Accessible design for self-service interactive devices including automated banking machines

Accessibility Standards Canada

Normes d'accessibilité Canada

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Preface

This is the first edition of CSA/ASC B651.2, Accessible design for self-service interactive devices including automated banking machines. It supersedes the second edition of CSA B651.1, published in 2009 under the title Accessible design for automated bank machines, and the first edition of CSA B651.2, published in 2007 under the title Accessible design for self service interactive devices.

This new edition of CSA/ASC B651.2 includes the following major changes:
a) consolidation of CSA B651.1 and CSA B651.2, as noted above, into one new standard;
b) updates to the contents of both standards noted above; and
c) improvements to the standard on access to devices.

This Standard is intended to be used in conjunction with CAN/CSA-B651.

The requirements of this Standard are minimum requirements. This Standard does not have the force of law unless mandated by legislation or referenced in the regulations of the authority having jurisdiction. The user is advised to contact the authority having jurisdiction in order to determine to what extent this Standard is referenced.

This Standard was prepared by the CSA Subcommittee on Accessible Design for Self-Service Interactive Devices and ABMs, under the jurisdiction of the CSA Technical Committee on Accessibility and the CSA Strategic Steering Committee on Community Safety and Well-Being, and has been formally approved by the Technical Committee.

This Standard has been developed in compliance with the Standards Council of Canada requirements for National

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Notes:

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2) Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.
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   b) relevant clause, table, and/or figure number;
   c) wording of the proposed change; and
   d) rationale for the change.

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0 Introduction

0.1 Legislation

The Canadian Charter of Rights and Freedoms states that every individual is equal before and under the law without discrimination based on race, national or ethnic origin, colour, religion, sex, age, or mental or physical disability. The Canadian Human Rights Act has brought the issue of providing accessible consumer services and built environments to the forefront for industries that are federally regulated. Federal, provincial, and territorial accessibility regulations are in effect throughout Canada and each provincial and territorial government has enacted human rights legislation to promote equality and reduce discrimination.

0.2 Demographics

More then one in five Canadians aged 15 and over — an estimated 6.2 million people, or 22% of the adult population — has one or more disabilities (S. Morris, G. Fawcett, L. Brisebois and J. Hughes. November 2018). The highest rate of disability occurs in the age group 75 and over, where almost one-half of men and women report a disability.

Statistics Canada reports that the median age of Canada's population continues to climb, with the average age of Canadians reaching 41.7 years (Statistics Canada, 2021), the median age being one of many indicators that signifies the

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population is aging. It is expected that the proportion of people aged 65 and over will continue to increase, with the advancing age of the large baby boomer cohort.

Shifts in population size within various age groups have far-reaching social, economic, and policy impacts. The number of individuals within an age group has a profound effect on the demand for products and services. People with disabilities and older people are coalescing as an economic and social force and constitute a significant portion of the consumer market. Therefore, it makes good business sense to increase access for all customers.

0.3 Benefits

Accessibility is an important consideration in the design of products, systems, environments, and facilities because it affects usability for people with the widest possible range of capabilities. Many accessibility features benefit those who do not have a disability by enhancing usability and providing possibilities for customized design. For example, taking into account the needs of people who are partially sighted helps all users trying to read a display in poor lighting conditions or without their reading glasses.

Involving users with a range of abilities during the design and development phase can reduce development time and costs and ensure the early detection of problems, thus avoiding expensive redesign. Improvements implemented during the design phase are less costly than those implemented after production.

Accessible design also helps organizations and businesses develop or maintain global markets by making their products compliant with legal accessibility requirements in force in other countries. For example, accessible design is a requirement for acceptance into the U.S. market (e.g., under the Americans with Disabilities Act of 1990 and Section 508 of the Rehabilitation Act of 1973). Accessible design is also covered by European Commission Mandates M/273 and M/283.

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1 Scope

1.1 Purpose

This Standard specifies minimum accessibility requirements for self-service interactive devices (such as, but not limited to, automated banking machines, retail self-checkout, self check-in devices, ticket vending kiosks, smart card sales, query and reload devices).
Note: While the purpose of this Standard is to make a product as accessible and usable as practicable, it is possible that some people will have needs greater than or different from the needs addressed by this Standard, and having the ability to interact with a person can be supportive. See Annex A for common design barriers for people with disabilities.

1.2 Application

This Standard specifies technical requirements applicable to the design, manufacture, site preparation, and installation of self-service interactive devices.

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1.3 Limitations

This Standard does not cover
a) physical environment of drive-through self-service interactive devices; and
b) websites and web applications that are beyond the control of the service provider and accessed from public devices.

1.4 Terminology

In this Standard, "shall" is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; "should" is used to express a recommendation or that which is advised but not required; and "may" is used to express an option or that which is permissible within the limits of the Standard.

Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

Notes to tables and figures are considered part of the table or figure and may be written as requirements.

Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

1.5 Alt text

Alt text is provided in the captions associated with figures and tables.

2 Reference publications

This Standard refers to the following publications, and where such reference is made, it shall be to the edition listed below, including all amendments published thereto.

CSA Group

B651-18
Accessible design for the built environment

CAN/CSA-B659-08 (R2018)
Inclusive design for an aging population

ETSI (European Telecommunications Standards Institute)

EG 202 116 V1.2.1 (2002-09)
Human Factors (HF) — Guidelines for ICT products and services — "Design for All"

European Commission

M/273 (1998)
Mandate to the European Standards Bodies for Standardization in the field of information and communications technologies (ICT) for disabled and elderly people

M/283 (1999)
Mandate to the European Standards Bodies for a guidance document in the field of safety and usability of products by people with special needs

Government of Canada

Canadian Charter of Rights and Freedoms, Part I of the Constitution Act, 1982, being Schedule B to the Canada Act 1982 (U.K.), 1982, c. 11

Canadian Human Rights Act, RSC 1985, c. H-6

S. Morris, G. Fawcett, L. Brisebois and J. Hughes. November 2018. "A demographic, employment and income profile of Canadians with disabilities aged 15 years and over, 2017". Statistics Canada

Statistics Canada, 2021. Annual Demographic Estimates: Canada, Provinces and Territories, 2021

Government of the United States

Americans With Disabilities Act. Public Law 101-336. 108th Congress, 2nd session (July 26, 1990)

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Equal Opportunity for Individuals with Disabilities Act of 1990,
Title 42 — The Public Health and Welfare Chapter 126, 42 U.S.C
§§ 12101 et seq.

Rehabilitation Act of 1973, Section 508, as amended, 29 U.S.C
§ 794d Electronic and information technology

IEC (International Electrotechnical Commission)
60950-1:2005
Information technology equipment — Safety — Part 1: General
requirements

ISO (International Organization for Standardization)
7000:2019
Graphical symbols for use on equipment — Registered symbols

7001:2007
Graphical symbols — Public information symbols

ISO/TS 16071:2003 (withdrawn)
Ergonomics of human-system interaction — Guidance on
accessibility for human-computer interfaces

W3C (World Wide Web Consortium)
Web Content Accessibility Guidelines (WCAG) 2.1-2018

3 Definitions
The following definitions shall apply in this Standard:

Accessible — as applied to the design or adaptation, or both,
of self-service interactive devices, sites, and exterior spaces
possess the necessary characteristics for them to be as usable
as practicable.

Accessible self-service interactive device site — a location
having, at a minimum, one self-service interactive device that
meets the requirements of this Standard.

Alternative (alternate) format — information presented in braille, large print, audio, or electronically (accessible digital formats).

