INTERNATIONAL
STANDARD

**ISO/IEC
24752-1**

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Information technology — User interfaces — Universal remote console —

Part 1:
Framework

Technologies de l'information — Interfaces utilisateur — Console à distance universelle —

Partie 1: Cadre général

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Contents

Page

Foreword

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ISO/IEC 24752-1 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 35, *User interfaces*.

ISO/IEC 24752 consists of the following parts, under the general title *Information technology — User interfaces — Universal remote console*:

— *Part 1: Framework*

— *Part 2: User interface socket description*

— *Part 3: Presentation template*

— *Part 4: Target description*

— *Part 5: Resource description*

Introduction

This part of ISO/IEC 24752 is one of a set of standards to facilitate operation of information and electronic products through remote and alternative interfaces and intelligent agents. The purpose of this part of ISO/IEC 24752 is to facilitate the development and deployment of a wide variety of devices (from different manufacturers) that can act as universal remote consoles ("URCs") for an equally varied range of target devices and services ("targets"), also from different manufacturers. It allows users to control any number of information and electronic products in their environment.

The **targets** include both devices and services. They can range from things as simple as light switches and thermostats to more complex items such as audio-visual equipment, home appliances, in-car electronics, web-based services, and any other devices or services that can be controlled electronically (or via information technology).

Targets can be in the same location as the individual who desires to control the target through the URC, or at any distance from the URC/user as long as there is some type of network connection between the URC and the target. This is possible since a URC provides the user with all of the necessary controls as well as the prompts and other information displayed by the target.

The **URCs** could be software running on common mainstream devices such as personal computing and information technology devices [laptops, personal digital assistants (PDAs), telecommunications/wireless application protocol (WAP) devices (e.g. cell phones), etc.]. They could also be functions implemented in assistive technology devices, or they could be devices which were specially built to function as URCs. They could be devices which were built to function primarily as a remote console for a particular family of products (e.g. a remote console designed to be part of a home audio-visual system), but could also serve to control any other devices compatible with this part of ISO/IEC 24752. They are similar to the behavior of universal remote controls today, except

a) they have much greater function and scope,

b) they synchronize with the target in both directions (i.e. they can display the current status of the target),

c) they do not need to be programmed by the user (since they will automatically discover devices that are controllable in a user's vicinity, discover the abstracted user interface of the targets and present it in the way preferred by the user and their URC), and

d) they can be used out of sight of the product they are controlling.

The URCs could be all visual, all tactile, or all verbal in nature (or any combination thereof), because this International Standard specifies the content of a target user interface independently from the form in which it is presented. Thus, URCs could be designed that an individual could talk to and, through the URC, the user could have speech access to any compatible target listed above without any of these targets having any voice recognition or voice control functionality themselves. A person might, therefore, be able to say to their URC, "Record channel 12 and show me 'Law and Order'". Or they could lie in bed and say, "Set the alarm to 6:30 AM, start brewing the coffee at 6:00 AM, and now set the home security system to 'active' ". Or, if one's spouse is already asleep, a person could pick up their PDA or any other compatible URC device and accomplish these same tasks silently either by calling up control panels or by issuing the instructions in writing. (The URC framework does not provide the natural language control, but would provide all of the information and control necessary for control by a natural language processing URC.)

Note that, although a URC implementation can involve hardware, requirements on this hardware such as safety and design requirements are not within the scope of ISO/IEC 24752.

A more detailed overview of the URC framework is provided as Annex A.

Information technology — User interfaces — Universal remote console —

Part 1:
Framework

1 Scope

ISO/IEC 24752 is a multi-part International Standard to facilitate operation of information and electronic products through remote and alternative interfaces and intelligent agents.

This part of ISO/IEC 24752 defines a framework of components that combine to enable remote user interfaces and remote control of network-accessible electronic devices and services through a universal remote console (URC). It provides an overview of the URC framework and its components.

2 Conformance

2.1 URC

A conforming URC shall implement

- at least one target-URC network link as specified in 5.5,

- the URC requirements as specified in Clause 5.

Table 1 summarizes the requirements on URCs, as specified in detail in Clause 5.

