



EMBEDDED TECHNOLOGY SOLUTIONS

Silent Herdsman TM ; The Heat Detection System for the 21st Century

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Outline

- Background
- *Silent Herdsman*TM Platform
 - Methodology
 - Operation
 - Features
- *InterHerd* - Dairy Herd Management
- Evolution
- Summary



Technology?



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- potential solution to mitigate the continual economic pressures within the global farming sector?
 - profit margins being eroded; staff cost rising
 - desirable to automate detection of welfare (and revenue) threatening animal conditions
- only viable at appropriate cost and ease of deployment, use and maintenance
 - cost of technology at increased capability getting lower
 - electronic chips for storage, processing and communications are sufficiently low cost that the return in revenue of investing in technology based solutions is attractive
 - provided as a service by a third party?



The Silent Herdsman Solution



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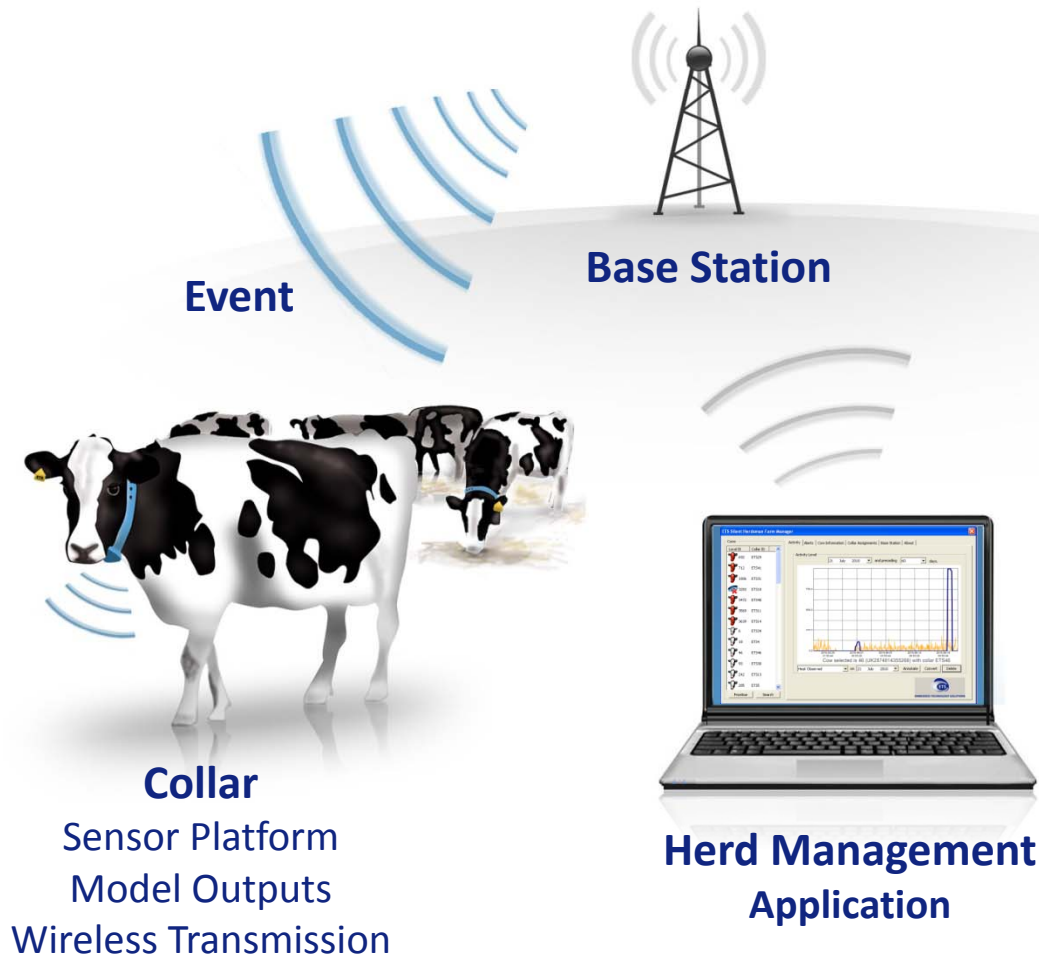
“A monitoring system for cows based on a neck mounted collar continuously monitoring individual cows’ activity and detecting automatically animal conditions. Forming the basis for decision support service provisioning.”