Automated banking machine (ABM) — a stand-alone or wall-mounted machine that is customer-activated and designed to perform basic transactions, such as cash withdrawal, cheque deposit, bill payment, and transfer between accounts.
Note: An ABM is also referred to as an automated teller machine (ATM).

> **Stand-alone ABM** — a machine installed in an area with no additional enclosure.

> **Wall-mounted ABM** — a machine installed in a
> a) wall opening of an existing structure; or
> b) structure built to house the machine.

Biometrics — the use of a physical attribute for identifying an individual.

Centreline — The path defined by geometric midpoints of a component or structure within a self-service interactive device dividing it into two equidistant parts, either vertically or horizontally.

Colour contrast — a significant contrast in colour between the foreground and the background of an element, i.e., light characters on a dark background or dark characters on a light background.

Contactless identification and authentication — technologies utilized to identify and authenticate self-service interactive device users. These technologies can include bank cards, mobile devices, wearable devices, and radio-frequency identification device (RFID) fobs.

Contrast — a juxtaposition of tones, textures, colours, and/or brightness to create striking differences.

Glare — luminance within the visual field that is sufficiently greater than the luminance to which the eyes have adapted and that is liable to cause annoyance, discomfort, or diminished surface visibility.

Interface — the point at which the user interacts with the self-service interactive devices.

Keyboard — an unencrypted alphanumeric input device with at least 26 alpha and 10 numeric keys plus a variable number of special character, control, and function keys.

Keypad — an unencrypted numeric input device with at least 10 numeric keys plus a variable number of special function keys (e.g., okay, correct, etc.).

Luminance — the intensity of light emitted from a surface, per unit area, in a given direction.

Michelson contrast — the formula, C_M, used to calculate the luminance (colour) contrast value (%):

$$C_M = (L_1 - L_2) / (L_1 + L_2) \times 100$$

where
L_1 = the value of luminance on a lighter surface, expressed in cd/m^2
L_2 = the value of luminance on a darker surface, expressed in cd/m^2

Notes:
1) When luminance values are not available but CIE Y values are available, the values Y_1 and Y_2 may be substituted for L_1 and L_2. Note the CIE Y value is identical to the LRV.
2) When the CIE Y values or the LRVs of the two surfaces to be compared are known, these values can be used to determine the luminance (colour) contrast. Otherwise, a measurement of luminance or reflectance is used to determine the luminance (colour) contrast.

Pin entry device — an electronic device used in a debit, credit, or smart card-based transaction to accept and encrypt

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the cardholder's personal identification number, as well as act as a means to interact with the self-service interactive device.

Pinpad — an encrypted numeric input device with at least 12, and not more than 16, keys that are specifically designed for inputting secure personal identification number (PIN) information required to authorize the entry of a financial transaction.

Plain language — a style of communication that organizes information logically and uses concrete, familiar words.

Public use — self-service interactive devices that are designed to be used by the public. This definition includes devices located on public property (i.e., places where the public has a right to be) and private property (i.e., places where the public is allowed by permission).

Route — an area such as a walkway, hall, corridor, passageway, or aisle.

Screen transaction text — a clearly defined portion of the screen that presents information and instructions relating to a user's transactions.

Self-service interactive device — a device where the user might need to enter data, read presented information, respond to prompts, or select from a number of choices for the service to be performed.

Service provider — an organization or individual that is responsible for self-service interactive devices.

Shelf — a horizontal surface that extends beyond the bezel of the self-service interactive device.

Site — a location where a self-service interactive device is installed.

Tactile markings — alpha numeric characters that are raised between 0.8 and 1.5 mm above the surface. Tactile markings

are distinct from Braille. Tactile markings may also include graphical depictions of symbols.

User space — the entire area where users line up, wait, or operate the self-service interactive device.

> **User operating space** — the area directly in front of the self-service interactive device, where the user operates the self-service interactive device.

Vertical plane — the plane that is at the midpoint between the nearest and the most distant interface component.

4 Design requirements

4.1 General

4.1.1 Design requirements compliance
The following steps shall be used to determine the design requirements for an interactive device:
a) identify the functional performance requirements (see Clause 4.2);
b) identify the accessibility requirements for each hardware component of the device (see Clause 10);
c) identify the software accessibility requirements for electronic (including electro-mechanical) devices (see Clause 11);
d) test the design against the functional performance requirements; and
e) apply the CSA B651 requirements for the installation of interactive devices (see Clause 9).

Note: The design requirements for a self-service interactive device depend on installation, software, and hardware components.

4.1.2 Language
Audio and written instructions shall
a) use plain language; and

b) be available in English and French.

Note: Clear and understandable graphics or symbols can be helpful in addition to onscreen instructions.

4.2 Functional performance of interactive devices

4.2.1 Instructions

All functionality of the interactive device shall be supported, at minimum, in visual text and audible speech modes of output.

Note: A braille-based interface can be added for those who use braille.

4.2.2 Output

An interactive device shall facilitate information retrieval by means of, at minimum, hearing and sight.

4.2.3 Important notifications

An interactive device shall relay important notifications through, at minimum, two modes of output (e.g., a visual output accompanied by a sound cue used to alert the user to a task or error).

4.2.4 Customization

The modes of output that an interactive device offers shall be customizable by the user (e.g., blanking the screen for privacy or adjusting the volume of audio output).

4.2.5 Input

An interactive device shall be operable by a tactile input device (e.g., a keyboard or keypad).

4.2.6 Simultaneous access

4.2.6.1 General

The methods of operation offered by an interactive device shall be usable simultaneously (e.g., a keyboard and touchscreen can be used interchangeably during a session).

4.2.6.2 Disabling interaction mode

The user shall have an option to disable a mode of interaction (e.g., blank a screen while using a keypad or keyboard).

4.2.7 Physical operation of controls

Where hand controls are used, the complete operation and information retrieval process shall have at least one mode where controls are operable
a) with one hand;
b) without tight grasping, pinching, or twisting of the wrist;
c) with a force not to exceed 22 N; and
d) from a seated or standing position.

Notes:
1) The requirement of Item a) does not preclude several operations one after the other.
2) The operation and information retrieval process of an interactive device may be executed by means of a user's own device which could contribute to a more inclusive experience, e.g., a user configuring a bank transaction through their smartphone and so does not have to interact with the interface of a bank machine.

5 External and internal access

5.1 Parking

Accessible parking spaces shall be provided and shall be in compliance with CSA B651.

Note: Parking spaces should be on the shortest possible accessible route to the location containing the accessible interactive device or devices.

5.2 Signage

5.2.1 International Pictogram of Access

Where a self-service interactive device meets the requirements of this Standard, the International Pictogram of Access (see Figure 1) shall be clearly displayed on or near the device. If there are additional signs indicating the direction to or location

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of the device, they shall also include the International
Pictogram of Access.

Note: To accommodate the broadest number of users, visual,
audio, and electronic means of identifying the availability and
location of accessible self-service devices should be considered.

5.2.2 Signs

Signs shall comply with signage requirements of CSA B651.

5.2.3 Tactile signs

Tactile signs shall
a) comply with CSA B651 and have characters and graphics
   with slightly rounded edges;
b) where applicable, be located at the main entrance; and
c) where applicable, be located on the wall, with the closest
   edge of the sign 150 ± 10 mm from the door jamb on the
   latch side of the door.

5.3 Exterior route

Exterior circulation, spaces, and amenities shall comply with
CSA B651.

Note: Exterior routes should be maintained such that they are free
of obstructions such as snow, ice, fallen leaves, and debris.

5.4 Interior route

Interior circulation shall comply with CSA B651.

6 Lighting

6.1 General

Lighting shall comply with interior and exterior illumination
requirements of CSA B651.

