



# User Guide

V.14 – Oct 2012 English (UK)

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## 1 Introduction

### 1.1 The origins of the IceQube and the CowAlert System

IceRobotics has been supplying animal science institutions worldwide with specialist behaviour monitoring solutions since 2005. Its IceTag and IceQube sensors are used by leading livestock researchers in over 20 countries to enable research into health, welfare and behaviour, principally in dairy cattle. Research based on these sensors appears in highly regarded journals such as the Journal of Dairy Science and the Journal of Applied Animal Behaviour Science. Recent published papers have covered diverse themes including oestrus expression, lameness patterns, different bedding types, hoof trimming methods and feed intake.

The IceQube was developed in 2008 from the proven IceTag platform to provide a sensor that is suitable both for large-scale research and commercial farm applications. It was launched in 2010 after extensive field-trialling across many herds and sites. The IceTag and IceQube are designed to be fully compatible with each other to ensure that ongoing research insights can be extended into practical applications in commercial farming.

Both sensors use a 3-axis accelerometer, capturing precise data on the cow's movements several times per second, providing highly detailed activity and behaviour information. The CowAlert system was developed to provide advanced management and analysis capability for the data generated by the IceQube.

The system's internet connectivity allows large amounts of data to be securely stored and extensively analysed. Users can keep information over several generations of animals if they wish and complex mathematical analysis and calculations can be performed which would not be possible on older-generation stand-alone systems. Information from different sites can be compared or combined and users can access the system from any location with an internet connection. Information can therefore be shared remotely with third parties such as vets or feed advisors if desired.

The IceQube's excellent heat detection performance has been verified through a series of scientific trials involving progesterone testing. With the IceTag established as the market leading choice of dairy animal scientists, the award winning IceQube and CowAlert system is now being selected by the most progressive dairy farmers.

*CowAlert and IceQube are Registered Trade Marks of IceRobotics Ltd*

## 1.2 Minimum System Requirements to view CowAlert

Using your unique User ID and password you can access CowAlert from anywhere there is a reliable internet connection and a modern web browser, whether that is the farm office or from the other side of the world. There is no software to be installed and all updates are automated so the most recent version will always be available. Accessing CowAlert through an internet broadband connection is preferred as this provides good speed and reliability.

CowAlert can therefore be viewed on any internet-enabled device such as a PC, Mac, laptop or tablet PC. It is suggested that equipment with a reasonable sized screen is used to ensure full benefit from the advanced graphing capability.

Recommended web browsers include:

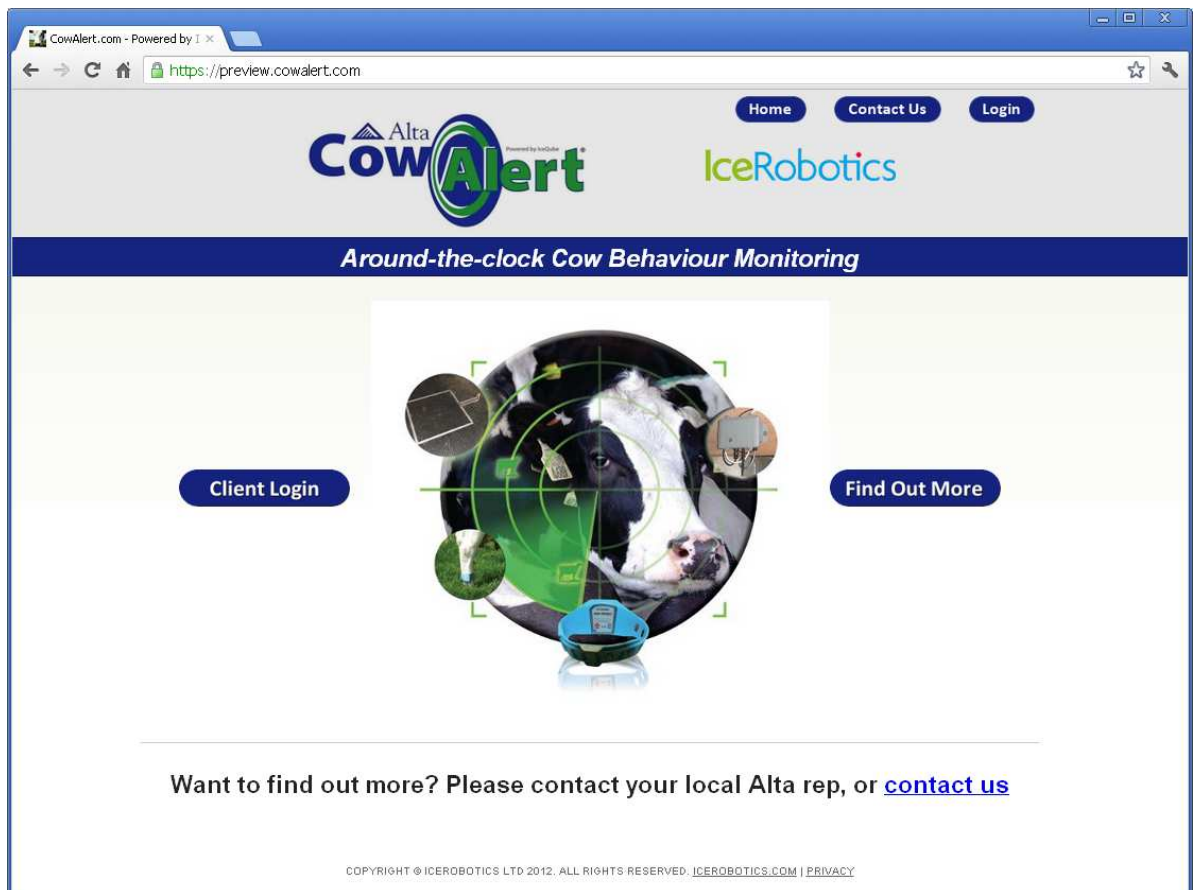
- Firefox version 4
- Google Chrome (this updates itself so the latest version should always be installed)
- Internet Explorer 8
- Safari for mobile devices

