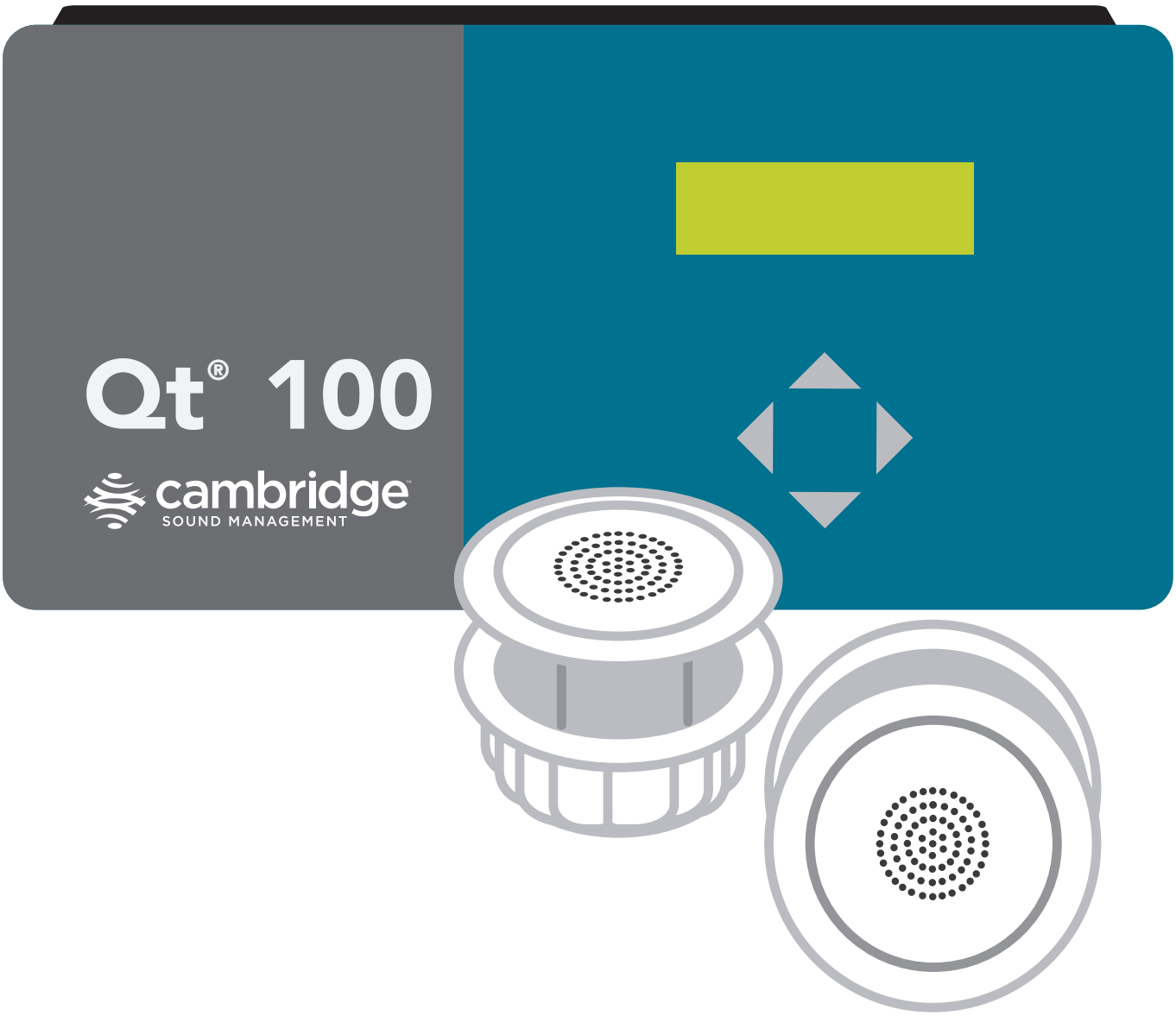
Qt 100
Installation and Operations Guide



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Safety Information

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water. Indoor use only.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Use only power supply provided with the unit.
10. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
11. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
12. Only use attachments/accessories specified by the manufacturer.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when:

    - the apparatus has been damaged in any way, such as power-supply cord or plug is damaged
    - liquid has been spilled or objects have fallen into the apparatus
    - the apparatus has been exposed to rain or moisture
    - the apparatus does not operate normally, and/or has been dropped

Qt 100 Introduction

This manual covers system installation, masking level setting and system maintenance. This introduction section discusses guidelines to ensure effective sound masking coverage.