Note: Lighting should be designed to avoid misleading shadows
and to highlight obstacles such as stairs, curbs, and ramps. The goal
is to provide a consistent pattern and level of light in the absence of
natural light.

6.2 User space

Lighting levels (natural and artificial) throughout the user space shall

a) be maintained at a level of at least 200 lx; and
b) not create glare, reflections, or reduced contrast on the screen of the interactive device.

6.3 Interface panel

The interface panel of the interactive device shall be illuminated at a minimum level of 350 lx.

Notes:
1) Lighting on the interface of the interactive device should be carefully designed to preserve high contrast on the screen and to avoid glare and reflections for both seated and standing users.
2) Illuminated signs on the face of a self-service interactive device should be designed so that they do not interfere with the viewing of the screen.
3) Means should be used to ensure that sunlight does not affect readability of a display on a self-service interactive device.

7 Doors

7.1 General

Where doors lead into interactive device user space, they shall comply with CSA B651.

7.2 Security access for door entry

Where security access is required to gain entry to the user space,

a) security validation shall initiate the opening of the power assisted doors; and
b) security access devices shall comply with Clause 5.7.4 of CSA B651.

8 User space

8.1 General

8.1.1 Headroom and protruding objects

Headroom and protruding objects clearances shall comply with CSA B651.

8.1.2 User operating space

The user operating space in front of the interactive device shall
a) be clear and level; and
b) have minimum dimensions of unobstructed U-turn area allowance (centred on the device), separate from the lineup area, as specified in CSA B651.

Note: The user operating space does not include space required for the door swing.

8.2 Floor surfaces

Floor surfaces shall comply with CSA B651.

Note: Spatial orientation can be aided through the appropriate selection of contrasting colours that clearly distinguish the division between the floor and walls or other obstacles.

8.3 Lineup guides

Physical lineup guides, where provided, shall comply with lineup guides requirements of CSA B651.

Notes:
1) Lineup guides should only be used to define lineups where other alternatives are considered inadequate (e.g., lineup guides might be necessary in high-volume, multi-device installations).
2) The lineup should follow, in part or in whole, the interior route, so that the start of the lineup is easily identified.
3) Freestanding pedestal signs and other hazards should not be used to mark entrances to the lineup.

8.4 Ambient noise

Ambient noise levels shall be minimized wherever possible to ensure a quiet area.

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8.5 Waste receptacle

If provided, waste receptacles shall not obstruct access to the interactive device. Waste receptacles shall be identifiable using visual and tactile methods.

9 Installation

9.1 Approach and reach

9.1.1 General

A forward or side approach shall be acceptable.

Notes:
1) A forward approach is preferred as it will increase the percentage of people that can be accommodated.
2) In locations where multiple self-service interactive devises are provided, at least one device should be made usable by a front approach and one usable by a side approach.

9.1.2 Forward approach clearances

A forward approach shall have a combined clear knee and toe space of at least
a) 800 mm wide [see Figure 3 a)];
b) 680 mm high, measured from the floor [see Figure 3 b)]; and
c) 360 mm deep, measured from the leading edge of the machine (excluding the shelf) to the back of the knee space [see Figure 3 b)].

 Note: Increasing the depth to 430 mm would satisfy a greater proportion of the population.

9.1.3 Reach distances

Reach distances to all interface functions shall be
a) located within the grasp and touch ranges, as specified in Annex A of CSA B651; and
b) measured from the leading edge of the interactive device or the outer edge of the shelf to the device components.

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9.2 Protruding objects

9.2.1 General

Objects protruding from the wall shall comply with CSA B651.

9.2.2 Protrusion distance

For the width of the interactive device interface, no object shall protrude more than 40 mm from the same vertical plane as the device interface within a height range of 900 to 1980 mm from the floor.

9.3 Grab bar

A grab bar shall be provided for wall-mounted or wall-protruding interactive devices. The grab bar shall
a) comply with CSA B651;
b) contrast visually with the background;
c) be a minimum of 600 mm in length;
d) be mounted vertically with its lowest point starting at a height of 750 mm from the floor; and
e) be at a maximum distance of 600 mm from the midpoint of the screen to the centre of the grab bar.
Note: Grab bars provided on both sides of the machine will increase the number of people that can be accommodated.

9.4 Shelf

Where provided, a shelf shall
a) contrast visually with the background;
b) have bevelled edges;
c) have a maximum depth of 250 mm;
d) have a maximum height of 860 mm from the floor; and
e) not protrude more than 100 mm into a route.
Note: See Figure 2.

9.5 Site installation manuals

Site installation manuals shall include instructions for installing devices in accessible sites that comply with CSA B651. Site

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installation procedures shall be in accordance with the
requirements of CSA B651 for
a) area allowances (Clause 4.1 of CSA B651);
b) floor and ground surfaces (Clause 4.3 of CSA B651); and
c) accessible routes (Clause 5.1 of CSA B651).

10 Hardware components

10.1 General

10.1.1 Interface
Input devices and controls shall be
a) designed to facilitate their intended use;
b) located to promote ease of use;
c) intuitive; and
d) clearly labelled with both visual and tactile labels.
Note: Consistency in the design of an accessible device will make
learning how to use the device easier for users.

10.1.2 Height of controls
The centreline of operating controls or input and output
components shall be located in a range between 400 mm to
1200 mm from the floor.
Note: This is particularly important when the characteristics of the
object (e.g., weight, size, and temperature) can affect its safe
retrieval. Locating components within this range also allows users
to reach over obstructions up to 500 mm deep in order to grasp
controls or objects.

10.1.3 Biometrics
An interactive device that incorporates biometrics shall provide
a second (preferably non-biometric) identification method for
its use.
Notes:
1) Self-service interactive devices should be usable by everyone.
   Proximity or contactless readers can facilitate this.
2) Biometric systems (e.g., retinal or palm reader) cannot
   accommodate all users.

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10.2 Enclosure stability

The enclosure of a floor-mounted device shall meet the stability requirements of Annex B.
Note: Stability is important because some people will hold on to the enclosure for support while using the device.

10.3 Displays

10.3.1 Position of monitors

Monitors shall
a) be free from obstructions above or around the screen;
b) be viewable from standing and seated positions when viewed directly in front of the screen;
c) provide sufficient brightness to overcome ambient conditions including direct sunlight; and
d) minimize reflections.

10.3.2 Touch screen displays

10.3.2.1 General

Touch screens shall
a) be usable with items such as a prosthetic limb or stylus; and
b) provide audible and visible feedback to indicate that the screen has been touched.

10.3.2.2 Activation of audio instructions

A device that incorporates a touch screen shall enable activation of audio instructions for using the device through
a) insertion of an audio jack into a receptacle adjacent to the screen; or
b) touching an area on the screen that is adjacent to a tactile identifier located to the lower right on the bezel surround.

10.3.3 Privacy filter

Where provided, a privacy filter shall not degrade the legibility of the screen when viewed perpendicular to the screen.

10.4 Insertion slots

10.4.1 Slot location assistance
Insertion slots for notes, coins, or other media shall
a) have a colour-contrasted surround or a lead-through indicator light; and
b) be identified by tactile labelling.

10.4.2 Media insertion orientation
When a media reader or acceptor (cash, cheque, ticket, etc.) accepts media in only one orientation, a tactile pictograph shall be used to indicate the media orientation required by the device. Audio and visual feedback shall be provided when the media is inserted incorrectly.
Note: Media readers that read media in all four orientations should be used. Currency note acceptors with escrow are preferred because they hold the note until the transaction has been successfully completed.

