The Building Integration System (BIS)

BIS is a flexible, scalable security and safety management system that can be configured to handle an enormous spectrum of operational scenarios. It contains a huge range of applications and features which enable both the integration and coupling as well as the monitoring and control of all technical building systems. This new version builds on Bosch's many years of experience in management systems and was considerably influenced by the following market trends:

- Increasing complexity of technical building equipment
- Using new technologies and standards

The increasing complexity of technical equipment inside buildings requires a powerful management system which combines the most varied functions (e.g. fire and intrusion alarm systems, access control, video systems and building automation... etc.) in the best possible way. Open standards enable BIS to process and share information efficiently with a huge and growing variety of hardware devices and other sources.

• Need for complete solutions
Facility managers and integrators are demanding a single building-management solution that is nevertheless able to integrate all their security subsystems.

Integration of Bosch and third party systems via open interfaces and SDK
- All relevant information in one user interface, and intuitive operation via interactive maps and HTML5 action plans
- Fully embedded access control
- Full event log and audit trail for forensic investigations
- Scalable system that grows with your needs

System overview

The Building Integration System is a versatile product made up of a basic package plus various optional components (also known as Engines) based on a common software platform. The engines can be combined to tailor building management systems to detailed requirements. These main components are:

- Automation Engine
- Access Engine
- Video Engine
- Security Engine

BIS has succeeded in harnessing the benefits of non-security-based technologies (e.g. OPC, CAD, web) and harmonizing them with the world of security technologies.
These engines are described in greater detail in separate datasheets.

**Functions**

**System architecture**
The BIS Engines provide fire and intrusion detection, access control, video surveillance, public address/alarms plus the monitoring of HVAC and other vital building systems.

BIS is based on a performance-optimized multi-tier architecture especially designed for use in LAN and WAN environments.

Subsystems are connected via the well-established, world-wide standards Classic OPC and OPC UA. These open standards make it easy to integrate BIS into existing OPC-compliant subsystems.

Optionally, individual BIS systems can cooperate by providing data to, or consuming data from, other BIS systems. The result is an open, multi-server BIS system.

1. A BIS consumer server with workstations and router in a local area network (LAN)
2. Wide area network (WAN)
3. BIS provider servers with workstations and routers in local area networks (LAN)

**Organizational structure and configuration**
A number of automatic functions and easy-to-use tools make configuration installer-friendly, saving time and expense.

Hierarchical location trees can be created by the import of existing CAD data containing layers, named views and detector locations. Zooming and panning allow rapid navigation through the building.

The user interface is web-based using dynamic HTML5 pages. Default pages for different screen resolutions and formats are included in the installation package, and the default pages can easily be customized using a standard HTML editor.

BIS automatically detects the monitor resolution and provides the appropriate user interface.

**Operation**
The system’s main task is to operate as the alarm-monitoring and control center for the various security systems within a site. Its graphical interface is designed to help the operator grasp the extent and urgency of an occurrence quickly, and to take prompt and effective action.

The heart of the system, the State Machine, monitors all incoming events and operator requests and, if desired, can take actions prescribed by user-defined rules, thus unburdening the operators.

**System security**
State-of-the-art encryption between BIS servers and workstations provides additional security in addition to configurable user-access rights. If PCs within a corporate network are to be used as client workstations then enhanced security can be achieved by restricting operators to specific workstations or IP-addresses.
Basic package
The Building Integration System basic package provides many features used in common by the various Engines.

- Customizable device condition counters to provide an overview of the condition of subsystems across the entire BIS system
- Message processing and alarm display
- Alarm queue with up to 5000 simultaneous alarm events and detailed alarm information
- **New**: Authentication of operators via Microsoft Active Directory, Windows or BIS passwords.
- Fixed assignment of operators to workstations for higher security
- State machine for automated event and alarm handling.
- Web-server-based platform allows client workstations to connect to BIS via just the browser.
- Direct support for location maps in standard AutoCAD DWF vector format reduces configuration effort.

- Changes to architecture within a graphic (new walls, moving a door, etc.) can be implemented without changing the BIS configuration, simply import a new plot file.
- Automated workflows between operators, with message broadcasting and customizable escalation paths
- Huge library of standardized detector icons in standard vector format including color, event and control definitions
- Direct control and monitoring of detectors via the context menus of their icons in the location maps
- Direct control and monitoring of detectors via the logical tree-structure (e.g. building, floor, room) of a site, with hyperlinks to photos, manuals, instructions
- Location tree generated automatically from the "named views" within the AutoCAD graphic
- Action management for automatic and manual control into connected subsystems and their peripherals
- Device overview for all connected subsystems, and their peripherals (detectors) and internal virtual devices (operator, server, ...) in the form of a tree structure with detailed information about address, status, type, location and notes. Control the peripherals via the context menus of their tree nodes.

