The ISO Norm – new developments Additional information on Microchips

PLANET ID®

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Presented by Dr. med. vet. Sven Hüther

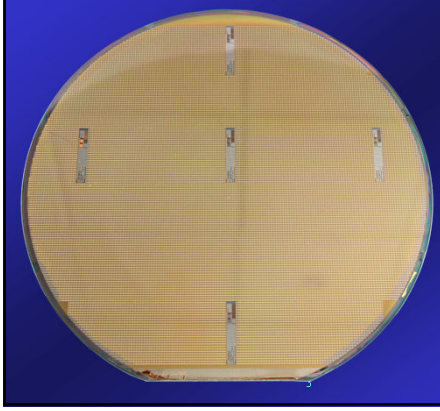
Terminology, avoiding misunderstandings

1. Microchip = Silicon = Intelligence
2. Antenna = a) Ferrite core
   b) Air coil
3. Surrounding material: here BIOGLASS (class 8625)

The antenna for ear tags is air coil, the surrounding material plastics.

A transponder is a product, which is built by the 3 components microchip with antenna and surrounding material.

The Wafer with up to 20.000 microchips



The wafer is the first production step of a transponder

The wafer is sawed and the single chips are packed in trays or on film for on going production depending on the production method

ISO 11784 Silicon or Microchip

1. Laser programed

   At the time of the creating of the ISO standard and of the EC regulations there was only laser programed silicon. The ISO 11784 code was already unchangeably programed in the chip on wafer level.

2. OTP (one time programmable)

   Today the majority of transponders are made of OTP silicon. The transponder is being built without pro-graming the chip according to ISO 11784. The code shall be programed at any desired time of manufacturing. Each OTP contains a UID.

3. An important point to watch are the silicon clones. (technically identical copies)

ISO 24631-1 Conformance Test

1. Annex D – Code of conduct

   The ISO 24631 series stands for the tests to be carried out for conformance approval of transponders, readers, synchronisation, displaying the code the ISO 24631-1 stands for the conformance test of transponders and Annex D for the code of conduct.

2. Major points of the Code of Conduct

   As the transponders can be programmed today at any time during or after production the uniqueness of the ISO 11784 code is only guaranteed if the manufacturer runs a database which stores the UID of the silicon chip together with the programmed ISO 1174 code.

3. What is a UID?

   In the first production step, the wafer, each single silicon chips for the transponder gets a laser programmed, unique serial number, called the UID.

Guarantee of the uniqueness only with the UID

11784 Code	UID
972 100000000005	3A24DDC4
233 093400980111	160A9141
233 093400980111	3A24E124
233 096500000011	200E7F5C
900 100000000345	160B6A10
900 000000000008	160B72F2
999 097200000000	3A24D93B
276 274877906943	3A24D8AF
528 219006006006	3A24D86F

Both transponder numbers according to ISO 11784 are identical and vary only with the UID

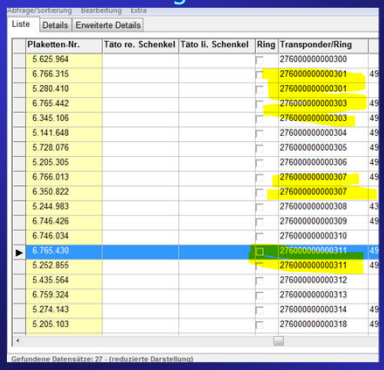
The UID varies according to the silicon manufacturer, here it is EM

Welfare! Wrong animal transponder codes

All problems of the transponder are becoming major problems for the animal and the owner!!!

Problem transponder	11784 code	My commentary
Animal bit = 0	233 098700980111	This is then an industrial code, the reader must clearly show that or does not have to display the code with information like: no animal code
no product code	233 096500000011	The manufacturers 965 as well as 967 have an ICAR manufacturer code and a product
no product code	233 096700000011	code for a 12 mm injectable but no product code for an ear tag
Shared manufacturer	900 072000000345	**This is the correct use of the shared manufacturers codes, according to their ICAR**
code 900	900 108000000008	**approval it is rather impossible to use the country codes like CH, DK or NL**
Wrong Code	804 090010800886	The numbering range of the manufacturer is 900 / 108.000.000.000 - 108.000.999.999 Misuse of the country code and completely wrong coding caused by the lack of a National Authority
Senseless Code	099 090900000000	the country codes 099, 280, 049 and 006 as well as a lot of others are no valid ISO-3166
Senseless Code	280 274877906943	codes, the transponder looks like an ISO-11784 conform code but is not a valid animal
Senseless Code	006 006006006006	code. The coding of the transponders is a proper task of the manufacturer and not of
Senseless Code	049 000284161306	anybody. A country coded transponder needs a reference to the manufacturer

In Tasso registered codes



The country code of Germany is used without any control.
276
The first 2 digits are regulated for Livestock by the Ministry BMELV:
00 = cattle
01 = sheep, goats
02 = horses
Here:
The cattle code structure is used for companion animals and several double codes by the Chinese Manufacturer
WUXI FOFIA

Double transponder number and uncontrolled use of the country code; identification of 2 different animals with the identical transponder code.
Responsibility:
The country!!!