The *Silent Herdsman*TM Platform



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Inter-Herd DB
National DB
Global DB



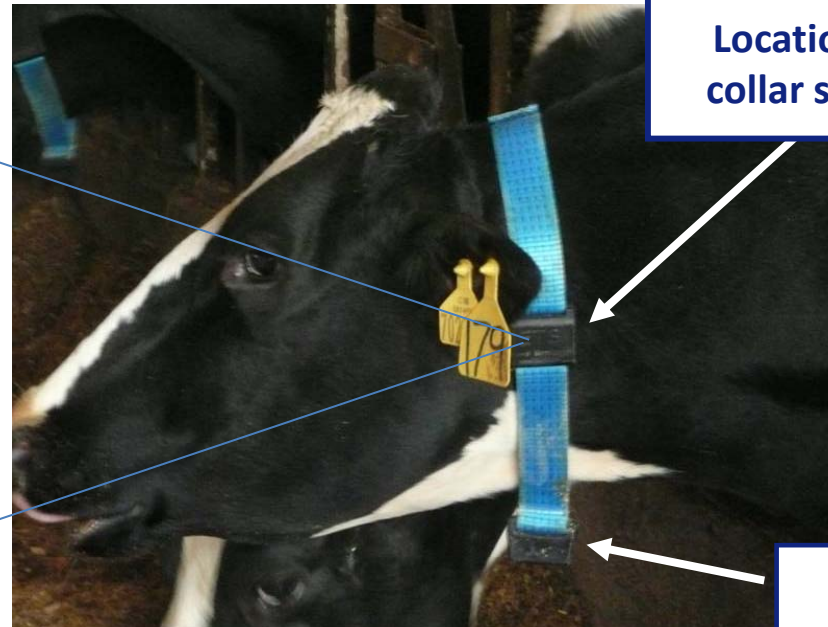
**Alert GUI, SMS,
GSM, Internet**



The Collar



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Location for
collar sensor

Weight

Approximate positioning of sensor unit.
This is not critical but better rf coverage obtained if unit
Placed around 'ear' level as shown





