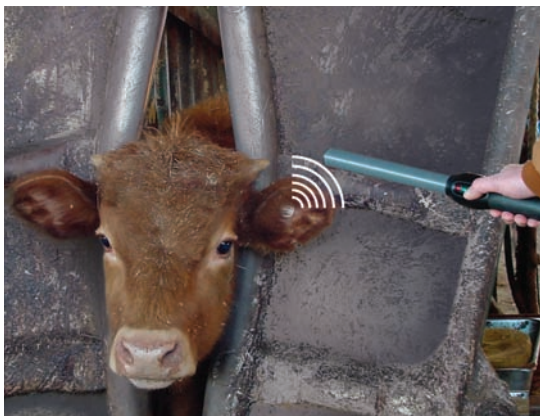


## GETTING STARTED WITH RFID

### What is RFID?

Radio Frequency Identification (RFID), also known as electronic identification or (EID), gives producers the ability to quickly, easily, and accurately capture animal information and review/record information into a record-keeping program or database of their choice. RFID accomplishes this by transmitting an electronic signal from the RFID device, such as an Allflex EID Tag, to a reader/scanner.

*The EID tag is simply the first of four elements needed for complete data collection and management. Data collection systems are varied and constantly evolving. They typically include:*



### RFID Standards for Livestock

In 1996, the International Organization for Standardization (ISO) established RFID standards for livestock identification, which utilized the strengths of the low frequency 134.2 kHz band. This frequency provides the ability to read through most materials in wet and dirty conditions and provides a well-defined read zone for animals passing next to the reader.

Allflex proudly adheres to these standards. At Allflex, it is our belief that investing in a system based on ISO-compliant technology can ensure broader compatibility than a non-ISO system. For many Allflex customers and partners, ISO standards compliance is key in their decision to invest in Allflex technology.

## How RFID Works

Allflex EID Tags are considered passive tags because they have no battery or power source of their own. These tags are activated when they pass within the transmission field of a reader. The tag then absorbs power from the reader and returns its unique number to the reader.



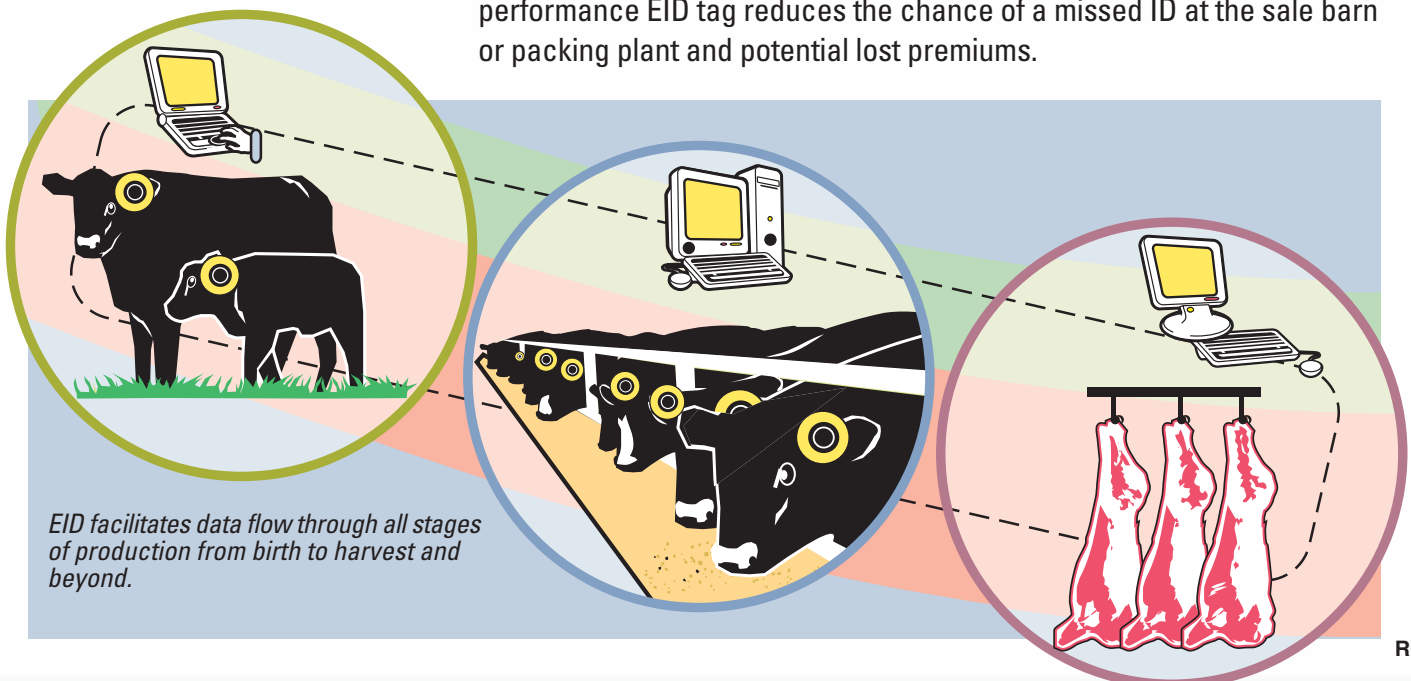
*Allflex introduced an aircoil antenna system encapsulated within a modified Allflex Small Female tag. This durable tag helps the transponder withstand environmental conditions.*

