Home Technology Integrator Certification
HTI+ Systems Infrastructure and Integration Examination Objectives
HT0-102

Final: December 2002

Introduction

The HTI+ certification is a vendor-neutral cross-industry credential providing recognition that a Home Technology Integrator (HTI) professional has attained a standard of excellence in the integrated home networks industry. The HTI+ certification is based on a set of standards designed to measure the mastery of core competencies regarding the installation, integration and troubleshooting of the following sub-systems: **Home Security, Audio/Video, Computer Networks, Electrical Wiring, HVAC (Heating/Air Conditioning Systems), Cable/Satellite, Broadband, Telecommunications and Structured Wiring**. In order to achieve the HTI+ Certification, the candidate must successfully complete this examination and the HTI+ Residential Systems (HT0-101) exam.

This exam targets individuals who want to demonstrate a knowledge and skills baseline that enables them to work with the security, comfort, and entertainment subsystems of the automated ("connected") home. By successfully demonstrating this knowledge and skill sets, the candidate is enabling oneself to pursue a career as a technician supporting the diverse services and needs of the automated ("connected") home industry. This exam not only helps individuals enter the industry, but it also helps consumers, the building trades industry, and hiring managers determine whether a prospective employee has the appropriate level of technical knowledge and skill.

The skills and knowledge measured by this examination are derived from a North American focused job task analysis. The intent is to certify individuals in a body of knowledge that is identified and accepted as the baseline or foundation set of skills and knowledge that are possessed by home integration professionals with one to two years of experience.

Note: This examination blueprint for the **HTI+ Systems Infrastructure and Integration** examination (HT0-102) includes weighting, test objectives, and example content. Example topics and concepts are included to clarify the test objectives and should not be construed as a comprehensive listing of all the content covered by this examination. This blueprint may undergo additional minor modifications during the test development phase.

The table below lists the domains measured by this examination and the approximate extent to which they are represented in the examination.

Domain	% Of Examination
1. Structured Wiring	
a. Low Voltage (e.g., twisted pair, coax, shielded, fiber)	25%
b. High Voltage (nominal 120/240 volt)	25%
2. Systems Integration (User Interfaces, Control Processors)	50%
Total	**100%**

Response Limits

The examinee selects, from four (4) or more response options, the option(s) that best completes the statement or answers the question. Distracters or wrong answers are response options that examinees with incomplete knowledge or skill would likely choose, but are generally plausible responses fitting into the content area. Test item formats used in this examination are:

Multiple-choice: The examinee selects one option that best answers the question or completes a statement. The option can be embedded in a graphic where the examinee "points and clicks" on their selection choice to complete the test item.

Multiple-response: The examinee selects more then one option that best answers the question or completes a statement.

Sample Directions:
Read the statement or question and from the response options, select only the option(s) that represent the most correct or best answer(s).

Home Technology Integrator Certification
HTI+ Systems Infrastructure and Integration Examination Objectives
HT0-102

Final: December 2002

Domain 1: Structured Wiring:
1A - Low Voltage

This domain requires that the candidate has the knowledge of a wide range of structured wiring cabling. The candidate should be able to identify and describe the specific characteristics, uses, and limitations of each type of low voltage structured wiring cabling type. In addition, the candidate should have the knowledge and skills required to design, implement, and maintain a low voltage structured wiring schematic. The ideal target candidate will have at least 9 –12 months IT networking field experience, and be able to identify and describe key cabling terminology.

This domain subcategory examines the following project management concepts and modules:

- Identify client's current and future needs
- Project design scope of work integrating equipment, budget and timeline constraints
- Conduct a site/project survey--type of construction (e.g., remodel, new construction, retrofit, single/multi-story, single/multi-family dwelling)
- Conduct a site/project survey--current environment (existing equipment and systems)
- Conduct a site/project survey--location of equipment, systems, geographic location of house (rural, suburban, urban), and topography (mountains, desert)
- Define the scope of services
- Develop preliminary design(s) and proposal (scope of work/equipment, budget, timeline, payment terms)
- Review proposal with client and obtain approval
- Confirm equipment list and procure
- Develop connectivity documentation (e.g., wire charts, schematics, equipment layouts)
- Pre-wire (implement structured wiring) and rough-in equipment
- Trim out (wire termination, install fixed equipment)
- Test wiring
- Finish/final (complete) installation of equipment
- Test hardware
- Program and configure equipment/system
- Test operation of equipment/system
- Train clients on operation of equipment/systems
- Offer service maintenance contract(s) to client

1A.1. Identify standard structured wiring <u>design</u> considerations

Content will include the following:

- Wire Types
  - Shielded twisted pair (STP)
  - Unshielded twisted pair (UTP)
  - Coaxial
  - Fiber Optics
- Conduits
- Daisy chain
- Homerun

1A.2. Identify standard structured wiring location considerations

Content will include the following:

- Project settings
  - Remodeling/Existing structure
  - New construction
- Equipment component placement

1A.3. Identify physical structured wiring connection components

Content will include the following:

- Distribution panels
- RJ45
- RJ11
- RG6
- BNC
- Amplifiers
- Filters
- Binding posts
- Connectors

1A.4. Identify the core configuration and settings for low voltage structured wiring design

Content will include the following:

- Distribution panels
- Termination points

1A.5. Identify standard methods of device connectivity for low voltage structured wiring design

Content will include the following:

- Coax
- Category 5
- Fiber
- Plenum
- Audio wire
- Security wire
- Termination points

1A.6. Identify and describe current industry standards for structured wiring design

Content will include the following:

- Standards and organizations (i.e.
  - National Electrical Code
  - EIA/TIA Standards
    - 568a
    - 568b
    - 570

1A.7. Identify and describe standard installation plans and procedures for structured wiring design

1A.8. Identify and describe maintenance plans and procedures for structured wiring design

Domain 1: Structured Wiring:
1B - High Voltage

This domain requires that the candidate has the basic knowledge of the characteristics, uses, and limitations of high voltage structure wiring. The candidate will be well versed in the safety and industry standard considerations when working with high voltage structure wiring. The candidate's knowledge and skills should not be considered a replacement for a licensed and experienced electrical professional. The ideal target candidate will have at least 9 –12 months field experience, and be able to identify and describe high voltage components within a residential integrated home system design.

