Annex A (normative)

Integration of installed bases

A.1 Introduction

This International Standard specifies a transceiver capable of activating, receiving and interpreting an identification telegram transmitted by a transponder using either the FDX or the HDX method of transmission. However, a large population of animals has already been identified by means of transponders, in particular injectable ones, transmitting their identification telegram using one of the methods specified below. This annex specifies how this situation is to be coped with.

The annex comprises two sections. Section A.2 specifies the technical characteristics of known, widely used technologies with which animals have been identified. Section A.3 defines a concept showing how these technologies can be incorporated in a transceiver according to the main body of this International Standard.

A.2 Technical characteristics

A transceiver shall activate a transponder at either the frequency $f_0 = 134,2$ kHz or at the optimal frequency f_0 specified below.

A.2.1 Destron (FECAVA version)

The transponders have been designed for optimum performance to be activated at the frequency $f_0 = 125$ kHz with a tolerance of $\pm 10^{-4}$. The transponder shall send its message using AM-FSK. The duration of a binary state shall be 100 cycles of f_0. A ZERO shall be represented by 50 cycles at $f_0/10$, followed by 50 cycles at $f_0/8$ (see figure A.1). A ONE shall be represented by 50 cycles at $f_0/8$, followed by 50 cycles at $f_0/10$.

The identification telegram shall comprise 48 data bits, of which 35 shall be information bits. The structure of the identification telegram is given in figure A.2. The transceiver shall validate the unique identification code after reception of at least two identical telegrams.
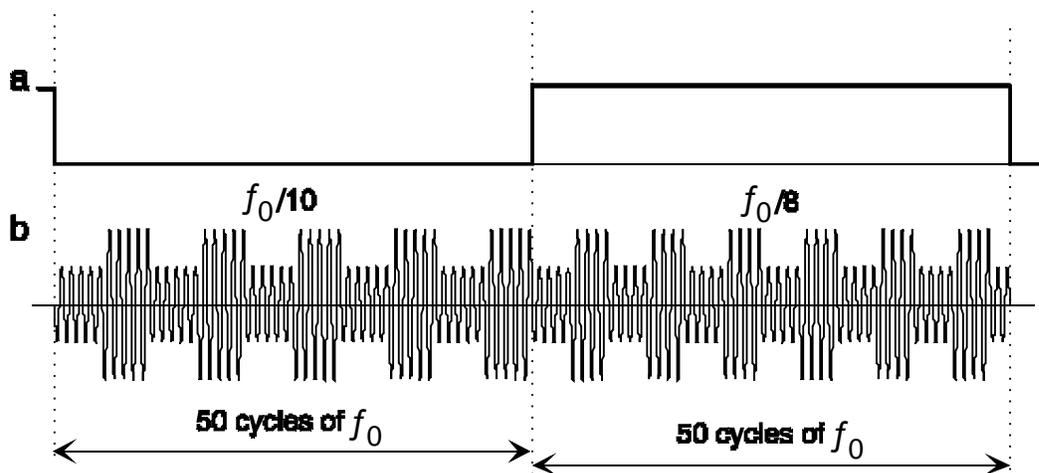

Figure A.1

The encoding (a) and radio frequency signal structure (b) of data bit ZERO of Destron (FECAVA version).
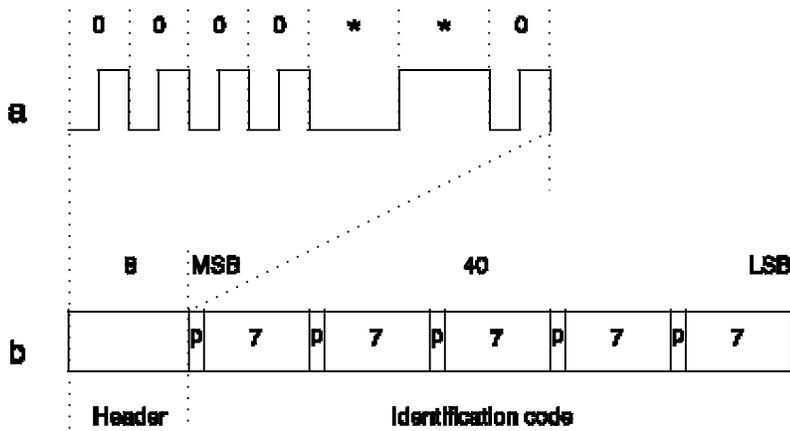
Figure A.2

The structure of the Destron (FECAVA version) identification telegram.
a: Header; b: Full telegram.
(⚡ means encoding violation; p means parity data bit, odd parity check)

A.2.2 Datamars

The transponders have been designed for optimum performance to be activated at the frequency $f_0 = 125$ kHz with a tolerance of $\pm10^{-4}$. The transponder sends its message using PSK in the frequency band $f_0/9$. The duration of a binary state (is one bit length) is 100 cycles of f_0. The encoding of the message is Manchester. Each transition in the Manchester encoded signal is represented by a 120° phase shift. The Manchester transition representing a ZERO of the original message consists of a -120° phase shift and that representing a ONE consists of a +120° phase shift.

