
Sistemi za avtomatizacijo in regulacijo stavb (BACS) - 3. del: Funkcije (ISO/DIS 16484-3:2026)

Building automation and control systems (BACS) - Part 3: Functions (ISO/DIS 16484-3:2026)

Systeme der Gebäudeautomation (GA) - Teil 3: Funktionen (ISO/DIS 16484-3:2026)

Systèmes de gestion technique du bâtiment (SGTB) - Partie 3: Fonctions (ISO/DIS 16484-3:2026)

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97.120	Avtomatske krmilne naprave za dom	Automatic controls for household use

oSIST prEN ISO 16484-3:2026**en,fr,de**

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DRAFT International Standard

ISO/DIS 16484-3

Building automation and control systems (BACS) —

Part 3: Functions

Systèmes de gestion technique du bâtiment (SGTB) —

Partie 3: Fonctions

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ISO/DIS 16484-3:2026(en)**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.

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 16484-3 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 247, *Building automation, controls and building management*, in collaboration with Technical Committee ISO/TC 205, *Building environment design*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement)

This second edition cancels and replaces the first edition (ISO 16484-3:2005), which has been technically revised.

The main changes are as follows:

- overall structure of document has been updated;
- [Clause 3](#), [Clause 5](#) and [Clause 6](#) have been revised;
- technical content throughout the document has been modified and updated.

A list of all parts in the ISO 16484 series can be found on the ISO website.

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.

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Introduction

This series of standards is intended for design of new buildings and retrofit of existing buildings for an acceptable indoor environment, practical energy conservation, and efficiency.

The application of this series of standards for BACS is envisaged as follows:

- the environmental design for all building types requires complex methods for automation and control. The functional integration of services other than HVAC is a general task for all parties employed to develop an integrated multi-application system. The Integration comprises, e.g. 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. This standard will give guidance to architects, consultants, and contractors as well as to users on how to share such resources;
- the innovation cycles between devices, systems, and networks vary. 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 this standard along with the necessary communications protocol and conformance test required to support the inter-working of devices;
- a manufacturer, a systems house, or an electrical or mechanical contractor can assemble an implementation of a building automation and control system;
- the application of this standard 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 functionality and the quality of the solution are clearly defined.

The purpose of this series of standards 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 this standard;
- in product development, to avoid unnecessary duplication of function or terminology, but should not place 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 the procurement of building automation and control products for systems suppliers and customers;
- as a code of practice for expertly commissioning prior to handover of a system;
- by educational establishments wishing to train people in the field of building automation and control systems.

This entire series of BACS standards consists of the following contents:

Part 1: Overview and definitions

Part 1 of this standard describes the objectives and interrelationships of all parts of this standard. It provides an overview and detailed information about the structure of the related series of standards for the BACS industry.

This part of the standard provides also the vocabulary with terms and definitions for the understanding of the entire series of this standard and it contains a translation of the main terms in English, French, Russian, and German in an informative annex.

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Part 2: Hardware

Part 2 of this standard specifies the requirements for the hardware to perform the tasks within a BACS. It provides the terms, definitions, and abbreviations for the understanding of Part 2 and Part 3.

Part 2 relates only to physical items/devices, i.e.:

- devices that require human interaction, such as management stations or operator panels;
- devices for data storage and analysis, such as edge or cloud servers;
- devices for control applications, such as automation stations;
- devices for physical quantities acquisition, such as sensors and actuators.
- Part 2 provides a generic system topology based on a building network infrastructure, which includes both the devices inside the building envelope and those outside the building envelope.

National annexes:

National annexes may specify the local requirements of physical and electrical characteristics, the verifications for BACS devices and equipment, and the code of practice for the physical installation of systems. The annexes shall refer to the regional implementations of the relevant IEC standards.

Part 3: Functions (refer to the scope of this part)

Part 4: Applications

Part 4 of this standard specifies the requirements for specific communicating applications/devices, e.g. for general room automation and for sophisticated optimization of controls for heating, fan coil and induction units, CAV, VAV and radiant cooling.