The Qt 100 control module supports one zone of sound masking with two cable runs. Each run supports up to 60 emitters. The maximum coverage area for the Qt 100 is 12,000 square feet (1,115²). The module features one audio input for distribution of audio from paging controllers or background music players.

It is important that the masking volume be set correctly to achieve the full effectiveness of the Qt 100 system. If volume levels are set too low, speech privacy will be reduced and workplace distractions will become more apparent. If volume levels are set too high, the masking sound could become a source of distraction. The higher the setting that can be used comfortably, the better the acoustic privacy.

For a given open office design, including ceiling height, ceiling material and workstation panel height, we can define the masking volume required to achieve “normal acoustic privacy,” (i.e., normal voices are unintelligible yet audible). In an open office environment, the target background sound level is in the 45–48 dBA range, as measured 3 feet (0.9 m) above floor level.

Similarly, for private offices, based on wall panel design and ceiling construction, we can define masking volumes required to achieve “confidential privacy” (i.e., normal voices not audible). Most private offices have a target background sound level in the 38–42 dBA range.

If a sound level meter is available, it is recommended that the control module’s masking volume be adjusted up or down to achieve the readings listed in the Sound Level Meter Readings section.

Sound Level Meter Readings

Private Office Zones

38–42 dBA, averaged spatially within the office

Open Area Zones

45–48 dBA, measured 3 feet (0.9 m) above floor level

No Sound Level Meter Available

The recommended levels are likely to be achieved in most environments by setting the control module's masking volume settings as follows:

Private Office Zones

05–09, for all ceiling heights

Open Area Zones

11–14, for 08 ft. (2.4 m) ceilings

13–16, for 10 ft. (3 m) ceilings

15–18, for 12 ft. (3.7 m) ceilings

Masking volumes must be set sufficiently high to improve speech privacy and reduce distraction but not so high that the masking sound becomes obtrusive. Settings within the above ranges typically accommodate both objectives. As a general rule, use the high end of the range. Base final settings on site conditions and customer preferences.

Hardware Installation

Installing the Control Module

NOTE: Always plug/unplug power supply at wall outlet

Wall Mount (attached to the back of the control module): Remove the wall mount from the control module. Mount the wall mount using the 4 screws and plastic anchors provided. Use a 1/4 inch drill bit for the anchor hole. The included plastic anchors are #6 x 1 inch with #6 x 1 1/4 inch screws.

Use the bubble level on the wall mount to guide installation. Make sure to completely tighten the screws to ensure proper mounting of the front panel.

All connections are made to the control module and then the module ‘snaps’ into place on the wall mount.

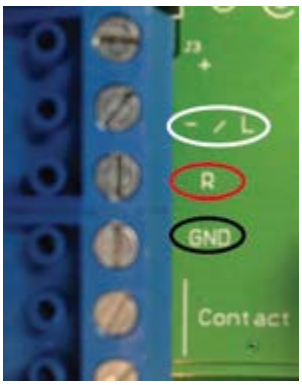
Connections to the Front Panel

Connect Paging or Music

NOTE: The fixed terminal block can be removed for ease of connecting.

Balanced Audio Input: (Most often, but not always characteristic of paging systems.)

1. Connect signal wires to + and - at the input.
2. Connect the shield to GND at the audio source.



Unbalanced Audio Input: (Typical of music systems.)

- **Mono Signals:** Connect the mono signal wire to both L and R (split the wire) on the block. Connect the ground wire to GND.
- **Stereo Signals:** Connect the respective signal wires to L and R on the block. Connect the ground wire to GND.

Contact Closure

The Qt 100 provides an instant shut-off capability for masking if connected to a contact closure interface. The contact closure utilizes the same connector as the audio input. To leverage this feature, connect a two-conductor cable to the two connectors labeled “contact”.

The other end of these conductors (treated as pairs/circuits) can be terminated on closure mechanisms of choice.

1. To shut off masking, form a connection between the two conductors.
2. To resume masking, break the connection.

Connecting Power

The controller comes standard with a 24 V wall plug power supply. This supply features a wall plug and a fixed barrel connector.

Alternatively, power can be supplied to the fixed block connector, which allows for stripped and tinned wires for added flexibility and convenience.

The terminal block can be removed for easy wiring. Simply connect the positive and negative wires to the terminal block and slide the terminal block back onto the posts.

