

MASTERFORMAT™ 2004 EDITION SECTIONS

27 51 19 – SOUND MASKING SYSTEMS

27 51 13 – PAGING SYSTEMS

PREVIOUS MASTERFORMAT™ SECTION

16820 – SOUND REINFORCEMENT / SOUND MASKING SYSTEMS

NOTE TO SPECIFIER

LogiSon® Acoustic Network – Networked sound masking, paging and music system.

This section is based on the products manufactured by K.R. Moeller Associates Ltd., located at:

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K.R. Moeller Associates Ltd. also manufactures the Scamp® and AccuMask™ Sound Masking Systems.

(Spec Version 2.0)

1. PART ONE – GENERAL

1.1. SECTION INCLUDES

- A. Sound masking systems
- B. Paging systems

1.2. RELATED SECTIONS

- A. 27 51 19 – Sound Masking Systems
- B. 27 51 13 – Paging Systems

1.3. REFERENCES

- A. UL6500 – Standard for Audio/Video and Musical Instrument Apparatus for Household, Commercial and Similar General Use
- B. UL 2043 – Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces; 1996
- C. ASTM E 1374-02 – Standard Guide for Open Office Acoustics and Applicable ASTM Standards
- D. ASTM E 1573-02 – Standard Test Method for Evaluating Masking Sound in Open Office Using A-Weighted and One-Third Octave Band Sound Pressure Levels
- E. ASTM E 1130-02e1 – Standard Test Method for Objective Measurement of Speech Privacy in Open Offices Using Articulation Index
- F. FCC – EN 55103-1&2 – Audio, Video and Entertainment Lighting Control

1.4. PERFORMANCE REQUIREMENTS

- A. General Performance

1. The sound masking and paging system shall be entirely centrally controllable from a control panel and / or an attached computer (including over multiple floors).
 2. The system shall be able to automatically assign an address to individual network components.
- B. Sound Masking Performance
1. The system shall use digital signal processing (DSP) technology for masking sound generation and adjustment of masking and paging signals.
 2. The masking sound shall be random and provide no noticeable repetitive pattern.
 3. The primary network devices shall provide a 1/3 of an octave equalizer for the masking signal, capable of equalizing zones of 1 to no more than 3 speakers.
 4. The masking volume shall be digitally adjustable in 0.5 dBA increments at each primary network device (controlling 1 to no more than 3 speakers) over a range of 35 dBA to 85 dBA @ 1m.
 5. The system shall be capable of muting the masking volume at each primary network device.
 6. After adjustment, the system shall provide a spatial uniformity of $\pm 1/2$ dBA for the masking volume with furnishings in place.
- C. Paging Performance
1. The primary network devices shall provide a 1/1-octave equalizer for the paging signal, capable of equalizing zones of 1 to no more than 3 speakers.
 2. The paging volume shall be digitally adjustable in 0.5 dBA increments at each primary network device (controlling 1 to no more than 3 speakers) over a range of 35 dBA to 85 dBA @ 1m.
 3. The system shall carry three digital multiplexed paging channels.
 4. The network control panel shall accept up to three audio input modules with any combination of auxiliary, telephone or microphone inputs.
 5. The system shall be able to assign one of the three paging channels to each primary network device.
 6. The system shall be able to change the paging channel assigned to a primary network device without rewiring.
 7. The system shall be capable of muting the paging signal at each primary network device.
 8. The system shall provide an priority paging override of existing paging settings.
- D. Timer Performance
1. The system shall provide a timer function allowing masking volume levels to be automatically adjusted according to a programmed schedule.
 2. The system shall provide a calendar-based programmable timer function. Timer schedules shall be assigned to an individual or group of primary network devices.
 3. The system shall provide automatic daylight saving time adjustments.
 4. The system shall provide an acclimatization process that automatically increases the masking volume over a period of time according to a programmed schedule. The system should allow for independent acclimatization schedules for each timer zone.
 5. The system shall allow for up to nine independent timer zones per control panel/programmable timer.
 6. The system shall allow independent timer schedules for each day of the week.
 7. The system shall allow variable rates of volume adjustment.
 8. The system shall provide optional exception timer schedules for calendar days requiring a different schedule from the norm.
 9. The system shall offer a programmed system activation date.
- E. In-Room Occupant Control
1. The system shall be capable of including wall mounted, in-room programmable keypads giving the facility occupants manual control over the masking and paging volumes

2. The keypads shall be capable of adjusting masking and paging volumes independently.
3. The keypads shall be capable of restricting access to masking and/or paging volume control.
4. The keypads shall be capable of restricting the range of allowable volume adjustment for masking and paging independently.
5. The keypads shall be capable of individually muting the masking and paging output.
6. The keypads shall provide an infrared remote control receiver.