What to do, if a country does not take responsibility?

Responsabilities for a manufacturer

- ICAR certification of the manufacturer – **MC code**
- conformance test for **each** single tag – **ISO 24631-1**
- Signing the Code of Conduct – respecting all ISO rules
- Maintaining an internal database to guarantee each single production step (no Excel list) for the traceability of all manufactured transponder codes! There is no definition how this data base has to look like.
- **Guaranteed** uniqueness of the number
- If using OTP silicon (One Time Programmable) the 11784 code must be stored in a database inseparably together with the UID of the silicon. This is the only way to guarantee uniqueness.

Recommendation to solve the problems of the actual uncontrolled conditions

1. Due to the lack of a National coordinating Authority (so called Competent Authority) wrong codes with the misuse of the country code are brought into the market.
   The transponder has then an ISO 11784 conform structure, but is not a valid animal transponder.
2. Mandatory use of Country Codes
   Only the country code offers a Nation to establish guidelines, consequences and penalties as it is not possible to follow a producer in Far East when using the manufacturer code.
3. Building up the laws (EC 998/2003 is too weak)
   - Creating a homologation procedure
   - Establishing a contract between National Authority and
   - Manufacturer
   - Education program for the member state countries supported or organised by the EU

National regulation of the country code use for companion animals (UK, CH)

England:
the use of the country code for pets is strictly forbidden by DEFRA, only transponders with manufacturer code are allowed, which does not offer to have a controlled market (Department for Environment, Food and Rural Affairs)

Switzerland:
in the National code the first position is 0 and on the following 3 positions the ICAR manufacturer code, a way which blocks too much numbers for a country

CC = ISO 3166	7	5	6		0	9	7	2	0	0	0	0	1	2	3	4

National regulation of the country code use for companion animals (DK, NL, IT)

Denmark and Netherlands:
the first position in the national code is a 2*
the figures 2 and 3 are the result of the subtract of 991 – the ICAR manufacturer code; for Planet ID i. E. 991 – 972 = 19, Planet ID Code für NL und DK = 219.

CC = ISO 3166	5	2	8		2	1	9	0	0	0	0	0	1	2	3	4

2* The responsibility for the uniqueness of the codes are given to the manufacturer

Italy:
Sending a copy of the ICAR manufacturer and product code document is sufficient to get a code range for using the Italian country code. For Planet ID:

380 260 090 000 000 to 380 260 099 999 999

National regulation of the country code use FR

Structure of the French country, species and homologation code															
POSITION	1	2	3		4	5	6	7	8	9	10	11	12	13	14	15
Country code FRA	2	5	0		2	6	8	6	1	2	3	4	5	6	7	8
Country code FRA	2	5	0		2	5	8	6	1	2	3	4	5	6	7	8
Country code FRA	2	5	0		2	2	8	6	1	2	3	4	5	6	7	8

France:
The positions 4 and 5 of the total code, resp. 1 and 2 of the National Code represent the species, 26 = dogs, cats, ferrets; 25 = horses; 22 = wild animals.

The positions 6 and 7, respective 3 and 4 stand for the French homologation code of the manufacturer

Best system in Europe, but partly obsolete and no need for species code; lack of UID, no control of sterilisation process and of the used glass for the transponder

Use of the country code DE Partly regulated - only for Livestock

Registered codes with country code in Germany															
Senseless Code	0	4	9		0	4	3	2	1	2	5	0	5	6	6	6
Pets with	2	7	6		0	9	8	1	1	2	3	4	5	6	7	8
manufacturer code	2	7	6		0	9	7	2	1	2	3	4	5	6	7	8
in the animal code	2	7	6		0	9	6	1	1	2	3	4	5	6	7	8
Problem with cattle	2	7	6		0	0	0	0	1	2	3	4	5	6	7	8
wrong Code	2	7	6		0	9	0	0	0	7	2	0	1	2	3	4
PID with BMVEL	2	7	6		1	0	0	0	1	2	3	4	5	6	7	8
Cattle ID	2	7	6		0	0	a	c	c	o	r	d	i	n	g	
Sheep ID	2	7	6		0	1		t	o		V	V	V	O		
Horse ID	2	7	6		0	2										

In Germany there is **no regulation** for the use of the country code **for companion animals**.

