

Implementation of
ISO/IEC 10538:1991

Information technology — Control functions for text communication

UDC 681.3.04

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW



Document Sharing Hub

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Information Systems Technology Standards Policy Committee (IST/-) to Technical Committee IST/2, upon which the following bodies were represented:

- British Computer Society
- British Federation of Printing Machinery and Supplies Ltd.
- British Radio and Electronic Equipment Manufacturers' Association
- British Telecommunications plc
- Computing Services Association
- EEA (the Association of Electronics, Telecommunications and Business Equipment Industries)
- Information and Communications Industry Association
- Institution of Electrical Engineers
- International Press Telecommunications Council
- Coopted members

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- Department of Trade and Industry (IT Standards Unit)
- HM Treasury (Central Computer and Telecommunications Agency)
- Information Systems Committee of the Universities Funding Council
- Ministry of Defence
- Coopted members

This British Standard, having been prepared under the direction of the Information Systems Technology Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 20 December 1991

© BSI 02-2000

The following BSI references relate to the work on this standard:
Committee reference IST/2
Draft for comment 90/62174 DC

ISBN 0 580 20408 1

Amendments issued since publication

Amd. No.	Date	Comments

Contents

	Page
Committees responsible	Inside front cover
National foreword	ii
Foreword	vi
Text of ISO/IEC 10538	1

National foreword

This British Standard reproduces verbatim ISO/IEC 10538:1991 and implements it as the UK national standard.

This British Standard is published under the direction of the Information Systems Technology Standards Policy Committee whose Technical Committee IST/2 has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international committee any enquiries on interpretation, or proposals for change, and keep UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

NOTE International and European Standards, as well as overseas standards, are available from BSI Sales Department, BSI, Linford Wood, Milton Keynes, MK14 6LE.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the ISO/IEC title page, pages ii to vi, pages 1 to 41 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

INTERNATIONAL STANDARD

ISO/IEC
10538

First edition
1991-09-15

Information technology — Control functions for text communication

*Technologies de l'information — Fonctions de commande pour la
communication de texte*



Reference number
ISO/IEC 10538:1991(E)

Contents

	Page
Foreword	vi
Introduction	1
Section 1. General	
1 Scope	1
2 Conformance	1
2.1 Types of conformance	1
2.2 Conformance of information interchange	1
2.3 Conformance of devices	1
2.3.1 Device description	2
2.3.2 Originating devices	2
2.3.3 Receiving devices	2
3 Normative references	2
4 Definitions	2
4.1 active area	2
4.2 active field	2
4.3 active line	2
4.4 active page	2
4.5 active position	2
4.6 area	2
4.7 bit combination	2
4.8 byte	3
4.9 character	3
4.10 character path	3
4.11 character position	3
4.12 coded character set	3
4.13 coded-character-data-element (CC-data-element)	3
4.14 code extension	3
4.15 code table	3
4.16 control character	3
4.17 control function	3
4.18 control sequence	3
4.19 control string	3
4.20 cursor	3
4.21 default	4
4.22 to designate	4
4.23 device	4
4.24 display	4
4.25 document	4
4.26 document terminator	4
4.27 editor function	4
4.28 escape sequence	4
4.29 field	4
4.30 Final Byte	4
4.31 formator function	4
4.32 formattable text	4
4.33 formatted text	5
4.34 graphic character	5
4.35 graphic rendition	5
4.36 graphic symbol	5
4.37 Intermediate Byte	5

