO	

GROUP SELECTION	B
GROUP SELECTION	2
ENTER GROUP: 0	
PRESS "0" FOR ALL GROUPS	
COMBINATION: NO	

In function 7: GROUP SELECTION (found in the main menu), a specific group (or a combination of groups) can be selected so it will comprise only this group (or groups) of cows. Before pressing the numeral keys for desired printing, group (or combination of groups) is selected in function 7. All groups are included in the lists by programming 0.

Note! The asterisk in the upper right corner of the display tells that 0, i.e. all groups has been programmed. If one group is programmed in function 7, the group number will be given instead. If a combination of groups has been selected, a letter (A, B, C, or D) will be given.

Usually, 0 is selected in this function, i.e. lists with data on all cow groups, each time a list is printed.

CORRECT COW /TAG	*
COW NO: 285	TAG NO: 1285
UNKNOWN TAGS	123 234 345 567 789 1284

The display shows that cow no 285 is not active. Her tag no is 1285. Tag no 1284 is shown among the unknown tags. This is probably a typing error, which is easily corrected by changing the Tag No to 1284.

To keep up tag numbers

1:2:5 CORRECT COW/TAG

This display makes it possible to find and correct cows with wrong tag numbers in the ALPRO system.

If a cow in the herd shows no activity, the most probable explanation is that she is programmed in ALPRO with a wrong tag number. If there, at the same time, are tags not programmed to any cow (unknown tags) that indicate activity, the right tag number is probably found among the unknown tags.

Cows showing no activity - 24 or 48 hours no sending alarm and cows with 0 activity the last 24 hours - are presented on this display together with the numbers of unknown tags.

To work with the display: Choose Cow No or Tag No with the right and left arrows. Scroll the cow numbers by pressing ENTER and the Unknown tags with the up and down arrows. Change to the correct Tag No by editing it in the Tag No square and press ENTER. When an Unknown Tag No is connected to a cow, it will disappear from the Unknown tag list.



To keep the system updated

To update the cow calendar

To get the most out of the Activity meter system you have to update the cow calendar with information of heat, insemination, pregnancy check, calving etc. This is done in display 1:3 Breeding.

See also ALPRO ver 6.60, Program description.

BREEDING	CALVING->HEAT		*
COW NO: 607	04.08.10	04.10.11	
GROUP NO: 3	*CHANGE* (+++) DR		
LAST HEAT: 04.09.20	*M* ▲		
CULL: NO	10.6 !		



To adapt the system

To increase or lower the number of cows on the activity list

To set sensitivity level

The sensitivity level is by default set to 1. It means that the system requires only one hour of significant, high activity before it sets an alarm. For sensitivity level 2, the system requires two consecutive hours of high activity. Sensitivity 3 requires 3 consecutive hours etc. The level can be set between 1 and 10.

Changing the level upwards means that the system will sift out cows with just a short period of high activity and less cows will occur on the activity list.

The sensitivity parameter is set on system basis in display 6:1:6:4:1. The setting can be overruled by setting other levels for a group of cows in display 6:1:6:4:5, GROUP DATA. See section "No undesired alarms from a group of cows" further on in this chapter.

To adjust accuracy level

Filter accuracy is set in display 6:1:6:4:2 FILTER SETTINGS

The filter has three levels: 50, 60 or 70. Every level has a corresponding accuracy expressed in %.

Default values are shown in the display, 50 corresponds to one plus sign, 60 to two plus signs and 70 to three plus signs.

Each level can be adjusted upwards and downwards by changing the activity level value.

Adjustments of activity levels can be very effective in optimizing heat detection on individual farms. The higher the accuracy, the lower the numbers of cows identified, both positive and false positive. With a high accuracy you will be more accurate in identifying high activity cows, but you may also miss cows showing heat signs.

FILTER SETTINGS		*
	SENSITIVITY	
HOURS:	1	

FILTER SETTINGS			*
	ACCURACY		
+	50	(99.996 %)	
++	60	(99.998 %)	
+++	70	(99.999 %)	



Lowering the accuracy will present more cows, but also more false positive ones. This will however give opportunity to check these cows for visual heat signs. In most cases these false positive cows can be easily filtered out based on cow calendar and visual heat signs.

Optimizing accuracy is dependant on conditions of each individual farm.

Read chapter Function, The statistical calculation!

To make the system more attentive the days before and after expected heat

6:1:6:4:4 EXPECTED HEAT

This display makes it possible to decrease the accuracy for high activity alarms for up to 4 days before and after the expected heat date. Default value is 2 days.

When a lower accuracy is set, also a smaller change in activity during the days close to expected heat will give an high activity alarm.

Note! Heat date must be reported in the Breeding menu 1:3. Otherwise the ALPRO system cannot calculate the expected heat date!

To avoid undesired alarms

No undesired alarms for high activity for a group of cows

6:1:6:4:5 GROUP DATA

High activity alarm could be turned off for a group where heat detection is unnecessary. Then set GIVE HIGH ACTIVITY ALARM for that group to NO.