It specifies control applications and function blocks focusing on, but not limited to, lighting, solar protection and heating, ventilation and air conditioning (HVAC) applications.

It describes how energy performance, comfort, and operational requirements of buildings as defined by EN ISO 52120-1, Table 5, are translated into functional specifications for integrated plant and room control.

Part 5: Data Communication – Protocol

Part 5 of this standard specifies data communication services and objects for computer equipment and controllers used for monitoring and control of HVAC&R and other systems of building services.

This protocol provides a comprehensive set of object types for conveying encoded binary, analog, and alphanumeric data between devices including, but not limited to:

- input measuring: analog input object;
- output positioning/setpoint: analog output object;
- binary input counting;
- input state: binary input object, multi-state input;
- output switching: binary output object, multi-state output;
- values: analog value, binary value, multi-state value, accumulated value, averaging object, trend log object;
- text string;
- schedule information;
- alarm and event information;

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- files; and
- control programs and parameters respectively.

This protocol models each building automation and control system as a collection of data structures called object types, the properties of which represent various aspects of the hardware, software, and operation of the device. These objects provide a means of identifying and accessing information without requiring knowledge of the details of the device's internal design or configuration.

NOTE An overview of possible integration with other systems in buildings, e.g. fire, security, access control, maintenance and facilities management, is shown in [Figure 1](#) of Part 2 of this standard.

Part 6: Data communication conformance testing

Part 6 of this standard specifies the technical requirements of the conformance test suite and the methods for testing the products for the conformance with the protocol. It provides a comprehensive set of procedures for verifying the correct implementation of each capability claimed on a BACS network protocol implementation conformance statement (PICS) including:

- support of each claimed BACS network service, either as a client (initiator), server (executor), or both;
- support of each claimed BACS network object-type, including both required properties and each claimed optional property;
- support of the BACS network layer protocol;
- support of each claimed data link option, and
- support of all claimed special functionality.

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Building automation and control systems (BACS) —

Part 3: Functions

1 Scope

This Part 3 of the standard specifies in [clause 5](#) the functions for control, building automation and technical building management which contribute to the energy performance of buildings as listed in EN ISO 52120-1, table 5.

This part of the standard further provides in [clause 6](#) means for functional specification of requirements for the overall functionality and engineering services to achieve building automation and control systems. It defines terms, which shall be used for specifications and it gives guidelines for the functional documentation of project/application specific systems. It provides a sample template for documentation of plant/application specific functions, called BACS points list in informative [annex A](#).

The informative function block examples explain a method to display the referenced functions in system documentation; they do not standardize the method for programming functions and applications.

2 Normative references

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

ISO 10628, *Flow diagrams for process plants — General rules*

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

ISO 16484-4, *Building automation and control systems (BACS) — Part 4: Control Applications*

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

ISO 52120-1:2021, *Energy performance of buildings — Contribution of building automation, controls and building management — Part 1: General framework and procedures*

ISO 52127-1:2021, *Energy performance of buildings — Building management system — Part 1: Module M10-12*

IEC 60617-12:1998¹⁾, *Graphical symbols for diagrams — Part 12: Binary logic elements*

IEC 60617-13:1993¹⁾, *Graphical symbols for diagrams — Part 13: Analogue elements*

3 Terms and definitions

For the purposes of this International Standard, the terms and definitions given in ISO 16484-2 apply.

ISO and IEC maintain terminology 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/>

1) Withdrawn. Replaced by IEC 60617:2001.

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3.1 building automation and control BAC

products, software, and engineering services for automatic controls, monitoring and optimization, human intervention and management to achieve energy-efficient, economical, and safe operation of building services equipment

[SOURCE: ISO 52120 1:2021, 3.2]

3.2 technical building management TBM

process(es) and services related to operation and management of buildings and technical building system (3.14) through the interrelationships between the different disciplines and trades

Note 1 to entry: The disciplines and trades comprise all technical building services for the purpose of optimized maintenance and energy consumption.

EXAMPLE Optimization of buildings through interrelationships ranging from heating, ventilation and air conditioning (HVAC), to lighting and day lighting, to life safety and security, to electric power systems and energy monitoring and metering, to services, including communications and maintenance and to management.