	Page
4.38 to invoke	5
4.39 line	5
4.40 line home position	5
4.41 line limit position	5
4.42 line progression	5
4.43 page	5
4.44 page home position	5
4.45 page-image format	5
4.46 page limit position	6
4.47 page terminator	6
4.48 Parameter Byte	6
4.49 position	6
4.50 repertoire	6
4.51 tabulation	6
4.52 tabulation stop	6
4.53 text area	6
4.54 user	6
5 Notation and names	6
5.1 Notation	6
5.2 Names	7
6 Categories of control functions	7
7 Coded representation	7
7.1 General	7
7.2 Elements of the C0 set	7
7.3 Elements of the C1 set	7
7.4 Control sequences	8
7.5 Independent control functions	8
8 Types of control functions	8
Section 2. Control functions for page-image format (PIF)	
9 Concepts relating to page-image format (PIF)	9
10 Repertoire of control functions	10
10.1 Format effectors	10
10.2 Presentation control functions	10
10.3 Introducers	10
10.4 Information Separators	10
10.5 Miscellaneous control functions	10
11 Definition of control functions	11
11.1 BS — BACKSPACE	11
11.2 CR — CARRIAGE RETURN	11
11.3 CSI — CONTROL SEQUENCE INTRODUCER	11
11.4 DT — DOCUMENT TERMINATOR	
IS4 — INFORMATION SEPARATOR FOUR	11
11.5 ESC — ESCAPE	12
11.6 FF — FORM FEED	12
11.7 HPR — CHARACTER POSITION FORWARD	12
11.8 IGS — IDENTIFY GRAPHIC SUBREPERTOIRE	12
11.9 LF — LINE FEED	13
11.10 PFS — PAGE FORMAT SELECTION	13

	Page
11.11 PLD — PARTIAL LINE FORWARD	13
11.12 PLU — PARTIAL LINE BACKWARD	14
11.13 PT — PAGE TERMINATOR	
IS3 — INFORMATION SEPARATOR THREE	14
11.14 SGR — SELECT GRAPHIC RENDITION	14
11.15 SHS — SELECT CHARACTER SPACING	15
11.16 SPD — SELECT PRESENTATION DIRECTIONS	15
11.17 SUB — SUBSTITUTE	16
11.18 SVS — SELECT LINE SPACING	16
11.19 VPR — LINE POSITION FORWARD	16
12 Levels of control functions	17
Section 3. Control functions for formatted and formattable text	
13 Concepts relating to formatted and formattable text	18
13.1 Formatted text	18
13.2 Formattable text	18
13.3 Unique representation of elements of text in interchange	18
14 Repertoire of control functions	19
14.1 Format effectors	19
14.2 Presentation control functions	20
14.3 Logical control functions	20
14.4 Introducers	20
14.5 Miscellaneous control functions	21
15 Definition of control functions	21
15.1 BPH — BREAK PERMITTED HERE	21
15.2 CR — CARRIAGE RETURN	21
15.3 CR FF — CARRIAGE RETURN/FORM FEED	21
15.4 CR/LF — CARRIAGE RETURN/LINE FEED	21
15.5 CSI — CONTROL SEQUENCE INTRODUCER	22
15.6 ESC — ESCAPE	22
15.7 FF — FORM FEED	22
15.8 GCC — GRAPHIC CHARACTER COMBINATION	22
15.9 HPB — CHARACTER POSITION BACKWARD	22
15.10 HPR — CHARACTER POSITION FORWARD	23
15.11 HT — CHARACTER TABULATION	23
15.12 IGS — IDENTIFY GRAPHIC SUBREPERTOIRE	23
15.13 LF — LINE FEED	23
15.14 NBH — NO BREAK HERE	24
15.15 NEL — NEXT LINE	24
15.16 NEL FF — NEXT LINE/FORM FEED	24
15.17 PEC — PRESENTATION EXPAND OR CONTRACT	24
15.18 PFS — PAGE FORMAT SELECTION	25
15.19 PLD — PARTIAL LINE FORWARD	25
15.20 PLU — PARTIAL LINE BACKWARD	26
15.21 PTX — PARALLEL TEXTS	26
15.22 SACS — SET ADDITIONAL CHARACTER SEPARATION	27
15.23 SAPV — SELECT ALTERNATIVE PRESENTATION VARIANTS	27
15.24 SCO — SELECT CHARACTER ORIENTATION	28
15.25 SCS — SET CHARACTER SPACING	28