This settings overrule the system setting in 6:1:6:4:1

GENERAL ACTIVITY TYPE can be set to CONTINUOUS or STATE. This setting does not affect the High activity alarm, but is a way to select cows according to their relative activity. STATE is the setting recommended, it considers the normal variations in the cows' motion pattern.

FILTER SETTINGS		*
DAYS FROM HEAT:	2	
EXP. HEAT ACCURACY:		
99.996 - 0.000 = 99.996	(50)	
99.998 - 0.000 = 99.998	(60)	
99.999 - 0.000 = 99.999	(70)	

GROUP DATA		*
GROUP NO:	1	
GIVE HIGH ACTIVITY ALARM:	YES	
GENERAL ACTIVITY TYPE:	STATE	
SENSITIVITY:		
HOURS:	2	(2)



CONTINUOUS should be used only for cows with a low, normal level of the activity pattern, (e.g. for cows, which are tied up during parts of day or night).

The sensitivity level can be set between 1 and 5. It refers to how many hours of activity that should pass before ALPRO makes an alarm. The value in parenthesis refer to the system setting in menu 6:1:6:4:1.

No alarms from certain breeding states

6:1:6:4:3 BREED STATE

If you don't want any high alarms from cows in certain breeding states, set NO for that breeding state.

Default value for all states is YES.

FILTER SETTINGS *		
GIVE HIGH ACT ALARM:		
CALVING -> HEAT		YES
HEAT -> INSEMINATE		YES
INSEMINATE -> PRG CHK		YES
INSEM -> PRG CHK2		YES
INSEMINATE -> DRY OFF		YES
DRY OFF -> BUILD UP		YES
BUILD UP -> CALVING		YES

To set the activity tags in appropriate mode

1:2:3 ACTIVITY TAG MODE

To reduce the amount of High Activity Alarms or No Sendings Alarms it is possible to put the activity tag in four different modes: ON, OFF, WATCH and STDBY.

The ON mode

The tag is set to ON at start up. In this mode the tag can record sendings and enable the processor to give alarms.

ACTIVITY TAG MODE *		
COW NO	1	GROUP NO: 1
TAG NO:	4567	
STATUS:	ON	

The WATCH mode

The WATCH mode is used when the cows are on pasture or out of range of the receiving area. For a tag in this mode the system will not generate any No RF sending alarms. When the cow returns to the receiving area the tag will change to ON mode when a new sending has been recorded.

ACTIVITY TAG MODE *		
COW NO	1	GROUP NO: 1
TAG NO:	4567	
STATUS:	WATCH	



ACTIVITY YAG MODE *			
COW NO	1	GROUP NO:	1
TAG NO:	4567		
STATUS:	STDBY	5 DAYS	
END DATE:	01.10.12		

*			
CHANGE NOT ALLOWED. USE THE MAGNET TO CHANGE TAG TO OR OFF MODE PRESS <ENTER> AND TRY AGAIN			

The STDBY mode

STDBY (standby) mode is used for suppressing activity alarms when a cow is pregnant, or when there is no need for a cow to give alarms. When setting the STBY mode also set the number of days you want the alarms turned off. Max 255 days. The END DATE will show. After the number of days has passed the activity tag returns to WATCH mode.

The OFF mode

The tag can only be turned to OFF mode with a magnet. If an operator tries to change to OFF mode in the processor, the display will show an error message.



Activity Receiver

Product data

Article number

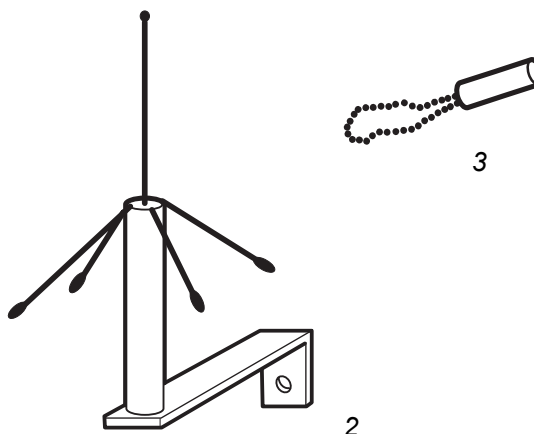
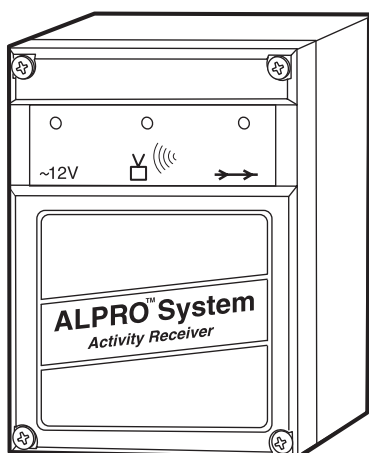
Activity Receiver, complete:

- Activity receiver (1)
- Antenna (2)
- Magnet (3)

90651080 433 MHz

90651180 418 MHz

90672980 separate Antenna (2), complete



Description

General

The Activity Receiver is the link between the Activity Tags, fixed to the cow neckbands, and the ALPRO system processor, where data from the Activity Tags are processed.