## Benefits of RFID

Over 100 million ISO EID tags have been placed in animals over the last 10 years. The industry does not have to wait on a promise; it has a technology that is proven to deliver a return on investment to individual producers and the entire industry. Understanding the performance of an individual or group of animals enables you to make more informed management changes.

***The use of EID increases returns to individual producers if used as a management tool in many practical ways, including:***

- 1. EID automates data capture which reduces time and cost.** It also increases accuracy by eliminating transcription errors possible with visual tags. While an EID device may cost more than a visual tag at the onset, the time, savings, and accuracy advantages outweigh the cost difference.
- 2. EID can provide an animal's complete individual history** to buyers regarding genetics, breed type, health treatments, performance, and age verification through use of a management software package or an on-line data service.
- 3. EID facilitates premium marketing opportunities for beef production** through Quality Systems Assessment's (QSA's) for export markets. A high performance EID tag reduces the chance of a missed ID at the sale barn or packing plant and potential lost premiums.



*EID facilitates data flow through all stages of production from birth to harvest and beyond.*

## RFID TOOLS

### EID Tags



Allflex High Performance EID Tag



Allflex FDX EID Tag



Allflex Swine and Sheep EID Tags

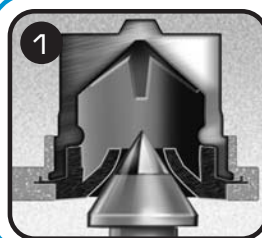
(TAGS SHOWN ACTUAL SIZE)

Allflex Electronic Identification (EID) Tags are passive and operate on low frequency. They are powered by energy from the reader itself to activate the tags. Allflex EID Tags are available in High Performance Half-Duplex (HDX) or Standard Performance Full-Duplex (FDX). These low-frequency tags can read through tissue and wood.

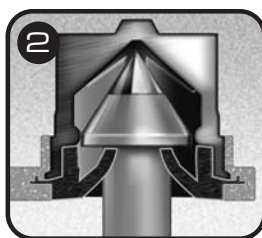
While HDX and FDX tags are both recognized by ISO standards for animal identification, there are important practical differences. High Performance HDX technology optimizes the signal transmission and provides the greatest possible read distance. Standard Performance FDX offers a somewhat reduced performance at a lower initial cost. Allflex is proud to be the only company that offers both technologies. This advantage ensures that you do not have to settle for one size fits all technology. Instead, we provide options, so that you can determine which system works best for your operation. HDX technology is beneficial to the system if it is used in packing plants, automated reading systems, or with a walk-through reader. If read range is not an issue, the FDX technology is sufficient for capturing data.