	Page
15.26 SGR — SELECT GRAPHIC RENDITION	29
15.27 SHS — SELECT CHARACTER SPACING	30
15.28 SLH — SET LINE HOME	30
15.29 SLL — SET LINE LIMIT	30
15.30 SLS — SET LINE SPACING	31
15.31 SP — SPACE	31
15.32 SPD — SELECT PRESENTATION DIRECTIONS	31
15.33 SPH — SET PAGE HOME	31
15.34 SPL — SET PAGE LIMIT	32
15.35 SRCS — SET REDUCED CHARACTER SEPARATION	32
15.36 SRS — START REVERSED STRING	32
15.37 SSU — SELECT SIZE UNIT	33
15.38 SSW — SET SPACE WIDTH	33
15.39 SUB — SUBSTITUTE	33
15.40 SVS — SELECT LINE SPACING	33
15.41 TAC — TABULATION ALIGNED CENTRED	34
15.42 TALE — TABULATION ALIGNED LEADING EDGE	34
15.43 TATE — TABULATION ALIGNED TRAILING EDGE	34
15.44 TBC — TABULATION CLEAR	35
15.45 TCC — TABULATION CENTRED ON CHARACTER	35
15.46 TSR — TABULATION STOP REMOVE	35
15.47 VPB — LINE POSITION BACKWARD	35
15.48 VPR — LINE POSITION FORWARD	35
16 Levels of control functions	36
Annex A (informative) Text area formats	38
Annex B (informative) Differences between Section 2 and CCITT Recommendation T.61	39
Annex C (informative) Differences between Section 2 and Section 3	40
Table A.1 — Dimensions of the text area	39

Descriptors: Data processing, information interchange, text communication, coded representation, control functions.

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for world-wide 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. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 10538 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

Annex A, Annex B and Annex C of this International Standard are for information only.

Introduction

This International Standard combines in one document the repertoires of control functions for text communication that were first published in Draft International Standard ISO/DIS 6937-3 (for the control functions for page-image format), and in the Draft Proposal for ISO 6937-4 (for the control functions for formatted and formattable text).

Because these repertoires of control functions are applicable to text communication in general, and can be used independently from ISO 6937, JTC 1/SC2 at its 21st plenary meeting in London in October 1988 decided in resolution 8 that the former ISO 6937-3 and ISO 6937-4 were to be published as a single new International Standard.

Section 1. General

1 Scope

This International Standard defines the control functions, and their coded representations needed, for use in text communication.

Section 2 specifies the control functions for text in page-image format, Section 3 specifies the control functions for formatted and formattable text.

The control functions, with the exception of two, have been taken from ISO 6429. The definitions of the control functions in this International Standard are, in general, more specific than the corresponding definitions in ISO 6429.

The specifications in this International Standard apply to the interchange of text in the form of binary-coded representations of graphic characters and control functions. They are not intended for the actual processing of text.

Although, in general, text consists of characters and pictures, this International Standard applies only to text made up of characters.

The coded representations defined in this International Standard are intended for use when the control functions concerned are embedded in the communicated text, not when they are separated from the text as elements of a communication protocol, for example.

This International Standard does not define any control functions required for controlling the process of communication.

2 Conformance

2.1 Types of conformance

Full conformance to a standard means that all of its requirements are met. Conformance will only have a unique meaning if the standard contains no options. If there are options within the standard then they shall be clearly identified, and any claim of conformance shall include a statement that identifies those options that have been adopted.

This International Standard is of a different nature since it specifies for the applications in Section 2 and Section 3 a number of facilities from which different selections may be made to suit individual application requirements. These selections are identified as levels in clause 12 and clause 16. They shall be identified at the time that a claim of conformance is made. Conformance to such an identified selection is known as limited conformance.

2.2 Conformance of information interchange

A coded-character-data-element (CC-data-element) within coded information for interchange is in conformance with a Section and a level of this International Standard if all coded representations of control functions within that CC-data-element conform either to the requirements of clause 12 or to those of clause 16.

A claim of conformance shall identify the Section and the level adopted.

2.3 Conformance of devices

A device is in conformance with this International Standard if it conforms to the requirements of 2.3.1, and either or both 2.3.2 and 2.3.3. Any claim of conformance shall identify the document which contains the description specified in 2.3.1, and shall identify Section and the level as well as the selected control functions.

2.3.1 Device description

A device that conforms to this International Standard shall be the subject of a description that identifies the means by which the user may supply the selected control functions or may recognize them when they are made available to him, as specified in 2.3.2. and 2.3.3, respectively.