## 2 Getting connected to CowAlert

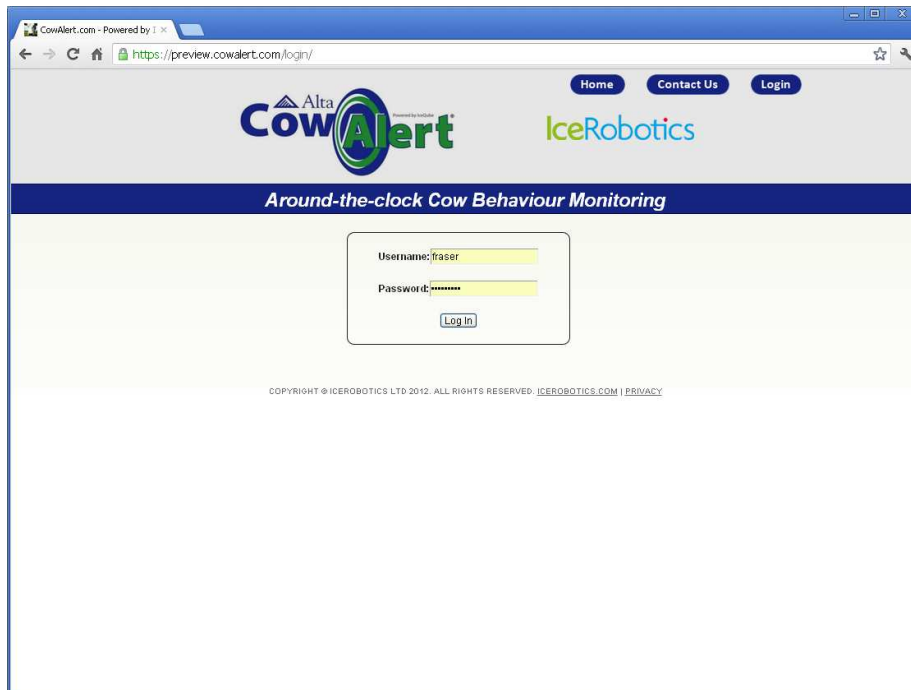
1. You should have a modern internet browser (such as Google Chrome, Firefox 4, Internet Explorer 8 or Safari) installed on your PC or equivalent.
2. Ensure that you are connected to the internet
3. Open your internet browser
4. In the address bar, type this address and then press enter

**[www.cowalert.com](http://www.cowalert.com)**

5. You should now see this login screen:



6. Click on **Client login** which will take you to the login page.



7. Enter your username and password and press **Enter** – this will take you to the Home Page of the CowAlert system for your farm.

***Your username and password are unique to you. Please do not share these details with others as they will then be able to make changes that may affect your data and therefore the effective functioning of the system. If however, you would like to authorise someone else to have access, please email [support@cowalert.com](mailto:support@cowalert.com) and a separate username and password can be issued for each additional user.***

If you forget your password or believe that it is no longer secure, please email [support@cowalert.com](mailto:support@cowalert.com) and a replacement will be issued.

TIP: Bookmark your CowAlert page, or set it up as your Home Page on your browser, so you can access it quickly in the future

### 3 CowAlert Home Page

The Home Page allows you to access the different functions of the system – it is like a Table of Contents to direct you to where you want to go in the system.

The functions are:

- Animal activity graphs
- Heat alerts
- Health alerts if you have subscribed to receive them
- Average herd lying times
- IceQube management functions

The illustration below provides an overview of the CowAlert front page.

Click on your farm name on any page to come back to this front page. It acts as a “Home” button.

Navigation bar allows you to access different features of CowAlert

Click here to logout from the system and select your language preference. Users can logout from any page.

The screenshot shows the CowAlert interface for 'The Dairy Farm'. At the top is a navigation bar with 'CowAlert', 'Heats', 'Manage', 'Reports', 'Site', 'Help', and buttons for 'Cow...' and 'IceQube...'. The user 'a.user' is logged in. The main content area includes:

- Heat Alerts:** A table showing the number of cows in heat over time.
- Download Metrics:** Two boxes showing download success rates for 12h vs 48h (100.0%) and 24h vs 60d (98.2%).
- Latest Data:** A table listing cow IDs, IceQube IDs, and their last download times.
- Herd Metrics:** 'IceScore Mobility' score of 1.6 with a color-coded bar (green, amber, red) and a 'Lying Time' of 11h10m.