It is also important to note that both Allflex HDX and FDX Tags are Tamperproof™ EID tags, which means they have a unique design which provides ease of application, tamper evident security, and retention. Tamperproof cattle tags can be identified by the Ultra Tamperproof Cap™. Allflex also provides Tamperproof EID tags for sheep and swine.

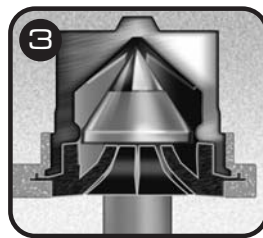
#### Allflex's Ultra Tamperproof Cap™



1 On entry into female, the male tip forces the exclusive Ultra Tamperproof Cap to spring open inside.



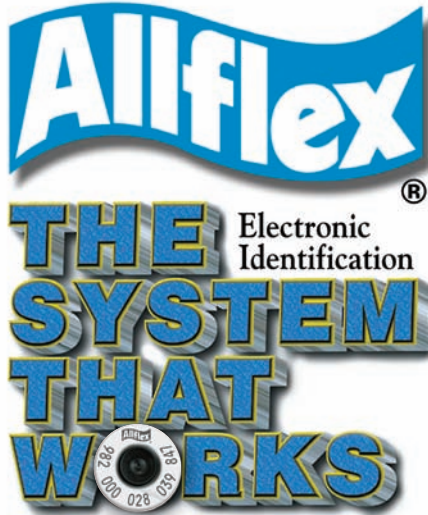
2 When tip has fully entered, Ultra Tamperproof Cap snaps back to lock tag solidly in place.



3 Ultra Tamperproof Cap's hard ridge and female's molded ridge doubly secure tag. Ultra Cap allows female to turn on male stem to help prevent snagging.

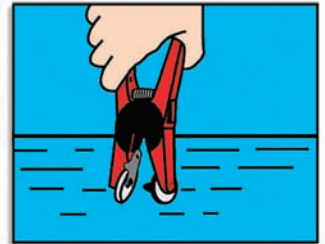
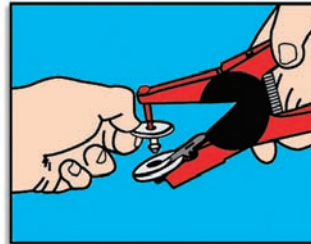
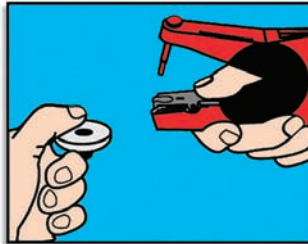
Globally, Allflex High Performance HDX Technology is seen as the 'gold standard' in electronic livestock identification. In fact, HDX technology is the exclusive technology used in the Australian NLIS National Animal ID Program, in Uruguay's National ID System, in Quebec's Provincial System, the National Livestock Identification (NLID) for Canadian Dairy, and the National FAIR Program in the USA.

HDX offers the greatest possible reading distance and efficiency in the broadest range of applications available under the ISO standard – a difference that industry leaders recognize and demand for their most critical electronic identification applications.



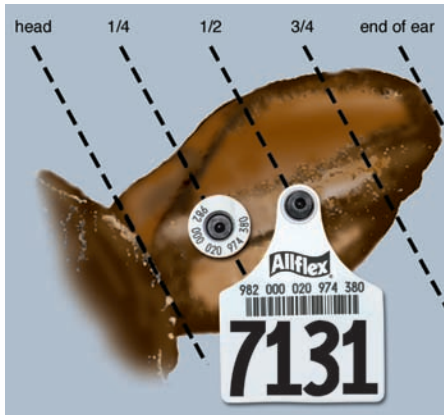
## Recommended Application Instructions for Allflex Electronic Identification Ear Tags

Apply Allflex Electronic ID Tags with the Universal Total Tagger (Red).  
Use the Red Blunt Pin and remove the Insert (white or black) from the base of the jaws.

