

INSTALLATION AND  
OPERATIONS GUIDE

# Qt 100™



**cambridge**  
SOUND MANAGEMENT

[www.csmqt.com](http://www.csmqt.com) | 800.219.8199

SOUND MASKING | PAGING | MUSIC

# Contents

Qt 100 Introduction	3
Hardware Installation	4
Installing the Control Module	4
Wall Mount (back panel of the controller)	4
Connections to the Front Panel	5
Connect Paging or Music	5
Contact Closure	5
Connecting Power	6
Installing Qt Emitters	7
Emitter Installation Order	7
Custom Cabling Guidelines	9
System Configuration via the Front Panel	10
System Information	10
Setting Sound Masking Level	11
Setting Audio Input Levels	11
Lock/Unlock the Front Panel	11
Error Codes	12
Post Installation Handoff	13
Settings Record	13
Warranty	14

# 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 Configuration App Manual*, shipped with our Bluetooth dongle, describes how the Qt 100 system can be configured using our companion iPad app.

The Qt 100 control module supports one zone of sound masking with 2 cable runs. Each run supports up to 60 emitters. The maximum coverage area for the Qt 100 is 12,000 square feet (1,115 m<sup>2</sup>). 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.

Setting the masking volumes can be approached in one of three ways:

**Best:** The Qt 100 has a companion iPad app that takes acoustic measurements and relays the results to the control module via Bluetooth to set the appropriate masking sound level. See *Qt 100 Configuration App Manual*.

**Good:** 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 following readings on the meter:

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

**OTHERWISE:** If a sound level meter is not available, the recommended levels are likely to be achieved in most environments by setting the control module's masking volumes as follows:

#### Control Module's Masking Volume Settings

##### Private Office Zones

05-09, for all ceiling heights

##### Open Area Zones

13-16, for 08 ft. (2.4 m) ceilings

15-18, for 10 ft. (3 m) ceilings

17-20, 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 in/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 ¼ inch drill bit for the anchor hole. The included Plastic anchors are #6 x 1" with #6 x 1 ¼" screws.

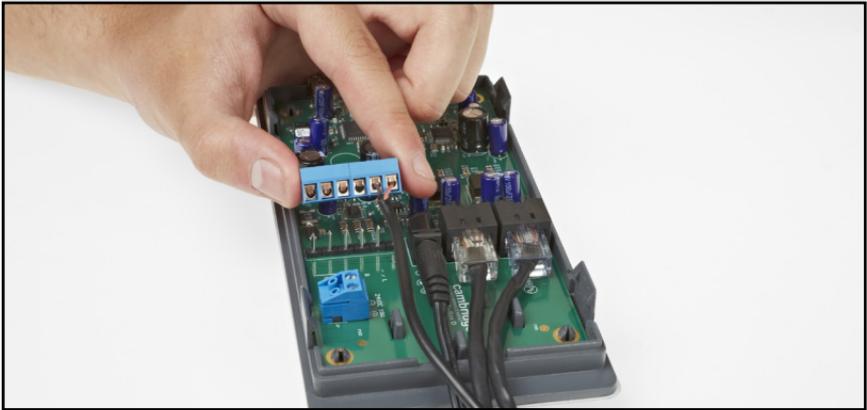
Use the bubble level on the wall mount to guide installation. Make sure to completely tighten the screws to ensure proper mounting of the front panel.



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



Unbalanced Audio Input: (Typical of music systems.)

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

### Contact Closure

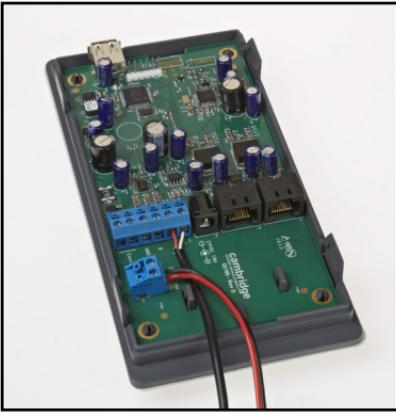
The Qt 100 provides an instant shut-off capability for masking if connected to a contact closure interface. The contact closure utilizes the same connector as the audio input. To leverage this feature, connect a two-conductor cable to the two connectors, labeled “contact”. The other end of these conductors (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 9.
- 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:

1. 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.
2. 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, if necessary.