Click this link to email the heats summary to someone. A pop up window will appear and you enter the email address

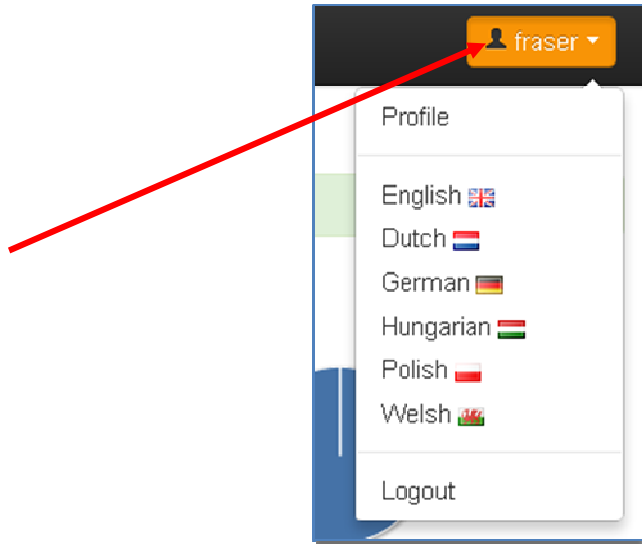
The number of cows in heat. Click on any number takes you directly to the detail for that cow

and the latest downloads and times.

Average lying time of the herd over 24 hours  
IceScore Mobility. Average Mobility Score of the Herd, plus indicator of the number of animals flagged as green, amber and red. Poor mobility scores may indicate lameness or another health problem.



Click on orange button to open up user profile options such as language selection and to logout. Other languages will be added as they become available.



### 3.2 Navigation Bar Details

Separate sections will be covered in more detail below.

The Dairy Farm

Heats: Accesses list of heats – see section 5

Manage: Associating cows with IceQubes, removing attachments, adding cows – see section 7

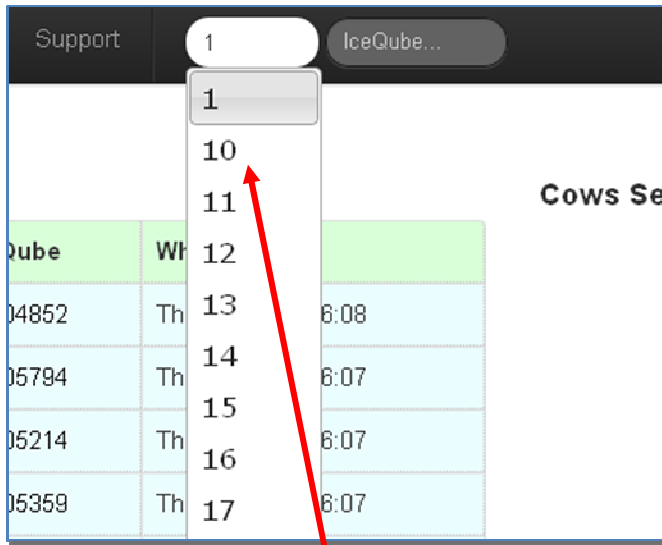
Reports: Accesses lying time, IceScore and IceQube reports - see section 8

Site: Accesses information and settings – see section 9

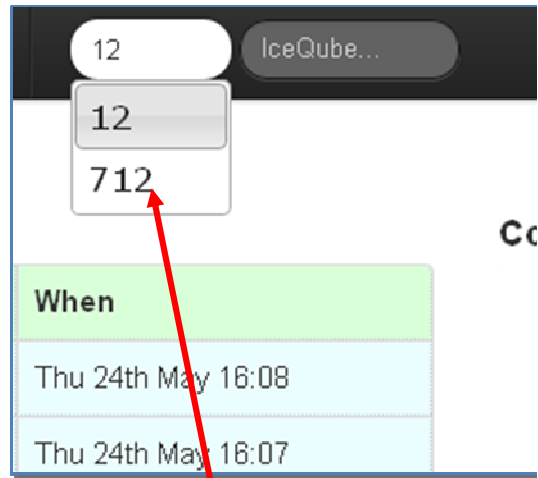
Help: Send an email to [support@icerobotics.com](mailto:support@icerobotics.com) – see section 13

Cow / IceQube: Search directly by Cow or IceQube

### 3.3 Search for Cow or IceQube Numbers



Search by Cow: Entering a number 1 shows all cows that have the number 1 in cow number



Adding a second digit, in this case a 2, searches for the number 12 and displays all cow numbers with this number pair.

Select the cow you wish to view and left mouse click to select, or enter a cow number and <enter>

Use the same process to search for an IceQube number, using the IceQube field.