10.4.3 Tapering
Coin and token slots shall be tapered to facilitate insertion.

10.5 Card reader

10.5.1 General

10.5.1.1 Activation
The initial activation or interface point shall be located to the right of the screen in a consistent manner.
Note: Placing the initial activation point close to the right-hand side of the screen will make it easier for the user to locate it.

10.5.1.2 Feedback
Readers shall provide feedback by visual and audible cues on successful and unsuccessful reading of a card or document.

10.5.1.3 Identification
Readers shall be identified by a tactile graphic symbol that
a) is prominently displayed and commonly understood;

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b) represents the card or document in question; and
c) identifies the orientation necessary for insertion of the card
or document.

10.5.1.4 Lead through indication

The slot of a card reader shall be bevelled at its edges and shall
have
a) a high colour contrast with the surrounding area; or
b) an indicator light at the slot.
Notes:
1) Bevelling the edge of a reader slot increases ease of
identification by tactile means and reduces the degree of
accuracy required for insertion.
2) Illuminating the slot surround can be helpful.

10.5.1.5 Card removal

For removal, the card shall
a) protrude a minimum of 25 mm; and
b) require a maximum force of 22 N.

10.5.2 Motorized readers

The slot of a motorized card reader shall be oriented
horizontally.

10.5.3 Flatbed document scanners

Flatbed document scanners that use a light source that emits
light in the visible spectrum shall be positioned such that the
light does not shine into the eyes of the user.

10.5.4 Barcode scanners

The effective scan area shall be discernible visually and
tactilely. Successful scans shall be indicated by audio and visual
feedback.
Notes:
1) Contactless barcode scanners should be used.
2) Omni-directional scanners with a light source that emits light in
the visible spectrum should be used.
3) Barcode scanners should be capable of reading both 1D and 2D
barcodes.

10.5.5 Swipe readers

Swipe readers shall be able to read a card or document when it is swiped in either direction.

Notes:
1) A two-headed swipe reader increases usability because the card or document can be swiped with the magnetic stripe on either side.
2) The more a card or document protrudes from the slot of a swipe reader, the easier it is for people with limited manual dexterity to use the reader.
3) Swipe readers should be oriented vertically.
4) For accessibility and security, swipe readers should no longer be used.

10.5.6 Dip readers

Dip readers shall be able to read a card via energizing the chip upon card insertion, or via reading the magnetic stripe when inserted and removed.

Notes:
1) Dip readers require greater dexterity for use and can cause difficulty with inserting and retrieving an item.
2) Dip readers should be oriented horizontally.

10.6 Dispensers

10.6.1 Identification

Graphic symbols to mark dispensers shall be tactile and visually contrasted with their background.

10.6.2 Slot dispenser

10.6.2.1 Issued media

Notes and other media issued from a slot dispenser shall protrude a distance of at least 25 mm from the surface of the slot's front edge.

Note: Notes should be dispensed in a single denomination or with the lowest denomination on top, and users should be given the option to select bill denominations.

10.6.2.2 Removal force

The force necessary for users to remove cash, receipts, and other items from a slot shall not be greater than 22 N.

10.6.3 Tray, pocket, or bin dispensers

The tray, pocket, or bin cover shall be designed to allow the user unimpeded access to the tray, pocket, or bin.

The tray, pocket, or bin shall
a) have a maximum depth of 70 mm measured from the front of the cover; and
b) be of sufficient size for users to retrieve items without the use of fine motor control.

10.7 Data entry devices

10.7.1 General

Data entry devices shall comply with Annex C.

10.7.2 Keys for keypads and keyboards

10.7.2.1 Keypad

The keypad shall
a) be telephone style with the number "1" at the top left and the number "5" in the centre;
b) have the number "5" marked with a centrally located raised dot that is 0.7 ± 0.1 mm high and has a diameter not less than 0.5 mm;
c) have numeric keys separated by at least 3.2 mm, measured from the edges of the keys;
d) have function keys, where required, separated from the numeric keys by at least three times the distance of that between numeric keys;
e) be placed at an angle between 10 to 45 degrees from the horizontal plane*; and
f) have a matte surface that minimizes glare (e.g., sandblasted aluminum or stainless steel).

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* Drive-up applications are not subject to this requirement.

Note: The location and use of a keypad's function keys should be included in both the audio and visual instructions for using the device.

10.7.2.2 Key surfaces

The surface of every key shall
a) have a minimum dimension of 15 mm;
b) be concave or non-slip;
c) be raised a minimum of 1 mm above the adjacent surface;
d) have a maximum edge radius of 0.5 mm; and
e) minimize glare.

10.7.2.3 Key characters or symbols

The characters or symbols on keys shall
a) have a luminance contrast of at least 50% with the adjacent surface using the Michelson Contrast formula;
b) be as large as the area of the key permits, using a broad stroke (i.e., bold text); and
c) use a sans serif font (e.g., Arial or Verdana).

10.7.2.4 Feedback

Key activation shall provide feedback as specified in Clause 11.3.3.

10.7.2.5 Privacy shield

Where they are used, keypad privacy shields shall be designed so that the keypad continues to meet the requirements of Clause 4.2.7.

Notes:
1) Privacy shields should be chosen to minimize any shadows cast on the keypad.
2) Privacy shields should be designed for the user, so that the entire PIN pad is visible, keys can be used without obstruction, and the shield could be inspected for the presence of any foreign objects like a covert camera.

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10.7.3 Function keys

10.7.3.1 Pin entry device function keys

The pin entry device function keys shall be
a) located to the right of the numeric keys; and
b) arranged vertically, top to bottom, in the following order:
   i) "Cancel";
   ii) "Correction"; and
   iii) "OK/Enter".

10.7.3.2 Pin entry device tactile symbols

Raised tactile symbols shall be
a) placed as follows:
   i) to the right side of the function keys; or
   ii) on the right-hand surface of the function keys; and
b) marked as follows:
   i) "Cancel" — raised X;
   ii) "Correction" — raised arrow <; and
   iii) "OK/Enter" — raised O.

10.7.3.3 Pin entry device key colours

If the function keys are colour-coded, they shall be colour-coded as follows:
a) "Cancel" — red;
b) "Correction" — yellow; and
c) "OK/Enter" — green.

10.7.3.4 User display function keys

User display function keys, if equipped, shall
a) be located on the bezel adjacent to the screen;
b) line up as close as possible to the function being selected;
c) correspond with onscreen instructions;
d) have extended leader lines that contrast with their background; and
e) have a matte surface that minimizes glare.

10.7.4 Audio interface

10.7.4.1 Audio output

The interactive device system shall

a) allow the user to increase or decrease the volume;
b) have a maximum volume of 120 dB measured 25 mm from the speaker; and
c) have a default volume set at the middle of the adjustment range.

Volume shall return to the default level when all transactions are completed.

10.7.4.2 Headphone jack

When a headphone jack is used to provide audible information, the jack shall

a) be compatible with plugs that are
    i) 3.5 mm in diameter; and
    ii) compatible for both stereophonic and monophonic headphones;
b) be located to the right of the screen;
c) have a funnel-shaped surround; and
d) be identified with a tactile symbol.

10.7.4.3 Handsets

When handsets are used to provide audible information, they shall

a) have a flux coil; and
b) have a handset cord that is at least 1000 mm long.

10.8 Contactless identification and authentication

10.8.1 Card or device clearance

Contactless readers, if equipped, shall accommodate presentation of a card or device by the user with no physical barriers within 10 cm of the device.

10.8.2 Indication of location

Contactless readers shall incorporate a tactile symbol on or near the device to indicate its location.