2.3.2 Originating devices

An originating device shall allow its user to supply any sequence of control functions from the Section and level adopted, and shall be capable of transmitting their coded representation within a CC-data-element.

2.3.3 Receiving devices

A receiving device shall be capable of receiving and interpreting any coded representations of control functions that are within a CC-data-element, and that conform to 2.2, and shall make the corresponding control functions available to its user in such a way that the user can identify them from among those of the Section and level adopted, and can distinguish them from each other.

3 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 2022:1986, *Information processing — ISO 7-bit and 8-bit coded character sets — Code extension techniques*.

ISO 6429:1988, *Information processing — Control functions for 7-bit and 8-bit coded character sets*.

ISO 7350:1991, *Text communication — Registration of graphic repertoires of characters from ISO 10367*.

4 Definitions

For the purpose of this International Standard, the following definitions apply.

4.1

active area

the area which contains the active position

4.2

active field

the field which contains the active position

4.3

active line

the line which contains the active position

4.4

active page

the page which contains the active position

4.5

active position

the character position which is to image the graphic symbol representing the next graphic character or relative to which the next control function is to be executed

NOTE In general, the active position is indicated by a cursor.

4.6

area

a series of successive character positions that are not necessarily on the same line

4.7

bit combination

an ordered set of bits used for the representation of characters

4.8**byte**

a bit string that is operated upon as a unit

4.9**character**

a member of a set of elements used for the organization, control or representation of data

4.10**character path**

the direction of presentation of successive graphic characters along a line

4.11**character position**

the portion of a display that is imaging or is capable of imaging a graphic symbol

4.12**coded character set; code**

a set of unambiguous rules that establishes a character set and the one-to-one relationship between the characters of the set and their representation by one or more bit combinations

4.13**coded-character-data-element (CC-data-element)**

an element of interchanged information that is specified to consist of a sequence of coded representations of characters, in accordance with one or more identified standards for coded character sets

NOTE 1 In a communication environment according to the reference model for Open Systems Interconnection of ISO 7498, a CC-data-element will form all or part of the information that corresponds to the Presentation-Protocol-Data-Units (PPDU) defined in that International Standard.

NOTE 2 When information interchange is accomplished by means of interchangeable media, a CC-data-element will form all or part of the information that corresponds to the user data, and not that recorded during formatting and initialization.

4.14**code extension**

the techniques for the encoding of characters that are not included in the character set of a given code

4.15**code table**

a table showing the character allocated to each bit combination in a code

4.16**control character**

a control function the coded representation of which consists of a single bit combination

4.17**control function**

an element of a character set that effects the recording, processing, transmission, or interpretation of data, and that has a coded representation consisting of one or more bit combinations

4.18**control sequence**

a sequence of bit combinations starting with that representing the control character CONTROL SEQUENCE INTRODUCER (CSI), used for the coded representation of control functions with parameters

4.19**control string**

a delimited string of characters which may occur in the data stream as a logical entity for control purposes

4.20**cursor**

a special indicator used to mark the active position in a display

4.21

default

a value or a state that is to be assumed when no value or state is explicitly specified

4.22

to designate

to identify a set of characters that are to be represented, in some cases immediately and in others on the occurrence of a further control function, in a prescribed manner

4.23

device

a component of information processing equipment which can transmit, and/or receive, coded information within CC-data-elements

NOTE It may be an input/output device in the conventional sense, or a process such as an application program or a gateway function.

4.24

display

the region for visual presentation of data on any type of character-imaging device, including printer, cathode ray tube and similar devices

4.25

document

an ordered set of one or more pages intended by the sender to be regarded as an entity

4.26

document terminator

a function that delimits the text that is part of a given document and separates it from the text of the next document, if any. The separator is either an occurrence of the control function DOCUMENT TERMINATOR (DT) [INFORMATION SEPARATOR FOUR (IS4)] embedded in the text, or the equivalent function as a protocol element

4.27

editor function

control function used for editing, altering or transposing the visual arrangement of data

