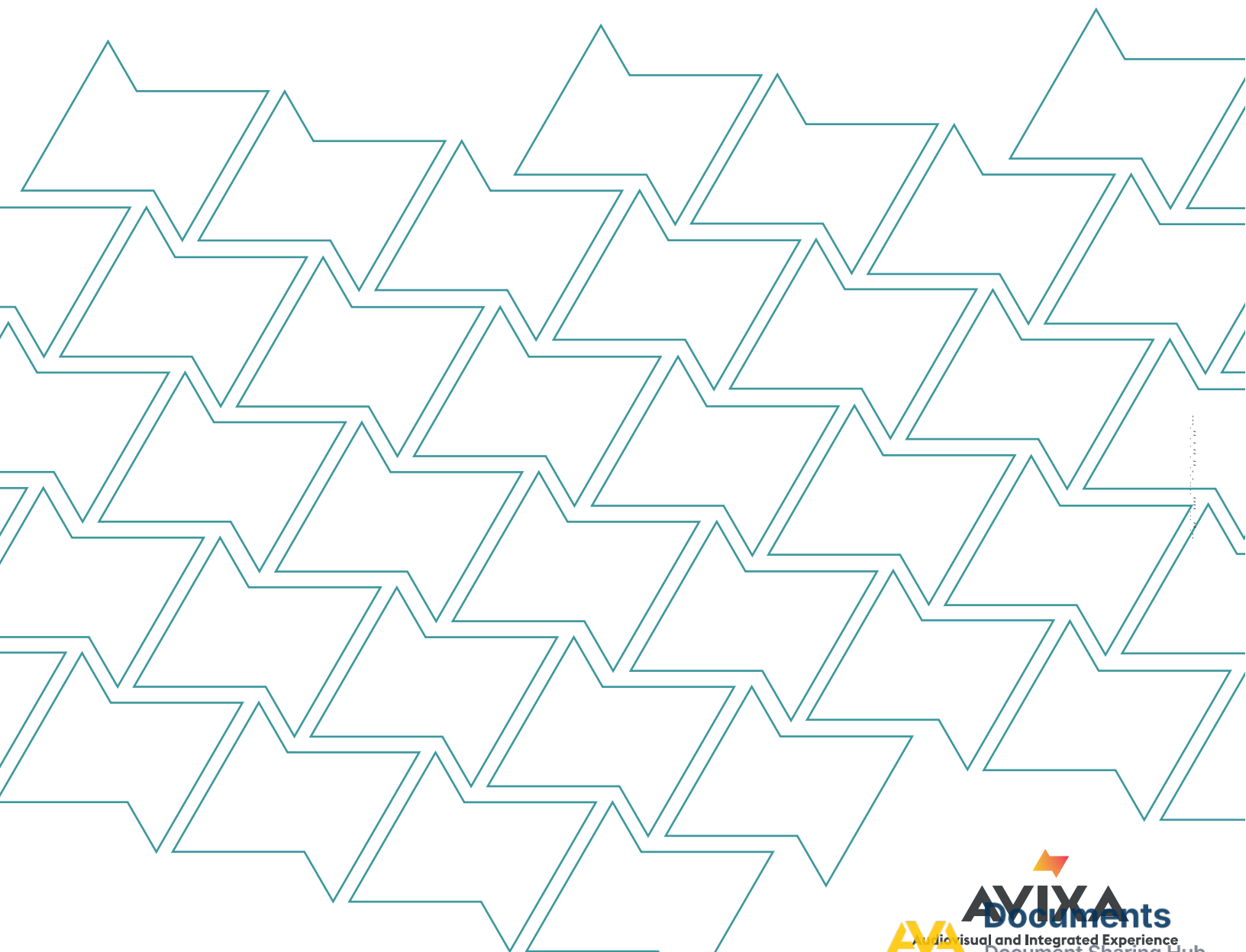


ANSI/INFOCOMM 4:2012

Audiovisual Systems Energy Management



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Audiovisual Systems Energy Management

InfoComm International Standard

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Abstract

This Standard defines and prescribes processes and requirements for ongoing power-consumption management of the audiovisual (AV) system. The Standard identifies requirements for the control and continuous monitoring of electrical power for audiovisual systems, whereby power is conserved whenever possible and components operate at the lowest power-consuming state possible without compromise to the system's performance for the needs of the user. Audiovisual systems in conformance with the Standard will meet the defined requirements for automation, measurement, analysis, and training.

