



Document #	19810130-V1.00
Revised	April 5, 2016
Product Affected	Audio Sensors on FlexIP and Audio-8 Pro
Purpose	A detailed account of Glass Break Analytics feature available for Audio Sensors on FlexIP and connected Audio-8 Pro modules.

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Overview

The SONIP FlexIP and the Audio-8 Pro module support Glass Break Detection with the Audio Sensor. While enabled, audio from each Audio Sensor is evaluated by the FlexIP (or Audio-8 Pro) using proprietary glass break detection algorithms that when activated a Glass

Break Analytic alarm is sent to the Central Station. This eliminates the need to use a GBD-ST which requires the use of one Alarm Input per sensor (in addition to the Audio Sensor input).

Compatibility Requirements

Glass Break Analytics are available for FlexIP, and Audio-8 Modules that are connected to FlexIP. Glass Break is not available on iBase, or FlexiBase systems. Glass Break Analytics are exclusively available on Audio-8 Pro modules when the host panel is a FlexIP; the feature cannot be enabled on any non-FlexIP system. The Audio-8 (predecessor of Audio-8 Pro) does not support Glass Break Analytics. See all version requirements in Table 1 below.

Table 1: Compatibility Requirements

Description	Minimum Version
FlexIP	0A.12
Audio-8 Pro	0A.03
SONIP Central Station	3.2.10

Coverage and Detection Characteristics

Sensitivity and Potentiometer

An Audio Sensor's programmable sensitivity does not affect its ability to generate Glass Break Analytics events. A sensitivity of 0 (Listenback) can also be programmed, preventing Audio Activation events, and only listening for Glass Break. Audio Sensor's potentiometer shall be positioned at the center position when Glass Break is enabled. A potentiometer that is positioned at for maximum sensitivity is more likely to generate false Glass Break Analytics alarms. Never adjust the potentiometer from its factory position.

Detection Range

The distance between the protected glass and the Audio Sensor determines the glass break coverage pattern. For example, an Audio Sensor mounted at the maximum distance of 25' away and aimed at the center of the protected glass, provides a coverage pattern approximately 25' wide and 25' high. Comparably, an Audio Sensor mounted 15' away and aimed at the center of the protected glass provides a coverage pattern approximately 15' wide and 15' high. In all cases, the maximum detection range for Glass Break Analytics is 25' when mounted directly in front of and aimed at the center of the protected glass. Coverage pattern and range for a traditional Audio Activation event is unchanged. In all cases range may vary based on the acoustic properties of the environment. Review the coverage pattern shown in Figure 1 below.



Area protected by Glass Break Analytics

Note: Maximum possible coverage area is shown. Obstructions and environmental variables decrease coverage area.

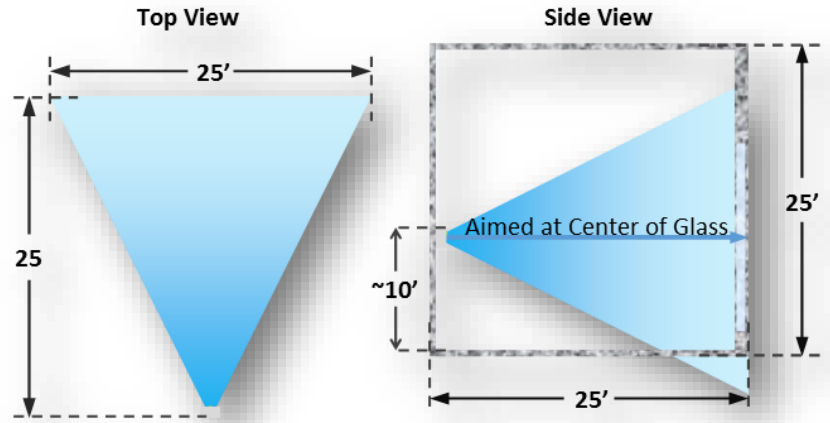


Figure 1: Maximum Coverage Pattern for Glass Break Analytics

Detectable Types of Glass

Glass Break Analytics have been tested to detect glass break sound patterns from a variety of types and sizes of glass. All supported glass types and sizes are listed in Table 2 below.