F. Diagnostic Performance

1. The system shall be capable of ensuring that the expected number of primary network devices is present and communicating properly with the network control panel.
2. The system shall be capable of identifying the primary network devices that are not communicating properly over the network.

G. Reporting Performance

1. The network control panel shall be capable of reading and displaying the current settings for all primary network devices.
2. The system shall be capable of generating detailed reports of all system settings down to the level of individual primary network devices.

H. Security Performance

1. The network control panel shall be contained in a locked metal enclosure.
2. Access to the control panel functions shall be password protected.
3. No physical controls shall be located on the system loudspeakers or primary network devices.
4. The system shall allow for all settings to be backed up on an electronic storage medium
5. The system shall monitor performance at each network component.

1.5. SUBMITTALS

- A. Product Data: Manufacturer's specifications and installation instructions
- B. Network Design: Schematics of the network showing quantity and location of network components and related cabling and accessories
- C. Warranty Documents: Warranty documents covering the network components.

1.6. QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum of 10 years manufacturing sound masking systems.
- B. Network Design – Performed by an approved manufacturer representative.
- C. Installer Qualifications – Approved by manufacturer representative and are trained with the specified products or have demonstrated experience with the installation of similar products to those specified.
- D. Network Adjustment – Done by an approved manufacturer representative or trained contractor
- E. Single Source Responsibility – Source Network Control Panels, Primary and Secondary Network Devices, Loudspeaker Assemblies, Programmable Keypads and Cable Assemblies from a single manufacturer.

1.7. DELIVERY, STORAGE AND HANDLING

- A. Protect from moisture during shipping, storage and handling.
- B. Deliver in manufacturer's original unopened and undamaged packages with manufacturer's labels legible and intact.
- C. Inspect manufacturer's packages upon receipt.
- D. Handle packages carefully.

1.8. WARRANTY AND MAINTENANCE

- A. Provide a written warranty that products installed shall be free from defects in parts or assembly for a 5-year period from date of first use (the date of network initialization)

2. PART TWO – PRODUCTS

2.1. MANUFACTURERS

- A. Acceptable Manufacturer: K.R. Moeller Associates Ltd.; 3-1050 Pachino Court, Burlington, Ontario L7L 6B9 Canada. Toll Free: 866 LOGISON (1-866-564-4766). Tel: (905) 847-8633. Fax: (905) 847-7709. Email: info@logison.com. Web: www.logison.com.
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered provided that the all performance requirements in Section 1.4 of this specification are met. Other manufacturers seeking approval must provide a signed compliance statement from an executive officer of the manufacturer.

2.2. NETWORK COMPONENTS

General System Overview: The sound masking and paging system shall be a networked decentralized system with complete digital, central control down to individually addressable speakers. The system shall be comprised of a selection of a) distributed primary network devices; b) distributed secondary network devices; c) loudspeaker assemblies; d) one or more network control panels; e) pc network control software; f) programmable keypads; g) cable assemblies h) audio input modules; i) ceiling mount adaptors and j) one or more power supplies.

- A. Each primary network device shall provide:
 - 1. A DSP-based masking sound generator
 - 2. An individual 1/3 of an octave, 23-band equalizer for masking
 - 3. An individual 1/1 octave, 8-band equalizer for paging
 - 4. An individual volume control for masking
 - 5. An individual volume control for paging
 - 6. Network communication components
 - 7. A paging channel selector and demultiplexer
 - 8. An audio amplifier
 - 9. Overall dimensions of:
 - i. Diameter 5.1 inches; 13.0 cm
 - ii. Height 1.75 inches; 4.5 cm
- B. Each secondary network device shall provide:
 - 1. A loudspeaker connection
 - 2. Signal connections to/from other primary/secondary devices
 - 3. Overall dimensions of:
 - i. Diameter 5.1 inches; 13.0 cm
 - ii. Height 1.75 inches; 4.5 cm
- C. Each loudspeaker assembly shall provide:
 - 1. A connection to the network devices
 - 2. A suspension chain at least 20 inches (51 cm) in length and tool-less length adjustment clip
 - 3. An acoustically damped enclosure
 - 4. Tool-less, on-site adjustment of upward / downward loudspeaker orientation
 - 5. Overall dimensions of:
 - i. Diameter 6.5 inches; 16.5 cm
 - ii. Height 3.5 inches; 9.0 cm