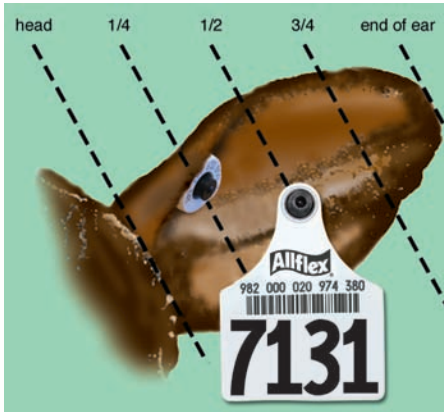


1. To load, depress spring clip and insert the female EID tag. Ensure that the raised portion of the tag, which encloses the transponder chip, is placed in the open portion of the jaws.
2. Slip the male tag completely onto the blunt applicator pin. Squeeze the jaws together lightly to ensure the male shaft is in line with the female.
3. Dip the jaws of the applicator holding the tag into an antiseptic or disinfectant solution.

### Placement Guide Illustration #1



### Placement Guide Illustration #2



**WARNING:** Placement Site #2 not recommended for mature or breeding cattle.

## Recommended Tag Placement for Cattle

Application site must be free of foreign debris prior to placement of tags on the animal. Review application instruction prior to tagging.

1. **Electronic Identification (EID) Ear Tag Placement #1:** The EID tag should be placed in the middle of the ear between the two cartilage ribs close to the head. This site is used for breeding or finishing cattle to allow for ear growth as the animal matures. See placement guide illustration #1.
2. **Electronic Identification (EID) Ear Tag Placement #2:** The EID tag should be placed above the upper cartilage of the ear towards the curvature of the ear. This site is generally used for finishing cattle. See placement guide illustration #2.
3. The female portion of the tag should be on the inside of the ear with EID tag application. Note that this is a thicker part of the ear. Application may be more difficult than when applying a visual tag.
4. **IMPORTANT:** Caution, **Free Air Space** is critical for proper healing and retention. Inspect placement after tagging to ensure there is sufficient space between ear and EID tag.
5. Apply the EID tag in the left ear<sup>1, 2</sup>.

<sup>1</sup> USAIP recommends individual animal identification be placed in the left ear.

<sup>2</sup> NCBA recommends individual animal identification be placed in the left ear.

## RFID TOOLS

### EID Readers

Depending on one's intended use, readers can range from simple hand-held devices to complex multi-panel systems that can automatically capture EID tags as they pass through the reading field.

Hand-held readers are typically used chute-side or in a processing alleyway. These readers provide a relatively inexpensive (approximately \$550 - \$1,300) means of reading EID tags. The read-range, depending on the reader model and the quality of the tag device, can range from a few inches up to 18 inches.

Alternatively, panel reader systems are usually permanently installed in high-volume processing areas and allow for automated capture of EID tag information without the need for a person to stand in place with a hand-held reader. In many environments, read-ranges of approximately three feet can be expected when using high performance EID tags. Panel reading system costs can range from a few hundred dollars for a small, single panel system, to well over \$10,000 for more complex multi-lane, multi-panel systems.

**Allflex RS250 Series Stick Reader** — otherwise known as the *chute-side* reader, is low-cost, extremely rugged, and compatible with ISO standards ISO11784 and ISO11785, including both FDX and HDX technologies. This hand-held reader is simple to use and provides either internal memory or can transmit identification codes via RS232 serial data cord.

**Allflex RS320 Series Stick Reader** — or *portable* reader, works best for those who desire cord-free capabilities when capturing livestock data from EID tags. The RS320 Series, ISO compatible reader, features an internal battery, LCD read out, tag counter option, internal memory for over 3,000 ID codes. The RS320 Series can easily be converted to Bluetooth® wireless technology by using the optional module providing the utmost in portability and communications.