In other words, the RF (Radio Frequency) part in the Activity Receiver receives the messages that the Activity Tags send via radio signals, checks the validity and, if the messages are correct, sends them further on to the ALPRO processor via the ALCOM bus.



Features

- The circuit board works with three different voltages. The digital part works with 5 V, the RF part with 10 V, except the receiver chip that works with 3 V. Supply voltage is 12 V AC.
- The circuit board has two processors:
 - A PIC-processor that processes what comes in from the RF part.
 - An 8051 processor, which has an overall function (communication with the ALPRO processor via the ALCOM bus).
- There are three terminals on the circuit board:
 - One for the ALCOM bus.
 - One for electrical power supply.
 - One for connection of the external antenna.
- There are three LED:s
 - One green for power on.
 - One yellow for indication of communication on the ALCOM bus.
 - One red for indication of communication going on internally between the PIC and 8051 processors.
- The circuit board has five jumpers for setting the address on the ALCOM bus.
- A reset circuit functions as a watchdog and performs a reset at power on.

Technical data

Current: 10–18 VAC

Power: 2 VA

Environmental specification

Temperature: 0–70 °C

Humidity: 10–100 %RH

Dimensions: 150 x 110 x 70 mm

Weight: 420 g



Activity Tag

Product data

Article number

90650080 Activity tag, 433 MHz

90650180 Activity tag, 418 MHz

*One activity tag per article No.
Delivered in a box containing 50 tags.*

Description

General

The **Activity Tag** is a part of the Activity Meter System. It detects and registers movements.

The tag is battery driven. The battery has a lifetime of approximately 10 years.

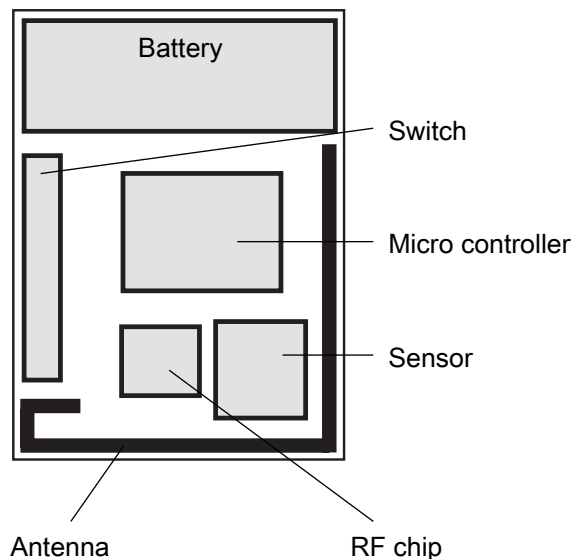
A small magnet is used to set the tag in ON or OFF mode via a switch inside the tag.

Each tag has a unique identity.

The tag must be placed on the cow's neckband at least five days before a heat cycle begins.

We recommend that the tag then stays permanently mounted on the cow.





Technical data

Internal electronics

The Activity Tag contains following parts:

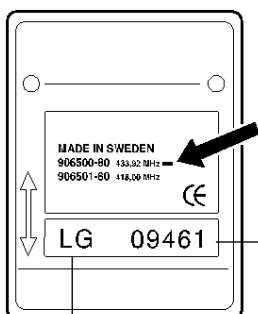
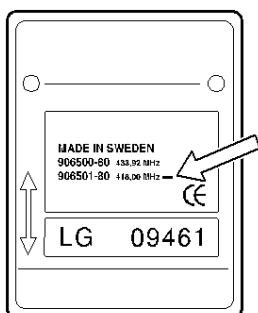
- Battery (with approximately 10 years lifetime)
- Electro-magnetic sensor (senses the cow's movements in all directions)
- Micro controller
- Radio frequency transmitter (RF chip)
- Reed relay (for setting ON/OFF)
- Antenna

Electrical characteristics

Storage temperature: -30°C – $+85^{\circ}\text{C}$

Operating ratings:

- Temperature range: 0°C – $+70^{\circ}\text{C}$
- Operating voltage: 2.7–3.3 V DC



Activity tag No.

Year and month when manufactured

Radio

Radio frequency transmitter works on 3 volt and sends with:

- 433.92 MHz in Europe
- 418.00 MHz in USA and UK.

Valid frequency is marked on the tag according to adjoining figure.

The message is sent one time each hour.



Warning! The battery contains *lithium*. Do not dispose of these items without complying with current environmental laws.





ALPRO ver 6.60/ Activity meter system

Program description

This is a short introduction to the ALPRO program. Detailed information is found in the book ALPRO, Program description, where the processor with its display and key sets is described. There you also find information about menus, how to find the functions desired and how to scroll to find all information in that function

The processor is always in stand by mode. When the display shows the vignette or is dark you will get to the top level menu by pressing any key. If the display shows a function, you get back to the top level menu by pressing the key ESC.

From the top level menu you find the desired function by choosing alternatives from the top level and sub levels. The address to a function display is expressed by the digits you'll have to press on the key set to get to the function display in question.