Table 2: Supported Glass Types and Sizes

Description	Thickness	Minimum Size	Maximum Size
Single Strength	3/32"	11" x 11"	25' x 25'
Double Strength	1/8"	11" x 11"	25' x 25'
Plate	1/4"	11" x 11"	25' x 25'
Laminated	1/4"	11" x 11"	25' x 25'
Tempered	1/4"	11" x 11"	25' x 25'
Wired	1/4"	11" x 11"	25' x 25'

Mounting the Audio Sensor

Audio Sensor shall be mounted in accordance with the following rules:

1. Audio Sensor is facing the protected glass.
2. Audio Sensor is as close to the protected area as possible.
3. Audio Sensor is mounted on a solid, non-vibrating surface.
4. Audio Sensor is mounted 8-10 ft. from the ground, or at a height in which it will not be blocked, damaged, or tampered with. Do not exceed 13 ft. height unless special circumstances require such height.
5. Audio Sensor is mounted at least 1 ft. away from corners.
6. Audio Sensor operating temperature will be within 32° – 120°F.

Wiring the Audio Sensor

Refer to Table 3, and Figure 2 below for details on wiring an Audio Sensor to a FlexIP or Audio-8 Pro module:

Table 3: Audio Sensor Wiring Details

Wire Type	22AWG stranded
Maximum Wire Length	1000 ft.
Terminal Type	Audio Sensor: Panduit® FlexIP and Audio-8 Pro: Screw Terminal
Red	+12V DC
Black	Ground
Green	Audio
White	Self-test. A test tone is emitted during arming and walk tests to verify that the Audio Sensor's listening capabilities are properly functioning.
Tamper	TMP terminals on Audio Sensor may be connected to any available, alarm input on the system. Normally Closed.

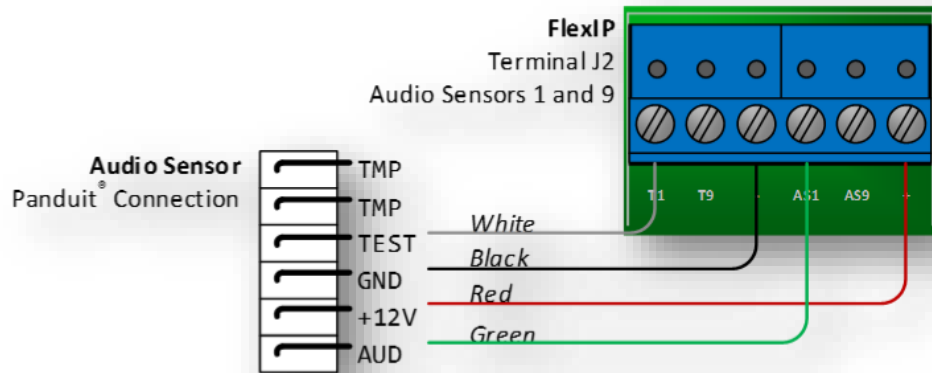


Figure 2: Audio Sensor Wiring with FlexIP

Enabling Glass Break Analytics

Glass Break Analytics may be enabled for specified Audio Sensors by a programmable option on a FlexIP or an Audio-8 Pro module that is on a FlexIP system. All compatibility requirements are on page 2 of this document. The option can be configured locally using a connected Keypad, or remotely by the SONIP Central Station via a programming update, followed by an Options Download.

Use the following instructions to enable Glass Break Analytics for an Audio Sensor:

1. Using a Keypad:
 - a. Access the **SYSTEM MENUS** by using the Technician Code. If code is unknown, contact the Central Station for the code.
 - b. Select **PROGRAMMING MODE ► AUDIO SENSOR**.
 - c. Select the FlexIP or Audio-8 Pro module that the Audio Sensor is connected to.
 - d. Key in the Audio Sensor number, then press the Enter key.
 - e. Scroll through the Audio Sensor's programming options using the Up or Down arrow key until the **GLASS BREAK** option is selected. Set the **GLASS BREAK** option to **1 (enabled)** then press the Enter key.

```

FIP      ,AUDSEN 01
GLASS BREAK
valid 0-1
          -1
  
```

Figure 3: Enabling Glass Break on an Audio Sensor using a Keypad

- f. Exit the **SYSTEM MENUS**.
 - g. All final data changes must be updated at the Central Station and downloaded to the panel (Step 2, below).
2. SONIP Central Station Operator
 - a. Navigate to the target Audio Detector in SONIP.
 - b. Check the Glass Break Detection box.
 - c. Select the Save button from the bottom toolbar.
 - d. Download Options to the FlexIP.

