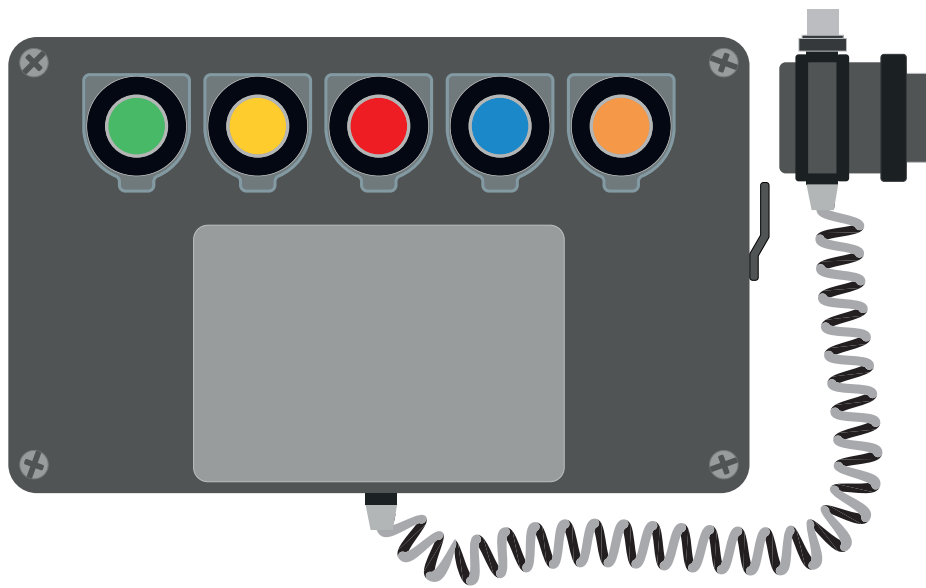


SONIX™ Hmi-5 Ex Access Panel



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Powering Business Worldwide

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Glossary

Abbreviation	Meaning
PA/GA	Public Address and General Alarm
Sonix	Sonix PA/GA System
A&B	Duplicated PA/GA system architecture
N+1	Hot spare PA/GA system architecture
AB+	Sonix improved redundancy architecture
Hmi	Human interface
BGM	Background music
Tick-tone	Short burst of tone repeated every few seconds, used to check the output of connected loudspeakers
Sense Test	Periodic test carried by Sonix amplifier to check integrity of 100 V line
100 V line	High voltage loudspeaker connection line at nominal 100 V ac
MCB	Miniature Circuit Breaker
RCBO	Residual current circuit breaker with overcurrent protection
Unit ID/Number	Unique identifier assigned to each of Sonix module, used to identify it to the 2Mx and SAS.
Priority	Number assigned to a Sonix audio source to facilitate system usage conflict resolution, 31 (highest) to 1 (lowest)
PTT	Push to talk
FAT	Factory Acceptance Test
SAT	Site Acceptance Test
Larson's Effect	When a microphone is acoustically coupled to the loudspeaker and generates feedback
2Mx	Sonix 2Mx Central controller
Amp / 350-d	Sonix 350 W Power Amplifier with 100 V line output
Eol1	Sonix Remote End of Line unit
Eol8	Sonix Amplifier to 100 V line interface unit (8 channel)
SP AD	Sonix Intelligent loudspeaker monitoring unit
Hmi-Br	Sonix intrinsically safe barrier (ATEX/IECEx) for connecting Hmi-5 in explosive atmospheres
Hmi-Mute	Sonix 100V loudspeaker mute (Ex/SA)
Hmi-26	Sonix Human Interface access panel
Hmi-5	Sonix Small Human Interface access panel
Io	Sonix Input / Output unit
Ms12	Sonix 12-message digital message store
Pbx	Sonix Private branch exchange interface unit
Pm10	Sonix Power Management unit
Vw2	Sonix Beacon control and monitoring unit (2 channel)
SAS	Sonix Administration Software
Amp Bus	A 2Mx bus, used to communicate with and control Sonix Amplifier units
HMI Bus	A 2Mx bus, used to communicate with and control Sonix Hmi units
I/O Bus	A 2Mx bus, used to communicate with and control Sonix input/output devices: IG, Io and Ms12
Beacon Bus	A 2Mx bus, used to communicate with and control Sonix Vw2 units
Power Bus	A 2Mx bus, used to communicate with and control Sonix Pm10 units
Global Bus	A 2Mx bus, used to communicate with SAS application
Sync	A 2Mx bus used to communicate with the second 2Mx unit when PA/GA system is configured as A&B, AB+ or N+1 system