The alternatives in the top level are the following:

- 1 Cow data**
- 2 Feeding data**
- 3 Milking data**
- 4 Attentions**
- 5 Printouts**
- 6 System data**
- 7 Group selection**
- 8 Alarm indication**

Addresses to the function displays used in the work with the Activity meter system are shown in the table below.



Program description

Top level menu	Sub level 1	Sub level 2	address	Function display
1. Cow data	2. Activity		1:2:1	Activity graph
			1:2:2	Activity data
			1:2:3	Activity tag mode
			1:2:4	Activity alarms
1. Cow data			1:3	Breeding
4. Attentions	1. Breeding		4:1:1	First heat
			4:1:2	Insemination
			4:1:3	Insemination check
			4:1:4	Pregnancy check
			4:1:5	Dried off
			4:1:6	Build up/ step down
			4:1:7	Calving
4. Attentions	3. Milking		4:3:3	Relative yield
4. Attentions			4:4	High activity cows
			4:5	Summary
5. Printouts	1. Cow data		5:1:1-7	Prints Cow data and Breeding lists
	5. System data		5:5:1-8	Prints system data lists
6. System data	1. General		6:1:1	General setup
			6:1:2	Group data
			6:1:3	Breeding
6. System data	1. General	6. Activity	6:1:6:1	General
			6:1:6:2	Tag On/ Off
			6:1:6:3	Last sending
			6:1:6:4:1	Filter: Sensitivity
			6:1:6:4:2	Filter: Accuracy
			6:1:6:4:3	Filter: Breed state
			6:1:6:4:4	Filter: Exp.heat
			6:1:6:4:5	Filter: Group data
			6:1:6:5	RF diagam
			6:1:6:6:1	Set attention on MPC: Act. level
			6:1:6:6:2	Set attention on MPC: No RF sending
			6:1:6:6:3	Set attention on MPC: Relative activity



Extract from ALPRO, Program description

This is an extract from the book ALPRO, 6.60/Program description. The functions connected to the Activity meter system are listed.

1:2 ACTIVITY

The activity information originates from the Activity meter system.

The activity menu has 5 alternatives. Besides showing activity data in graph and numbers respectively, it has functions for checking/changing activity tag mode and checking/clearing activity alarms. The function Correct cow/tags make it possible to change the tag number if a cow is connected to a wrong tag number in ALPRO system

To study activity data and graphs

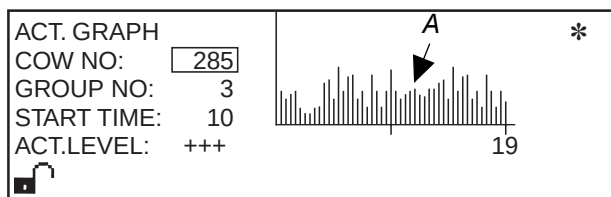
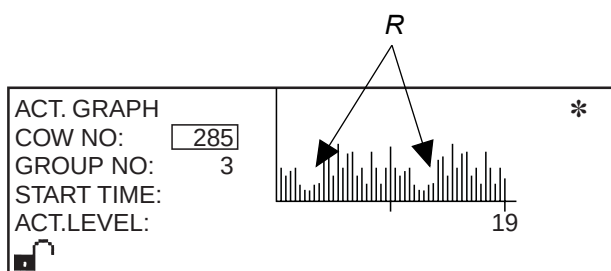
1:2:1 ACT. GRAPH

This function shows the activity for the last 48 hours in an activity graph. It also displays the hour for current time.

For example: Assume there is a resting period (R) each day. After 24 hours there is an increased activity (A). The activity is set to + + + . Start time is set to 4–5 hours after we have detected the first hour of high activity.

If the activity data is older than 24 hours, no activity graph will be shown. Instead the message will be: ACT DATA TOO OLD.

ACTIVITY *	
1: ACT. GRAPH	5: CORRECT COW/TAGS
2: ACTIVITY DATA	
3: ACTIVITY TAG MODE	
4: ACTIVITY ALARMS	





Program description

ACTIVITY DATA								*
COW NO:	285	12	10	12	14	8	9	
TAG NO:	5123	4	8	9	10	7	12	
LAST SENDING:	18	65	72	60	62	12	10	
STATUS:	ON	4	4	6	12	10	-	

B

A

1:2:2 ACTIVITY DATA

This function shows the activity for the last 24 hours in numbers and the last transferred activity reading. This is the same information as in 1:2:1 but with digits. The digit can be between 0 and 255.

(A) Current time sending ("-" = no sending). If there has been a sending, a time is shown.

(B) Last sending at 6 PM had activity 10, meaning that the cow's tag registered 10 movements during the passed hour.

the status of the tag is also shown in the display. See section "To set the activity tags in appropriate mode", further on in this chapter.

If the activity data is older than 24 h no activity data will be shown.

1:2:3 ACTIVITY TAG MODE

General information

This function makes it possible to put the activity tag in a special mode, to reduce the amount of High Activity Alarms or No Sendings Alarms.

Mode description

It is possible to put the activity tag in four different modes: ON, OFF, WATCH, and STDBY.