Keywords

Audiovisual; audiovisual system; automation; AV equipment; AV installation; AV system; baseline; components; conformance; control system; dashboard; energy management; energy measurement; InfoComm; power; power consumption; power management; power monitoring; power states; standby

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Foreword

This Standard addresses power consumption management of audiovisual systems. An audiovisual system designed to minimize power consumption includes power monitoring and automated control of components in an effort to use the least amount of electrical power possible when the AV system is in operation, in standby modes, and when the system is not being used. Energy conservation can be managed through ongoing active monitoring and reporting of power consumption. Design of the technical architecture of the AV systems and components, implementation based on design documentation, and thorough testing procedures of installed systems are critical to the success of an energy management program.

This Standard addresses power consumption requirements of the audiovisual system as a whole, while allowing the user of the Standard flexibility in system design as well as selection of individual components.

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Although there is no requirement for a specific percentage of energy reduction, the Standard requires preparation of an energy management plan that will assist users in formulating their energy reduction goals by requiring baseline measurements; automation; ongoing monitoring, measurement, and analysis; and education/training for the owners and users of the AV systems. This Standard provides requirements for automation, measurement, ongoing analysis, and training for users of the AV system that are intended to harmonize with both current and future building automation initiatives.

Devices that do not directly affect the AV function of the system are not considered part of the AV system for purposes of this Standard (i.e., centralized IT equipment) including centralized equipment which may provide support to the AV system.

This Standard is not designed to be used for competitive positioning between manufacturers or technologies. It is the performance of the AV system that is tested and evaluated, while reference to component elements is limited to quantification of their contribution to the system as a whole.

Operating cost reductions are a logical result of power reduction.

This Standard shall not supersede any regulatory or statutory requirements.

About InfoComm International

InfoComm International® is the leading nonprofit association serving the professional AV communications industry worldwide. Founded in 1939, the association offers industry expertise and market research serving press and others seeking information about the industry. Through activities that include trade shows, education, certification, government relations, outreach, and information services, InfoComm promotes the industry and enhances members' ability to conduct business successfully and competently. InfoComm International is the ANSI Accredited Standards Developer (ASD) dedicated to the dissemination of the knowledge of audiovisual systems performance parameters.

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InfoComm International maintains a Standards Steering Committee which provides oversight to the standards development task groups responsible for specific standards. The Steering Committee reports to the InfoComm International Board of Directors, whose approval is required before standards may be submitted to ANSI.

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I. Scope, Purpose, and Application

A. Scope

This is an internationally applicable standard for the control, monitoring, and use of electric power for audiovisual (AV) systems, whereby power is conserved whenever possible through the use of ongoing operational management, design principles, and component selection. AV systems that are managed in conformance with the Standard will include education, benchmarking, monitoring, and control.

Energy management of an audiovisual system is accomplished through:

- Strategic design of the monitoring system, software, and components;
- Accurate implementation of the design;
- Testing procedures of installed systems;
- Ongoing supervision and control of the system;
- Creation and execution of an energy management plan;
- Reporting and analysis of power consumption;
- Owner and end-user training.

B. Purpose

The purpose of this Standard is to provide requirements for efficient energy management and use of power-consuming audiovisual systems. The Standard will help designers, specifiers, and installers of audiovisual systems provide users with successful audiovisual solutions that incorporate optimum energy efficiency while adhering to the stated operational and functional requirements.

C. Application

1. This Standard applies to all permanently installed audiovisual (AV) systems with exceptions that are noted on page 2 of this Standard. The power management of the AV system extends through all permanently installed components of the AV system and any other components powered from the circuits supplied for said AV system.
2. This Standard defines four power states of an audiovisual system: DISCONNECTED, OFF, STANDBY, and ON. Each power state defines the power status of the AV system (system state). The definition of each state is provided in the Definitions section (III.) of this Standard. Operational requirements for each system state are defined in the Requirements section (IV.) of this Standard.
3. This Standard is applied using:

Automation

Through the use of intelligent control systems (such as vacancy/occupancy sensors and actuators), the audiovisual system can maintain the lowest possible power-consuming state while still providing the intended audiovisual functionality.

Measurement and Analysis

Measurement systems gather data, and the analysis of that data provides usage and trending information that will be reviewed and analyzed to determine if the efforts to maximize reductions in power consumption have been successful or require additional modifications.

Education/Training

Through proper education and training, the potentially inefficient actions of human interaction with an audiovisual system can be minimized, enabling the user/operator of an audiovisual system to make energy-conserving decisions.

Education and training are used by this Standard to ensure that operators and those maintaining the system have the knowledge they require to ensure the efficient use of energy now and into the future.