Installing Qt Emitters

Important Considerations:

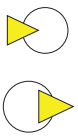
- Each run has a maximum of 60 emitters.
- Each run supports a maximum cable length of 1000 ft.
- Each home run cable attached to the control module should be labeled by Zone # and Run #. Adding a logical name (e.g. Marketing, Private Offices) is suggested. In addition, fill out “Zone Destination Record” at the end of this Guide.
- The module has two identical outputs, Run 1 and Run 2. All emitters on Run 1 and Run 2 are controlled equally.
- Each job-made cable should be manufactured according to ANSI/TIA/EIA Standard 568-B. See custom cabling guidelines on page 10.
- Job-made cables should be tested with a LAN cable tester before installation.

Emitter Installation Order

1. Set the masking output level to the maximum level of 30.
2. Refer to the emitter layout and wiring diagram provided by the dealer for cable run connections.
3. Run home run cables from control module to the location of the first emitter for all runs.
4. Gather all ceiling tiles (per layout drawing) that are to receive emitters. Use the supplied hole saw to cut holes in designated tiles. Cut all tiles from the front. (Different types of emitter housings are available to attach in areas where there are no suspended ceiling tiles.)
5. Push the emitter through the front of the hole in tile and secure it by pushing down and twisting the locking ring at the back of the emitter.

NOTE:

- The “tombstone” hook on the back of each emitter is next to the INPUT jack. This can help you find the INPUT jack by touch.
- To adjust for unexpected obstacles such as sprinkler heads, each emitter may be moved up to two feet (one tile or 0.6 m) in any direction.



6. Connect a run cable from the specified OUTPUT jack on the module to the INPUT jack of the first emitter. DO NOT put the input cable into the output port of the emitter. If sound is only heard by putting the cable in the output, there is a problem earlier in the cable run. Listen to each emitter as it is connected. If you cannot hear its “whooshing” sound, do the following:
   - Try a different emitter.
   - Test all four previous cables for continuity and shorts. Repair any faulty cables.
   - If a short is detected, the masking will shut off until the short is physically fixed. The error on the control module will remain until the error is cleared. (see Error Codes and Clear Error on page 12)
   - Be sure to fix any problems and hear the “whooshing” sound before installing the next emitter.
7. Connect the next OUTPUT cable to the emitter OUTPUT jack.
8. Run the cable to next designated tile specified on emitter layout and wiring diagram. Tie cables up to structure or suspend from deck as required by local building code.
9. On the next emitter, connect this cable to the INPUT jack.

10. Repeat Steps 4 through 9 for the remaining emitters on the home run.
11. Set sound masking volume levels for each zone, using either the front panel controls or the software interface. Set sound levels according to Table 1.

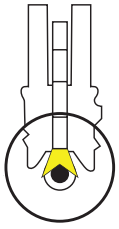
Table 1

Zone	Type	Ceiling Height	Vol. Level	Intended Result (at listener ear level)
Open	Office Areas	< 9’ (2.75m)	11-14	45-48 dBA
Open	Office Areas	9’-10’ (2.75-3m)	12-15	45-48 dBA
Open	Office Areas	10’-11’ (3.0-3.3m)	13-16	45-48 dBA
Open	Office Areas	11’-12’ (3.3-3.6m)	14-17	45-48 dBA
Open	Office Areas	>12’ (3.6m)	15-18	45-48 dBA
Private	Office Areas	ALL	4-8	38-42 dBA

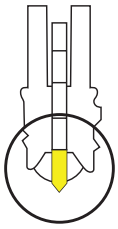
Custom Cabling Guidelines

For system compliance, follow these guidelines if custom cables are required:

1. Use solid conductor 24 AWG CAT-3 cable that meets local code requirements.
2. If the system is installed in a return air plenum, the cable must be plenum rated.
3. Shielding is not required. Unshielded twisted pair (UTP) cable is acceptable.
4. Snagless boots are not required.
5. RJ-45 plugs must use the “bent 3-tine” RJ-45 plugs intended for use with solid core CAT wire. Three-tine plugs can be purchased at a hardware store and from most CAT cable suppliers. DO NOT USE the “aligned two-tine” type intended for stranded wire, as they provide improper contact and may yield intermittent system operation. The diagram below shows the cross section view of both types.
6. Field test each cable after fabrication with the RJ-45 connectors (before final installation), using a standard network LAN cable tester, to check for continuity, shorts, and 1:1 (straight through) connection.