The ON mode

Use the magnet to start the tag. In this mode the tag can record sendings, and enable the processor to give alarms.

The OFF mode

The tag can only be turned to OFF mode with a magnet. If an operator would choose to make a change to OFF mode in the processor, the display will show an error message.

ACTIVITY TAG MODE				*
COW NO	1	GROUP NO:	1	
TAG NO:	4567			
STATUS:	ON			

CHANGE NOT ALLOWED. USE THE MAGNET TO CHANGE TAG TO OR FROM OFF MODE PRESS <ENTER> AND TRY AGAIN				*
--	--	--	--	---



Program description

ACTIVITY TAG MODE		*
COW NO	1	GROUP NO: 1
TAG NO:	4567	
STATUS:	WATCH	



ACTIVITY TAG MODE		*
COW NO	1	GROUP NO: 1
TAG NO:	4567	
STATUS:	STDBY	5 DAYS
END DATE:	99.10.12	



ACTIVITY ALARM		*
ALL		
48 HOURS NO ACTIVITY	COW NO: 5342	
CLEAR THIS ALARM:	NO	
CLEAR ALL ALARMS:	NO	



FIRST ALARM

GENERAL SETUP		*
COMM. BAUD RATE:	57600	
NO RF SENDING:	00 HOURS	
SELECT UNIT OF WEIGHT:	KG/TON	
SOUND:	YES	



The WATCH mode

In the WATCH mode the No Sendings Alarms are shut off. The activity tag will return to ON mode when a new sending has been recorded. This is useful when the cows are on pasture or out of range of the receiving area.

Watch mode is used as default value when a new tag is entered in the processor.

The STDBY mode

STDBY (standby) mode is used for suppressing activity alarms when a cow is pregnant, or when there is no need for a cow to give alarms. Set the status to STDBY and press ENTER. Enter the number of days you want the alarms turned off. Max 255 days. The End Date will show.

After the number of days has passed the activity tag returns to WATCH mode.

1:2:4 ACTIVITY ALARMS

The function 1:2:4, ACTIVITY ALARMS displays the alarms for the activity meter system. There is a possibility to toggle between:

- ALL
- 48 HOURS NO ACTIVITY ALARM
- NO RF SENDING
- 24 HOURS NO RF SENDING
- 48 HOURS NO RF SENDING.

The function can handle all triggered alarms.

The NO RF SENDING alarm is triggered when the activity meter has not been sending for the amount of hours (1–23) that has to be set in menu 6:1:1 under NO ACTIVITY ALARM. When 0 is set the NO RF SENDING will be switched off.

If function 1:2:4, ACTIVITY ALARM indicates an alarm, the alarm bell will flash. There will also be an alarm in function 8, ALARM INDICATION.

Since the alarms are put into the cow record, they are also backed up and



Program description

restored.

Removing the NO ACTIVITY and NO RF SENDING alarms

"This alarm" (CLEAR THIS ALARM) refers to the alarm set in the first row. Choose YES and press Enter to remove only this type of alarm from the cow.

To remove all alarms on all cows set CLEAR ALL ALARMS to YES and press Enter. Make sure that the ALL-field is selected on the first row.

One specific type of alarm selected on the first row and CLEAR ALL ALARMS set to YES, will remove this type of alarm from all cows.

Removing 24 AND 48 HOURS NO RF SENDING is not possible from this display

The 24 HOURS NO RF SENDING and 48 HOURS NO RF SENDING alarms are used in Activity graph, function 1:2:1 and Activity data, function 1:2:2. Therefore it is not possible to clear these alarms. They will be cleared only by a new sending from the activity tag on that cow. If the user tries to clear those alarms the NO RF SENDING alarm will be cleared and the message shown to the left will be displayed.

After pressing Enter or Escape the ACTIVITY ALARMS display will appear again.

The three sending alarms will be automatically removed when a new sending is received from that cow.

1:2:5 CORRECT COW/TAG

This display presents -one by one- the cows showing no activity together with their tag number. A list of unknown tag numbers is also shown.

In this case "No activity" is defined as: cows alarmed for 48 or 24 hours no sending or cows with activity 0.

If a cow in the herd shows no activity, the most probable explanation is that she is programmed in ALPRO with a wrong tag number. An unknown tag is a tag that

ALARM TYPE CAN'T BE CLEARED
CAN ONLY BE CLEARED BY A NEW
ACTTAG SENDING
PRESS <ENTER> AND TRY AGAIN

CORRECT COW /TAG		*
COW NO: 285	TAG NO:	1285
UNKNOWN TAGS	123 234 345 567 789 1284	





Program description

reports activity though it is not connected to a cow.

This display makes it possible to correct cows with wrong tag numbers by connecting them to the right tag number.

4:3:3 RELATIVE YIELD AND ACTIVITY

From this display you can filter on cows with low relative yields or low relative activity.

The relative yield is defined as actual yield/expected yield. With high limit set to 80 (default), the filtrating will present all cows milking less than 80 % of their expected yield. Choose between the yields from the Latest Session or consecutive yields from Milking Session no 1, 2, 3 or 4, today or yesterday.