11 Software

11.1 General

Instructions shall be displayed for one task at a time. Voice guidance shall follow to match one task at a time.

11.2 Colour contrast

11.2.1 Contrast requirements

Screen text shall comply with the minimum contrast screen requirements of WCAG 2.1.

Note: The application should give the user the ability to switch between dark background/light text and light background/dark text. Dark text on a light background minimizes glare from the light source. However, light text on a dark background has been found to be easier to read for people who are partially sighted.

11.2.2 Colour coding

Colour may be used for the coding of on-screen indicators or buttons, provided that a redundant feature such as a shape, text, or an icon is also used.

11.3 Input/control devices and input feedback

11.3.1 Accidental activation

When an input device or control is accidentally activated, there shall be a way for the user to undo the effects of the unintended action.

11.3.2 Adjustable time

Where user input is required to complete a task, the time allowed for completion shall be adjustable through a question posed to the user (e.g., "Do you need more time?").

11.3.3 Feedback

Every keypress shall be immediately acknowledged visually, audibly, and where physical keys are used by tactile registration to indicate that the system has received input.

Note: Providing audible feedback is important when the control surface does not depress or move (e.g., touch screens). The volume should be at least 20 dB above the anticipated ambient level when visual and audible feedback are the primary mechanisms.

11.3.4 Confirmation

Confirmation of the executed task shall be given in visual and audio mode.

Note: The user needs to be able to distinguish between confirmation tones and error/warning tones. Detection of low- and high-frequency tones can be more challenging, therefore, mid-frequency tones should be used.

11.3.5 Warning tones

The duration and frequency of warning tones shall differ from the duration and frequency of auditory confirmation tones.

11.3.6 Warning information

Error or warning information shall repeat in a suitable manner for as long as it is relevant to the task or until the user cancels it.

11.4 User options

Users shall have the option of selecting the output mode and options at the beginning of the transaction (e.g., captioning, screen font size, background/foreground colour, and blanking of the screen).

11.5 Audio output sequence

When audio output has been selected, the most important information shall be read first (e.g., for an airline ticket, the gate number, flight number, seat number, and boarding time). There shall be an option for the user to re-read the information.

11.6 Dynamic display of information

11.6.1 Long text
Moving text on the screen shall be avoided.

When information is presented in a form that extends across several screens, the text shall not automatically scroll and the device shall allow the user to control the pace of reading.

11.6.2 Background
Displayed text shall not be superimposed on watermarked, patterned, or picture backgrounds.

11.6.3 Advertising
There shall be no advertising within the instructional area of the transaction screen.

11.6.4 Font

11.6.4.1 Font style
A legible font shall be used. Script fonts and other highly stylized fonts shall be avoided. Fonts shall have
a) true ascenders and descenders;
b) uniform stroke width; and
c) variable width, so that "i" characters are narrower than average and "m" characters are wider.
Note: Preference should be given to sans serif styles (e.g., Arial or Verdana).

11.6.4.2 Characters
Every font shall allow users to clearly distinguish between characters such as X and K, T and Y, I and L, I and 1, O and Q, O and 0, S and 5, and U and V.

11.6.4.3 Font size
The largest practicable font size shall be used. When technically feasible, users shall be given the option of increasing the font size.
Note: Text that is 14-point or larger should be used.

11.6.5 Written text and instructions

11.6.5.1 Characters case
Text shall be presented using upper- and lower-case characters.

11.6.5.2 Justification
Text shall be left-justified, with a ragged right edge to improve readability.

11.6.5.3 Number alignment
Columns of numbers shall be aligned under the decimal point.

11.6.5.4 Instructions
Instructions shall
a) use the active voice; and
b) be phrased as positive commands that focus on what to do rather than what not to do.

11.6.5.5 Abbreviations and acronyms
Abbreviations and acronyms shall be avoided, except for the names of organizations or brands.

11.6.5.6 Listing
When instructions include numbered lists, Arabic numerals shall be used (i.e., 1, 2, 3, etc.).

11.6.5.7 Numeric amounts
When displaying numeric amounts, periods and decimals shall be approximately 0.3 times the height of the letter "o", and commas shall be approximately 0.55 times the height of the letter "o".

11.6.6 Graphics and video

11.6.6.1 Audio descriptions
Where voice output is used, audio descriptions for graphic images central to the task shall be provided.

11.6.6.2 Text use limitation

Text characters shall not be used for drawing lines, boxes, or other graphic symbols (e.g., ASCII art).

11.6.6.3 Captioning

Text captioning shall be provided for all visual multi-media output having a soundtrack. Captioning shall be closed and able to be controlled by users.

Where video is used, descriptive audio shall be available and able to be activated by users.

11.7 Audio

11.7.1 Automatic initiation

Insertion of a headphone jack shall automatically initiate audio instructions.

When an audio facility is activated, an option to blank out the screen shall be provided.
Note: Screen blanking is an important security feature for users who cannot monitor the position of other people within the device user space.

11.7.2 Order of instructions

Audio instructions shall state the name of the service provider, followed by
a) the selection of language (English or French);
b) information that describes the location of components of the interactive device and their operation; and
c) style of keypad or keyboard (e.g., telephone pad, numeric pad, QWERTY keyboard) when used.

11.7.3 Frequency

Audio communication shall be within the mid-range frequency range of human hearing.

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11.7.4 Voices

The audio shall have two distinguishable voices: one for instruction and the other for dynamic content.

Note: Consideration should be given to allowing users to vary the speed of speech. Allowing users to choose between a high and low register voice will accommodate a greater frequency tolerance and range for users.

11.7.5 Abbreviations

Abbreviated text shall be pronounced in full in audio (e.g., "ON" as "Ontario" and "e.g." as "for example").

11.7.6 Numbers

Numbers shall be pronounced phonetically (e.g., "12" as "twelve").

11.7.7 Coordination of information

On screen and audio instructions shall be coordinated and shall convey the meaning of all information presented in an equivalent manner.

Note: For example, if instructions are presented on the screen, the audio will convey the same instructions or if there is a sharp tone indicating an error, an equivalent visual alert will be shown.

11.7.8 Repeated instructions

A pause of at least 3 s shall be provided between repeated instructions.

11.7.9 Advertising

The user shall have the option of listening to advertising. Any advertising shall not interrupt the primary task.

11.7.10 Audio interruption

Any audio shall be interruptible by the user. For example, a long set of instructions can be bypassed if a user wishes.

11.8 Printed output

Information printed by the interactive device shall be printed in
a) upper and lower-case text;

b) sans serif font (e.g., Arial or Verdana);
c) 14-point font for critical information, at the user's request; and
d) high-contrast text (e.g., black text on white background).

Notes:
1) A minimum font size of 14 points should be used or, when this is not possible due to the fixed size of a receipt, a size as close as possible to 14 points.
2) Stylized, shadowed, and italic fonts should be avoided.
3) Printers should be regularly checked to maintain high-quality output.

Figure 1
**International Pictogram of Access**
(See Clauses 0.4 and 5.2.1.)

a)

b)

This figure shows the International Pictogram of Access, which is an outline of a person in a wheeled mobility

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Figure 1 (Concluded)

device. Figure a) shows a rounded version of the figure with more natural proportions, while Figure b) shows the traditional stick figure.

Note: Two figures for the International Pictogram of Access are presented. The International Pictogram of Access on the bottom is the older pictogram. ISO 7001 has updated the pictogram to be more representative of the human form. This new pictogram is shown on the top. Either pictogram can be used.

