Smart Building Technologies: BMS Integration, Building IoT and Digital Twins

3 – 7 May 2027
Dubai - Five-star CBD venue



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Introduction:

Many buildings run a BMS, lighting controls, access control and energy meters on separate networks, so building data stays in silos and occupants see little benefit from the technology already installed. Smart building technologies pay back only when these systems are integrated on open protocols, instrumented with occupancy sensing and managed as one estate. This Core Concept course equips facilities, real estate, MEP and IT staff to assess smart building maturity, specify BMS integration and building IoT, plan a building digital twin and secure building systems. Participants produce a Smart Building Integration Roadmap and Specification Brief.

Course Objectives:

- Assess the smart building maturity of a site and record integration gaps across BMS, lighting, access control, metering and occupant services
- Specify BMS integration on open protocols such as BACnet, KNX and Modbus with a point naming convention and an integration points schedule
- Integrate lighting, access control and energy metering sub-systems and select occupancy sensing that supports space and energy decisions
- Plan a building digital twin and fault detection rules that link BIM asset data with live BMS and sensor data
- Apply baseline cybersecurity controls to building systems networks, supplier remote access and connected devices
- Build a smart building business case, output-based specification and operating model with reference to SmartScore categories

Target Audience:

- Facilities and building operations staff responsible for the BMS, alarms and day-to-day building performance
- Real estate and asset management staff responsible for portfolio technology investment and occupier experience
- MEP and building services engineers responsible for designing and commissioning building systems and controls
- IT and OT network staff responsible for connecting, securing and supporting building systems
- Workplace and space planning staff responsible for occupancy, desk sharing and meeting room services
- Project and procurement staff responsible for specifying and tendering smart building works

Course Outline:

Day 1: Smart Building Concepts, Maturity and Current-State Assessment

- Smart Building Definition: Integrated Control of Building Systems, Data and Services
- Smart Building Stakeholder Map: Owner, Operator, Occupier and Technology Suppliers
- Value Drivers: Energy Performance, Space Utilisation, Operating Cost and Occupant Wellbeing
- Smart Building Maturity Model: Siloed, Connected, Integrated and Optimised Stages
- Building Systems Inventory and Integration Gap Assessment Template

Day 2: Building Automation Architecture and Open Protocols

- BAS and BMS Architecture: Field, Automation and Management Levels
- BACnet per ANSI/ASHRAE 135 and ISO 16484-5: Objects, Services, BACnet/IP and MS/TP
- KNX per ISO/IEC 14543-3 and EN 50090 for Room and Lighting Control
- Modbus RTU and Modbus TCP Gateways for Meters and Packaged Equipment
- Point Naming Convention, Semantic Tagging and Integration Points Schedule

Day 3: Sub-System Integration, Building IoT and Occupancy Analytics

- DALI Lighting Control Integration: Scenes, Daylight Harvesting and Occupancy Linking
- Access Control, Visitor Management and Lift Interfaces with the BMS
- Energy Metering Hierarchy and Sub-Metering Dashboards for Tenants and Zones
- Occupancy Sensing Options: Passive Infrared, Ultrasonic, CO2 and Thermal Area Sensors
- Wireless Retrofit Sensor Networks: Zigbee, BLE and LoRa Coverage Survey

Day 4: Digital Twins, Workplace Platforms, Cybersecurity and Certification

- Building Digital Twin: BIM Asset Data Linked to Live BMS and Sensor Feeds
- Fault Detection and Diagnostics Rules on BMS Trend Data and Alarm Floods
- Integrated Workplace Platforms: Room Booking, Desk Utilisation and Occupant App Services
- Building Systems Cybersecurity at Overview: Network Segmentation, Remote Access and Default Credentials
- SmartScore Nine Categories and WiredScore Connectivity Certification at Overview

Day 5: Case Work: Smart Building Integration Roadmap and Specification

- Office Tower Case: Integration Gap Review and Open Protocol Specification
- Smart Building Business Case Model: Capital Cost, Operating Savings and Payback
- Output-Based Specification and Master Systems Integrator Evaluation Matrix
- Smart Building Operating Model: Roles, Data Ownership and Service Levels
- Smart Building Integration Roadmap and Specification Brief Presentation and Peer Challenge

Skills You Will Gain:

- Smart Building Maturity Assessment
- Open Protocol Integration
- Building Data Tagging
- Occupancy Analytics
- Digital Twin Planning
- Fault Detection and Diagnostics
- Building Systems Cyber Hygiene
- Smart Building Investment Appraisal

Why Attend This Course:

- Return with a Smart Building Integration Roadmap and Specification Brief built around a building from your own portfolio
- Challenge supplier proposals that lock building data into closed systems by asking for open protocols, tagging and data ownership terms
- Turn occupancy and meter data into decisions on space, energy and occupant services instead of unused dashboards
- Compare smart building practice with peers from offices, healthcare, hospitality, education and mixed-use developments

Conclusion:

A smart building is defined less by the devices installed than by how its systems share data and serve the people who use them. The course moves from smart building concepts and maturity, through BMS architecture and the BACnet, KNX and Modbus protocols, to lighting, access, metering and occupancy integration. It then covers building digital twins, fault detection, workplace platforms, cybersecurity and SmartScore, before the final day applies these methods to cases and produces a Smart Building Integration Roadmap and Specification Brief.