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Features

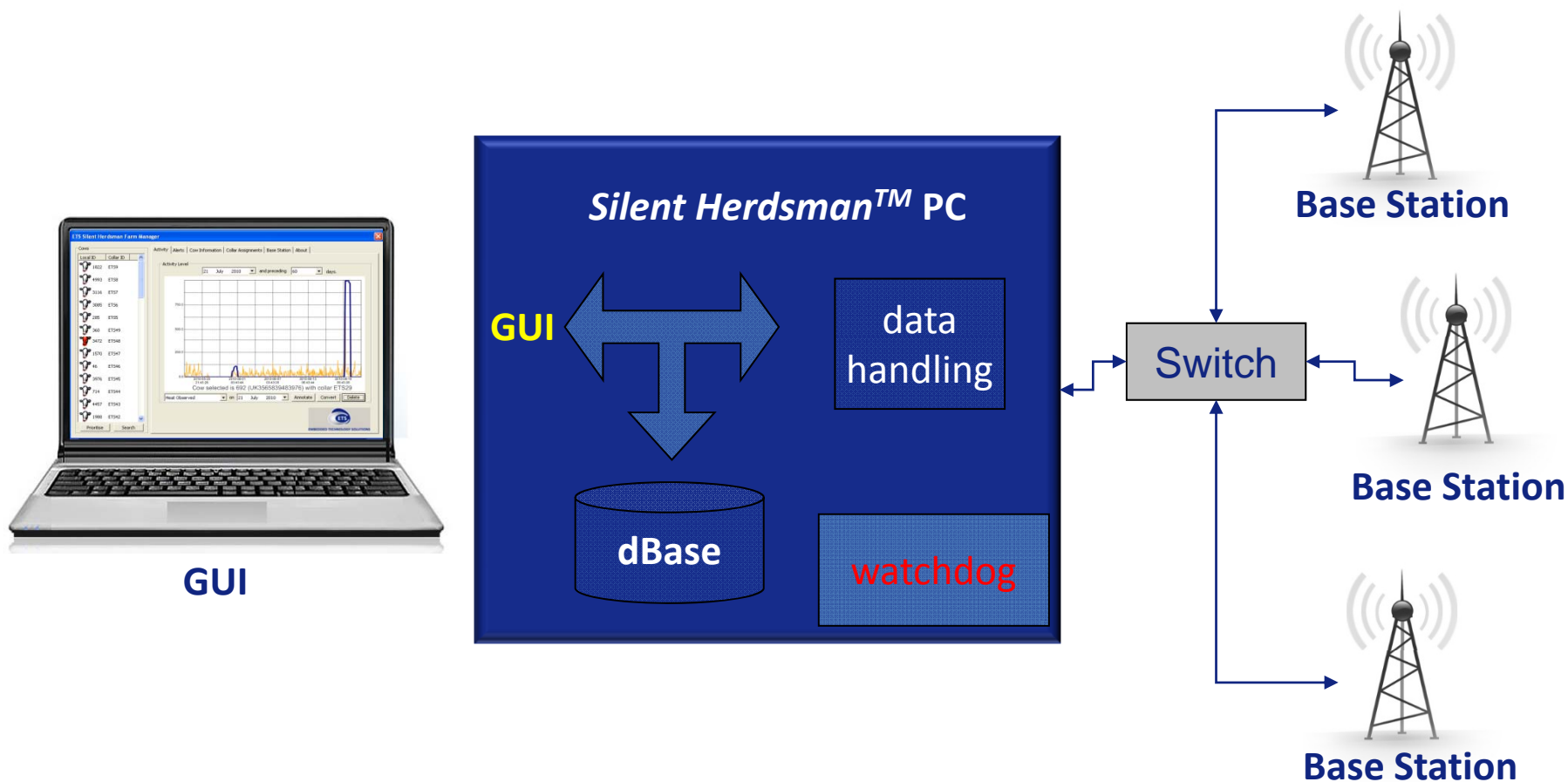
- Collar mounted sensor system
 - 3-axis accelerometer mounted on the side of animal's head
- Remote, wireless system that transmits data from cow collars to a backend system
 - an intelligent Medium Access Control (MAC) that enables data transmission to take place as soon as a cow enters into a base station effective area
 - effective transmission range of 90 metres using a wireless relay link
- Artificial intelligence algorithms embedded onto collar which interprets the sensor data and predict the state of the animal; amount of data transmitted is thus minimized giving
 - a scalable solution supporting herds >1000 cattle