Figure 2
Automated banking machine with shelf
(See Clause 9.4.)
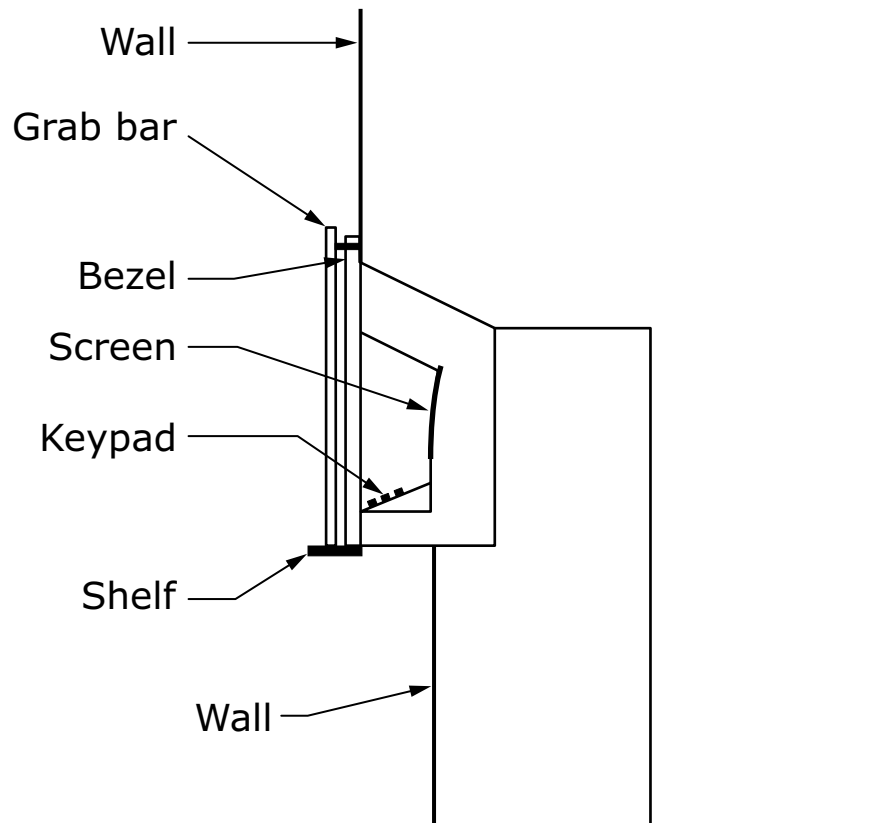
Side view diagram of an automated banking machine. Arrows pointing to the wall, grab bar, bezel, screen, keypad, and shelf are labeled.

Figure 3 a)
Knee and toe space — Front view
(See Clause 9.1.2.)
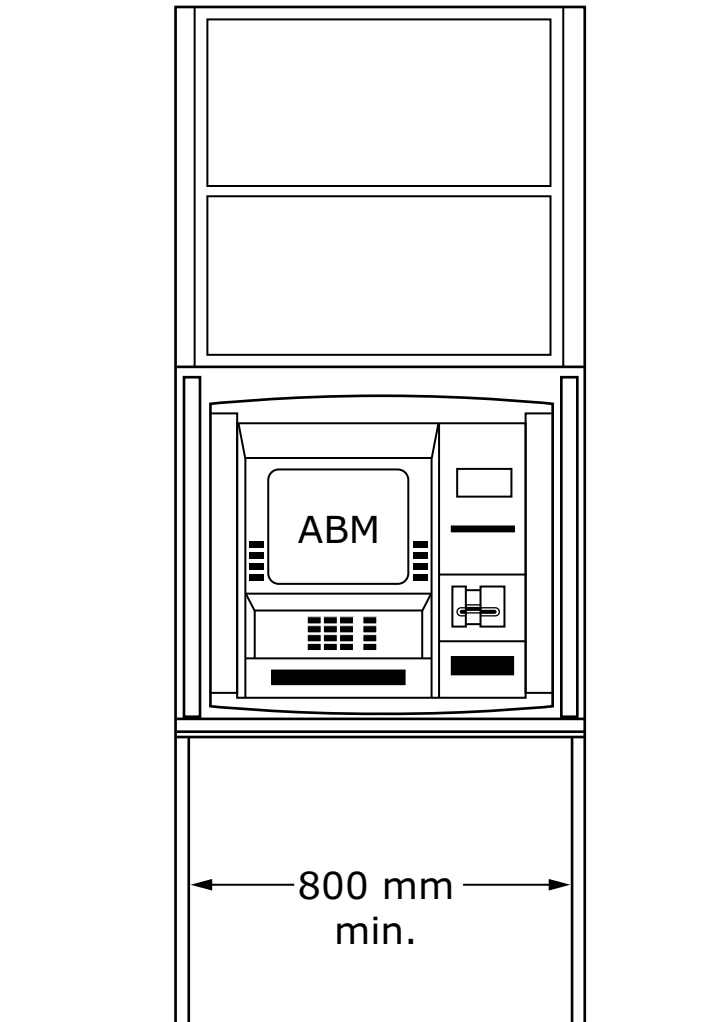
Front view of an automated banking machine diagram with the minimum recommended knee and toe space width of 800 mm labeled. Grab bars, a number pad, a card reader, a screen display, and a cash dispenser are shown as components of the ABM.

Figure 3 b)
Knee and toe space — Side view
(See Clause 9.1.2.)

Dotted line indicates reach distance for ABM user interface panel

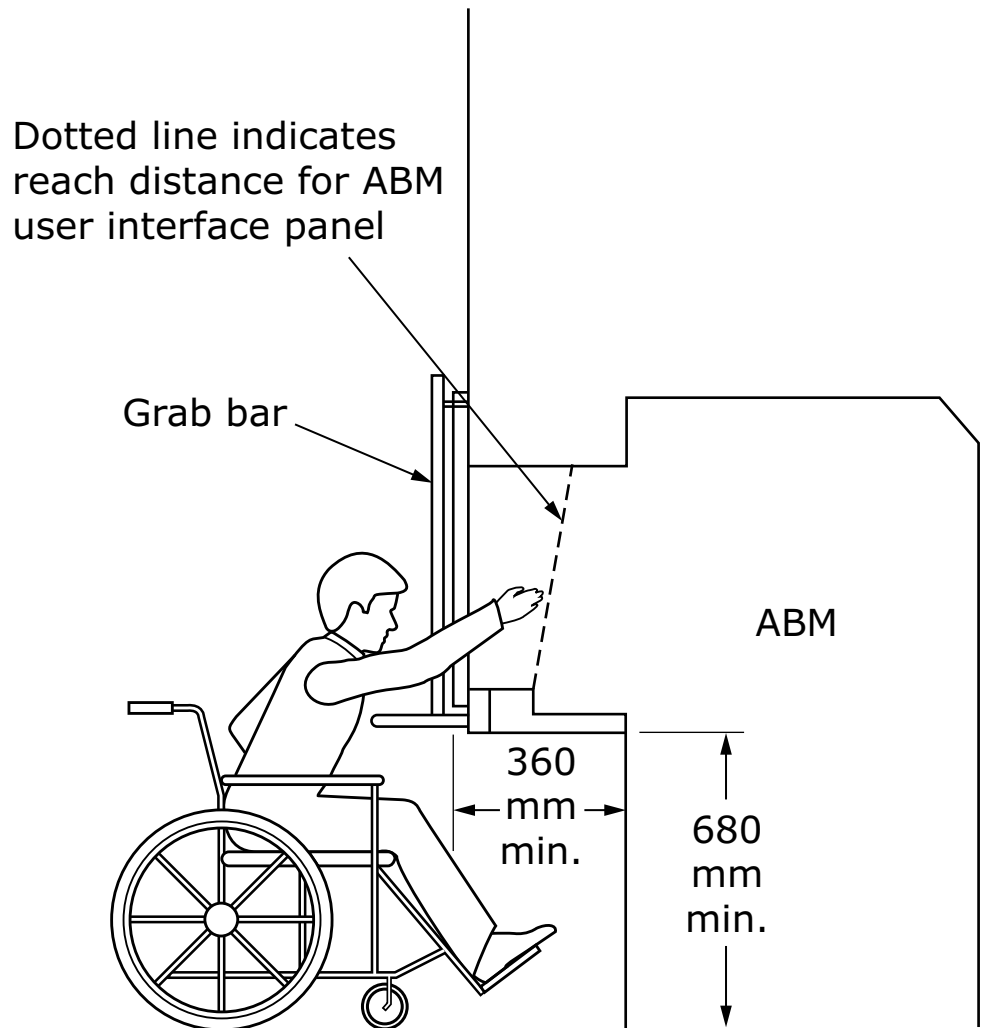Grab bar

ABM

360 mm min.