ISO 15639 series – injection sites

ISO 15639 – 1, injection site companion animals

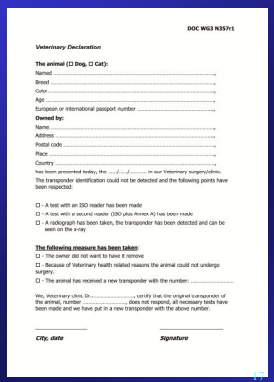
Actually second ISO/DIS including Veterinary declaration in case of a duty to replace a transponder

ISO 15639 – 2, injection site horses

Big trouble, no coordination between injection and removal of the transponder, transponder not found means the horse meat is unsuitable for the nutrition chain according to EC 504/2008

Actually the expert team is being built up and a WD (working draft) will be made until end of 2013

ISO 15639 – 1: Veterinary Declaration



DOC WG3 N357r1

Veterinary Declaration

The animal (☐ Dog, ☐ Cat):
Named: .....,
Breed: .....,
Color: .....,
Age: .....,
European or international passport number: .....,
Owned by:
Name: .....,
Address: .....,
Postal code: .....,
Place: .....,
Country: .....,
has been presented today, the ...../...../..... in our Veterinary surgery/clinic.
The transponder identification could not be detected and the following points have been respected:

☐ - A test with an ISO reader has been made
☐ - A test with a second reader (ISO plus Annex A) has been made
☐ - A radiograph has been taken, the transponder has been detected and can be seen on the x-ray

The following measure has been taken:
☐ - The owner did not want to have it remove
☐ - Because of Veterinary health related reasons the animal could not undergo surgery.
☐ - The animal has received a new transponder with the number: .....

Yes, Veterinary clinic Dr..... , certify that, the original transponder of the animal, number ....., does not respond, all necessary tests have been made and we have put in a new transponder with the above number.

City, date *Signature*

This document needs to be approved on EU level and reference to it is needed to facilitate the free travelling of the citizens with their pet

A failing transponder shortly before travelling to the most important dog breed competition Crufts in the UK has stopped a dog owner and obliged him to restart the whole rabies titre examination (costs also!!)

ISO 15639 parts not started yet

ISO 15639 – 3: Fish
- Fish for food consumption
- Ornamental fish

ISO 15639 – 4: Wild Life animals
- Zoo animals
- Wild Life animals

ISO 15639 – 5: Livestock
- Cattle
- Sheep and Goats
- Pigs (Is there a plan for mandatory identification of pigs, then this part needs to be made earlier)

ISO 14223 – advanced transponders

ISO 14223 – 1: Air Interface

– the way the information will be sent through the air – ready, ISO standard

ISO 14223 – 2: Code and Command Structure

– the structure and the commands how to send information from the reader into the transponder and vice versa – ready, ISO standard

ISO 14223 – 3: Application (not ready yet)

- BIT 15 – RUDI (reference on user data inside)
- Anti-collision – several transponders can be read at the same time
- Sensor data

ISO 14223 – reader modes

a) only 11785 mode for mixed population

Animals with 11785 and 14223 in a herd, the reader switches automatically into this mode

b) SAM – short access memory

Defined blocks for storing data at a dedicated position for very quick access and reading to be used in a walk through situation, read ID plus additional block

c) DDM – Data Dictionary memory

Access to the full memory, animal needs to be fixed, capacity of 4Kbyte, 4Kbit data transfer rate = about 8 sec for all memory content

Data Dictionary –Object Identifier

- The data dictionary is the summary of all items, which might be written in a transponder with the particularities of all animal species as well as the particularities for all continents. Every item consists of a 5-6-digit code, which stands for the equivalent information to be written into the transponder. This is of high importance for **Health related data** or the **EU - passport**
- No text: i.e. 12345 – stands for rabies vaccine
- The software of the readers knows 12345 and displays the information in the equivalent language