**Large Panel Series Reader or Packing Plant Series Reader** — The *automated solution* is used primarily in packing plants where high-speed, automated systems are needed. It is designed to give you the greatest possible read range (approximately three feet) in the harsh environments of a packing plant. These systems meet ISO standards.

**Walk-Through Series Readers** — These readers are ideal for livestock markets, loading chutes or other applications where the animal is never completely restrained.



RS250 Series  
Stick Reader



RS320 Series  
Stick Reader

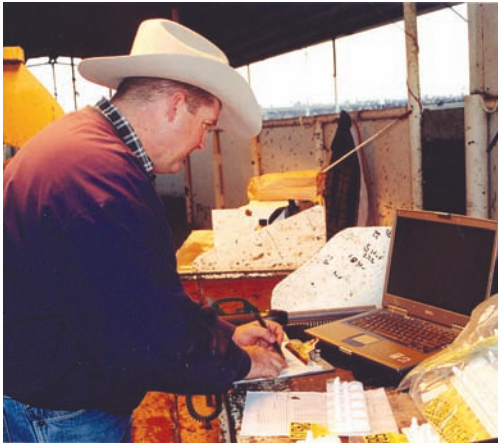


Large Panel Series Reader



Walk Through Series Readers

Allflex provides a wide range of readers, antennas, and data collection devices. If you are looking for a hand-held reader or a stationary reader that simply reads the EID tag and sends that signal to a computer, Allflex has a product that will work for you.



## RFID TOOLS

### Systems/Software

The critical component of the EID system is the computer and software. The use of EID tags allows for automation in the collection and analysis of production data which can improve the health and productivity of all livestock. Allflex partners with data service providers to offer real-world solutions to producers. The following are examples of systems available to producers today.

**Livestock Management Equipment Manufacturers** — EID systems are compatible with farm and ranch equipment used for daily livestock management practices such as electronic livestock scales, dairy equipment, and auto-feeding systems.

**Management Programs/Systems** — reside on your computer and allow for in-depth data collection, record keeping, and animal management. Many of these systems are used in cow/calf, auction barns, feedlots, dairies, and swine operations.

**Web-based Data Services Providers** — offer on-line systems that provide data repositories and analysis tools that allow for integration of data from all stages of an animal production history. These include associating cow/calf, stocker, feeder, and packer data in the beef industry into a single lifetime record.

**Animal Health and Tracking Systems** — collect limited pieces of data relative to animal ID and premises information and are used to assist in age and Process Verification Programs (PVP) and also animal health tracking programs. These systems can be either public, Federal/State/Provincial government, or private, such as the multi-species United States Animal Identification Organization (USAIO) consortium system.





# ALLFLEX LIVESTOCK IDENTIFICATION SYSTEMS

High Performance HDX EID Tag



Standard Performance FDX EID Tag



Sheep EID Tag



Swine EID Tag



From simple to sophisticated, Allflex can meet your livestock identification needs. As the maker of the World's No. 1 Livestock Identification System, livestock producers have trusted Allflex products for more than five decades.

Allflex delivers a wide range of ID solutions that fulfill producers' needs in every segment of the market:

**Electronic Identification Tags** are available in Tamperproof™ (single use) and provide the ultimate in automated data management on the farm and throughout the production process. Allflex EID tags are available in High Performance Half Duplex (HDX) or Standard Performance Full Duplex (FDX). Sheep and swine EID tags are also lightweight and withstand harsh production and processing environments.

(TAGS SHOWN ARE NOT ACTUAL SIZE)



**Standard Small Male for Visual Tags**

**Extended Small Male for EID Tags —**  
 1/8 longer than the Standard Small Male for placement deeper into animal's ear



**Matched Pair Tags** are a combination of EID tags with a matching visual tag with corresponding laser-ink printed numbering. The complete EID number is printed in the panel area above the management number of the visual tag. All tags feature Tamperproof design.