This domain subcategory examines the following project management concepts and modules:

- Identify client's current and future needs
- Project design scope of work integrating equipment, budget and timeline constraints
- Conduct a site/project survey--type of construction (e.g., remodel, new construction, retrofit, single/multi-story, single/multi-family dwelling)
- Conduct a site/project survey--current environment (existing equipment and systems)
- Conduct a site/project survey--location of equipment, systems, geographic location of house (rural, suburban, urban), and topography (mountains, desert)
- Define the scope of services
- Develop preliminary design(s) and proposal (scope of work/equipment, budget, timeline, payment terms)
- Review proposal with client and obtain approval
- Confirm equipment list and procure
- Develop connectivity documentation (e.g., wire charts, schematics, equipment layouts)
- Pre-wire (implement structured wiring) and rough-in equipment
- Trim out (wire termination, install fixed equipment)
- Test wiring
- Finish/final (complete) installation of equipment
- Test hardware
- Program and configure equipment/system
- Test operation of equipment/system
- Train clients on operation of equipment/systems
- Offer service maintenance contract(s) to client

1B.1. Identify and describe <u>design</u> considerations for high voltage structured wiring

Content will include the following:

- Load requirements
- Grounding
- Surge protection
- Power backup (UPS)
- Safety considerations

1B.2. Identify and describe audio and video equipment location considerations

Content will include the following:

- Project settings
  - Remodeling/Existing structure
  - New construction
- Equipment component placement

1B.3. Identify physical high voltage structured wiring connection components

Content will include the following:

- Outlets
- Dimming modules
- Light switches
- Fixtures
- Source equipment

1B.4. Identify the core configuration and settings for high voltage structured wiring design

Content will include the following:

- Distribution panels
- Termination points
- Power consumption

1B.5. Identify standard methods of device connectivity for high voltage structured wiring design

Content will include the following:

- NM cable
- MC cable
- AC cable
- Termination points

1B.6. Identify and describe current high voltage structured wiring standards and industry related organizations

Content will include the following:

- Standards and organizations
  - National Electrical Code
  - EIA/TIA Standards
  - IEEE Standards
  - Electrical Contractor's Association
  - Underwriters Laboratories, Inc (UL)

1B.7. Identify and describe installation plans and procedures for high voltage structured wiring design

1B.8. Identify and describe maintenance plans and procedures for high voltage structured wiring design

Domain 2: Systems Integration

This domain gives focus to emerging standards and consistent practices in connected home system integration design. The candidate should have the knowledge and skills required to design, implement, and maintain an integrated home system. The candidate will be able to troubleshoot and diagnose technical issues with system user interfaces and/or the control processor(s). Key technical skills and knowledge include the following: **Client Consultation, Systems Planning, and Systems Implementation**. The ideal target candidate will have at least 9 –12 months field experience as a systems integrator.

This domain subcategory examines the following project management concepts and modules:

- Identify client's current and future needs
- Project design scope of work integrating equipment, budget and timeline constraints
- Conduct a site/project survey--type of construction (e.g., remodel, new construction, retrofit, single/multi-story, single/multi-family dwelling)
- Conduct a site/project survey--current environment (existing equipment and systems)
- Conduct a site/project survey--location of equipment, systems, geographic location of house (rural, suburban, urban), and topography (mountains, desert)
- Define the scope of services
- Develop preliminary design(s) and proposal (scope of work/equipment, budget, timeline, payment terms)
- Review proposal with client and obtain approval
- Confirm equipment list and procure
- Develop connectivity documentation (e.g., wire charts, schematics, equipment layouts)
- Pre-wire (implement structured wiring) and rough-in equipment
- Trim out (wire termination, install fixed equipment)
- Test wiring
- Finish/final (complete) installation of equipment
- Test hardware
- Program and configure equipment/system
- Test operation of equipment/system
- Train clients on operation of equipment/systems
- Offer service maintenance contract(s) to client

2.1. Identify standard system integration <u>design</u> considerations

Content will include the following:

- Web pads
- Key pads
- Touch screens
- RF/IR receivers

2.2. Identify equipment location considerations in system integration designs

Content will include the following:

- Web pads
- Key pads
- Touch screens
- RF/IR receivers

2.3. Identify the core components found in system integration designs

Content will include the following:

- Web pads
- Key pads
- Touch screens
- RF/IR receivers
- Distribution panel
- Interface location
- Control processor
- Patch panel

2.4. Identify the configuration and settings for the components found in system integration designs

Content will include the following:

- User interface programming
- Control system programming

2.5. Identify methods of device connectivity for the components found in system integration designs

Content will include the following:

- Communications cable(s)
- Low voltage wiring
- Wireless
- Termination points

2.6. Identify and describe current industry standards for system integration designs

Content will include the following:

- Manufacturer's standards
- Standards and organizations
  - National Electrical Code
  - EIA/TIA Standards
  - IEEE Standards
  - Electrical Contractor's Association
  - Underwriters Laboratories, Inc (UL)

1.7. Identify and describe standard installation plans and procedures for structured wiring design

1.8. Identify and describe maintenance plans and procedures for structured wiring design