## 4 Behaviour Graphs & Summary Information

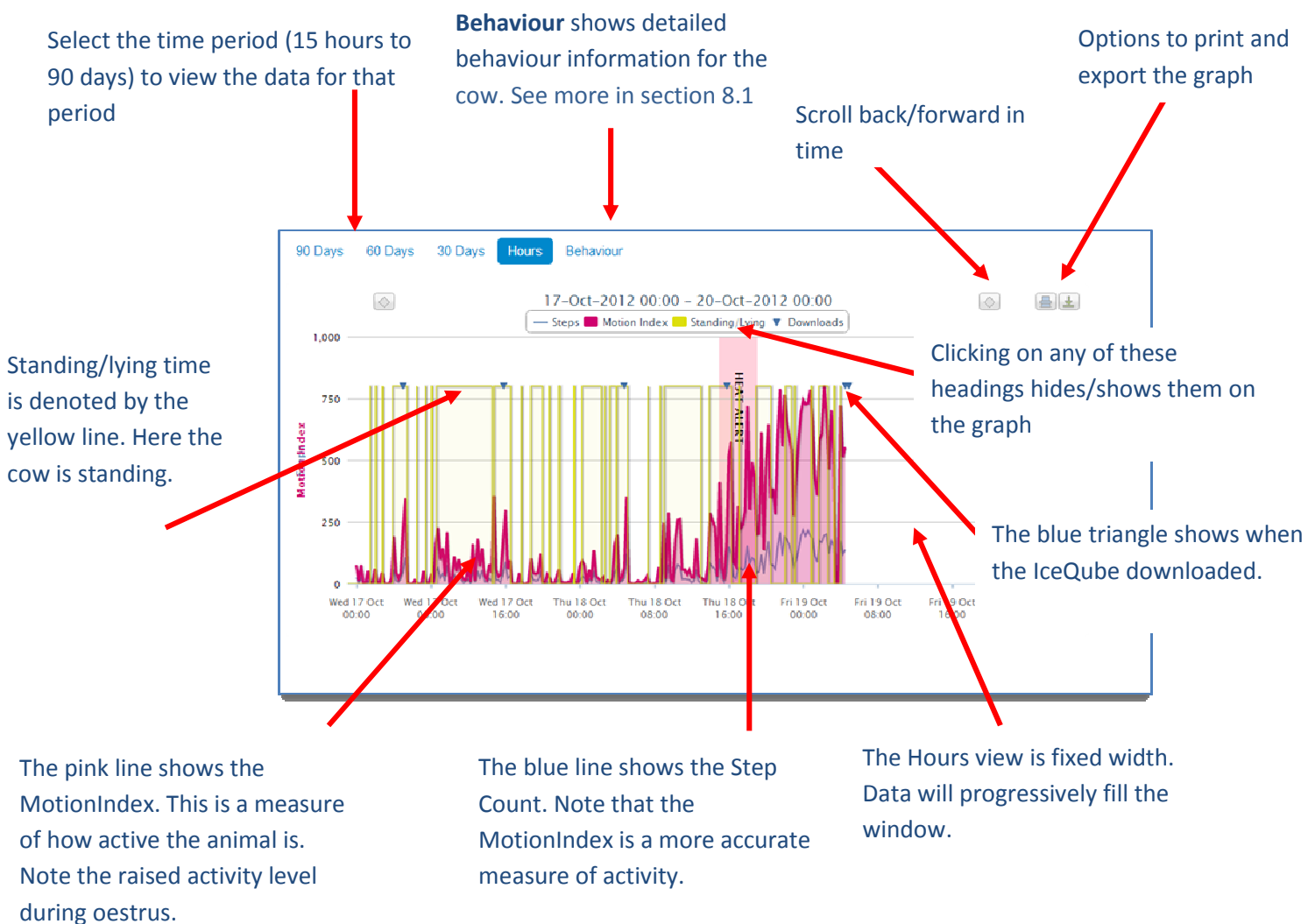
The behaviour graph page is divided into a graph and several tables.

### 4.1 Behaviour graph: Hours view

The Hours activity graph provides more detailed information on the animal’s behaviour. This view is particularly useful when looking at heat events or suspected health anomalies.

The Hours graph can be accessed either from:

- Selecting a heat event and clicking on the chart icon (see section 5)
- Selecting the Hours tab on the main cow activity screen