Relative Activity works a similar way and is defined as actual activity/expected activity.

RELATIVE YIELD AND ACTIVITY *	
HIGH LIMIT	80
LATEST MILK YIELD	

4:4 HIGH ACTIVITY COWS

The function contains all cows having high activity.

High activity indications:

- (+) Increased activity level 1, 24 h ago
- (++) Increased activity level 2, 24 h ago
- (+++)
- + Increased activity level 1, today
- ++ Increased activity level 2, today
- +++ Increased activity level 3, today.

A filter in the processor calculates the activity level for each cow.

Each cow has an individual database where her activity is stored hour by hour. The stored activity is currently compared to earlier values. If the cow is more active than the compared value, the filter will give a warning. From start it will take about 4–5 days to build up a cow's database with reliable data. The database will then be an activity pattern. When the cow e.g. is sent out to pasture the same hour each day, this activity will be built into the database and give no alarm for increased activity. A cow must generally have increased activity for 4 - 5 hours until the filter reports her to be +,

BREEDING	HEAT->INSEMINATE *	
COW NO: 285	99.06.30	99.07.21
GROUP NO: 3	*CHANGE*	15 (+++)
SIRE:	FERDINAND	
LAST INSEM:	99.07.12	
NO OF INSEM:	01	
LAST CALVING:	99.04.27	
CULL: NO		



Program description

++, or +++.

If the high activity alarm is more than 24 hours old, it will be reported as (++). This means that if a cow was reported with ++ at 5.00 pm one day, the report will say (++) at 5.00 pm the next day. After 48 hours the alarm will be removed.

HAMRA GARD

DATE:04.07.18 TIME:10.11 GROUP NO:ALL FILTER:YES PAGE: 1 UNIT:KG

ACT ALARM LIST
SUMMARY
GROUP NO:ALL FILTER:YES

NUMBER OF COWS	GRP NO	48 HOURS NO ACTIVITY (TOT)	NO RF SENDING (TOT)	24 HOURS NO RF SENDING (TOT)	48 HOURS NO RF SENDING (TOT)
12	ALL	3	8	6	8
1	3	0	0	1	0
2	4	0	2	1	2
8	5	3	5	3	5
1	6	0	1	1	1

ACT ALARM LIST
GROUP NO:ALL FILTER:YES

COW NO	GRP NO	48 HOURS NO ACTIVITY	NO RF SENDING	24 HOURS NO RF SENDING	48 HOURS NO RF SENDING
4	6	-	X	X	X
889	3	-	-	X	-
889	5	-	X	-	X
954	5	X	X	X	X
971	5	-	X	X	-
5567	5	-	X	-	X
5611	5	-	X	-	X

5:1:7:6 ACTIVITY ALARM LIST

This list shows cows with an alarm such as 48 HOURS NO ACTIVITY ALARM or NO RF SENDING. Cows can only have the 48 hours NO RF sending alarm when the 24 hours alarm is set. But it is possible to have 24 hours alarm without setting the NO RF SENDING alarm because that alarm could be switched off.

ACTIVITY *

1: GENERAL 5: RF TIME DIAG.

2: RF ANTENNA

3: LAST SENDING

4: FILTER SETTINGS

6:1:6 ACTIVITY

The functions in this menu allows you to configure the antennas and check the activity tags.

ANTENNA GENERAL *

NUMBER OF ANTENNAS:

START ADDRESS:

SYSTEM ALARM FOR ACTIVITY: YES

6:1:6:1 GENERAL

Enter the number of antennas you have and the start address.

The address range is 4 to 35 and the default value is 6.



Program description

The display also shows if a high activity alarm will cause an alarm shown on the processor screen or not.

6:1:6:2 TAG ON/OFF

The display presents a confirmation when a tag has sent an ON or an OFF message. The tag number, and the kind of message (ON or OFF) is presented. The antenna number presents all antennas that received the message.

TAG ON/OFF		*
TAG NO	64123	
STATUS:	ON	
ANTENNA NO:	1, 2, 3	

6:1:6:3 LAST SENDING

This function shows the last received sending in the system.

Shows also last sending from tag without corresponding cow number, i.e. unknown tag.

TAG NO, COW NO and the last reading from this activity meter.

TIME

The hour the last sending was received.

STATUS

Shows which mode the tag is set to. ON, OFF, WATCH, or STANDBY.

See function 1:2:3.

6:1:6:4 FILTER SETTINGS

Filter settings comprises settings for Sensitivity, Accuracy Breed state, Expected heat and Group data.

6:1:6:4:1 SENSITIVITY

The sensitivity parameter is set on system basis. The setting can be overruled by setting other levels for a group of cows in display 6:1:6:4:5, GROUP DATA. The sensitivity level for high activity can be set between 1 and 10.