[SOURCE: ISO 52127 1:2021, 3.2]

4 Symbols, abbreviations and acronyms

For the purposes of this standard, the symbols, abbreviations and acronyms given in ISO 16484-2 apply.

Abbreviated terms:

Abbreviated term	Description
AHU	air handling unit
AI	analogue input
AO	analogue output
BACS	building automaton control system
BACS FL	BACS function list
BI	binary input
BO	binary output
CI	counter input
DIU	data interface unit
EMC	electromagnetic compatibility
GUI	graphical user interface
HMI	human-machine interface
I/O	input/output
LAN	local area network
LO/ID	Local object identifier
MOU	memorandum of understanding
PABS	packaged air-cooled brine chiller
PI	proportional-integral
PID	proportional-integral-differential
TBM	technical building management

NOTE The abbreviations used and explained within the tables for the function block examples are for information only.

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5 Functions

5.1 Introduction

The purpose of a space or room in a building determines the required level of temperature, humidity, air exchange rate or other conditional state of the space. Wiring, piping, ducting and other infrastructure elements provide the electrical, heating and cooling energy and air for control of the desired space conditions.

The purpose of the building automation and control system (BACS) is to provide the desired space conditions with the least possible energy usage.

The purpose of technical home and building management (TBM) is to adapt the control settings to the actual usage of a building plant, space or room. The control settings also support improving the energy performance of a building by managing energy use systematically.

The contribution of building automation and control as well as technical building management functions towards the energy performance of buildings is listed in EN ISO 52120-1, table 5.

The different levels of functional characteristics of BAC and TBM functions are assigned to BAC efficiency classes, from D (lowest level) to A (highest level) in EN ISO 52120-1, table 6.

5.2 BAC functions

BAC functions include heating control, domestic hot water supply control, cooling control, ventilation and air-conditioning control, lighting control and blind control for indoor environmental quality (thermal and lighting) in a space or room.

ISO 16484-4, clause 5, provides functional specifications having an impact on energy performance, comfort, and operational requirements of buildings. These specifications provide a description and target for each BAC function listed in ISO 52120-1, table 5. Mandatory and optional inputs as well as mandatory and optional outputs are also provided.

5.3 TBM functions

The technical home and building management (TBM) enables to adapt easily the operation to the user needs. This is achieved by applying the following recommendations.

Check at regular intervals that

- the operation schedules of heating, cooling, ventilation and lighting is well adapted to the actual used schedules and that the setpoints are also adapted to the needs.
- attention is paid to the tuning of all controllers, this includes setpoints as well as control parameters such as PI controller coefficients.
- heating and cooling setpoints of the room controllers are checked at regular intervals. The users often modify these setpoints. A centralized system enables to detect and correct extreme values of setpoints due to misunderstanding of users.
- if interlock between heating and cooling control of emission and/or distribution is only a partial interlock, the setpoint shall be regularly modified to minimize the simultaneous use of heating and cooling.
- alarming and monitoring functions support the adaptation of the operation to user needs and the optimization of the tuning of the different controllers. This will be achieved by providing easy tools to detect abnormal operation (alarming functions) and by providing easy way to log and plot information (monitoring functions).
- the interaction with the electrical and thermal energy system as well as the interaction with the electrical vehicle system supports flexible building operation.

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5.4 User operation functions

5.4.1 Overview

Users interfacing with BACS and TBM have different perspectives (e.g. as room occupant, maintenance personnel, building operator) and different types of interaction requiring visual (vision), auditory (hearing), or tactile (touching) capabilities.

Different types of interaction are described in [5.4.2](#).

The perspectives may be related to a space (e.g. room, floor, building), a plant (e.g. chiller, boiler, solar PV), an operating mode (e.g. occupied – unoccupied, on - off), or physical values (e.g. temperature, flow, volume, energy usage rate). These different perspectives have an influence on the user interfaces that need to be provided and specified.