# ALLFLEX LIVESTOCK IDENTIFICATION SYSTEMS



**Tamperproof™ Tags** from Allflex feature the Ultra Tamperproof Cap, which is designed to be tamper evident, so that once applied to an animal, the identity cannot be transferred to another animal without destroying the tag.



**Standard Visual ID Tags** feature the innovative Global Tag design and laser-ink marking made to last for the life of the animal, even in the roughest conditions. These tags incorporate all of our latest innovations, including a retention collar and sloped shoulder design. These tags are available either blank or with permanent laser-ink marking. A variety of sizes and colors are available to fit all livestock.



**Custom ID Tags** provide the ultimate in customer satisfaction. Permanent laser marking accommodates a wide variety of needs such as brands, images, logos, reverse side marking, or custom numbering. Management numbers larger than 1/2" come in high-contrast laser-ink marking. Custom Tags are available in both Standard Visual ID Tags and Tamperproof Tags.

**Feedlot Tags** provide superior short-term retention and readability at an economical price. Allflex one-piece feedlot tags are available in 20 distinct colors.



## GLOSSARY OF EID TERMS

**Active tags** – Electronic ID tags that use batteries as a partial or complete source of power to transmit the data structure. Normally used in wildlife/endangered species research. (See passive tags.)

**Antenna** – The antenna is the part of the reader/interrogator that radiates the radio frequency energy to, and receives energy from, the transponder.

**CCIA – Canadian Cattle Identification Agency** – The CCIA program is an industry initiated and established trace back system designed for the containment and eradication of animal disease. [www.canadaid.com](http://www.canadaid.com)

**Chip** – The electronic chip consists of an integrated circuit and a capacitor that is attached to two ends of a coil.

**Coil** – The component of the electronic chip which consists of very thin wire wound 500 to 1000 times into a loop that has a diameter of 20 to 30 mm.

**Collision** – A term used to denote an event when two or more transponders are competing for attention from the reader/interrogator at the same time.

**Data** – Representations – in the form of numbers and characters, for example – to which meaning may be ascribed.

**EID (Electronic Identification)/ RFID (Radio Frequency Identification)** – Any electronic identification system comprised of a reader/scanner/interrogator and a transponder that can read or write data content using a specified radio frequency.

**Frequency** – The number of cycles a periodic signal executes in unit time. Usually expressed in Hertz (cycles/second) or appropriate weighted units such as Kilohertz (kHz), Megahertz (MHz) and Gigahertz (GHz).

**FDX - Full Duplex** – A design principle whereby the return signal initiates as soon as the beginning of the interrogation signal is received and the smoothing capacitor in the transponder has been charged. The return signal is received repetitively and without interruption for as long as a continuous interrogation signal is maintained. An FDX transponder does not have to store energy to be able to return its entire data content.

**HDX - Half Duplex** – A high performance design principle whereby the transponder initiates the return signal to the reader/scanner/interrogator only after the end of the interrogation signal has been received and only after the storage capacitor has been fully charged in the transponder. The return signal is then only sent once, since the transponder has emptied its storage capacitor after it has sent its entire data content.

**Herd of origin** – Herd of birth.

**ISO** – International Organization for Standardization. [www.iso.org](http://www.iso.org)

**ISO 11784** – This international standard represents the definition of the data numeric architecture of the 64-bits code for electronic animal identification.

**ISO 11785** – This international standard describes the accepted protocol for transmission between the reader/scanner/interrogator and the transponder (tag). The standard consists of two transmission protocols, half duplex (HDX) and full duplex (FDX).

**Manufacturer/Country Code** – Three-digit code defined by ISO 11784 standards. If country codes are used, ISO 3166 standard is used (USA country code is 840; Canada country code is 124).