Sensitivity level 1 means that the system

LAST SENDING										*
TAG NO	51285	12	10	12	14	8	9			
COW NO	234	8	9	10	7	12	18			
TIME	12:45:26	19	65	72	60	62	12			
STATUS	ON	4	4	6	12	10	16			

Current time data

FILTER SETTINGS		*
1: SENSITIVITY	5: GROUP DATA	
2: ACCURACY		
3: BREED STATE		
4: EXP. HEAT		

FILTER SETTINGS		*
	SENSITIVITY	
HOURS:	1	



Program description

requires only one hour with of high activity to set an alarm. For sensivity level 2, the system requires two consecutive hours of high activity. Sensitivity 3 requires 3 consecutive hours etc.

6:1:6:4:2 ACCURACY

The filter has three levels: 50 , 60 or 70. Every level has a corresponding accuracy expressed in %.

Default values are shown in the display, 50 corresponds to one plus sign, 60 to two plus signs and 70 to three plus signs.

Each level can be adjusted upwards and downwards by changing the activity level value..

FILTER SETTINGS			*
ACCURACY			
+	50	(99.996 %)	
++	60	(99.998 %)	
+++	70	(99.999 %)	

6:1:6:4:3 BREED STATE

Set NO for the breeding states where increased activity should NOT result in a high activity alarm.

Default value for all states is YES

FILTER SETTINGS			*
GIVE HIGH ACT ALARM:			
CALVING -> HEAT	YES		
HEAT -> INSEMINATE	YES		
INSEMINATE -> PRG CHK	YES		
INSEM -> PRG CHK2	YES		
INSEMINATE -> DRY OFF	YES		
DRY OFF -> BUILD UP	YES		
BUILD UP -> CALVING	YES		

6:1:6:4:4 EXPECTED HEAT

This display makes it possible to decrease the accuracy for high activity alarms for up to 4 days before and after the expected heat date. Default value is 2 days.

When a lower accuracy is set, also a smaller change in activity during the days close to expected heat will give an high activity alarm.

Note! Heat date must be reported in the Breeding menu 1:3. Otherwise the ALPRO system cannot calculate the expected heat date!

FILTER SETTINGS			*
DAYS FROM HEAT:		2	
EXP. HEAT ACCURACY:			
99.996 - 0.000 = 99.996	(50)		
99.998 - 0.000 = 99.998	(60)		
99.999 - 0.000 = 99.999	(70)		



Program description

GROUP DATA		*
GROUP NO:	1	
GIVE HIGH ACTIVITY ALARM:	YES	
GENERAL ACTIVITY TYPE:	STATE	
SENSITIVITY:		
HOURS:	2	(2)

6:1:6:4:5 GROUP DATA

In this display it is possible to set activity parameters for a **group of cows**.

High activity alarm could be turned off. Then set GIVE HIGH ACTIVITY ALARM to NO.

General activity type is recommended to be set to STATE. CONTINUOUS is a very sensitive setting used only to detect low activity. It can only be used for a group of cows with very settled activity pattern and is handled in ALPRO Windows. See ALPRO/ Activity meter system.

The sensitivity level can be set between 1 and 5. It refers to how many hours of activity that should pass before ALPRO makes an alarm. The value in parenthesis refer to the system setting in menu 6:1:6:4:1.

RF TIME DIAG.	TIME	TIME	*
ANTENNA NO: 1	12:34:25	12:28:12	
ADDRESS: 4	12:32:12	12:26:34	
TAG NO: 12345	12:31:05	12:24:27	
	12:29:10	---	

6:1:6:5 RF TIME DIAGNOSTICS

This function is used for detecting the range of the RF antenna, to estimate the size of the area where the antennas can receive a sending.

- Select a RF-interface.
- Select a tag and enter the number that we want to use for the test.

Every time we get a sending from that tag, i.e. striking the magnet on the tag, we set a time stamp on the screen and a beep is heard from the processor's speaker.

If antenna No. is set to 0 a new column is added showing the antenna no. of the connected antennas. It is then possible to detect if one sending is received by more than one antenna. The display will show the last received sending and from which antenna No.

RF TIME DIAG.	TIME	ANT	TIM	ANT	*
ANTENNA NO: 0	12:34:25	2	---	---	
ADDRESS: 2	12:32:12	4	---	---	
TAG NO: 12345	12:31:05	5	---	---	
	12:29:10	4	---	---	



Program description

BREEDING ATTENTION ON MPC		
FIRST HEAT	LED NO:	0
HEAT-> INSEM	LED NO:	0
INSEM CHK	LED NO:	0
PREG CHK ATT	LED NO:	0
HIGH ACT	LED NO:	0
DRY OFF ATT	LED NO:	0
RELATIVE ACTIVITY	LED NO:	0
COW IN WRONG GROUP	LED NO:	0
NO RF SENDING	LED NO:	0
MPC DISPLAY MODE:	COW AND YIELD	
PULSATOR TYPE:	EP100	
HIGH VACUUM DELAY:	5.0 S	

Part of display 6:3:2:1

To set breeding attentions (remind codes) for activity

It is possible to set breeding attentions (Remind codes) for activity parameters. The parameters are: High activity, No RF sending and Relative activity.

The breeding attentions are set on the processor in menu 6:3:2:1 or in the MPC unit. The LEDs on the MPC unit will then be lit when a cow, reported with the attention in question, enters that cow place.