Testing Glass Break Analytics

All Audio Sensors with Glass Break enabled shall be tested before the installation can be considered complete to ensure that each device functions properly. The application may be tested using the Keypad's Glass Break Test Mode, or by using the STANLEY ToolBox's Advanced Audio Test utility. The test procedure can only be conducted on a single device at any given time.

Required Test Tool

A Glass Break Simulator tool that is equipped with a Test Mode and a Plate Glass setting.

Recommended Glass Break Simulators:

1. RISCO VITRON Glass Break Tester (RG65) (Figure 4)
2. Interlogix Sentrol 5709C



Figure 4: RISCO VITRON Glass Break Tester (RG65)

STANLEY ToolBox Advanced Audio Test

1. Open the STANLEY ToolBox software, version 3.1.4 or greater and select the Advanced Audio Test from the top toolbar (microphone icon).
2. Connect laptop to LAN of FlexIP system.
 - a. Any available LAN connection on the FlexIP system may be used.
3. Click the **Connect** button.
 - a. A list of all applicable Audio Sensors will be populated once the PC has finished establishing its network connection to the panel (normally takes about 5-10 seconds).
4. **Select sensors** that you want to test by individually selecting specific sensors, or by using the Select All button.
 - a. If you have a lot of sensors, the list could be quite large and cumbersome, so use sorting to quickly find the sensors you're looking for.
 - i. Default Sorting: Module number, then Sensor.
 - ii. Changing Sorting: Select the header of the column you want to sort by.

		Partition	Module	Module State	Sensor	Sensor Location	Total Count
▶	<input checked="" type="checkbox"/>	A: DISARMED	Audio-8 Pro - 1	Pass	1		0
	<input type="checkbox"/>	D: DISARMED	Audio-8 Pro - 1	Pass	2		0
	<input type="checkbox"/>	B: DISARMED	Audio-8 Pro - 1	Pass	3		0
	<input type="checkbox"/>	A: DISARMED	Audio-8 Pro - 1	Pass	4		0
	<input type="checkbox"/>	B: DISARMED	Audio-8 Pro - 1	Pass	5		0
	<input type="checkbox"/>	C: DISARMED	Audio-8 Pro - 1	Pass	6		0
	<input type="checkbox"/>	A: DISARMED	Audio-8 Pro - 1	Pass	7		0
	<input type="checkbox"/>	D: DISARMED	Audio-8 Pro - 1	Pass	8		0

Figure 5: STANLEY ToolBox Advanced Audio Test - Select Sensor(s)

- b. Select the **Start Test** button to begin.
- c. Ensure the Audio Sensor’s green LED is illuminated, indicating that it is ready to be tested.
- d. Ensure that the area being tested is quiet.
- e. Place the Glass Break Simulator into **Glass Mode**.
- f. Stand near the protected glass, aim the Glass Break Simulator towards the Audio Sensor, and activate the sound.
- g. The Audio Sensor's green LED will power off for two seconds if the test was successful.
- h. Repeat this step with all Audio Sensors that have not yet been tested.
- i. Review the test results displayed in the Advanced Audio Test.
 - i. Audio Sensors that passed the test are highlighted in green.
 - ii. Removed from the Non-Tripped Sensors list (right).

Additional Information - Advanced Audio Test

1. A log file is generated, containing time stamped account of all events that occurred while conducting the Advanced Audio Test. The configurable file location for the log file is shown at the top of the window (Figure 6 below).

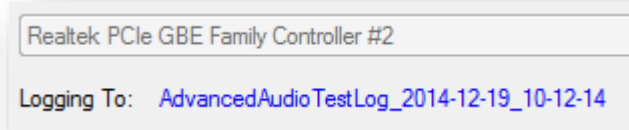


Figure 6: STANLEY ToolBox Advanced Audio Test - Log File storage location

2. Only Audio Sensors in Disarmed Partitions may be tested. If a Partition is armed during the test, those sensors will be highlighted in orange and will be taken out of test. If there are no other sensors in test at that time the test will stop automatically.

