



SLOVENSKI STANDARD
oSIST prEN ISO 16484-1:2023
01-januar-2023

Sistemi za avtomatizacijo in regulacijo stavb - 1. del: Specifikacija projekta in izvedba (ISO/DIS 16484-1:2022)

Building automation and control systems (BACS) - Part 1: Project specification and implementation (ISO/DIS 16484-1:2022)

Systeme der Gebäudeautomation (GA) - Teil 1: Projektplanung und -ausführung (ISO/DIS 16484-1:2022)

Systèmes de gestion technique du bâtiment (SGTB) - Partie 1: Spécifications et mise en oeuvre d'un projet (ISO/DIS 16484-1:2022)

Ta slovenski standard je istoveten z: prEN ISO 16484-1

ICS:

35.240.67	Uporabniške rešitve IT v gradbeništvu	IT applications in building and construction industry
97.120	Avtomatske krmilne naprave za dom	Automatic controls for household use

oSIST prEN ISO 16484-1:2023

en,fr,de

DRAFT INTERNATIONAL STANDARD

ISO/DIS 16484-1

ISO/TC 205

Secretariat: ANSI

Voting begins on:
2022-10-31

Voting terminates on:
2023-01-23

Building automation and control systems (BACS) —

Part 1: Project specification and implementation

Systèmes de gestion technique du bâtiment (SGTB) —

Partie 1: Spécification et mise en oeuvre d'un projet

ICS: 35.240.67; 91.040.01

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Reference number
ISO/DIS 16484-1:2022(E)

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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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

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

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

This document was prepared by Technical Committee ISO/TC 205, *Building environment design*, Working Group WG 3, *Building Automation and Control System (BACS) Design*.

This second edition cancels and replaces the first edition (ISO 16484-1:2010), which has been technically revised.

The main changes compared to the previous edition are as follows:

- updating of normative references
- updating of terms and definitions
- mention of cyber security measures, wireless communication

ISO 16484 consists of the following parts, under the general title *Building automation and control systems (BACS)*:

- *Part 1: Project specification and implementation*
- *Part 2: Hardware*
- *Part 3: Functions*
- *Part 5: Data communication protocol*
- *Part 6: Data communication conformance testing*

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

Introduction

ISO 16484 (all parts) is aimed at the design of new buildings and the retrofitting of existing buildings for an acceptable indoor environment, practical energy conservation, and efficiency.

ISO 16484 (all parts) is applicable to building automation and control systems (BACS), as follows:

- The environmental design for all building types requires complex methods of automation and control. The functional integration of services other than heating, ventilating and air conditioning (HVAC) is a general task for all parties employed to develop an integrated multi-application system. The integration comprises, for example, lighting and electric power distribution control, security control, transportation, maintenance management or facilities management. This system integration allows the user to take advantage of synergies between the different applications. ISO 16484 (all parts) gives guidance to architects, consultants and contractors as well as guidance to users on how to share such resources.
- The innovation cycles between devices, systems and networks vary. In order to make it possible to add and to change existing devices and extend the building automation and control network, several interfaces, both proprietary and standardized, are defined between the BACS network and the other systems. A manufacturer can design a product, both to meet his specific marketing objectives and to give the option to integrate that special device into a multi-application BACS. Interfaces are also defined in appropriate parts of ISO 16484 along with the necessary communications protocol and conformance test required to support the interworking of devices.
- A manufacturer, a systems house, or an electrical or mechanical contractor can assemble the implementation of a building automation and control system.
- The application of ISO 16484 (all parts) is not to standardize the hardware and software design or the architecture of a system, but to define the process for the creation of project specifications, where the functionality and the quality of the solution are clearly defined.

ISO 16484 (all parts) is intended for use by those involved in the design, manufacture, engineering, installation, commissioning, operational maintenance and training of BACS when contracted, i.e.

- as a guide to the terminology of the building automation and control trade. Unambiguous terminology is required for a complete and accurate conveyance of the intent and details of ISO 16484 (all parts),
- in product development, to avoid unnecessary duplication of function or terminology, but not necessarily placing a restraint on the evolution of new products, systems or applications,
- as a basis for interfacing products and systems. In order to interoperate, the elements of a BACS require a unified data communication protocol and information model,
- as a basis for drawing up a project specification for procurement,
- as a code of practice for expert commissioning,
- by educational establishments wishing to train people in the field of BACS.

Building automation and control systems (BACS) —

Part 1: Project specification and implementation

1 Scope

This document specifies guiding principles for project design and implementation and for the integration of other systems into the building automation and control systems (BACS).

This document specifies the phases required for the BACS project, including

- design (determination of project requirements and production of design documents including technical specifications),
- engineering (detailed function and hardware design),
- installation (installing and commissioning of the BACS), and
- completion (handover, acceptance and project finalization).

This document also specifies the requirements for as-built documentation and training.

This document is not applicable to operation and maintenance, nor is it applicable to retro or continuous commissioning, including a commissioning authority.