CORRECT
RJ-45 Connector with bent type



INCORRECT
RJ-45 Connector with aligned type

System Configuration Via the Front Panel

After the Qt 100 is mounted and the emitters have been tested, it is time to configure the Qt 100 for general operation.

The front panel display shows system information and allows for adjustment of the masking and the auxiliary audio input levels.

System Information

Initial display of the front panel, shown below, shows the software version and system status.

The VERSION X.X.X indicates the following fields: major release. minor changes . bug fixes The BRx format is to identify the version of the internal code and used as reference for technical support on rare occasions. Status indicates if there are errors (see Error Codes and Clear Error on Page 12) or if the system is OK.

The Cambridge Sound Management support phone number is on the display as the default service contact.

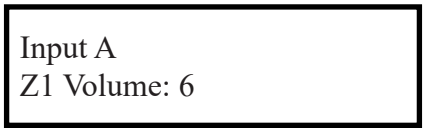
Setting Sound Masking Level

This figure shows that the format of the panel for configuring masking. Z1 stands for zone 1 and it is currently set to mute.

The initial value of Mute is displayed. To adjust the level, use the up and down arrows while this screen is displayed.

Settings within the recommended ranges (see page 4) should optimize speech privacy without excessive distractions. Generally, set masking volumes toward the high end of the recommended range and adjust according to site conditions and user preferences. If possible, measure the results with a sound level meter and check for the achieved sound pressure level. Adjust as necessary or judge by listening in the area.

Setting Audio Input Levels



This figure shows the format of the panel for configuring the volume for input A. The example shows Input A is level 6.

The system has one input for paging or music. If no paging and/or music from the input is desired, set the audio volume level to mute. The audio input levels are set in a similar way as the masking. Use the arrows on the front panel to move left and right to find the input A field. The input is enabled and level set using the up and down arrows.

Lock/Unlock the Front Panel

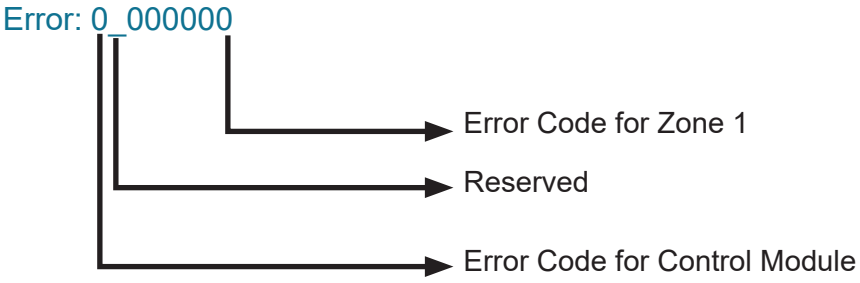
If the configuration app was used to set the masking level, the app could have locked the front panel. To unlock the front panel, hold the left and right buttons for 5 seconds. The front panel display will indicate that the panel has been unlocked. To lock the front panel, repeat the process, hold the left and right buttons for 5 seconds. If using the configuration app, the front panel will automatically unlock when adjusting the masking level.

Error Codes and Clear Error

System errors are shown on the control module front panel display. If an error occurs, the message “Status: Error” will be displayed. To determine the cause of the error, press NEXT (right arrow button), to display the error code.

Error Codes

If one or more errors exist in the sound masking system, an eight-digit error code is displayed on the LCD display (scroll forward to the “Error” screen):



Where a number other than 0 indicates an error.

Examples

Error: 0_000001: Short sensed in the wiring of the zone.

Error: 0-000004: Emitter not working

Error: 2_000000: Over temperature

Error: 4-000000: Intermittent fault

Error: 8-000000: Contact the Manufacturer

Clearing Error Codes

To clear an error that is currently shown on the display:

1. Press the right arrow button on the front panel to see the error code.
2. Press the up arrow to clear the error code.
3. If the error still persists, the problem has not been resolved.
4. If you are not sure how to resolve the problem, contact support@cambridgesound.com.

Post-Installation Handoff

Perform a final walk through to satisfy all aspects of the system performance:

1. Fill out the Settings Record (page 16).
2. Store this Guide with completed settings record near the control module. System settings are retained after a power outage. If there is a hard module failure, the recorded values can be used to reconfigure the system.
3. Lock the control module panel by holding down the left and right buttons for 5 seconds.