**NAIS – National Animal Identification System** – The NAIS has been designed by the U.S. Department of Agriculture with the input and involvement of the animal agriculture industry to identify and track livestock in the U.S. for the purposes of detecting, containing, and eradicating animal diseases. [www.usda.gov/nais](http://www.usda.gov/nais)

**NIAA - National Institute for Animal Agriculture** – NIAA carries a strong legacy of providing the U.S. livestock industry with a forum to collectively address issues of common interest. The organization, successor to the Livestock Conservation Institute (LCI), is the result of a progressive process and vision that began in 1996 when LCI's board of directors commissioned a long-range planning team to landscape an organization that would best serve animal agriculture in the 21<sup>st</sup> century. [www.animalagriculture.org](http://www.animalagriculture.org)

**Noise disturbance** – A cause normally attributed to low data capture around heavily industrialized areas such as packing plant facilities and feedlot processing areas. In such areas, extraneous electromagnetic interference from florescent lights and other devices emit conflicting signals from other competing devices.

**Orientation** – The alignment of a transponder with respect to the reader antenna.

**Passive tags** – In order to transmit tag data content, the reader/scanner/interrogator must “excite” the transponder at a specific radio frequency. RFID tags that rely upon the energy generated from the magnetic field induced by the reader/scanner/interrogator in order to transmit tag data content. (See active tags.)

**Premises Identification** – A premises is any geographically unique location associated with animal agriculture. A unique premises identification number will be issued to each premise.

**Process verification** – The ability to verify if an animal has received a specific product (such as a vaccine) or procedure (defined set period of weaning) as claimed by seller.

**PVP – Process Verified Program** – The USDA - Agricultural Marketing Service (AMS) Process Verified Program provides suppliers of agricultural products or services the opportunity to assure customers of their ability to provide consistent quality products or services. This is accomplished by having their documented manufacturing or service delivery processes verified through independent, third party audits. PVP program requirements are modeled after ISO 9001 and require a USDA-approved Quality Management System.

**QSA – Quality System Assessment** – The USDA – Agricultural Marketing Service (AMS) Quality System Assessment Program provides suppliers of agricultural products and services the opportunity to assure customers of their ability to provide consistent quality products or services. It is limited to programs or portions of programs where specified product requirements are supported by a documented quality management system. The specified product requirements may be identified by the supplier or by another Audit, Review, and Compliance (ARC) Branch Program. The documented quality management system

is verified through independent, third party audits conducted by the ARC Branch. QSA program requirements are modeled after ISO 9001 and require a USDA approved Quality Management System.

**Read distance** – Refers to the distance between the transponder and the reader antenna. The distance will be affected by the power available to the reader, the power available within the tag to respond and electromagnetic interference.

**Reader (interrogator)** – The device in a radio frequency system that contains the digital electronics that trigger the transponder to respond and extracts and validates the information from the transponder’s response. (See also interrogator, scanner or transceiver.)

**RS232** – A common physical interface standard for the interconnection of devices. The standard allows for a single device to be connected at baud rates up to 57,000 bps, at distances up to 15 meters.

**Source verification** – The ability to verify the source of animal as claimed by the owner or seller.

**USAIP- United States Animal Identification Plan** – The USAIP defines the standards and framework for implementing and maintaining a phased in National Animal Identification System (NAIS) for the U.S. [www.usaip.info](http://www.usaip.info)

**USAIO - United States Animal Identification Organization**— The USAIO is a nonprofit, independent organization working with every segment of animal industry and animal health authorities to manage the industry-led animal identification movement database as prescribed by the National Animal Identification System (NAIS) plan.

**Wedge** – Software that converts data from a scanner or interrogator into a format that a computer application can use, typically by making scanned data appear as though it were keypunched.



**Allflex USA, Inc.**  
 P.O. Box 612266  
 Dallas/Ft. Worth Airport, TX 75261-2266  
 (800) 989-TAGS (8247)  
 Customer Toll Free FAX (877) 456-3969



**Allflex Canada**  
 4135 Bérard  
 St-Hyacinthe, QC J2S 8Z8  
 (866) 505-TAGS (8247)  
 FAX (450) 261-8028