680 mm min.

Diagram showing a side view of an automated banking machine with a grab bar being accessed by a person using a wheelchair and reaching across a shelf to touch a screen. The recommended minimum knee and toe space depth of 360 mm and height of 680 mm are labeled. A dotted line on an angle is shown to indicate reach distance for the ABM interface panel.

Annex A (informative)
Considerations when designing for accessibility

Note: This Annex is not a mandatory part of this Standard.

A.1 Considerations when designing for accessibility

Multiple factors can impact the ability of individuals to participate in the use of ABMs and self-services interactive devices. This can include, but is not limited to age, disabilities, temporary disabilities (e.g., injuries or illness), economic factors, geographic location, and training. Accessibility requirements vary significantly, even among people who are living with the same disability. This Annex provides an outline of the barriers typically encountered by individuals with disabilities, but does not constitute a comprehensive account.
Note: For further information, see CAN/CSA-B659, ETSI EG 202 116 V1.2.1, and ISO/TS 16071.

A.2 Designing for people who are blind, partially sighted, or Deafblind

People who are blind, partially sighted, or Deafblind experience sight loss in a wide variety of ways. Blindness is a spectrum that can range from a person not seeing anything, to having only central or peripheral vision, or blurred and distorted vision in all or parts of their visual field. This means that, while people's experiences vary significantly, people who are blind or partially sighted might use auditory and/or tactile, as well as techniques and technology to enhance visual content as means of interaction with a system.

When designing for people who are blind, partially sighted, and Deafblind consideration should be given to the provision and promotion of information through methods other than
- visual;
- reading standard text;

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- identification and navigation among objects on screens; and
- the control of focus, navigation, and other functions using a touch screen.

People who are partially sighted might only be able to see a fraction of the information presented on a standard screen. When interacting with systems, people who are partially sighted might be unable to detect standard font sizes, have difficulty with font discrimination, and have trouble locating or tracking interface objects such as pointers, cursors, drop targets, and direct-manipulation handles.

Approximately 10% of people who are blind use braille as their primary reading method, but many more people use it for reading shorter pieces of information such as signage or labels. People who are Deafblind (experience both hearing loss and sight loss to varying degrees) might also use braille as a reading method if listening to auditory outputs is not a feasible method for the receipt of information.

People who are blind, partially sighted, and Deafblind interact with systems through assistive technology such as

- screen readers, i.e., assistive software that can provide spoken information for windows, controls, menus, images, text, and other information typically displayed on a screen;
- refreshable braille displays, which are mechanical devices that convert text information on screen into braille using round tipped pins raised through holes on a flat surface;
- screen magnification software that allows end users to magnify their screen and change colours of the text and background; and
- magnification hardware such as large monitors and CCTVs.

In addition, because people who are blind, partially sighted, or Deafblind might use synthesized speech output to receive information, it can be difficult to simultaneously listen to and attend to auditory outputs that occur while reading.

A.3 Designing for people who are deaf

A person who is deaf is anyone who does not perceive amplified speech, even with the use of a hearing aid. People who cannot hear sound below 90 dB is also another method that is used to define deafness.

Sign language is often the primary language for people who are born deaf, or who become deaf at an early age, and so they might have difficulties understanding information written in a spoken language such as English or French.

Voice-input systems also create barriers for some people who are deaf and who have difficulty producing speech that is recognizable by these systems. It is also important to note that historically, and even today, people who are deaf have been sent to schools to learn to speak against their will and assimilate with people who are hearing, and so requiring a person who is deaf to speak is highly contentious and might be traumatic to the individual.

When interacting with systems, people who are deaf encounter challenges when information is presented in audio form only. The same issues can apply to people in contexts where sound is masked by background noise (e.g., a machine shop floor) or where sound is turned off or cannot be used (e.g., a library).

A.4 Designing for people who are hard of hearing

People who are hard of hearing might experience difficulties in distinguishing frequency changes (as well as decreased frequency range and dropout), challenges to localize sounds, or picking up sounds against background noise, even with the use of a hearing aid.

Some people who are hard of hearing use electronic hearing aids, depending on the nature and extent of their hearing loss.

When interacting with systems, people who are hard of hearing might not be able to recognize sounds of certain low-volume

frequencies. Sound individualization is essential for maintaining accessibility.

A.5 Designing for people who have physical disabilities

A physical disability affects a person's mobility and dexterity in a number of ways, including but not limited to, coordination, strength, mobility, and range of motion. People with physical disabilities sometimes use assistive technologies, including a variety of hardware and software. Examples include, but are not limited to, eye-tracking, speech recognition, sip and puff devices, and on-screen keyboards.

Some people with physical disabilities can experience barriers when directly manipulating objects using modifier keys or pointing devices and performing actions that require precise movement or timing, such as moving to a target. The wide diversity of needs among people with physical disabilities makes individualization of input parameters and timing extremely important.

A.6 Designing for people who have cognitive or learning disabilities

People who have cognitive disabilities might have difficulties receiving, processing, and communicating information. People with learning disabilities can have trouble learning new things, making generalizations and associations, and expressing themselves through spoken or written language.

By using plain language, preferably in both visual and audio forms, important information becomes more understandable for people with cognitive and learning disabilities and improves usability with self-service interactive devices. The use of plain language also improves communication for all users of self-service interactive devices.

Reading difficulties can be alleviated by having the text highlighted and read out loud or by providing "plain language" versions of the texts. All users can benefit from plain language

versions of written text. Providing synthetic speech output for what is being written can aid people who have reading difficulties.

A.7 Designing for people who live with multiple disabilities

Disabilities are not limited to a few categories; the range of accessibility needs must take into account the fact that disabilities sometimes exist in combination. For example, an individual with a cognitive disability might also be partially sighted.

Guidelines for addressing a specific disability are not always applicable to a person with multiple disabilities. For example, auditory output of written text might not be usable by people who are Deafblind. It is, therefore, important that support for multiple disabilities be individualized for the specific person and task.

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Annex B (normative)
Stability

Notes:
1) This Annex is a mandatory part of this Standard.
2) The requirements of this Annex are based on IEC 60950-1.

B.1 Scope

Under conditions of normal use, a device shall not become physically unstable to the degree that it could become a hazard to an operator.

The requirements of this Annex shall not apply where the installation instructions for a device specify that it is to be secured to a building structure before operation.

Under conditions of normal use, a stabilizing means, when needed, shall operate automatically when drawers, doors, etc. are opened.