If you need assistance installing or commissioning this Qt 100 sound masking system, please contact CSM support at:

1.800.219.8199 (Toll free within US & Canada)

617.349.3779 (Outside US & Canada)

support@cambridgesound.com

www.cambridgesound.com/support

Warranty

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Modifications not expressly approved by the manufacturer could void the user's authority to operated the equipment under FCC rules.

Warranty Coverage — Qt® Emitters

Cambridge Sound Management, LLC (the "warrantor") will, for a period of five (5) years, starting with the date of purchase, warrant that the Qt Emitters™ (the "speakers") will be free of defects in materials and workmanship that interfere with proper operation as a sound masking, paging and music speaker system. During that period, the warrantor will, at its option, either (a) repair the speaker, or (b) replace the speaker. The decision to repair or replace will be made by the warrantor.

Warranty Coverage — Qt Control Unit

The warrantor will, for a period of five (5) years, starting with the date of purchase, warrant that the Qt control unit (the "system") will be free of defects in materials and workmanship that interfere with its proper operation as a sound masking, paging and music distribution control system. During that period, the warrantor will, at its option, either (a) repair the system, with new or refurbished parts, or (b) replace the system with a new or refurbished system of equal functionality at no charge. The decision to repair or replace will be made by the warrantor.

All software installed in the Qt system is warranted to substantially conform to its published specifications. In no event does the warrantor warrant that the software is error free or that the customer will be able to operate the software without problems or interruptions. The warrantor will, from time to time, make available software bug fixes. It is the responsibility of the purchaser to download and install these software modifications. Except for the forgoing, all software and software upgrades are provided AS IS.

The following terms apply to all products:

These warranty terms are extended only to the original purchaser of a new product. A purchase order or other proof of the original purchase date and purchaser is required for warranty service.

Obtaining warranty repairs: Please access and review online help resources for the product before requesting warranty service. If the product is still not functioning properly after making use of these resources, please contact Cambridge Sound Management for a return authorization number. All returns are to be prepaid. The warrantor will pay return surface freight within the continental United States on warranty repairs. All customs and freight charges in excess of surface freight within the United States will be borne by the purchaser.

Warranty Limits and Exclusions

This warranty ONLY COVERS failures due to defects in materials or workmanship, and DOES NOT COVER normal wear and tear or cosmetic damage. THIS WARRANTY DOES NOT COVER USE OF THE SYSTEM WITH ANY OTHER SPEAKER OR EMITTER MANUFACTURED BY ANY ENTITY, ORGANIZATION OR COMPANY OTHER THAN CAMBRIDGE SOUND MANAGEMENT, LLC OR USE OF THE SYSTEM FOR ANY PURPOSE OTHER THAN SOUND MASKING AND/OR PAGING AND/OR MUSIC DISTRIBUTION. THIS WARRANTY DOES NOT COVER THE USE OF ANYTHING OTHER THAN CAT-3 OR EQUIVALENT, 24 GAUGE CABLING. The warranty ALSO DOES NOT COVER damages that occurred in shipment, failures that are caused by products not supplied by the warrantor (e.g., replacement power supplies) or failures that result from accidents, misuse, abuse, neglect, mishandling, misapplication, alteration of any sort, installation, use as a system driver during speaker installation, set-up adjustments, misadjustment of controls, improper maintenance, power line surge, lightning damage, power surges, modification, rental use, service by anyone other than the warrantor or damage that is attributable to acts of God. THERE ARE NO EXPRESS OR IMPLIED WARRANTIES EXCEPT AS LISTED UNDER “WARRANTY COVERAGE.” THE WARRANTOR IS NOT LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THE PRODUCT OR ARISING OUT OF ANY BREACH OF THIS WARRANTY. As an example, this specifically excludes damages for lost time, lost use of the system, cost of removal or reinstallation of the system or travel to and from the purchaser’ location. ALL EXPRESS AND IMPLIED WARRANTIES ARE LIMITED TO THE PERIOD OF THE WARRANTY. This warranty provides specific legal rights, and there may be others that vary from state to state or in the country of compliant use. Therefore, certain additional exclusions may apply.

Zone Destination Record

Zone 1 Run 1 _____ Run 2 _____

Settings Record

Volumes:

Zone: 1

Masking:

Input A: _____

_____

Installation / Service:

Company name:

Install date: _____

Phone: _____

_____

Installation Checklist and Emitter Guidelines

QT® SYSTEM INSTALLATION CHECKLIST

For full installation information, please refer to the Installation and Operations Guide for the appropriate control module.