D. Exceptions

1. Life safety systems (i.e., spaces where automatic control would affect the safety or security of the room or building occupants)
2. 24-hour operation (e.g., spaces where the audiovisual systems are intended for continuous operation such as monitoring stations)
3. Devices that do not directly affect the AV function of the system are not considered part of the AV system for purposes of this Standard (e.g., centralized IT equipment) including centralized equipment that may provide support to the AV system.
4. This Standard is not intended to serve as a certification of energy efficiency. Although adherence to the principles described herein should lead to power consumption reduction, there is no guarantee that a particular system will benefit in savings.
5. This Standard, in and of itself, is not designed to be used as a basis for any specific LEED® points, or to receive an Energy Star® or similar rating.
6. This Standard does not address the energy efficiency of individual audiovisual components; rather, it addresses the power management of the audiovisual system as a whole.
7. This Standard does not dictate a specific design solution or any particular product selection.
8. This Standard does not apply to battery-powered wireless devices.

II. Referenced Publications

A. Normative References

There are no normative references for this Standard.

B. Informative References

The following publications contain information that supports the design and application of this Standard, but are not required provisions of the Standard:

IEC 62087:2011 *Methods of measurement for the power consumption of audio, video and related equipment*

ISO 50001:2011 *Energy management systems – Requirements with guidance for use*

NFPA 70-2011 NFPA 70®: (NEC) *National Electrical Code*, or country equivalent

ANSI/ASHRAE/USGBC/IES Standard 189.1-2009, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*

ATIS-0100523.2011 *Telecom Glossary 2011*

ANSI/ASHRAE/IES Standard 90.1-2010, *Energy Standard for Buildings Except Low-Rise Residential Buildings I-P Edition*

III. Definitions

For the purposes of this Standard, the following definitions apply:

1. **Audiovisual (AV) System:** All equipment integrated into the energy-consuming infrastructure necessary to fulfill the intent of communicating audio and/or video content to an audience. A set of specified, individual audio and video components designed and configured to operate as one comprehensive system.
2. **Automation:** A method or product used to transition a component between two system states when one of the following conditions is detected: (1) device has ceased performance of all primary functions, (2) the last user interface command has been received (e.g., remote control, control system, physical human intervention), (3) a predetermined amount of time has elapsed, or (4) an established calendar or schedule is activated.
3. **Baseline:** The initial measurement of power consumption recorded for each system state of an audiovisual system against which the basis of all change is measured.
4. **Dashboard:** A visual display for administration and monitoring of AV systems' power consumption.
5. **DISCONNECTED:** (see System State)
6. **End user:** A person or group of persons designated to operate the AV system.
7. **Energy Management Plan (EMP):** A document that details a systematic approach to implementing the most effective power consumption methods and procedures to achieve and maintain optimum energy usage.
8. **Human Machine Interface (HMI):** (see User Interface)
9. **OFF:** (see System State)
10. **ON:** (see System State)
11. **Owner:** The designated responsible party with the authority to make final decisions on contract and technical issues, and provide final acceptance of the energy management plan according to the verification requirement of this Standard.

12. **Pooled equipment:** Any devices that can provide functionality to multiple systems but only to one system at a time (e.g., a videoconferencing codec attached to a shared matrix switcher can be routed to and used with one of the systems).
13. **Power Factor (PF):** The measurement of an AC electric power system defined as the ratio of real power (watts) divided by the apparent power (VA). Power factor is a unitless number between 0.0 and 1.0, typically expressed in a decimal form. A pure resistive load has a power factor of 1.0.
14. **Real Power:** Component of electrical power that performs true work; expressed in watts, it is equal to volt-amperes multiplied by the power factor ($W=VA*PF$).
15. **Shared equipment:** Any devices that provide functionality to multiple systems simultaneously (e.g., a central matrix switcher with inputs and outputs to multiple systems).
16. **STANDBY:** (see System State)
17. **System Interface:** Any mechanism used to alter the state of the system (e.g., turning on/off, manual switches, scheduled events, remote control, etc.). A system interface may have, but is not limited to, physical human intervention, and hardware and software providing interaction between the audiovisual system and other systems.
18. **System State:** An individual component power state based on the functional requirements of the AV system's operation.

DISCONNECTED

The AV system components are not consuming any power beyond a minimal amount required to facilitate remote transitioning via the control system to the OFF state.

OFF

The AV system components are in the most power-conserving mode, still enabling the system to be turned to a power-saving state or an ON state via a system interface. Some system components may be in the ON state while the system is in the OFF state (e.g., control system, processor, Ethernet switch).

STANDBY

The AV system components are in a power-conserving mode and have a short transition time to the ON state.

ON

The minimum AV system components required to perform the necessary function are enabled for use.

19. **User Interface:** A type of system interface referring to the method by which humans interact with the operation of the system. Also known as Human Machine Interface (HMI).