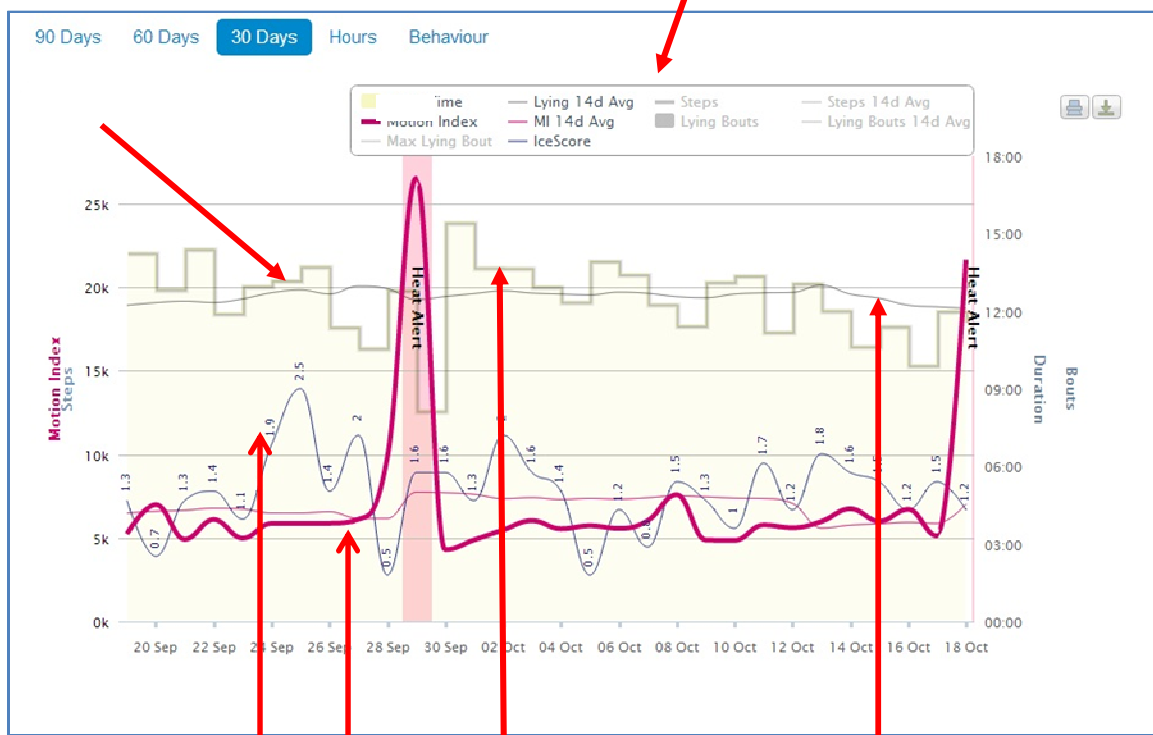


## 4.2 Behaviour Graph: Multi-day view

An example of a 30 day activity graph is shown below. The activity graphs include the following information:

- MotionIndex – how active the animal has been (thick pink line)
- MotionIndex 7 day average (thin pink line)
- Lying/standing (thick grey line)
- Lying time 7 day average (thin grey line)
- Steps (thick blue line)
- Steps 7 day average (thin blue line)
- IceScore

Click on any of these headings to show or hide that feature on the graph



IceScore: Numbers above 2 denote a potential health problem

MotionIndex

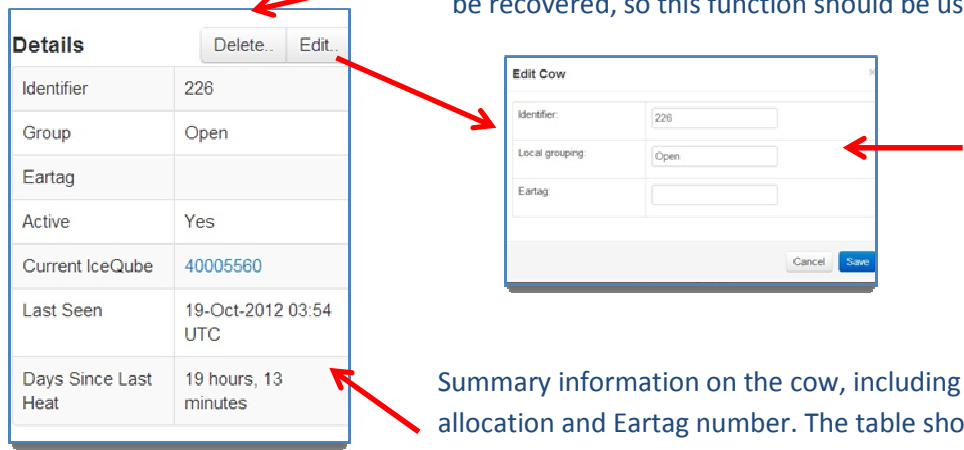
Lying time (higher values indicate that the cow is lying for longer)

Lying time average. Note that this is very consistent for this cow.

### 4.3 Behaviour Tables

Several tables are shown on the screen along with the behaviour graph.

Delete a cow by clicking here . Note that this will remove the animal from the cow list along with all its data. The data can not be recovered, so this function should be used with caution.



Click on **Edit** to edit the Cow Number, Group or Eartag fields. Use Cancel to exit without saving.

Summary information on the cow, including optional Group allocation and Eartag number. The table shows the number of the IceQube that is currently attached, when the IceQube last downloaded, and when the last heat event occurred.

| Details              |                       |
|----------------------|-----------------------|
| Identifier           | 226                   |
| Group                | Open                  |
| Eartag               |                       |
| Active               | Yes                   |
| Current IceQube      | 40005560              |
| Last Seen            | 19-Oct-2012 03:54 UTC |
| Days Since Last Heat | 19 hours, 13 minutes  |

| Edit Cow  |                                   |
|---|-----------------------------------|
| Identifier:   | <input type="text" value="226"/>  |
| Local grouping:   | <input type="text" value="Open"/> |
| Eartag:   | <input type="text"/>              |
| <input type="button" value="Cancel"/> <input type="button" value="Save"/> |                                   |

The **Events** Table provides a list of the dates of previous Heats.