- Ability to compartmentalize the managed site into autonomous divisions, and to restrict operators to the control of specific divisions.
- Ability to provide specific information to the operator in the form of free-form "miscellaneous" hypertext documents, including text, bitmaps, video streams, etc.

- Highly configurable operator authorizations for monitoring and control of subsystems and their peripherals
- **New**: Mobile web client for Android and iOS powered devices running in different browsers. Alarms are shown and can be accepted and deleted on the phone. For Android, notifications can be configured so that alarms are notified even when the phone is in idle mode.
• Event log to ensure all events are completely documented (including messages received and actions taken)
• Audit trail to ensure that all configuration changes are completely documented in terms of who did what when
• Reporting services to quickly create customized and interactive reports from the event log
• Linking and embedding of OPC servers from any computer in the network
• New: Support of next generation OPC UA (Unified Architecture) for higher security, easier deployment and higher performance.
• Online Help

Action plans and location maps
BIS amplifies standard alarm-handling by its ability to display action plans and location maps, including graphical navigation and the alarm-dependent visualization of layers inside those maps. This ensures optimal guidance to operators especially in stress situations, such as fire or intrusion alarms.

Alarm-dependent action plans or workflows provide detailed event-dependent information such as standard operating procedures, live images, control buttons, etc. to the operator. Simply create and assign one action plan to each possible alarm type in your system, e.g. fire alarm, access denied, technical alarms, etc.

With the deletion of an alarm message an unmodifiable snapshot of the displayed action plan is attached to the event log. This ensures accountability by providing a trace of all steps performed by the operator during the alarm response.

BIS optional accessories
The optional features listed below can be added to the BIS system to meet specific customer requirements. They are usable with all the BIS Engines (Automation, Access, Video and Security Engine).

Alarm management package
This package extends the standard alarm-handling of your BIS system by some additional features:
Message Distribution allows the definition of escalation scenarios which are activated automatically when an operator or operator group fails to acknowledge an alarm message within a defined period. BIS will then forward the message automatically to the next authorized operator group. The Timer feature allows the setup of time schedules which can be used to perform automatic control commands, such as closing a barrier at 8:00 pm, as well as for time-dependent redirection of alarm messages, e.g. within time period 1 show message to operator group 1 else to operator group 2.
The **Operator Alarm** feature allows an operator to trigger an alarm manually from the location tree, for example, if informed by telephone of a dangerous situation. Such manual alarms are processed in the same way as those triggered by a detector: that is, the associated documents are displayed and all steps taken are recorded in the event log for thorough post-event investigation.

The **Application Launcher** allows the invocation of non-BIS applications by the system based upon predefined conditions, e.g. alarms or timers. A typical application of this would be for an automatic, scheduled system backup.

### Installation/configuration notes

#### Building Integration System in figures

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<table>
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<tbody>
<tr>
<td>Addresses, detectors, control elements, cameras etc. which can be processed</td>
<td>200,000 per BIS server</td>
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<tr>
<td>number of events per second</td>
<td>500 (continuous, with higher peaks possible)</td>
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</tbody>
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### Technical specifications

#### Minimum technical requirements for a login or connection server

**Servers**

- **Supported operating systems (standalone or client/server mode).**
  - Windows 8.1 (64 bit, Pro, Enterprise)
  - Windows Server 2012 R2 (64 bit, Standard, Datacenter)
  - Windows Server 2016 (64 bit, Standard, Datacenter)
  - Windows 10 Enterprise LTSB (64 bit)
  - **Note:** The default database delivered with this BIS Version is SQL Server 2016 SP2 Express edition with advanced services

**Other Software**

- Always install the latest drivers and OS updates.
  - IIS 8.5 for Windows 8.1 and Windows 2012 Server R2
  - IIS 10.0 for Windows 10
  - **Note:** IIS is not necessary on BIS connection servers
    - Internet Explorer 9, 10 or 11 in compatibility mode
    - .NET for various operating systems:
      - On Windows 7 and Server 2008: .NET 3.51 and .NET 4.0
      - On Windows 8.1 and Server 2012: .NET 3.51 and .NET 4.5.1 (includes .NET 4.0)
      - On Windows 10: .NET 3.51 and .NET 4.6.1 (includes .NET 4.0)

**Minimum hardware requirements**

- Intel i5 processor with at least 4 physical cores
- 8 GB RAM (32 GB recommended)
- 200 GB of free hard disk space
- Graphics adapter with
  - 256 MB RAM,
  - a resolution of 1280x1024
  - at least 32 k colors
- **Note:** IIS is not necessary on BIS connection servers
  - OpenGL® 2.1 and DirectX® 11
  - 1 Gbit/s Ethernet card
  - A free USB port or network share for installation files
Minimum technical requirements for a client computer

**Clients**

- Supported operating systems (standalone or client/server mode). Installations of BIS on other operating systems may succeed, but are entirely without warranty.