Control Module and Emitter Network Installation

- ☐ **STEP 1:** Install control module and confirm that there are no errors on the module's view LCD screen.
- ☐ **STEP 2:** Set the volume level for each zone to the module's maximum volume level. (Connect emitter locally in data closet on all zones/runs temporarily to check that control module is functional and successfully emitting the masking sound.)
- ☐ **STEP 3:** Run the home run cable (first cable in the sequence) terminating the cable if necessary. Connect to the IN port of the emitter.
- ☐ **STEP 4:** Listen to the first emitter from each home run cable to confirm that the masking sound is being emitted.
- ☐ **STEP 5:** Install the remaining emitters along each run, remember to complete each run within a zone before moving to the next zone.
  - ☐ Follow your wiring diagram to ensure proper set up of the system and correct masking channel allocation.
  - ☐ Connect the CAT cable from the OUT port on the previous emitter to the IN port on the emitter you are installing. Connecting to the wrong port will create problems later in the run.
  - ☐ Listen to ensure the masking sound is emitted, then connect the next emitter.
  - ☐ When all emitters have been connected walk the run to make sure that all emitters are still operational. (If an emitter is not functioning, refer to the emitter installation guide.)
- ☐ **STEP 6:** Repeat steps 3 - 5 until all runs/zones have been installed.
- ☐ **STEP 7:** Set the appropriate masking levels for the space once all runs/zones have been installed.
  - ☐ If you plan to use the front panel controls, proceed to STEP 10.
  - ☐ If you plan to use the Qt Monitoring and Control Software (MCS), connect the control module to your TCP/IP network or directly to your PC via Ethernet. Continue to STEP 8. (This feature available only on select Qt control modules.)

Monitor & Control Software (MCS) Setup

- ☐ **STEP 8:** Locate the IP address, username and password credentials on the unit's front panel. (default username: 'admin' / default password: 'secret')
- ☐ **STEP 9:** Once you've logged into the MCS, choose the administration tab and set the:
  - ☐ Service information (unit name, location and service contract.)
  - ☐ Zone descriptions
  - ☐ Date and time / time source server
  - ☐ Network configuration
  - ☐ Email notification (if desired)

Configure Time of Day and Installation Auto Ramping Features

- ☐ **STEP 10:** Set appropriate masking levels. (Goals: private office 37-39 dB, open office 45-48 dB.)
  - ☐ Front Panel: use the right arrow button to find the zone you wish to adjust. Use the up and down arrows to adjust the masking volume level. When finished, proceed to STEP 13.
  - ☐ MCS: Click on the operations tab. Check the boxes next to the zone names on the right you wish to adjust. Use the drop-down menus on the left of the screen to select the day and night masking volume levels. When finished, continue to STEP 11.
- ☐ **STEP 11:** Establish the Time of Day settings for control module (if desired).
- ☐ **STEP 12:** If you wish to slowly acclimate the occupants of the space to the masking sound, enable the auto ramping feature.

Auxiliary Audio Sources, Contact Closures & Locking the Front Panel

☐ **STEP 13:** Physically wire up any auxiliary audio sources (background music and/or paging). Then adjust volume level, by zone, for each audio source, using the same method for modification as found in STEP 10.

☐ **STEP 14:** Lock the Control Panel if desired to prevent unauthorized system adjustments (see the Installation and Operations Guide included with your control module for information on locking the front panel.

☐ **STEP 15:** Connect the contact closure (if desired, available only on select control modules) from an external mechanism, wire up and test the contact closures to cut masking and auxiliary audio inputs.

Qt Emitter Installation Guidelines

To ensure proper system function, these guidelines must be followed when installing Qt Emitters:

Number of Emitters

☐ **Qt 100/Qt 200/Qt 600:** no more than 60 emitters on a single cable run.

☐ **Oasis Qt 30/SPS 30** no more than 30 emitters system-wide.

Cable Requirements

☐ No more than 1000 ft of cable in a single run (including splitters).

☐ All home-run cables leaving the controller should be labeled with a unique number/name.

☐ Ensure that the cable from the control module or the previous emitter is connected to the INPUT port on the emitter.

IMPORTANT:

If an emitter is not generating sound, DO NOT connect the incoming cable to the output port. There is likely a faulty wire or connection in the run. Check the connections and wires on the previous four (4) emitters in the run to ensure proper distribution of the four masking channels.

SUPPORT:

If you need assistance while installing a new QtPro™ Sound Masking System, please email support@biamp.com or call the Global Support Line: 1-503-718-9257 / 1-877-242-6796