2 Normative references

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

ISO/IEC/TR 14763-2, *Information technology — Implementation and operation of customer premises cabling — Part 2: Planning and installation*

ISO 16484-2, *Building automation and control systems (BACS) — Part 2: Hardware*

ISO 16484-3, *Building automation and control systems (BACS) — Part 3: Functions*

ISO 16484-5, *Building automation and control systems (BACS) — Part 5: Data communication protocol*

ISO 16484-6, *Building automation and control systems (BACS) — Part 6: Data communication conformance testing*

ISO 52120-1, *Energy performance of buildings — Contribution of building automation, controls and building management — Part 1: General framework and procedures*

ISO 52127-1, *Energy performance of buildings — Building management system — Part 1: Module M10-12*

IEC 62305-4, *Protection against lightning — Part 4: Electrical and electronic systems within structures*

IEC/TS 62443-1-1, *Industrial communication networks — Network and system security — Part 1-1: Terminology, concepts and models*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16484-2, ISO 16484-5, ISO 16484-6 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

acceptance

decision and act of signing the handover document during the completion phase

Note 1 to entry: The transfer of the responsibility for the system(s) from the supplier to the customer or their representative can be a legal act.

3.2

building performance

set of measurable building characteristics

Note 1 to entry: This includes e.g., energy efficiency, indoor air quality, moisture management and thermal comfort.

Note 2 to entry: This is also influenced by building construction and utilization, installed technical services and their operation.

3.3

BACS commissioning

project and system-specific process of calibrating field devices, testing data points, adjusting parameters, verifying sequences of operation and other functionalities for the various elements of a BACS application

Note 1 to entry: The BACS commissioning is a part of the engineering services and includes commissioning activities at the installation phase.

Note 2 to entry: Commissioning reports are proof of the completeness of tasks and work.

Note 3 to entry: There are country variations in the naming of the term “commissioning” and variations in the tasks covered by this term.

3.4

commissioning process

systematic application of processes and procedures designed to ensure that the project objectives are achieved and maintained throughout the building lifetime

Note 1 to entry: The commissioning process begins at project conception and continues through to the pre-design, design, construction, start-up, turnover and occupancy to the operation phase.

Note 2 to entry: Details of how to conduct the commissioning process are outside the scope of this document.

3.5

commissioning authority

CxA

entity identified by the owner who leads, plans, schedules, and coordinates the commissioning team to implement the commissioning process

Note 1 to entry: In some countries there are “certified commissioning authorities”.

3.6 completion

project phase where, when handover and finalization are achieved, the implementation of the BACS project can be considered as completed

3.7 engineering

acquiring and applying technical knowledge to design and implement devices, systems and processes that realize the desired objective

Note 1 to entry: This includes project and system-specific services for planning, configuring and commissioning of the various parts of a BACS.

3.8 finalization

task during the project completion phase where the supplier resolves outstanding items

3.9 functional description

overall description that explains how each part of the system/plant is expected to operate, interact and be interacted with

Note 1 to entry: The description covers material energy and signal flow of a plant or a system. Functions/operations are described as: storing, transmitting, converting, transforming and interlinking.

3.10 handover

formal process that transfers a system or part of a system usage from the supplier to the customer or their representative

Note 1 to entry: The transfer of the operational responsibility for the system from the supplier to the customer can be a legal act or be agreed by contract.

3.11 installation instruction

document that explains how to install a technical device

Note 1 to entry: There can be several installation instructions for a device, e.g. mechanical, electrical.

Note 2 to entry: Installation instructions can be found from many sources, e.g. directives, standards, guidelines, professional recommendations, manufacturer's instructions for products.

3.12 interoperability

seamless interworking of devices and functions in a system and ability of a system to work with or use the parts or equipment of another system

Note 1 to entry: Functions may be e.g. data sharing, event and alarm management, scheduling, trend and event logging, device and network management.

3.13 migrate, verb

modernize the implemented software or the hardware under extensive utilization of the present infrastructure

3.14 system integration

bringing together subsystems into one system to function together as a system

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4 Abbreviated terms

For the purposes of this document, the symbols, abbreviations and acronyms given in ISO 16484-2, ISO 16484-5, ISO 16484-6 and the following apply.

BACS	building automation and control system
CxA	commissioning authority
EMC	electromagnetic compatibility
EMP	electromagnetic pulse
HVAC	heating, ventilating and air conditioning
LEMP	lightning electromagnetic pulse
UPS	uninterruptible power supply
VPN	virtual private network

5 Requirements and recommendations

5.1 Overview

5.1.1 General

The BACS project normally commences after the client appoints a BACS consultant or supplier.

The quality of the implementation of a BACS is dependent on the design of building systems and the specification of the commissioning process. In order to produce and maintain the required quality of building performance after the implementation has been completed, application of a commissioning process for review and improvement of commissioned values is recommended. Retro or continuous commissioning, including a commissioning authority, is not within the scope of this document.

5.1.2 Phases of the BACS project

5.1.2.1 General

[Clause 5.1.2](#) specifies the main actions and decisions necessary in order to implement a project in the different phases (see [Figure 1](#)). It serves for all the parties involved in the different phases of a project. The phases of a project associated with the implementation of a BACS are as follows. For all cybersecurity measures refer to IEC 62443-1-1.

5.1.2.2 Design phase

The design phase consists of

- a) the determination of project requirements,
- b) the project planning and organization,
- c) the technical specification,
- d) the establishment of a contract.