User operation functions for BACS and TBM functions listed in EN ISO 52120-1, table 5, are described for selected perspectives in [5.4.3](#).

5.4.2 Types of interaction

The level of interaction of users with BACS and TBM depends on their perspective.

The interaction of users with BACS and TBM may be based on visual, auditory, or tactile interfaces. Room occupants may have impairments (e.g. red-green blindness) that have an impact on the usability of user interfaces. Depending on the purpose of the building and the expected capabilities of the typical room occupant the user interfaces should be designed to enable control by users with impairments.

Depending on the perspective the user interface may be designed for an untrained person (e.g. room occupant) or for trained personnel (e.g. maintenance personnel, building operator). The user interface for room occupants enables them to manually change or override the room control functions (e.g. temperature setpoint). Manual or automatic reset to preset settings is a functionality of a building operator or a supervisory optimization function (e.g. energy management system).

5.4.3 User operation functions

5.4.3.1 Setpoint management

5.4.3.1.1 Perspective >building operator<

Referring to EN ISO 52120-1, table 5, point 7.1, a building operator may execute these functions:

- management, set back and adaptation of BAC setpoints according to the room/zone operating modes
- manual setting room by room individually
- adaptation from distributed/decentralized plant rooms only
- adaptation from a central room (e.g. work station, web operation; room operating units are excluded)
- adaptation from a central room (e.g. work station, web operation; room operating units are excluded) with frequent set back of user inputs.

Referring to EN ISO 52120-1, table 5, point 7.1, a building operator may control the room temperature setpoint not only in the room if at least one of the following modes are applied:

- heating emission control with individual (modulating) room control (1.1 – type 2, 3 or 4) is available
- cooling emission control with individual (modulating) room control (3.1 – type 2, 3 or 4) is available
- heating emission control for TABS (modulating) room control (1.2 – type 1, 2, or 3) is available

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- cooling emission control for TABS (modulating) room control (3.2 – type 1, 2, or 3) is available
- heating emission control with individual (modulating) room control (1.1 – type 2, 3 or 4) is available
- cooling emission control with individual (modulating) room control (3.1 – type 2, 3 or 4) is available
- heating emission control for TABS (modulating) room control (1.2 – type 1, 2, or 3) is available
- cooling emission control for TABS (modulating) room control (3.2 – type 1, 2, or 3) is available.

5.4.3.1.2 Perspective >room occupant<

Referring to EN ISO 52120-1, table 5, a room occupant may control the indoor environment setpoints of room temperature, humidity or CO₂ level if at least one of the following modes are applied:

- heating emission control with individual (modulating) room control (1.1 – type 2, 3 or 4) is available
- cooling emission control with individual (modulating) room control (3.1 – type 2, 3 or 4) is available.
- humidity control (4.10 – type 1 or 2)
- ventilation control

5.4.3.2 Runtime management

5.4.3.2.1 Perspective >building operator<

Referring to EN ISO 52120-1, table 5, point 7.2, a building operator may adapt system/plant operating hours according to given time schedule and/or calendar.

Refer to EN ISO 52127-1, clause 7, for details on how to apply runtime management.

5.4.3.3 Detecting faults of technical building systems and providing support to the diagnosis of these faults

5.4.3.3.1 Perspective >building operator<

Referring to EN ISO 52120-1, table 5, point 7.3, a building operator may be supported in detecting faults of technical building systems and provided with support to the diagnosis of these faults.

A building operator may have these levels of support:

- with central indication of detected faults and alarms (e.g. equipment or communication network)
- with central indication of detected faults and alarms including diagnosing functions (e.g. providing support in identifying and addressing the root cause).

5.4.3.3.2 Perspective >maintenance mode<

If a part of the BACS is operated in maintenance mode then alarms are blocked unless these alarms are lifesaving.

5.4.3.4 Reporting information regarding energy consumption and indoor conditions

5.4.3.4.1 Perspective >building operator<

Referring to EN ISO 52120-1, table 5, point 7.4, a building operator may receive reports information regarding energy consumption, indoor conditions for different levels of analysis, performance evaluation and benchmarking of indoor environment and energy usage.