Silent Herdsman™ Platform; Scalability



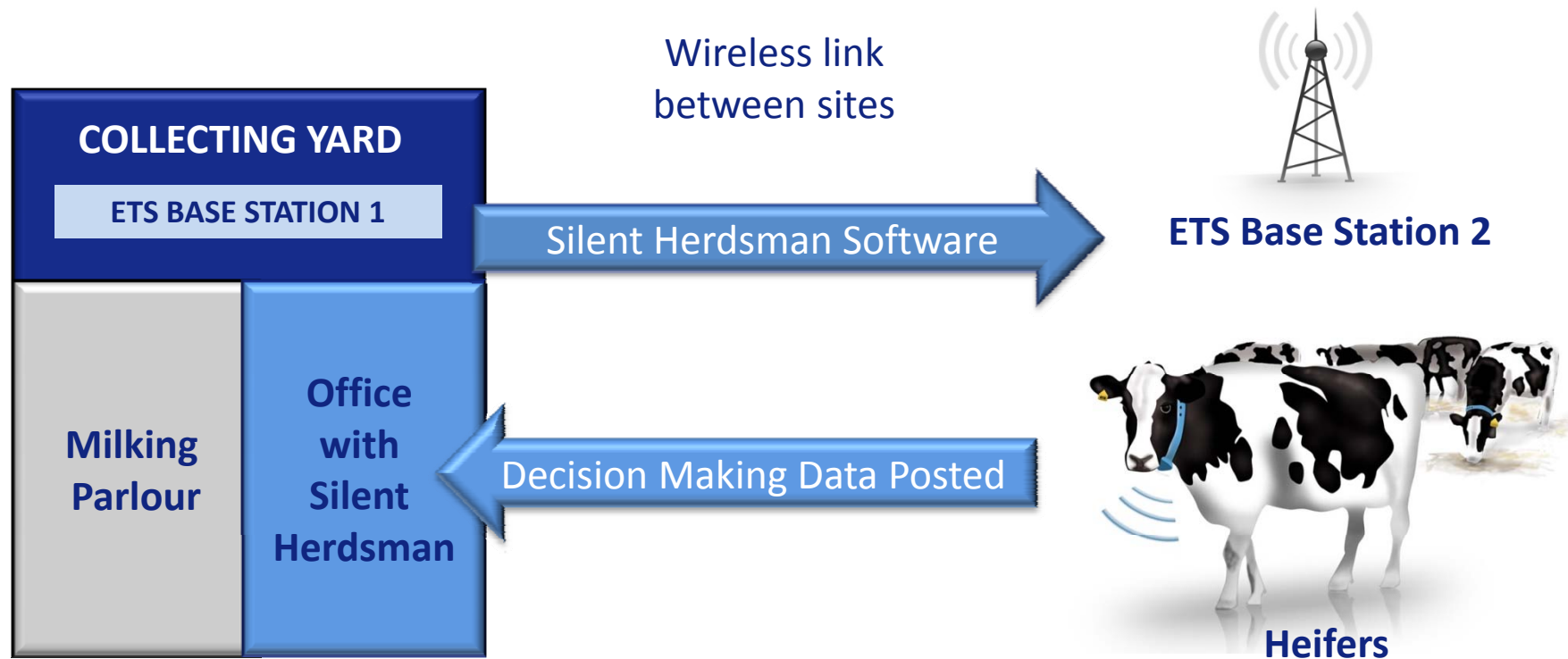
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Multiple Farm Locations



