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## **Ergonomic requirements for office work with visual display terminals (VDTs) - Part 16: Direct manipulation dialogues**

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## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 9241-16:2000 sisaldab Euroopa standardi EN ISO 9241-16:1999 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 18.02.2000 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN ISO 9241-16:2000 consists of the English text of the European standard EN ISO 9241-16:1999.</p> <p>This document is endorsed on 18.02.2000 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b> This standard gives guidance on the design of direct manipulation dialogues. In direct manipulation dialogues the user directly acts on objects on the screen; e.g. by pointing at them, moving them and/or changing their physical characteristics (or values) via the use of an input device. Such objects are typically concrete, often graphical, representations of abstract software structures or capabilities and generally fall into two categories: task object and interface object.</p>	<p><b>Scope:</b> This standard gives guidance on the design of direct manipulation dialogues. In direct manipulation dialogues the user directly acts on objects on the screen; e.g. by pointing at them, moving them and/or changing their physical characteristics (or values) via the use of an input device. Such objects are typically concrete, often graphical, representations of abstract software structures or capabilities and generally fall into two categories: task object and interface object.</p>
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ICS 13.180, 35.080

**Võtmesõnad:** data processing equipment, data terminal equipment, display devices, ergonomics, office machines, operating requirements, specifications, text processing

ICS 13.180; 35.080

English version

Ergonomic requirements for office work with visual  
display terminals (VDTs)

Part 16: Direct manipulation dialogues  
(ISO 9241-16 : 1999)

Exigences ergonomiques pour travail  
de bureau avec terminaux à écrans  
de visualisation (TEV) – Partie 16:  
Dialogues de type manipulation  
directe (ISO 9241-16 : 1999)

Ergonomische Anforderungen für  
Bürotätigkeiten mit Bildschirm-  
geräten – Teil 16: Dialogführung  
mittels direkter Manipulation  
(ISO 9241-16 : 1999)

This European Standard was approved by CEN on 1999-07-21.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

## Foreword

International Standard

ISO 9241-16 : 1999 Ergonomic requirements for office work with visual display terminals (VDTs) – Part 16: Direct manipulation dialogues,

which was prepared by ISO/TC 159 'Ergonomics' of the International Organization for Standardization, has been adopted by CEN/CS as a European Standard.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by March 2000 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard:

Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

## Endorsement notice

The text of the International Standard ISO 9241-16 : 1999 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZA (normative).

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## Introduction

ISO 9241 deals with several aspects of the use of visual display terminals (VDTs). Currently, the individual parts can be grouped in the following categories:

ISO 9241-1: General introduction

ISO 9241-2: Guidance on task requirements

ISO 9241-5 and ISO 9241-6: Workstation and environment

ISO 9241-3, ISO 9241-4, ISO 9241-7, ISO 9241-8 and ISO 9241-9: Ergonomics pertaining to hardware

ISO 9241-10 through ISO 9241-17: Ergonomics pertaining to software interfaces

This part of ISO 9241 is concerned with the ergonomic design of direct manipulation dialogues where users perform operations by acting on displayed objects in ways analogous to manipulating physical entities.

This part of ISO 9241 serves the following types of user

- a) the user interface designer, who will apply this part of ISO 9241 during the development process;
- b) the buyer, who will reference this part of ISO 9241 during the product procurement process;
- c) evaluators responsible for ensuring that products meet the recommendations in this part of ISO 9241;
- d) designers of user interface development tools to be used by interface designers;
- e) end-users who will gain from the potential benefits provided by this part of ISO 9241.

This part of ISO 9241 consists of a number of recommendations, some of which are conditional, concerning direct manipulation dialogues. Conditional recommendations are recommendations that should be met only within the specific context for which they are relevant (e.g. particular kinds of users, tasks, environments, technology).

It should be noted that ISO 9241-10 describes dialogue principles that are relevant for the design of direct manipulation dialogues. These principles provide the designer and evaluator with additional information concerning the ergonomic rationale for the various recommendations in this part of ISO 9241 and, therefore, assist in making trade-offs. However, it may be necessary to base trade-offs on other considerations as well.

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## 1 Scope

This part of ISO 9241 provides guidance on the design of direct manipulation dialogues. In direct manipulation dialogues the user directly acts on objects on the screen; for example, by pointing at them, moving them and/or changing their physical characteristics (or values) via the use of an input device. Such objects are typically concrete, often graphical, representations of abstract software structures or capabilities and generally fall into two categories.

- a) Task object — a metaphorical representation of a real-world artefact manipulated to support the user's task (e.g. a sheet of paper, pen, spanner, graph).
- b) Interface object — an object introduced into the interface so that the user can perform tasks related to the use of the computer application or system. This introduced object may be a real-world object but the metaphor is not directly related to the user's real work task (e.g. button, slider, window, screen).

Objects and their representations on the display are referred to as objects, except where it is necessary to make a clear distinction.

Interfaces that use stereoscopic or virtual reality-type interfaces are not covered in this part of ISO 9241.

In practice, the term direct manipulation is often used interchangeably with graphical user interfaces (GUIs). However, within GUIs other dialogue techniques, such as menu dialogues or command dialogues, are often implemented as well. Though GUIs can provide many direct manipulation features, not every user input in GUIs can be interpreted as direct manipulation. For example, printing a document by moving a document icon upon a printer icon implies a higher degree of direct manipulation than a mouse click on a push button labelled "print".

This part of ISO 9241 covers usability issues of direct manipulation dialogues. Recommendations on GUI components are given only if they are related specifically to features of direct manipulation.

Features of direct manipulation dialogues such as step-by-step input may be inefficient (e.g., if one wishes to delete all files starting with "d"). Therefore, other interaction techniques; for example, command input or menus, may be more appropriate and are typically used to supplement direct manipulation.

## 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 9241. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 9241 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 9241-12:1998, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 12: Presentation of information.*

ISO 9241-13:1998, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 13: User guidance.*

ISO 9241-14:1997, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 14: Menu dialogues.*

ISO/IEC 11581-1:—<sup>1)</sup>, *Information technology — User System Interfaces — Icon symbols and functions — Part 1: Icons — General.*

ISO/IEC 11581-2:—<sup>1)</sup>, *Information technology — User System Interfaces — Icon symbols and functions — Part 2: Object icons.*

ISO/IEC 11581-3:—<sup>1)</sup>, *Information technology — User System Interfaces — Icon symbols and functions — Part 3: Pointers.*

## 3 Terms and definitions

For the purposes of this part of ISO 9241, the following terms and definitions apply.

### 3.1

#### **attribute**

property of an object or its representation (e.g. colour) which may be modified by user actions in certain contexts

### 3.2

#### **choice list**

list containing a number of items which a user can select

**NOTE** Single selection or multiple selection may be possible. The number of items may be fixed or may change during the dialogue.

### 3.3

#### **clicking**

operation of pressing and immediately releasing a button on a pointing device without moving the pointer off the selected input-sensitive area

### 3.4

#### **control**

graphic, often analogous to physical controls such as dials, radio buttons, which allows a user to directly manipulate data, other objects or their attributes

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<sup>1)</sup> To be published.