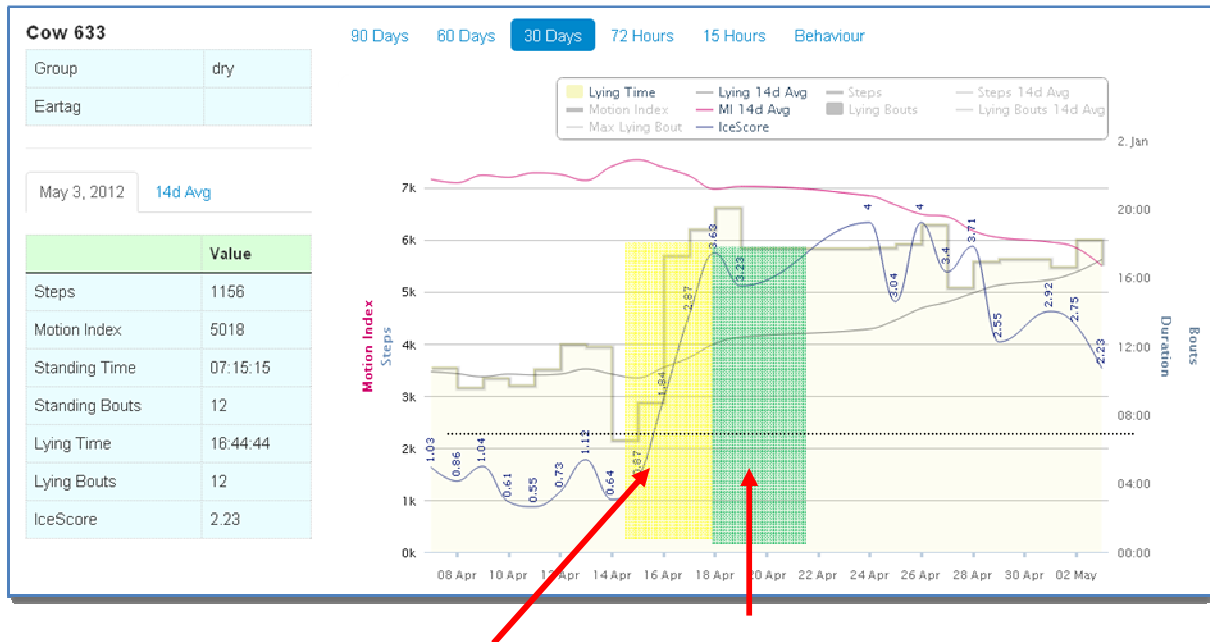
The **IceQube Attachments** table provides details on when IceQubes were attached and removed from the cow, and the associated IceQube numbers.

The **Summary Information** Table provides summary information for the current day, the average of the last 7 days and the average of the last 14 days

## 4.4 IceScore Mobility

IceScore is an optional paid-for subscription service subject to a free trial period during its validation phase. It provides an alert for animals that exhibit a change in mobility that is likely to be related to some sort of health issue such as lameness or mastitis.

The example below shows an IceScore trace for a cow that was confirmed to have gone lame.



IceScore identified a mobility issue

Dairyman reported problem here, 2 or 3 days into the problem

See also section 8.2 for further information on IceScore Mobility.

## 4.5 Interpreting the graphs

To assist in identifying unusual behaviour patterns it is useful to know the expected range of “normal” behaviours.

Whilst this can vary between farms, the table below shows the typical ranges for Motion Index, Step Count and Lying Time.

| Behaviour Measure | Indoor  | Grazing   |
|-------------------|---|---|
| Motion Index      | 5000-10000  | 10000+ (can be as high as 30000, 40000 depending on how far cows have to walk to pasture) |
| Step Count        | 1000-3000 (generally around 1/4 of the Motion Index)  | 3000-10000  |
| Lying time        | 8-16 hours. Note that scientific experts recommend that dairy cows should lie for 12 hours per day <sup>1</sup><br>Low herd or individual lying times could be an indicator of several factors including illness or cow comfort issues. | 8-16 hours (often higher outdoors than indoors)   |

<sup>1</sup> Jensen, M.B., L.J. Pedersen, and L. Munksgaard. 2005. The effect of reward duration on demand functions for rest in dairy heifers and lying requirements as measured by demand functions. Appl. Anim. Behav. Sci. 90:207-217

## 5 Heat Alerts

### 5.1 Viewing recent heat alerts and their associated behaviour graphs

Heat alerts are shown in the left-hand table on the farm homepage.

| Heat Alerts |      |
|-------------|------|
| Hours Ago   | Cows |
| 0 - 12h     | 3    |
| 12h - 18h   | 3    |
| 18h - 24h   | 1    |
| 24h - 36h   | 2    |
| Total       | 9    |

Click on any row to open the details of the highlighted alerts

Use the Ignore button to cancel the Heat alert (eg if caused by a known event). Use the Info button to view further details and to reinstate an alert (eg if Ignored by accident)

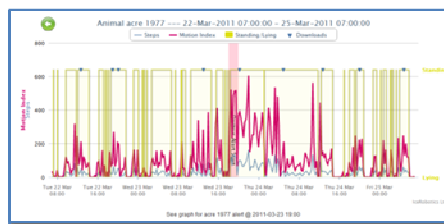
Click to open drop-down menu to select different search criteria

| Cow    | Heat Start     | Days Since | AI Window             | Links        |
|--------|----------------|------------|-----------------------|--------------|
| 1 6348 | Oct 2012 14:00 | 22         | Sat 20, 02:00 - 14:00 | Ignore, Info |
| 2 6487 | Oct 2012 12:00 | 37         | Sat 20, 00:00 - 12:00 | Ignore, Info |
| 3 6346 | Oct 2012 12:00 | 20         | Sat 20, 00:00 - 12:00 | Ignore, Info |

Click the cow number to show activity graphs for this animal

This column gives the time the heat started. The search box below it also allows further refinement. Click column header to order by date /time

This is the recommended AI window and is set by the farm by selecting **Site** from the main menu bar, and then **Settings** (see section 9.1)



Clicking the chart icon opens the Hours behaviour graph so the user can view the activity around the Heat



## 5.2 Viewing all Heat alerts

A list of all cows and Heat alerts can be accessed by selecting **Heats** from the top menu bar.