Look up table – Data Dictionary

Item	status	description	Life stock	companion animals	Zoo	endangered species	laboratory	fish	Size	data type	checker (to verificate)	Additional informat
country code	locked	country code compatible to ISO 3166 and 11875	m	m	m	m	m	m	3 digits	numeric	?	OID
unique life number	locked	unique life number compatible to ISO 11875	m	m	m	m	m	m	12 digits	numeric	?	OID
CRC	locked	cyclic redundant check ISO 11785 conform	m	m	m	m	m	m	16 bit	CRC	?	OID
reserved memory	locked	space not in use based on ISO 11785	m	m	m	m	m	m	2F bit	binary	?	OID
ISO 11874 total memory use	X	X	X	X	X	X	X	X	128 bits	X		OID
DD version												ADIS
Birth date	locked	date of birth	m	s	m	m	m	?		date	?	ADIS
birth country code	locked	country where animal was born, ISO 3166 conform	m	s	m	m/s	m	?		numeric	?	ADIS
birth farm	locked	farm number where animal was born	m	?	m	x	m	?		alphanumeric	?	ADIS
Gender	locked	Sex of animal	m	s	o	o	o	o	1 bit	binary	?	ADIS
origin	locked	Father / Mother	o	s	m	m	o	?		alphanumeric	?	ADIS
DNA	locked	DNA marker profile	m/o	m/o	?	o	o	?		?	?	ADIS
Race	locked	race information	o	m	?	x	?	?		alphanumeric	?	ADIS
embryo transfer	locked	Animal bred via embryo transferring	m/o	s	m/o	x	?	x	1 bit	binary	?	ADIS
Birth weight	locked	weight of animal at birth in g	o	s	o	o	o	?	4 digits	numeric	?	ADIS
Multiples	locked	twin, triplet etc	o	s	o	x	o	x	1 bit	binary	?	ADIS
castration	locked	date of castration or sterilisation	o	s	o	x	o	o		date	?	ADIS
meat production	locked	meat production	o	s	x	x	o	o	1 bit	binary	?	ADIS
breeding	locked	breeding	o	s	o	x	o	o	1 bit	binary	?	ADIS
milk production	locked	milk production	o	s	x	x	x	x	1 bit	binary	?	ADIS
Farm number last owner	o/w	official farm number of last owner	m	s	o	x	o	?		alphanumeric	?	ADIS
Farm number actual	o/w	official farm number of actual place	m	s	o	x	o	?		alphanumeric	?	ADIS
Owners title	o/w	no mrs /mrs. Dr / PhD / etc	o	s	o	x	o	o		alphanumeric	?	ADIS
Owners first Name	o/w	first name of owner	o	s	o	x	o	o		alphanumeric	?	ADIS
Owners name	o/w	family name of owner	o	s	o	x	o	o		alphanumeric	?	ADIS
Owners street	o/w	address part: street name	o	s	o	x	o	o		alphanumeric	?	ADIS
Owners postal code	o/w	address part: postal code	o	s	o	x	o	o		alphanumeric	?	ADIS
Owners city	o/w	address part: city	o	s	o	x	o	o		alphanumeric	?	ADIS
Owners phone	o/w	phone number	o	s	o	x	o	o		numeric	?	ADIS
Owners fax no	o/w	Fax number of actual owner	o	s	o	x	o	o		numeric	?	ADIS
Owners eMail	o/w	eMail address of the owner	o	s	o	x	o	o		alphanumeric	?	ADIS
last owner	o/w	last owner	m	s	o	x	o	?		alphanumeric	?	ADIS
arrival	o/w	arrival on actual farm	m	s	o	x	m	?		date+time	?	ADIS
departure	o/w	departure of last farm	m	s	o	x	m	?		date+time	?	ADIS
waiting time	o/w	Earliest time animal can be slaughtered	m	s	x	x	?	m		date	?	ADIS
disease status	o/w	actual disease	m	s	o	o	m	o		alphanumeric	?	ADIS
med. for treatment	o/w	e.g. Shock reaction on penicilin, allergic reaction on several penicilin	o	s	o	o	m	o		binary	?	

The status of the OID Data Dictionary

- The structure and the principal have been worked out in form of a thesis at the Pathology Institute of the Justus-Liebig University in Gießen by a Veterinary
- The work is not finished due to a lack of financing of the Veterinary for the laborious task of completing the **O**bject **ID**entifier **D**ata Dictionary
- To be able to use ISO 14223 a full time job for 2 years is needed with a person who understands the subject to complete the OID DD
- A workshop with international and political responsible participants is needed to contribute to the OID DD
- A budget needs to be available to be able to pay for the work

Thank you for your attention

You are welcome to ask your questions

Planet ID GmbH

Dr. med vet. Sven Hüther
President CEO
Hauptstr.5-9
D - 45219 Essen
Tel.- +49 (0) 2054 939 65 - 0
Fax.- +49 (0) 2054 939 65 -19
www.planet-id.com