6. Connect a run cable from the specified OUTPUT jack on the module to the INPUT jack of the first emitter. Listen to each emitter as it is connected. If you cannot hear its “whooshing” sound:
  - a. Try a different emitter.
  - b. Test all four previous cables for continuity and shorts. Repair any faulty cables.
  - c. 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 *Clearing Error Codes*, page 12)
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.

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.

Be sure to fix any problems and hear the “whooshing” sound before installing the next emitter.

**NOTE:**



The input jack of each emitter bears this symbol and is located near the safety tie off



The output jack of each emitter bears this symbol

**Table 1**

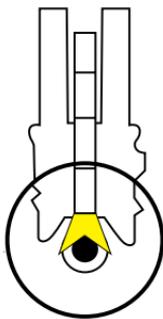
Zone Type	Ceiling Height	Vol. Level	Intended Result (at listener ear level)
Open Area	8'	13 - 16	45 - 48 dBA
Open Area	10'	15 - 18	45 - 48 dBA
Open Area	12'	16 - 19	45 - 48 dBA
Private Office	ALL	05 - 09 +	38 - 42 dBA

## Custom Cabling Guidelines

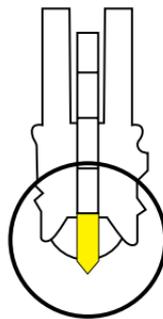
For system compliance, follow these guidelines if custom cables are required:

1. Use solid conductor 24 AWG CAT 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 Format) or if the system is OK.

VERSION X.X.X  
Status: OK      BRx

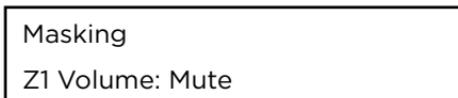
If the Bluetooth dongle used for configuration by the Qt 100 Configuration Application is installed, the following screen is displayed. If the dongle is not installed, the screen will not be seen. "FW1" indicates the firmware version programmed on the dongle and may change in future editions. "BT Idle" indicates that the connection is idle. This will change to "Conn" when the configuration app makes a connection to the controller.

Bluetooth FW1  
USB OK: BT Idle

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

For Service Call  
617-349-3779

## Setting Sound Masking Level

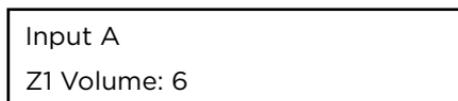


This figure shows that the format of the panel for configuring masking. Z1 stands for zone 1 and it is currently set to mute.

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 3) 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). The error state is indicated by an eight digit code of the form:

Error: 0\_000000



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@csmqt.com](mailto:support@csmqt.com)

# Post Installation Handoff

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

1. Fill out the settings record.
2. Store guide with completed settings record near the control module. If there is a hard module failure, the recorded values can be used to reconfigure the system. System settings are retained after a power outage.
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@csmqt.com](mailto:support@csmqt.com) | [www.csmqt.com/support](http://www.csmqt.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 operate 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 one (1) year, 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 foregoing, all software and software upgrades are provided AS IS.

### The following terms apply to all

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 born 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 GAGE 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 re-installation of the system or travel to and from the purchaser’s 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.



**cambridge**<sup>™</sup>  
SOUND MANAGEMENT

## Zone Destination Record

Zone 1      Run 1 \_\_\_\_\_ Run 2 \_\_\_\_\_

## Settings Record

### **Volumes:**

Zone:      1

Masking: \_\_\_\_\_

Input A: \_\_\_\_\_

### **Installation / Service:**

Company name: \_\_\_\_\_

Install date: \_\_\_\_\_

Phone: \_\_\_\_\_