6. A loudspeaker driver with:
 - i. Diameter 4.0 inches; 10.0 cm
 - ii. Power Rating 25 Watts RMS
 - iii. Sensitivity 87 dBA @ 1W / 1m
 - iv. Frequency Response 100 - 10,000 Hz (+/- 6 dB)
 - v. Impedance 16 Ohms
 - vi. Magnet Structure Weight 17.6 oz; 500 g

- D. Each network control panel shall provide:
 1. Network communication components
 2. Network control electronics for masking, paging and timer functions
 3. Connections for audio input modules
 4. Paging multiplexing circuitry
 5. Connections to network devices, additional control panels and a computer
 6. Ethernet connection and IP addressability
 7. Overall dimensions of:
 - i. Height 9.4 inches; 23.8 cm
 - ii. Width 11.0 inches; 28.0 cm
 - iii. Depth 3.2 inches; 8.0 cm

- E. The PC network control software to:
 1. Allow control of all system adjustments from a computer, including:
 - i. Network setup
 - ii. Sound masking volume and equalization
 - iii. Paging volume and equalization
 - iv. Sound masking timer programs
 - v. Paging zoning
 - vi. Programmable Keypad setup
 2. Allow the reporting of all system settings
 3. Perform network diagnostics

- F. Programmable Keypads shall provide:
 1. Network communication components
 2. A display indicating function selection and volume adjustments
 3. A keypad interface for controlling all functions (masking/paging selection, volume increase/decrease, mute)
 4. An infrared remote control receiver
 5. An enclosure capable of being installed in a single gang box

- G. Cable assemblies to:
 1. Provide power, audio and control signals over a single cable assembly
 2. Provide overmolded micro-connectors

- H. Audio Input Modules to provide:
 1. Audio input for microphone, telephone or auxiliary audio sources
 2. Level adjustment controls

- I. Ceiling Mount Adaptors to:
 1. Attach on-site to convert plenum loudspeakers to ceiling plate loudspeakers

- J. Power Supplies to:

1. Power the network devices and control panels

3. PART THREE - EXECUTION

3.1. NETWORK DESIGN

- A. Design network according to manufacturer's specifications.

3.2. EXAMINATION

- A. Ensure that facility build out is at a stage suitable for the system installation.
- B. Ensure that facility is constructed according to plans including wall locations, ceiling types and plenum barriers.
- C. Ensure that the plenum height is appropriate as per manufacturer's recommendations and as per plan.
- D. Ensure power requirements have been provided as per plan.
- E. Ensure sufficient space for centrally located components is available as per plan and manufacturer's specifications.
- F. Ensure any third-party components required to be interfaced with the network have been provided.

3.3. PERMITS

- A. Obtain necessary permits for installation work.

3.4. INSTALLATION

- A. Follow all applicable codes for the area
- B. Follow manufacturer's recommendations regarding installation as found in the *LogiSon Acoustic Network Installation Manual*
- C. Follow the system design for location of loudspeakers and wiring
- D. Record any necessary changes to the system design on the plan
- E. Ensure that supplementary materials used meet applicable safety standards

3.5. FIELD QUALITY CONTROL

- A. Ensure that plenum heights meet the minimum recommended by the manufacturer for the loudspeakers
- B. Ensure that distance between the top of the loudspeaker and the deck meets manufacturer's minimum specifications
- C. Ensure that loudspeakers are suspended in a level manner
- D. Ensure that loudspeakers are not obstructed as much as possible
- E. Ensure cables are properly supported in the ceiling
- F. Ensure cables are securely terminated

3.6. NETWORK CONFIGURATION AND ADJUSTMENT

- A. Follow manufacturer's recommendations for system settings as found in the *LogiSon User Manual*

3.7. CLEANING

- A. Ensure that empty packaging is removed.
- B. Ensure that any material waste is removed
- C. Ensure the product is clean and presentable where required

3.8. DEMONSTRATION AND TRAINING

- A. Demonstrate operational system to customer by walking the space

- B. Demonstrate functionality of the system to the customer or customer's representative
- C. Train customer employee to maintain system as required

3.9. TESTING AND REPORTING

- A. Test area for consistency of masking volume and quality
- B. Verify that paging zoning and levels are appropriate and as per plan
- C. Test masking volumes with mechanicals off and with space unoccupied
- D. Provide a printed report detailing system settings