The table can be sorted Cow or Heat Start by clicking on the appropriate column heading

Note that the cows within a current AI time window are highlighted in yellow. See section 9.1 on how to set the AI window.

|    | Cow  | Group | Heat Start        | Days Since | AI Window               | Links        |
|----|------|-------|-------------------|------------|-------------------------|--------------|
| 1  | 6348 |       | 19 Oct 2012 14:00 | 22         | Sat 20, 02:00 - 14:00   | Ignore, Info |
| 2  | 6487 |       | 19 Oct 2012 12:00 | 37         | Sat 20, 00:00 - 12:00   | Ignore, Info |
| 3  | 6346 |       | 19 Oct 2012 12:00 | 20         | Sat 20, 00:00 - 12:00   | Ignore, Info |
| 4  | 5623 |       | 19 Oct 2012 11:00 | 16         | Fri 19, 22:00 - 11:00   | Ignore, Info |
| 5  | 5894 |       | 19 Oct 2012 07:00 | 20         | Fri 19, 19:00 - 07:00   | Ignore, Info |
| 6  | 6429 |       | 19 Oct 2012 06:00 | 20         | Fri 19, 18:00 - 06:00   | Ignore, Info |
| 7  | 6409 |       | 19 Oct 2012 01:00 | 21         | ▼ Fri 19, 13:00 - 01:00 | Ignore, Info |
| 8  | 5910 |       | 18 Oct 2012 14:00 | 22         | ▼ Fri 19, 02:00 - 14:00 | Ignore, Info |
| 9  | 6505 |       | 18 Oct 2012 12:00 | 23         | Fri 19, 00:00 - 12:00   | Ignore, Info |
| 10 | 6478 |       | 18 Oct 2012 09:00 | 22         | Thu 18, 21:00 - 09:00   | Ignore, Info |
| 11 | 6589 |       | 18 Oct 2012 07:00 |            | Thu 18, 19:00 - 07:00   | Ignore, Info |

## 5.3 Receiving Heat Alerts by email

In addition to viewing heat alerts at any time via CowAlert, automated email messages can be sent to specific email addresses.

To set up automated email alerts, email [support@cowalert.com](mailto:support@cowalert.com) with the following information:

- Farm name
- Name and email address of the person/people to receive email alerts
- When the email alert should be received, eg once a day, sent at 3pm, or twice a day, sent at 6am and 6pm.

The email that is sent will include heat alerts generated within the last 72 hours and will look like the example below. Note that clicking on the cow number will show the relevant activity graph.

Estrus alerts beginning in the last 36 hours

| Event      | Subject             | Started        | AI Recommendation     |
|------------|---------------------|----------------|-----------------------|
| Heat Alert | <a href="#">894</a> | Mon 21 @ 00:00 | Mon 12:00 - Mon 18:00 |
| Heat Alert | <a href="#">36</a>  | Sun 20 @ 16:00 | Mon 04:00 - Mon 10:00 |

Contact Support ( [support@icerobotics.com](mailto:support@icerobotics.com) ) for changes to this mail