Table 1 – Summary of URC requirements

Requirement ("A URC shall …")	See subclause
Retrieve documents from a target, including recognition of MIME types	5.2.3
Interpret a target description so that it can identify a target and open a control session with one of its sockets	5.2.4
Support an open session request to a target	5.3.2
Support a URC close session event to a target	5.3.5
Support an abort session event from a target	5.3.6
Track connection status information from the underlying network (TUN)	5.3.7
Synchronize values of socket variables	5.4.2
Request invocation of a socket command, including support for local parameters and command state updates	5.4.3

Requirement ("A URC shall …")	See subclause
Receive and acknowledge notifications, including support for stacking notifications and their states	5.4.4
Synchronize actual indices of socket sets and elements	5.4.5
Support timeout variables and timeout constants	5.4.7
Provide at least one target-URC network link (see 8.2 for TUN requirements)	5.5.1
Support reception and updating of atomic resources at runtime for those socket elements that come with atomic resources at runtime	5.5.2
Provide a concrete user interface for a control session with a target's socket	5.7
Implement the security and privacy functions available from the implemented TUNs	9.2

2.2 Target

A conforming target shall implement:

- at least one target-URC network link as specified in 6.7;

- a target description, as specified in 6.1.4;

- one or more sockets that, when considered together, cover the full functionality of the target, as specified in 6.2;

- the target resources required to conform in at least one natural language (see 6.4.5); and

- the target components and requirements as specified in Clause 6.

Alternatively, a target's manufacturer may provide the above documents separately as supplemental resources, if the target is a legacy product that already provides the necessary communication and control functionality through a networking platform (target-URC network).

Table 2 summarizes the requirements on targets, as specified in detail in Clause 6.

Table 2 – Summary of target requirements

Requirement ("A target shall …")	See subclause
Have an instance identifier	6.1.2
Provide a fetch mechanism for its documents to be retrieved by URI, including support for MIME types	6.1.3
Provide exactly one target description with references to all socket descriptions and resource sheets	6.1.4
Provide one or more user interface sockets that collectively provide access to all of the functionality provided by the built-in user interface of the target	6.2.2
Inside a target's socket: • The *variables* shall include all of the dynamic data on the target socket's state a user can perceive and/or manipulate • The *commands* shall include all of the target functions that can be called explicitly or implicitly by users	6.2.3

Requirement ("A target shall …")	See subclause
Provide a user interface socket description for each of the target's sockets	6.3
Provide the required target resources in at least one natural language: • one grouping resource for every socket of the target • label resources (textual)	6.4.5
Support an open session request from a URC	6.5.1
Support a suspend session request from a URC	6.5.2
Support a resume session request from a URC	6.5.3
Support a close session event from a URC	6.5.4
Send an abort session event in case of user session abortion	6.5.5
Track connection status information from the underlying TUN network	6.5.6
Send a session forward event to the URC in case of session forwarding	6.5.7
Create and maintain a session between a socket and the URC after successful open session request	6.6.1
Indicate to the URC the availability of socket elements at runtime	6.6.3
Synchronize the socket variables between the socket and the URCs that participate in a joint session with the socket	6.6.5
Support command invocation requests from a URC (including handling of local parameters) and synchronization of command states	6.6.6
Support propagation of notification states to the connected URCs, and acceptance of pertinent acknowledgments	6.6.7
Synchronize actual indices of socket sets and elements	6.6.8
Not rely on the URC doing the interpretation of socket element dependencies	6.6.9
Provide general timeout variables and timeout variables for notify elements to represent user response timeouts implemented	6.6.10
Provide atomic resources at runtime for those socket elements that are marked to come with atomic resources at runtime	6.6.11
Provide at least one target-URC network link (see 8.2 for TUN requirements)	6.7

3   Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 24752-2, *Information technology — User interfaces — Universal remote console — Part 2: User interface socket description*

ISO/IEC 24752-3, *Information technology — User interfaces — Universal remote console — Part 3: Presentation template*

ISO/IEC 24752-4, *Information technology — User interfaces — Universal remote console — Part 4: Target description*

ISO/IEC 24752-5, *Information technology — User interfaces — Universal remote console — Part 5: Resource description*

ISO/IEC 10646, *Information technology — Universal Multiple-Octet Coded Character Set (UCS)*

W3C Recommendation: Extensible Markup Language (XML) 1.0 (Third edition), 04 February 2004, http://www.w3.org/TR/2004/REC-xml-20040204/