  - Windows 8.1 (32 or 64 bit, Pro, Enterprise)
  - Windows Server 2012 R2 (64 bit, Standard, Datacenter)
  - Windows Server 2016 (64 bit, Standard, Datacenter)
  - Windows 10 (32 or 64 bit, Pro or Enterprise LTSB)
  - Note: with a Pro edition, updates must be deferred until 8 months after the release of the BIS version. For further information see the Microsoft technet page at https://technet.microsoft.com/en-us/itpro/windows/manage/introduction-to-windows-10-servicing

**Other Software**

- ASP.NET
- Internet Explorer 9, 10 or 11 in compatibility mode
  (Note: The SEE client requires IE 9.0)
- .NET for various operating systems:
  - On Windows 8.1 and Server 2012: .NET 3.51 (for Video Engine with DiBos), and .NET 4.5.1 (includes .NET 4.0)
  - On Windows 10: .NET 3.51 and .NET 4.6.1 (includes .NET 4.0)

**Minimum hardware requirements**

- Intel i5 or higher
- 8 GB RAM (16 GB recommended)
- 20 GB free hard disk space
- Graphics adapter with
  - 256 MB RAM,
  - a resolution of 1280x1024
  - at least 32 k colors
- OpenGL® 2.1 and DirectX® 11
- 100 Mbit/s Ethernet card

**Additional minimum requirements for VIE (Video Engine) clients**

- No Windows Server operating systems
- Intel i5 processor or higher
- For camera sequencing, virtual matrix or Multiview add 4GB RAM
- Latest video drivers are highly recommended. Use the Windows dxdiag tool to make sure drivers are no more than 1 year old

**Ordering information**

BIS is available in the following languages:

- AR = Arabic
- DE = German
- EN = English
- ES = Spanish
- FR = French
- HU = Hungarian
- NL = Dutch
- PL = Polish
- PT = Portuguese
- RU = Russian
- TR = Turkish
- ZH-CN = Simplified Chinese

- ZH-TW = Traditional Chinese

A BIS basic license is required when setting up a new system.

**BIS-BGEN-B47 Basic license**

License for the Building Integration System (BIS) product as downloaded from the website. No physical parts are delivered and the user documentation is contained in the download.

Order number BIS-BGEN-B47

**BIS-BGEN-BAS47 Basic license without alarm documents**

License for BIS without the Alarm Document package, that is without display of action plans, display of location maps, graphical navigation, and layer controlling.

Order number BIS-BGEN-BAS47

**BIS-FGEN-AMPK47 License for alarm management**

License for the BIS Alarm Management package

Order number BIS-FGEN-AMPK47

**BIS-XGEN-1CLI47 License for 1 operator client**

License for 1 additional BIS Operator Client

Order number BIS-XGEN-1CLI47

**BIS-XGEN-5CLI47 License for 5 operator clients**

License for 5 additional BIS Operator Clients

Order number BIS-XGEN-5CLI47

**BIS-XGEN-10CL47 License for 10 operator clients**

License for 10 additional BIS Operator Clients

Order number BIS-XGEN-10CL47

**BIS-XGEN-1DIV47 License for 1 division**

License for 1 additional BIS Division

Order number BIS-XGEN-1DIV47

**BIS-XGEN-10DV47 License for 10 divisions**

License for 10 additional BIS Divisions

Order number BIS-XGEN-10DV47

**BIS-FGEN-MSRV47 License for multi server connect**

License for 1 additional BIS server in a multi-server topology. Required for adding servers to a hierarchy of ACE servers providing centralized cardholder management.

Order number BIS-FGEN-MSRV47

**BIS-FGEN-BVMS47 License for BVMS connectivity**

License for the connection between 1 BIS and 1 BVMS installation

Order number BIS-FGEN-BVMS47

**BIS-BUPG-B2TO42 BIS Upgrade from 2.x to 4.2**

License for an upgrade of BIS 2.x to BIS 4.2

Order number BIS-BUPG-B2TO42

**BIS-BUPG-B3TO42 BIS Upgrade from 3.x to 4.2**

License for an upgrade of BIS 3.x to BIS 4.2

Order number BIS-BUPG-B3TO42