

An Overview of Intelligent Building Systems and Construction Debugging Techniques

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ABSTRACT The implementation of the intelligent building of the general contractor in charge of the project construction drawings installation and testing design, equipment, materials, supplies and transportation, pipeline construction, equipment, system debugging through the acceptance of the relevant opening and administration until delivery. Composition and engineering techniques. This paper describes the architecture of intelligent systems and concluded that the implementation of intelligent building elements.

KEYWORDS

Building intelligent systems
Debugging techniques
Engineering system

1. Intelligent building engineering

Intelligent building comprising: a communication network systems, office automation systems, construction equipment monitoring systems, fire alarm and fire linkage systems, security systems, integrated wiring systems, intelligent integration system, power supply and ground, the environment, housing (cell) Smart ten sub-division of systems engineering.

1.1. Communication network system

The communication network system means: the user program-controlled telephone switching system, user access network (xDSL, HFC and FTTx, etc.), VSAT satellite communication systems, micro-cellular digital cordless telephone system, wireless coverage systems, optical transmission systems, satellite receiver and cable TV systems, video conferencing systems, public and emergency broadcast systems. For the construction works of the communication system is different from carrier-class backbone communications systems. But they really are the basic units of information society. With the development of information technology, digital means of communication are essential building works.

1.2. The computer network system

Computer network systems using communication technology, computer integrated technology, multimedia technology and other means to each individual user terminals connected to the computer, sharing resources. There are Ethernet, ATM switching network, token ring network.

1.3. Construction equipment monitoring system

Construction equipment monitoring system is composed of field data acquisition/control devices (DDC), transmission network, and the center of the main control device, the main function is to complete the various electrical and mechanical equipment for the detection, control and automation management, security, reliability, energy efficiency and centralized management. Main:

- (1) To the cold heat source system control and management functions.
- (2) For air conditioning and ventilation systems and control functions.
- (3) Power distribution system monitoring capabilities.
- (4) Detection and control of the lighting system.
- (5) To the drainage system monitoring and control functions.
- (6) The elevator and escalator systems monitoring capabilities.
- (7) Data communications construction equipment monitoring systems and between the main equipment

1.4. Automatic fire alarm systems linked

Automatic fire alarm system consists of front-end alarm detectors, transmission lines, corresponding linkage module and equipment, zone controller or centralized controller. The main feature is the use of modern com-

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munication and computer technology, control technology, the fire occurred at the time of the early warning in advance, when the fire confirmed by linkage function to start the appropriate fire-fighting system, fire damage to a minimum.

1.5. Security systems

Security system, mainly through the use of technological means, integrated communications technology, multimedia technology, computer control technology, technical means to take preventive measures to protect the objects. Including: intrusion alarm systems, audio and video surveillance systems, access control systems, electronic Patrol management system, garage / yard management systems.

1.6. Cabling system

Cabling is the foundation of all communications systems, is the physical media layer network system, which is mainly for communications provide physical links, divided between work area subsystem, horizontal subsystem, between the management subsystem, vertical trunk subsystem, equipment, child systems, subsystems and other buildings. The current mainstream backbone using optical fiber, horizontal and connectors used mainly over five and six non-shielded system.

1.7. Residential (cell) intelligent

Through a variety of control technology, communication technology, police technology, multimedia processing technology greatly improved the living environment, the key is the application of intelligent home systems for households mention convenient and safe for use on the guarantee.

(1) Residential (cell) communication network system comprises a telephone network, cable television network, with fast access network, home network and control network.

(2) Property management system includes construction equipment monitoring devices, property management systems, emergency radio and background music, vehicle access and parking management and automatic meter reading systems.

(3) The security system includes anti-Vietnam perimeter alarm system, television surveillance equipment, electronic patrol system, visitors' intercom and electronically controlled locking devices, home security systems, alarm system and fire alarm system.

1.8. Power system lightning protection and grounding

With the development of intelligent systems, and promote the development of lightning protection technology and products, including: a signal lightning, power mine. Grounding System for electronic products, especially the communication system is particularly important, the

grounding system directly affects the normal safe operation of intelligent systems and products.

2. The implementation of intelligent building elements

2.1. Building intelligent project implementation program

Developing → Equipment suppliers and engineering contractors building intelligent devices demand research → Intelligent program design and evaluation of tender documents → Complete → Construction plans to deepen the implementation of quality control engineering design → Engineering Testing Management training → Project acceptance opening → Put into operation.

2.2. The implementation of intelligent building construction elements

(1) The intelligent system should be designed with an open architecture to deepen, protocols and interfaces should be standardized and modular. Learn the basic situation of the tender documents from the building, the location of construction equipment, control and information technology requirements, product engineering and biochemistry for intelligent design.

(2) Before the construction process of the transition should be prepared to do a good job interface acknowledge and building structure, building decoration, building water supply and drainage, construction, electrical, ventilation and air conditioning and elevators and other divisions of the project.

For example: installation of fire and security on the interior walls and ceiling all kinds of detectors shall coordinate location and architectural and electromechanical construction.

2.3. The implementation of intelligent building engineering division interface

Determine the implementation of intelligent building interfaces to implement the whole process equipment selection, system design, construction, testing and acceptance. In engineering contract should clarify the system vendors' equipment, supply range of materials, interface software and their costs in order to avoid passing phenomenon occurred during construction, the impact of the project schedule.

2.3.1. Dividing equipment, materials supply interface

Equipment, procurement and supply of materials to be clear division of intelligent system interface equipment suppliers and monitored equipment suppliers. The scope of supply is mainly clear construction equipment monitoring systems and electrical and mechanical engineering equipment, materials, interfaces and software. For example: equipment air conditioning engineering contractors are VAV air handler, new fans and control systems and other

equipment, all kinds of valves, dampers, etc., electric control valves, actuators and damper drives (also by monitoring systems engineering contractor provider); equipment monitoring systems engineering contractor should provide temperature, flow rate, pressure and pressure sensors, pressure switches and other equipment and the corresponding software.

2.3.2. The system determines the interface device interface

Construction equipment monitoring systems and power distribution equipment, generators, chillers, heat pump units, boilers and elevators and other large construction equipment that implements the interface mode of communication, must be followed by a pre-agreed protocol. When the external device controller uses a non-standard communication protocol, you need suppliers to provide data format conversion by the construction equipment monitoring system contractor. For example: construction equipment monitoring system can be shared via TCP/IP communication protocol or RS232 interface mode and some other data from other systems interact with the linkage of various systems; chillers, heat pump, boiler equipment can also provide a communication interface card on the device, communication protocol and interface software to communicate way connected with the construction equipment monitoring system.

2.3.3. Coordinated intelligence system construction interface

The main installation is determined between the electrical and mechanical equipment and systems involved in the construction equipment monitoring system, ducts laying and threading and wiring, commissioning and issues of mutual cooperation.

For example: In the construction of intelligent control valve is required to determine the mounting location and line laying, sensor openings and installation, commissioning process, stakeholders of manpower, equipment and responsibilities need to be clear before construction, the emergence of a free monitor shirking responsibility for the situation when the construction problems.

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