ATTENTIONS (MPC)	*
1: ACT. LEVEL	
2: NO RF SENDING	
3: RELATIVE ACTIVITY	

BREEDING ATTENTION ON MPC			*
HIGH ACT:			
ACT. LEVEL	>=	+	
DAYS SINCE INSEM	>	-	
HOURS SINCE HIGH ACT	<	20	
HOURS SINCE HIGH ACT	>	-	
DAYS IN MILK	>	10	
PREGNANT	EXCLUDE		
CULL	EXCLUDE		

The attentions are defined in menu 6:1:6:6:1 - 3 and follows the same pattern. First the breeding attention is defined and then max and min values are set to define the time periods when reporting shall take place. The sign "-" always means that the parameter is ignored.

6:1:6:6 ATTENTIONS (MPC)

Used to define Breeding attentions for activity to be shown on as remind codes on the MPC unit.

6:1:6:6:1 HIGH ACTIVITY

The picture shows the default values.

High activity is defined by the Activity level; i. e. one or more plus signs, two or three plus signs or three plus signs during the last 24 hours.

The time period when the system shall look for active cows is defined by:

- A time period after insemination. Setting range: 1 and 99 days. By setting for example >12 days, the system will start to look for high activity when 12 days has passed since insemination.
- The hours shortly after the high activity



Program description

start. This time period is set on the two rows HOURS SINCE HIGH ACT. For the first row the value < 20 means that the reporting time will end 20 hours since high activity started. Settings between 10 and 48 are possible.

A value set on the next row will give a start time for the reporting time. Values between 0 and 16 can be set. *Note that this value must be lower than the previous otherwise no reporting will take place.*

- Days in milk > 10 means that reporting will start 10 days after calving. Setting range: 0 -200 days.
- Pregnant and cull cows respectively can be excluded (default) or included.

Recommended settings

The default values will make the system work in the same way as the settings in ALPRO 6:50, when parameter high activity was used as breeding attention (=Remind code). In ALPRO version 6.60 it is possible to define more exactly the cows to be noticed by the breeding attention LED. This means that high active cows, which are not supposed to be inseminated, will be sorted away by the system. This, in turn means, that the LED will bring attention to fewer but more relevant cows.

The recommended settings are:

ACT. LEVEL	<= +
DAYS SINCE INSEM	> 12
HOURS SINCE HIGH ACTIVITY	<24
HOURS SINCE HIGH ACTIVITY	>0
DAYS IN MILK	>50
PREGNANT	EXCLUDED
CULL	EXCLUDED



Program description

BREEDING ATTENTION ON MPC			*
NO RF SENDING			
HOURS SINCE SENDING	>	8	
DAYS FROM HEAT	>	-	
DAYS IN MILK	<	40	
DAYS SINCE INSEM	>	-	
PREGNANT		EXCLUDE	
CULL		EXCLUDE	
+ / + + / + + + /		EXCLUDE	

6:1:6:6:2 NO RF SENDING

No RF sending is defined by the numbers of hours since last sending. Setting range: 4 - 48, default is 8.

- Reporting can be set to start close to expected heat, setting range is 0-4.
- Days in milk > 40 means that reporting will start 40 days after calving. Setting range: 0-200 days.
- Days since insemination is by default "-". Setting range: 0- 200

Pregnant, cull or high active (+ / ++/ +++) cows can be excluded (default) or included.

BREEDING ATTENTION ON MPC			*
RELATIVE ACTIVITY			
REL. ACTIVITY (%)	>	-	
REL. ACTIVITY (%)	<	60	
HIGH ACT PROBABILITY	>	-	
HIGH ACT PROBABILITY	<	1.5	
DAYS SINCE INSEM	>	-	
DAYS SIN MILK	>	-	
+ / + + / + + + /		EXCLUDE	
PREGNANT		EXCLUDE	
CULL		EXCLUDE	

6:1:6:6:3 RELATIVE ACTIVITY

The picture shows the default values.

The relative activity is expressed by the % value of the animal's actual activity divided by expected activity. In this display it can be defined between 0 and 250 %.

The relative activity is defined on the first two rows. > - means that the parameter is neglected. A value between 0 and 250 % can be set, meaning that cows showing an activity lower than the preset value will **not** be reported.

On the second row the value < 60 means that cows showing a relative activity less than 60 % will be reported.

The high activity probability gives an estimation on how valid the relative activity value is for the cow. The probability is calculated from the variation of the cow's normal activity. The lower the high activity probability is, the more likely is it that the cow is showing a true low activity.

High activity probability is defined just like relative activity. Setting range: 0 - 99,9.

Days since insemination is by default "-". Setting range: 0 - 999

Days in milk is also by default set to "-". Setting range is 0-200.

Pregnant or cull cows can be excluded (default) or included.



Program description

High active (+ / ++/ +++) cows can be excluded (default), included or mandatory.

Recommended settings

The relative activity is in the first place designed for identifying cows with low activity. The recommendation is to include all cows in the selection; also pregnant, cull and high active cows.