The identification telegram comprises 62 bits of the following structure: 8 synchronisation bits (0000 "1" "0" 0)("1" and "0" are long bits which are 1,5 times longer than normal bits); 48 information bits, divided into 6 blocks of 8 bits; each block is supplemented with a parity (even) bit at the end (see figure A.3). The transceiver shall validate the unique identification code after reception of at least two identical telegrams.
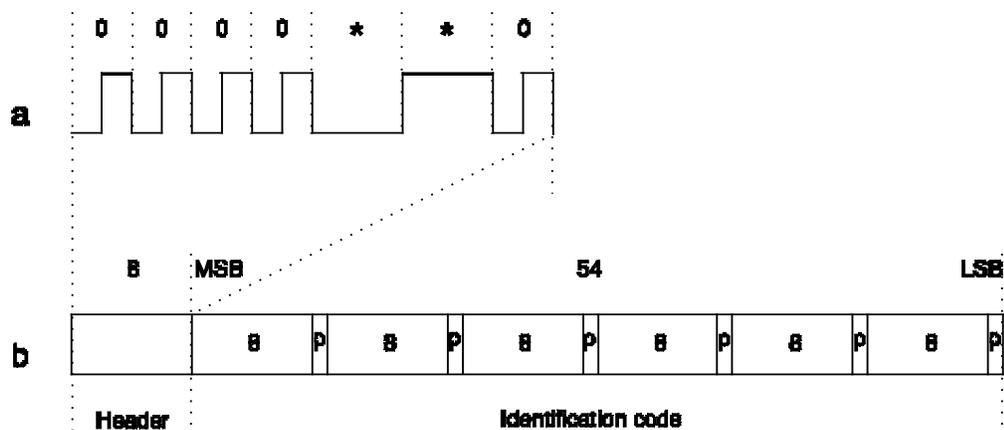

Figure A.3

The structure of the Datamars identification telegram. a: Header; b: Full telegram.
(⚡ means encoding violation; p means parity data bit, even parity check)

A.2.3 Trovan

The transponders have been designed for optimum performance to be activated at the frequency $f_0 = 128$ kHz with a tolerance of ±3 kHz. The transponder sends its message using PSK in the frequency band $f_0/2$. The encoding is differential bi-phase. A ZERO is represented by a phase shift of 180°. A ONE is represented by a phase shift of 0°. The duration of a binary state shall be 16 cycles of f_0.

The identification telegram shall comprise 64 bits of the following structure: 8 synchronisation bits (01111111); 39 information bits; and 17 error detection bits. The structure of the identification telegram is given in figure A.4.
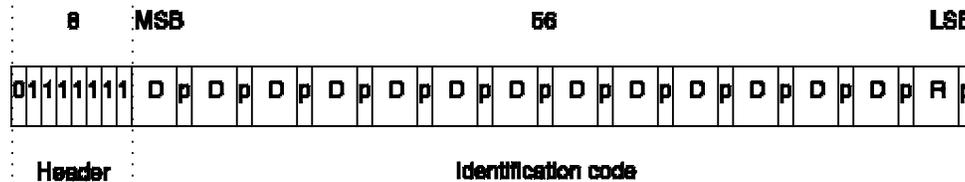

Figure A.4

The structure of the Trovan identification telegram. (D means data bits in groups of 3; p means row parity, odd parity check; R means column parity bits, odd parity check)

A.3 Concept for including the technologies in an FDX/HDX transceiver

This section recommends a concept for the inclusion of the technologies described in section A.2 in a transceiver. This concept consists in plugging into the receiver part of the transceiver a module for one or more of these technologies. Figure A.5 shows the operating mode. The default function is to read the FDX/HDX signal. After reading an Annex A transponder the transceiver shall immediately switch back to the default function.
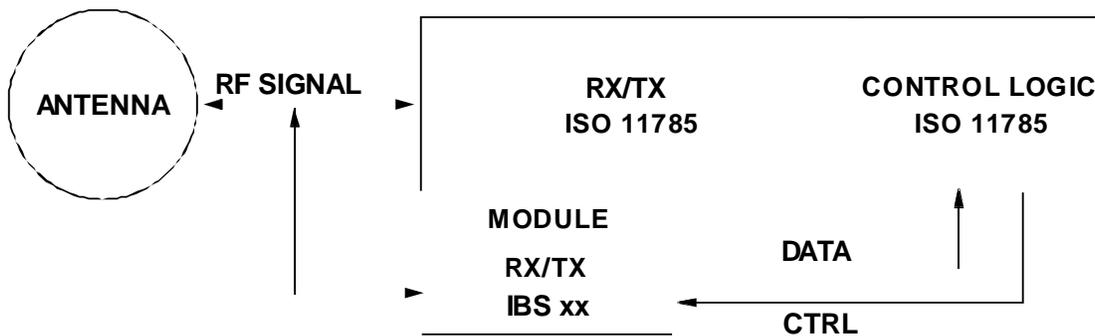

Figure A.5

Schematic diagram of a transceiver according to clause 6 combined with a module to read one of the technologies descibed in A.2. (RX means Receiver, TX means transmitter, IBS means Installed Base System)