



DXI SAC Software: Audio Level Alarm Settings

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1 Intent & Scope

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The Application Note describes how to configure audio level alarm settings.

2 Introduction

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The DXI system allows Audio Level Alarms (ALAs) to be used detect sound threshold alarms. There are a number of adjustable parameters used to set up these alarms. This document describes how these parameters can be set.

3 Overview

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3.1 Audio Level Alarm Overview

The audio level alarm system uses the audio signal from the alarm speakers (used as microphones) and processes this signal in a digital signal processor. The processor passes the signal through a band pass filter (to reduce/remove un-necessary components of the sound), it then averages power of this filtered signal over a given length of time (the “window size”) and compares it to a programmable threshold (labeled “sensitivity” in the software) value.

There is an option of using two window size/sensitivity parameters in the DXI system (“long” and “short”). However, in most cases, only one window size is required and the “long” and “short” sensitivity parameters can be set to the same value to effectively “turn off” the long parameter set.

For a typical configuration, all filter parameters are the same for all of the audio level alarm speakers. The only difference for different speaker zones is the sensitivity, which should have the same values in both “Short Sens” and “Long Sens” entries.

## 3.2 Touch screen Alarm Levels

The DXI system has provision for 4 selectable audio alarm levels. While they can be defined for any settings, this document assumes that Level 1 will be the most sensitive level (which will trigger on the quieter sounds), and Level 4 will be the least sensitive level (which will almost never trigger). The purposes for the levels in this example are outlined below:

**Level 1:** Level 1 is the “night time” setting. When the touch screen selects Level 1, the units should be sleeping. No loud noise should be present in these areas - Talking should trigger the alarms, when the alarms are set to Level 1.

**Level 2:** This is a setting between Level 1 and Level 3. This setting might be used for quieter times of the day, such as mornings, evenings, or lock-down periods. Above average talking, yelling, and other loud noises should trigger Level 2 alarms.

**Level 3:** Level 3 is the normal “day time” setting. Areas set to Level 3 should be able to handle normal talking, TV, lunch, and recreational times. Very loud noises such as shouting, yelling, etc. should trigger the alarms. This also includes staff members shouting at inmates to come to the desk, quiet down, etc.

**Level 4:** Level 4 uses very high threshold settings, effectively turning the audio level detection “off”. However, to provide some form of usefulness, the settings are not set to the maximum, so there still is a possibility of these alarms being triggered. However, these settings should only trigger an alarm if the audio level alarm speakers are directly attacked, or if there is a prolonged, very high volume noise present near the speakers.

## 4 Setup

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### 4.1 ALA configuration

To edit the ALA configuration, you need to go into the “Maintenance” set of menus. Then use the “Edit”, “Alarm Thresholds” menu items.

For each ACB (Card ID), you can set up a default set of settings (which will set all of the channels to the same settings). For specific stations, you can then select that particular channel and change its settings from the default.

For each station with threshold detection, find the first free channel on the ACB it is connected to (the Card ID must match the ACB card that controls the card cage that this station is located on). Then enter the station number in the “Station ID” field and set up the parameters as below.

#### 4.1.1 ALA Configuration Station setup

The basic default settings in the configuration screens are as follows:

Type:	Band Pass 1kHz
Center:	1500
Short Window:	375
Short Sens:	<i>This is the adjustable parameter and is described below</i>
Long Window:	1500
Long Sens:	<i>This should be set to the same as the Short Sens parameter</i>
Action:	Audio Alarm CRQ
Master ID:	<i>This should be the master number the audio alarm will be sent to</i>
Action at Master:	0
Other Action:	Unknown
Master ID:	0
Action at Master:	0

To adjust the audio level alarm sensitivity, all of the above parameters should be kept the same as shown, except for the “Short Sens” and “Long Sens” parameters. These are threshold levels and if the power of the received sound is higher than these settings, the alarm will be triggered. Thus, to make the alarms more sensitive (trigger an alarm for quieter sounds), the settings would be decreased. Conversely, to make the alarms less sensitive (trigger only on louder sounds), the settings would be increased. Both the “Short Sens” and the “Long Sens” values should be set to the same value when making adjustments.

These “threshold/sensitivity” values can range between the values of 1 and 32767.

Different speaker types, and different room acoustics will generally require different threshold levels. In most cases, there are four main speaker types: Harding intercom stations connected to SAB-400 boards, 25V intercom or paging speakers connected to Harding ICB modules, in turn connected to SAB-400 boards, 25V intercom speakers connected to an SAB-300 board, and and 70V paging speakers connected to TAB-400 boards.

#### 4.1.2 Typical setup values

The following threshold settings (“Short Sens” and “Long Sens”) values are typical values for one tested institution and can be used as a baseline to start adjustments from:

Area	Speaker Type	Level 1 (Night)	Level 2 (Medium)	Level 3 (Daytime)	Level 4 (Off)
400-series Intercom Station	Harding ICM-400/SAB-400	175	191	207	6143
300-series Intercom Station	25V Intercom / SAB-300	191	207	223	6143
25V/5W speaker on ICB-400	25V Speaker/ICB/SAB-400	2047	3327	4607	12287
Dayroom	2x70V Speaker/TAB-400	511	1023	2047	22527
Rec. Courtyard	70V Horn/TAB-400	12387	12899	13411	22527