

## Keeping track – Radiofrequency identification of animals

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**P**et owners can generally be counted on to recognize their own companion animals. But owners are not the only ones who may need to identify animals. Veterinarians require positive identification to provide proper treatment. Customs officials need to know the history of animals crossing national boundaries. The work of humane societies is made much easier when they can quickly find the owner of a lost pet.

Still more factors come into play when it comes to identifying livestock. On the farm, computerized milking and feeding equipment can provide individualized treatment. Off the farm, new owners, cattle sale yards, slaughterhouses and officials responsible for taxes or subsidies need to track animals belonging to numerous owners.



Alpaga,  
Morgins, Valais,  
Switzerland

photo: P. Krieger

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identification market  
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mature, competitive market.”**

It all adds up to making the field of identification applications one where the need for standards is very large – and rapidly growing.

### Tags that work

The code structure and communication protocols for RFID (radiofrequency identification) of animals have been standardized for over a decade in the International Standards ISO 11784:1996, *Radio frequency identification of animals – Code structure*, and ISO 11785:1996, *Radio frequency identification of animals – Technical concept*. Because the standard is based on low-frequency communication in the 134,2 kHz frequency band, it has worked very well for animals: in some applications the animal identification signal has to travel through tissue (e.g. with injectable tags), which is far more difficult to realise with higher frequency devices.

Furthermore, animal RFID tags cannot be swiped through a scanner, making necessary a certain reading distance. This is especially true for large animals



Figure 1 – RFID ear tag transponder.

## Main Focus

that may impose safety risks for their owners or handlers. Reading distances of up to 1 m are feasible with this technology. The standard enables the use of full-duplex transponder communication (FDX-B) as well as half-duplex transponder communication (HDX). Transceivers compliant with ISO 11784 and ISO 11785 can read both HDX and FDX-B transponders. Further, in ISO 11785 additional requirements are defined for making possible the use of portable transceivers close to a stationary transceiver, without disturbing the reading performance of any of them.

ISO 11785 also provides information on linking stationary transceivers without loss of reading performance.

## Evaluation of performance and conformance

**ISO 24631**, *Radiofrequency identification of animals*, is divided into four parts :

**Part 1:** *Evaluation of conformance of RFID transponders with ISO 11784 and ISO 11785 (including granting and use of a manufacturer code)*

Defines procedures for evaluating the transponder air interface and code structure. Also includes procedures and forms that help maintain unique identification codes, as specified in ISO 11784:1996.

**Part 2:** *Evaluation of conformance of RFID transceivers with ISO 11784 and ISO 11785*

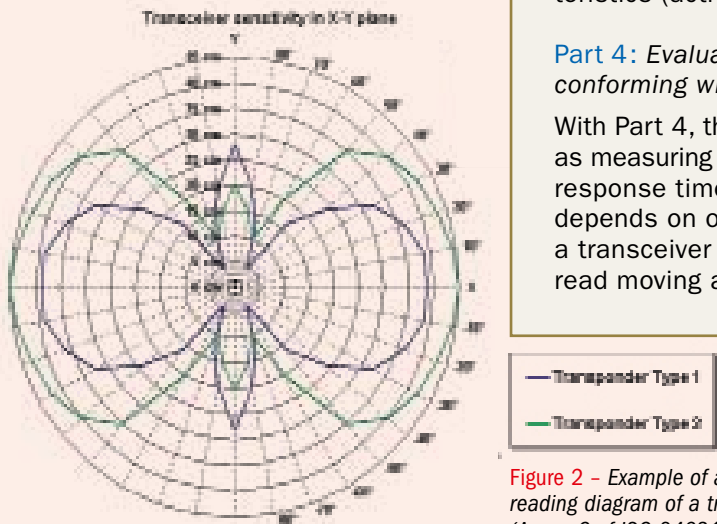
Defines procedures for evaluating the transceiver air interface and the transceivers' interpretation of the transponder code structure.

**Part 3:** *Evaluation of performance of RFID transponders conforming with ISO 11784 and ISO 11785*

Defines procedures for measuring the basic transponder characteristics (activation field, dipole moment and signal stability).

**Part 4:** *Evaluation of performance of RFID transceivers conforming with ISO 11784 and ISO 11785*

With Part 4, the performance of transceivers can be evaluated as measuring the reading distance diagram and the transceiver response time. The ability to read over a certain distance depends on orientation and direction (see **Figure 2**). The faster a transceiver can read a transponder, the better it will be able to read moving animals.



**Figure 2** - Example of a distance reading diagram of a transceiver. (Annex C of ISO 24631-4).

**“These new standards are expected to help users select the right products for their applications.”**

## About the authors



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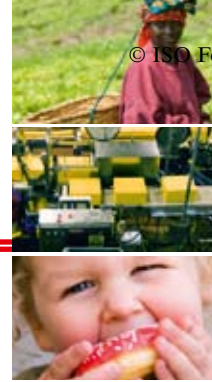


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for the ICAR-approved animal identification test laboratory and is project leader of several ISO animal identification standardization projects within ISO/TC 23/SC 19/WG 3. He is involved as project leader in several international and national animal identification projects.

## Precise and comparable data

Dozens of companies have entered the animal identification market with transponders (ear tag, injectable or bolus, see **Figure 1**, preceding page) and transceivers, making it a mature, competitive market and driving product costs down. The technology has been introduced on a massive scale with various applications in different parts of the world, and not only for companion animals and livestock. Use is widespread both in situations where owners may freely choose to tag their animals, as well as in many mandatory schemes around the world that are aimed at tracking animals.



The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) prescribes the use of identification in accordance with ISO 11784 and ISO 11785, and many zoo animals have these transponders. To help them judge the quality of these products prior to purchase, users have been calling for guidance on product selection.

A set of standards currently being developed within technical committee ISO/TC 23/SC 19, *Agricultural electronics*, working group WG 3, *Identification*, will respond to this demand. The draft standards address testing of transponders and transceivers for performance and conformance with ISO 11784 and ISO 11785 (see **Box**). These tests will result in precise and comparable data on transponders and transceivers.

## Making life easier

ISO develops International Standards, but does not itself conduct any conformance testing. Where required for ensuring the effective use of specific standards, ISO designates a competent body to serve as a maintenance agency or registration authority. In the case of the series of standards on radio frequency identification for animals, ISO has designated the Rome-based International Committee on Animal Recording (ICAR) as the registration authority (RA). The responsibilities of the RA will include the publishing of test reports on its Web site ([www.icar.org](http://www.icar.org)).

These new standards are expected to help users select the right products for their applications by making well-defined test results available to all interested parties. This will speed up further introduction, encourage producers to improve on performance, and reduce the costs for separate tests in multiple countries. ■