	Partition	Module	Module State	Sensor	Sensor Location	Total Count
<input type="checkbox"/>	A: ARMED	Audio-8 Pro - 1	Pass	1		0
<input checked="" type="checkbox"/>	D: DISARMED	Audio-8 Pro - 1	Pass	2		0
<input type="checkbox"/>	B: DISARMED	Audio-8 Pro - 1	Pass	3		0
<input type="checkbox"/>	A: ARMED	Audio-8 Pro - 1	Pass	4		0
<input type="checkbox"/>	B: DISARMED	Audio-8 Pro - 1	Pass	5		0
<input type="checkbox"/>	C: DISARMED	Audio-8 Pro - 1	Pass	6		0
<input type="checkbox"/>	A: ARMED	Audio-8 Pro - 1	Pass	7		0
<input checked="" type="checkbox"/>	D: DISARMED	Audio-8 Pro - 1	Pass	8		0

Figure 7: STANLEY ToolBox Advanced Audio Test - Armed Partitions

Keypad Glass Break Test Mode

1. Access the **SYSTEM MENUS** by using the Technician Code. If code is unknown, contact the Central Station for the code.
2. Select **TEST MODE ► GLASS BREAK TEST**.

3. Select the Partitions to be tested (This Partition, or All Partitions)
 - a. If no sensors have Glass Break enabled in the selected Partition, the menu will not be accessible and the Keypad will generate an audible tone, indicating the selection is invalid.
4. Un-tested Sensors will be displayed in a list on the display until the test is manually exited.

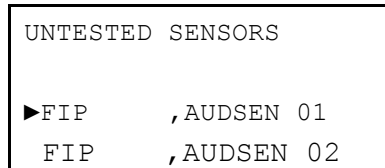


Figure 8: Keypad Glass Break Test - Untested Sensors

5. Ensure the Audio Sensor’s green LED is illuminated, indicating that it is ready to be tested.
6. Ensure that the area being tested is quiet.
7. Place the Glass Break Simulator into **Glass Mode**.
8. Stand near the protected glass, aim the Glass Break Simulator towards the Audio Sensor, and activate the sound.
9. The Audio Sensor’s green LED will power off for one second if the test was successful.
10. Repeat this step with all Sensors that have not yet been tested.
11. Review the Keypad display to ensure that there are no remaining Sensors.

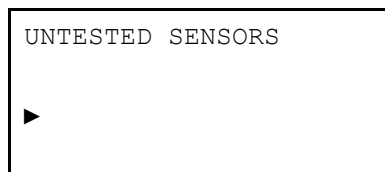


Figure 9: Keypad Glass Break Test - No Untested Sensors remaining

Additional Information – Keypad Glass Break Test Mode

1. A Glass Break Test Passed event is sent to the SONIP Central Station following each sensors successful testing.
2. A failed Glass Break Test is always indicated by the sensor not activating (indicated by a 2 second LED outage) during the test. It will remain listed as an untested sensor in the Keypad’s UNTESTED SENSORS screen if using the Keypad Glass Break Test and in the Non-Tripped Sensors pane if using the STANLEY ToolBox’s Advanced Audio Test.

Associated Events in SONIP Central Station Software

The following Alarm events may be received by a SONIP Central Station Operator in relation to Glass Break Analytics:

1. **Glass Break Analytics Alarm**

FlexIP system has detected glass breaking at the customer’s site. 1 second of Pre-Alarm Audio, followed by 4 seconds post-alarm audio is played for the Alarm Dispatcher on the SDM (Speaker Display Module), then the audio session is switched to a live audio stream from those sensors in the same Partition as the violated sensor. Audio Activation event may also be received during the same session in which a Glass Break Analytics Alarm was received, depending on the sounds heard by the Audio Sensor(s). Operators may replay the stored audio (first 5 seconds) by issuing the Replay command. (F7, or Commands → Audio → Replay)

Stop Alarms			Simulate	Ack	Reset Alarms	Enable Panel	Arm Panel	Activate Audio	Sensitivity
Panel	Time	Reset	Class	Count	Detail	Partition	Module	Input	
GB - 3	0:29	Reset	GLASS	1	Glass Break Analytics Alarm	A	IBase/FBase 0	1	
			GLASS	1	Glass Break Analytics Alarm	A	Audio-8 Pro 1	1	

Figure 10: SONIP Monitoring form with Glass Break Analytics Alarms

2. Glass Break Test Passed

FlexIP system Audio Sensors with Glass Break Analytics enabled are being tested. Sensors which have passed the test submit this status event to the Central Station in real time as they are tested.

Stop Alarms			Simulate	Ack	Reset Alarms	Enable Panel	Arm Panel	Activate Audio	Sensitivity	Volume
Panel	Time	Reset	Class	Count	Detail	Partition	Module	Input	Location	
GB - 2	4:05	Reset	TEST	1	Glass Break Test Passed	A	IBase/FBase 0	1	Sensor B	

Figure 11: SONIP Monitoring form with Glass Break Test Passed status event