4.28

escape sequence

a bit string that is used for control purposes in code extension procedures and that consists of two or more bit combinations. The first of these bit combinations represents the character ESCAPE

4.29

field

an area consisting of the character position at a character tabulation stop (beginning of the field) and the character positions up to, but not including, the character position at the following character tabulation stop (end of the field)

4.30

final byte

the bit combination that terminates an escape sequence or a control sequence

4.31

formator function

control functions (format effectors and presentation control functions) describing how the originator of the data stream wishes the information to be formatted or presented

4.32

formattable text

character-coded text that contains control functions intended by the sender to be usable to expedite the processing and/or the formatting of the text by the recipient

4.33**formatted text**

character-coded text that contains control functions which determine the detail of the layout and appearance of text as presented

4.34**graphic character**

a character, other than a control function, that has a visual representation normally handwritten, printed or displayed, and that has a coded representation consisting of one or more bit combinations

4.35**graphic rendition**

the visual style of displaying a set of graphic symbols

4.36**graphic symbol**

a visual representation of a graphic character or a control function

4.37**intermediate byte**

- a) In an escape sequence, a bit combination that may occur between the control function ESCAPE (ESC) and the Final Byte;
- b) In a control sequence, a bit combination that may occur between the control function CONTROL SEQUENCE INTRODUCER (CSI) and the Final Byte, or between a Parameter Byte and the Final Byte.

4.38**to invoke**

to cause a designated set of characters to be represented by the prescribed bit combinations whenever those bit combinations occur

4.39**line**

a set of consecutive character positions

4.40**line home position**

a reference position on a line ahead of which the active position can normally not be moved

4.41**line limit position**

a reference position on a line beyond which the active position can normally not be moved

4.42**line progression**

the direction of presentation of successive lines

4.43**page**

a set of consecutive lines

4.44**page home position**

a reference position on a page ahead of which the active position can normally not be moved

4.45**page-image format; PIF**

a representation of the image of text which is formatted by the sender for presentation by the recipient and which is not intended to be subjected to reformatting operations by the recipient

4.46

page limit position

a reference position on a page beyond which the active position can normally not be moved

4.47

page terminator

a function that delimits the text that is to be imaged on a given page and separates it from the text of the next page, if any, of the same document. The separator is either an occurrence of the control function PAGE TERMINATOR (PT) [INFORMATION SEPARATOR THREE (IS3)] or DOCUMENT TERMINATOR (DT) [INFORMATION SEPARATOR FOUR (IS4)] embedded in the text, or the equivalent function as a protocol element

4.48

parameter byte

in a control sequence, a bit combination that may occur between the control function CONTROL SEQUENCE INTRODUCER (CSI) and the Final Byte, or between CSI and an Intermediate Byte

4.49

position

the part of a code table identified by its column and row coordinates

4.50

repertoire

a specified set of characters that are represented by one or more bit combinations of a coded character set

4.51

tabulation

the technique of identifying character positions or lines in a display for the purpose of arranging information systematically

4.52

tabulation stop

the indication that a character position or a line is to be used for tabulation; a character tabulation stop may also serve as a boundary between fields

4.53

text area

the image of the part of a page on which text may be presented

4.54

user

a person or other entity that invokes the services provided by a device

NOTE 1 This entity may be a process such as an application program if the “device” is a code converter or a gateway function, for example.

NOTE 2 The characters, as supplied by the user or made available to him, may be in the form of codes local to the device, or of non-conventional visible representations, provided that 2.3 above is satisfied.

4.55

variable-spacing graphic symbol

the visible forms of graphic characters — letters, digits or symbols — in which their dimensions along the line may differ from one to the other

5 Notation and names

5.1 Notation

The bits of the bit combinations of an 8-bit code are identified by b_8 , b_7 , b_6 , b_5 , b_4 , b_3 , b_2 , and b_1 , where b_8 is the highest-order, or most significant, bit and b_1 is the lowest-order, or least significant, bit.

Analogously, the bits of a 7-bit code are identified by b_7 , b_6 , b_5 , b_4 , b_3 , b_2 , and b_1 , where b_7 is the highest-order, or most significant, bit and b_1 is the lowest-order, or least significant, bit.