B.2 Tests

B.2.1 General

Compliance shall be determined by performing the applicable tests specified in Clauses B.2.2 to B.2.4. Each test shall be carried out separately. During the tests, the device shall hold the amount of a substance, within its rated capacity, that produces the most disadvantageous condition. All jacks, where used in normal operation, shall be placed in their most unfavourable position, with wheels, casters, etc. locked or blocked. When casters are intended only for transporting the device and the installation instructions require jacks to be lowered after installation, the jacks (not the casters) shall be used for the test and shall be placed in their most unfavourable position, consistent with reasonable levelling of the unit.

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B.2.2 Tilt test

A unit shall not fall over when tilted an angle of 10° from its normal upright position. Doors, drawers, etc. shall be closed during this test.

B.2.3 Tip force test

A floor-standing unit having a mass of 25 kg or more shall not fall over when a force equal to 20% of the weight of the unit, but not more than 250 N, is applied in any direction except upward, at a height not exceeding 2 m from the floor. Doors, drawers, etc. that can be moved for servicing by the operator shall be placed in their most unfavourable position, consistent with the installation instructions.

B.2.4 Force-on-self test

A floor-standing unit shall not fall over when a constant downward force of 800 N is applied at the point of maximum moment to any horizontal surface of at least 125 mm × 200 mm at a height not exceeding 1000 mm from the floor. Doors, drawers, etc. shall be closed during this test. The 800 N force shall be applied by a suitable test tool with a flat surface of approximately 125 mm × 200 mm. The downward force shall be applied with the complete flat surface of the test tool in contact with the device under test.

Note: The test tool need not be in full contact with uneven surfaces (e.g., corrugated or curved surfaces).

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Annex C (normative)
Data entry devices

Note: This Annex is a mandatory part of this Standard.
Tables C.1 to C.5 show methods of data input for common data
entry devices.

Table C.1
Touch screen (virtual keyboard) and membrane keys

The table outlines methods of data input for touch screens (virtual keyboards) and membrane keys.

Data input	Alpha layout	QWERTY layout	Number pads
Financial transactions — Debit (PIN)	N/A	N/A	R
Financial transactions — Credit (signature)	N/A	N/A	R
Input of up to three characters	R	R	R
Selection of items from discrete lists	R	R	R
Simple form filling	R	R	N/A
Navigation	R	R	N/A
Reading large blocks of text (e.g., disclaimers, email, news)	N/A	N/A	N/A

(Continued)

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Table C.1 (Concluded)

Data input	Alpha layout	QWERTY layout	Number pads
Typing large blocks of text (e.g., email)	X	R	N/A
Complex form filling	R	R	N/A

Legend:

A = May be used as the only form of input or in combination with redundant forms of input. Shall be used in combination with voice output.

A* = May be used as the only form of input or in combination with redundant forms of input. Voice output not required.

N/A = Not applicable.

R = May be used only as a redundant form of input. Shall be used in combination with voice output.

R* = A redundant input device to an information transaction machine. Voice output is optional.

X = Shall not be used.

Table C.2
Physical keyboard

The table outlines methods of data input for physical keyboards.

Data input	Alpha layout	QWERTY Layout	Number pad with function keys	Number pad with softkeys	Number pad only (no function keys)
Financial transactions — Debit (PIN)	N/A	N/A	A	A	N/A
Financial transactions — Credit (signature)	N/A	N/A	A	A	N/A
Input of up to three characters	A	A	A	A	A*
Selection of items from discrete lists	A	A	A	A	A*

(Continued)

Table C.2 (Continued)

Data input	Alpha layout	QWERTY Layout	Number pad with function keys	Number pad with softkeys	Number pad only (no function keys)
Simple form filling	A	A	N/A	N/A	N/A
Navigation	R	A	N/A	N/A	N/A
Reading large blocks of text (e.g., disclaimers, email, news)	X	A	N/A	N/A	N/A
Typing large blocks of text (e.g., email)	X	A	N/A	N/A	N/A
Complex form filling	R	A	N/A	N/A	N/A

Legend:

A = May be used as the only form of input or in combination with redundant forms of input. Shall be used in combination with voice output.

(Continued)

Table C.2 (Concluded)

A* = May be used as the only form of input or in combination with redundant forms of input. Voice output not required.

N/A = Not applicable.

R   = May be used only as a redundant form of input. Shall be used in combination with voice output.

R* = A redundant input device to an information transaction machine. Voice output is optional.

X   = Shall not be used.

Table C.3
Pen/stylus-based input

The table outlines methods of data input for pen/stylus-based inputs.

Data input	Touchscreen pen/stylus hybrid	Overlay pad
Financial transactions — Debit (PIN)	N/A	N/A
Financial transactions — Credit (signature)	A*	A*
Input of up to three characters	R	N/A
Selection of items from discrete lists	X	X
Simple form filling	X	X
Navigation	X	X
Reading large blocks of text (e.g., disclaimers, email, news)	N/A	N/A

(Continued)

Table C.3 (Concluded)

Data input	Touchscreen pen/stylus hybrid	Overlay pad
Typing large blocks of text (e.g., email)	N/A	N/A
Complex form filling	X	X

Legend:

A = May be used as the only form of input or in combination with redundant forms of input. Shall be used in combination with voice output.

A* = May be used as the only form of input or in combination with redundant forms of input. Voice output not required.

N/A = Not applicable.

R = May be used only as a redundant form of input. Shall be used in combination with voice output.

R* = A redundant input device to an information transaction machine. Voice output is optional.

X = Shall not be used.

Table C.4
Navigation buttons/keys

The table outlines methods of data input for navigation buttons/keys.

Data input	Screen navigation keys	Assistive technology input devices
Financial transactions — Debit (PIN)	X	X
Financial transactions — Credit (signature)	X	X
Input of up to three characters	R	A
Selection of items from discrete lists	A	A
Simple form filling	X	R
Navigation	X	R
Reading large blocks of text (e.g., disclaimers, email, news)	R	N/A

(Continued)

Table C.4 (Concluded)

Data input	Screen navigation keys	Assistive technology input devices
Typing large blocks of text (e.g., email)	X	N/A
Complex form filling	X	R

Legend:

A = May be used as the only form of input or in combination with redundant forms of input. Shall be used in combination with voice output.

A* = May be used as the only form of input or in combination with redundant forms of input. Voice output not required.

N/A = Not applicable.

R = May be used only as a redundant form of input. Shall be used in combination with voice output.

R* = A redundant input device to an information transaction machine. Voice output is optional.

X = Shall not be used.

Table C.5
Single-purpose buttons and remote access

The table outlines methods of data input for single-purpose buttons and remote access.

Data input	Single-purpose buttons (direct mapping: one key = one function)	Remote access (any contactless form of input/output)
Financial transactions — Debit (PIN)	X	R*
Financial transactions — Credit (signature)	X	R*
Input of up to three characters	A	R*
Selection of items from discrete lists	A	R*
Simple form filling	X	R*
Navigation	X	R*
Reading large blocks of text (e.g., disclaimers, email, news)	N/A	R*

(Continued)

Table C.5 (Concluded)

Data input	Single-purpose buttons (direct mapping: one key = one function)	Remote access (any contactless form of input/output)
Typing large blocks of text (e.g., email)	N/A	R*
Complex form filling	N/A	R*

Legend:

A = May be used as the only form of input or in combination with redundant forms of input. Shall be used in combination with voice output.

A* = May be used as the only form of input or in combination with redundant forms of input. Voice output not required.

N/A = Not applicable.

R = May be used only as a redundant form of input. Shall be used in combination with voice output.

R* = A redundant input device to an information transaction machine. Voice output is optional.

X = Shall not be used.