

---

---

**Identification cards — Recording  
technique —**

Part 7:

**Magnetic stripe: High coercivity, high  
density**

*Cartes d'identification — Technique d'enregistrement —*

*Partie 7: Bandeau magnétique: Haute coercivité, haute densité*

*iTech Standards*  
*(<https://standards.iteh.ai>)*  
*Document Preview*

[ISO/IEC 7811-7:2018](https://standards.iteh.ai/catalog/standards/iso/732345c9-a53b-4c21-b69c-d91aa1b6bbba/iso-iec-7811-7-2018)

<https://standards.iteh.ai/catalog/standards/iso/732345c9-a53b-4c21-b69c-d91aa1b6bbba/iso-iec-7811-7-2018>



**iTeh Standards**  
**(<https://standards.iteh.ai>)**  
**Document Preview**

[ISO/IEC 7811-7:2018](https://standards.iteh.ai/catalog/standards/iso/732345c9-a53b-4c21-b69c-d91aa1b6bbba/iso-iec-7811-7-2018)

<https://standards.iteh.ai/catalog/standards/iso/732345c9-a53b-4c21-b69c-d91aa1b6bbba/iso-iec-7811-7-2018>



**COPYRIGHT PROTECTED DOCUMENT**

© ISO/IEC 2018

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

<b>Foreword</b> .....	<b>iv</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms, definitions, symbols and abbreviated terms</b> .....	<b>2</b>
3.1 Terms and definitions.....	2
3.2 Symbols and abbreviated terms.....	4
<b>4 Conformance</b> .....	<b>4</b>
<b>5 Physical characteristics of the identification card</b> .....	<b>4</b>
5.1 General.....	4
5.2 Magnetic stripe area warpage.....	4
5.3 Surface distortions.....	4
<b>6 Physical characteristics of the magnetic stripe</b> .....	<b>5</b>
6.1 Height and surface profile of the magnetic stripe area.....	5
6.1.1 Surface profile of the magnetic stripe area.....	6
6.1.2 Height of the magnetic stripe area.....	7
6.2 Surface roughness.....	7
6.3 Adhesion of stripe to card.....	7
6.4 Wear of magnetic stripe from read/write head.....	8
6.5 Resistance to chemicals.....	8
<b>7 Performance characteristics for the magnetic material</b> .....	<b>8</b>
7.1 General.....	8
7.2 Testing and operating environment.....	8
7.3 Signal amplitude requirements for magnetic media.....	8
<b>8 Data structure</b> .....	<b>10</b>
<b>9 Encoding specification</b> .....	<b>11</b>
9.1 Angle of recording.....	11
9.2 Nominal bit density.....	12
9.3 Flux transition spacing variation.....	12
9.4 Signal amplitude requirements.....	12
9.5 Bit configuration.....	12
9.6 Direction of recording.....	13
9.7 Leading and trailing clock bits.....	13
<b>10 Data structure</b> .....	<b>13</b>
10.1 Track format.....	13
10.1.1 Track layout.....	13
10.1.2 FSC.....	14
10.1.3 Data frame.....	15
10.2 Coding for error detection and correction.....	15
10.2.1 Track CRC.....	16
10.2.2 Column parity.....	17
10.2.3 Frame CRC.....	17
<b>11 Decoding</b> .....	<b>18</b>
<b>12 Location of encoded tracks</b> .....	<b>18</b>
<b>Annex A (informative) Compatibility of magnetic stripes (ISO/IEC 7811-6, ISO/IEC 7811-7)</b> .....	<b>20</b>
<b>Annex B (informative) Magnetic stripe abrasivity</b> .....	<b>21</b>
<b>Annex C (informative) Static magnetic characteristics</b> .....	<b>22</b>
<b>Annex D (informative) Reed-Solomon code references</b> .....	<b>24</b>

## Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by ISO/IEC JTC 1, *Information technology*, SC 17, *Cards and personal identification*.

This third edition cancels and replaces the second edition (ISO/IEC 7811-7:2014), which has been technically revised.

Major changes from the previous edition are as follows:

- the primary standard cards held by Q-Card are used to calibrate the manufacture of secondary reference cards; other primary standard cards held by PTB and Card Testing International (CTI) are used as backup to replace cards held by Q-Card as they wear out;
- deleted reference to character sets in the Scope since none are used in this document;
- list of major differences has been moved from the Introduction to [Annex A](#);
- the supplier of secondary reference cards has changed from PTB to Q-Card.

Notes in this document are only used for giving additional information intended to assist in the understanding or use of the document. They do not contain provisions or requirements to which it is necessary to conform in order to be able to claim compliance with this document.

A list of all the parts in the ISO/IEC 7811 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

# Identification cards — Recording technique —

## Part 7:

## Magnetic stripe: High coercivity, high density

### 1 Scope

This document is one of a series of standards describing the characteristics for identification cards as defined in the definitions clause and the use of such cards for international interchange.

This document specifies requirements for a high coercivity magnetic stripe (including any protective overlay) on an identification card and encoding technique. It takes into consideration both human and machine aspects and states minimum requirements.

Coercivity influences many of the quantities specified in this document but is not itself specified. The main characteristic of the high coercivity magnetic stripe is its improved resistance to erasure. This is achieved with minimal probability of damage to other magnetic stripes by contact while retaining read compatibility with magnetic stripes as defined in ISO/IEC 7811-2.

This document provides for a card capacity of approximately 10 times that of a card conforming to ISO/IEC 7811-6. The number of tracks has been increased to 6, each track being approximately half the width of tracks conforming to ISO/IEC 7811-6, located so that readers designed to read these high density tracks will also be able to read cards conforming to ISO/IEC 7811-2 and ISO/IEC 7811-6. Data is encoded in 8 bit bytes using the MFM encoding technique. Data framing is used to limit error propagation and error correction techniques further improve reliability of reading.

It is the purpose of the ISO/IEC 7811 series of standards to provide criteria to which cards shall perform. No consideration is given within these standards to the amount of use, if any, experienced by the card prior to test. Failure to conform to specified criteria is negotiated between the involved parties.

ISO/IEC 10373-2 specifies the test procedures used to check cards against the parameters specified in this document.

**NOTE** Numeric values in the SI and/or Imperial measurement system in this document may have been rounded off and are consistent with, but not exactly equal to each other. Using either system is correct but intermixing or reconvertng values can result in errors. The original design was made using the Imperial measurement system.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4287, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters*

ISO/IEC 7810, *Identification cards — Physical characteristics*

ISO/IEC 10373-1, *Identification cards — Test methods — Part 1: General characteristics*

ISO/IEC 10373-2, *Identification cards — Test methods — Part 2: Cards with magnetic stripes*