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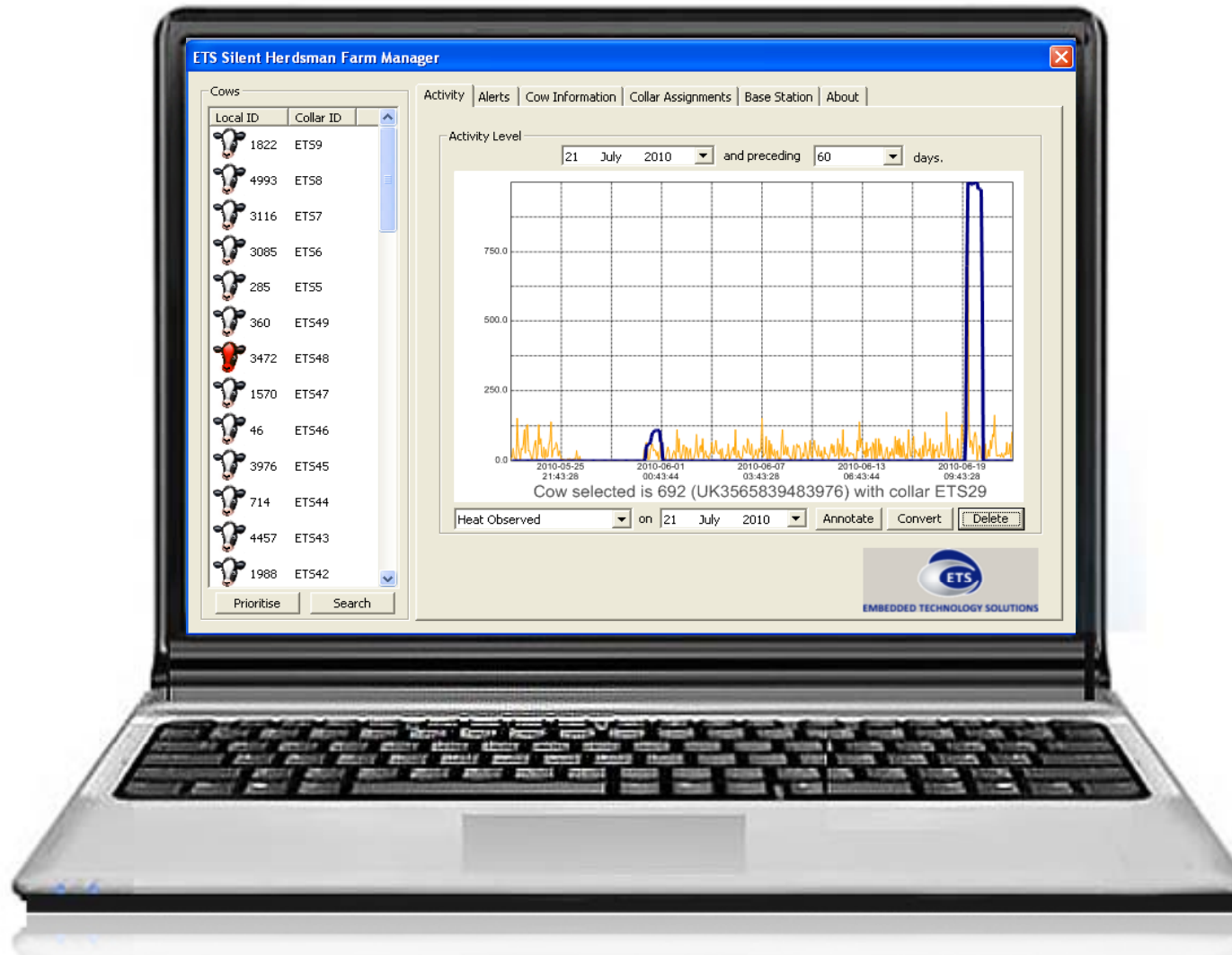


Farmers able to monitor remotely housed animals using a Silent Herdsman WiFi bridge at distances in excess of 2km

Presentation; GUI



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InterHerd



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- Flexible setup and reporting
- Full data entry facilities, including treatments, drugs and batches, movements and all health and fertility events
- Customisable reporting allowing the user to set up the reports as they wish
- Comprehensive health and fertility reporting
- Full milk production reporting with averages and graphs
- Easy cow record look up facility
- In depth analysis of management trends including key performance indicators





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Features

- Milk Production Management
- Health and Fertility
- Legislative Requirements
- Links to a Range of Parlours
- Data Export/Import Functionality
- Future Developments; *InterHerd*⁺
 - Integration with *Silent Herdsman*TM
 - Simpler Navigation and Data Presentation





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Evolution

- ETS and NMR will extend the on-farm decision support functionality (oestrus being the first feature focus) to provide early indication of other conditions associated with animal welfare e.g. lameness, parturition etc
 - utilising the same hardware platform
 - development of novel, self learning animal specific models that will identify significant departures from normal behaviour that can be related to conditions of interest utilising the methodology applied to yield accurate oestrus detection
 - a customised information presentation tool that displays the data in a manner that will assist a stockman to make an informed decision and capable of being linked to existing applications





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The Future of Farming

Wireless Sensor Network , updating farmers with real data...in real time !



Creating 24x 7 Animal Welfare Index.....using Condition Based Monitoring towards improved Asset Management.





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Questions?