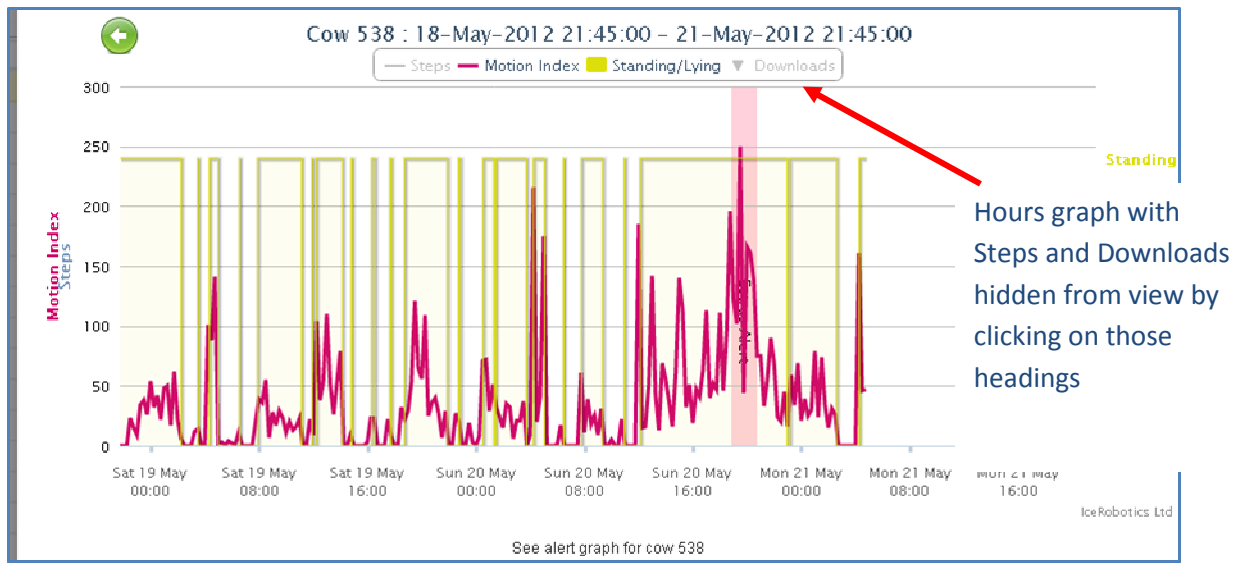
## 6 Lying Behaviour

### 6.1 Lying behaviour for the individual cow

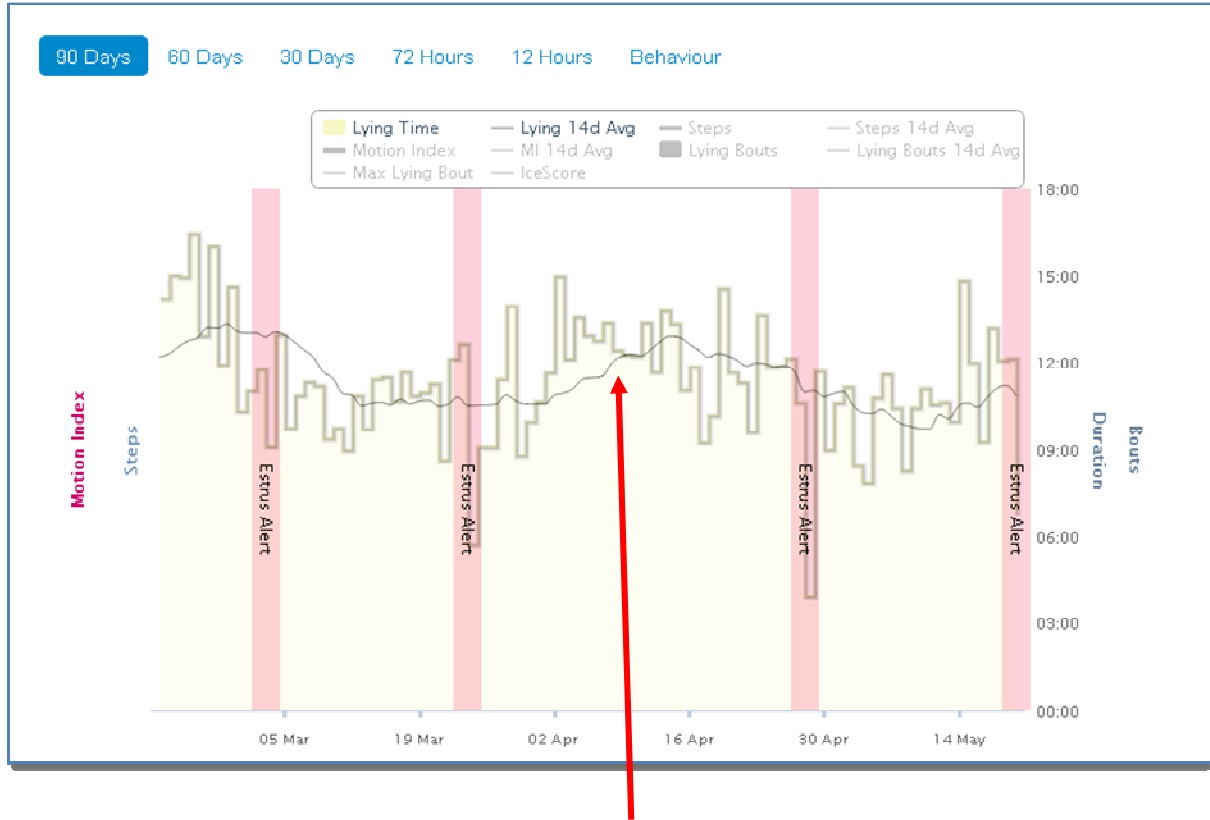
For the individual cow, CowAlert provides:

- Cow-level: Graphical overview of lying time and average lying time (Activity graphs)
- Cow-level: Total Lying time per day, and as a 7 and 14 day average (table located below activity graph for the specific cow) and as a graphical view (Behaviour view option on Activity graph)
- Cow-level: Number of lying bouts each day. A lying bout is when a cow changes from standing to lying to standing. (table located below activity graph for the specific cow)
- Herd-level: average number of hours the herd is lying.
- Typically she will have a very similar number of bouts each day and any change to that may indicate a potential problem.

Below is an example of an Hours graph, showing only the MotionIndex and the lying/standing patterns. Note the increased activity and increased standing time associated with the Heat event. The steps and downloads are hidden by deselecting them in the key.



Below is an example of a 90 day graph showing only the lying time plus 7 day average lying time.



Hiding the Steps and MotionIndex from view clearly shows the lying pattern and lying time trend of this animal.