Sonix Hmi-5 Technical Manual

1 INTRODUCTION	7
1.1 Eaton quality assurance	7
1.2 Packaging	7
1.3 ESD (Electro Static Discharge)	7
1.4 Safe working practice	7
1.5 Required tools / equipment	7
1.6 In the box	7
1.7 Recommended spares	7
2 ABOUT THE PRODUCT	8
2.1 Available features	8
2.2 Unit ordering and configuring	8
2.3 Conditions for use in hazardous areas	8
2.3.1 ATEX / IECEx Certification	8
2.3.2 ATEX / IECEx Classification	8
2.3.3 Entity Parameters (Terminals 1 to 4 with respect to 5, I.S safety earth)	8
2.3.4 Special conditions for safe use	9
3 OVERVIEW OF UNIT	9
3.1 Weight and dimensions	9
3.2 Power and utility	9
4 INSTALLATION AND CONNECTIVITY	10
4.1 Mounting	10
4.2 Glanding	10
4.3 Data and Audio connections	10
4.3.1 Local Mute / Local Attenuate unit	10
4.3.2 Local Power	10
4.3.3 Un-used connectors	11
5 UNIT OPERATION	11
5.1 Data communications	11
5.2 A & B duplication	11
5.3 Microphone options	11
5.3.1 Hand-held microphone	11
5.3.2 Flush mount microphone	12
5.3.3 No microphone	12
5.4 Button and LED indicator operation	12
5.4.1 System Idle	12
5.4.2 Indicator Test (LED Test)	12
5.4.3 Push to Talk (with System busy indication)	12
5.4.4 Important Message (Emergency Speech)	13
5.4.4.1 Combined Important Message and PTT	13
5.4.5 Zone button	13
5.4.6 Alarm activation	13
5.4.6.1 Zoned Alarms	13
5.4.7 Alarm Cancel	13
5.4.8 Alarm Attenuate	14
5.4.9 Alarm Inhibit	14
5.4.10 Ms12 message initiation	14
5.4.11 Local Attenuate	14

5.4.12 Background Music control	14
5.5 Indication only options	14
5.5.1 System busy	14
5.5.2 System Health / System comms health	15
5.5.3 Auto-initiated alarm	15
5.6 Making a speech broadcast	15
5.6.1 Priority	15
5.6.2 Zoning	15
5.6.2.1 Zone configuration	15
5.6.3 Microphone input	16
5.6.4 Routine speech	16
5.6.4.1 Routine Chime	16
5.6.4.2 PTT Timeout	16
5.6.5 Emergency speech	16
5.6.5.1 Emergency speech chime	17
5.6.6 PTT Release Delay	17
5.6.7 Mute Output	17
5.6.7.1 Attenuate output	17
5.7 Fault Reporting	17
5.7.1 Unit Monitoring	17
5.7.1.1 Fault reporting	17
6 CONFIGURATION	18
6.1 Hardware configuration links	18
6.2 Solo connected access panels	18
6.3 Fully connected access panels	18
6.4 Unit ID	18
6.4.1 Ping-set (Set new Unit ID)	18
7 MAINTENANCE	19
7.1 LED bulb changes	19
8 PROGRAMMING UNITS	20

LIST OF FIGURES

FIGURE 1 - UNIT LAYOUT9

FIGURE 2 - HMI-5 MOUNTING HOLES 10

FIGURE 3 - A-SIDE DATA AND AUDIO CONNECTIONS 10

FIGURE 4 - B-SIDE DATA AND AUDIO CONNECTIONS 10

FIGURE 5 - BUTTON FLAP GUARD OPERATION12

FIGURE 6 - PA/GA SYSTEM BROADCAST PRIORITY15

FIGURE 7 - SUGGESTED MICROPHONE POSITIONING16

LIST OF TABLES

TABLE 1 – ATEX / IECEX CONNECTION PARAMETERS8

TABLE 2 - LIST OF UN-USED CONNECTORS 11

TABLE 3 - AVAILABLE ROUTINE SPEECH CHIMES16

TABLE 4 - AVAILABLE EMERGENCY SPEECH CHIMES 17

TABLE 5 - MICROPHONE VOLUME GAIN VALUES18

1 Introduction

These instructions are intended for all users who have to install, commission, configure and setup the Sonix Hmi-5 Ex access panel. For this, the manual is action-oriented and explains how to achieve a certain objective on a step-by-step basis. It is assumed that you have necessary electrical, electronic and telecommunications experience to undertake the work. If in doubt, please consult your Eaton representative.

1.1 Eaton quality assurance

Eaton design, manufacture, install and commissions all our products to the highest standards of quality. This quality process is embraced and adopted throughout the group in all areas of our operations. This is demonstrated by our compliance and strict adherence to ISO 9001, 14001, ATEX, IECEx policies. On receipt of the product, ensure that the cartons are undamaged and that the contents are all correct and complete. Should this product reach you in an unsatisfactory condition please report this to Eaton to enable us to rectify and investigate the fault in a speedy manner.

1.2 Packaging

In the interest of preserving the environment, Eaton aims to use recycled packaging wherever practical. Due to the physical nature of our products, we provide adequate packaging to protect the goods during transit. Please ensure that once unpacked, checked and installed that all packaging is disposed / recycled in a responsible manner.

1.3 ESD (Electro Static Discharge)

The Sonix PA/GA system is largely constructed from electronic printed circuit boards. These printed circuit boards are sensitive to static electricity, ESD discharge on to any of the Eaton products could cause permanent and irreparable damage to the equipment. All such PCB's are shipped to you in ESD protective bags for transit. Prior to opening the transit bags please ensure that you are wearing either an ESD, earthed wrist strap or other suitable means of protection.

1.4 Safe working practice

Whilst working on or within the Sonix PA/GA system it is our prime interest that you remain safe throughout. During this work you will be exposed to potentially hazardous voltages, currents, confined spaces and potentially industrial environments.

Prior to undertaking any work please ensure relevant permits and regulations are adhered to.

1.5 Required tools / equipment.

To install and commission this part you will need the following tools.

- Flat-blade terminal screw driver
- Large PH1 screw driver
- Multi-meter
- 4 off mounting screws, M6 or equivalent

1.6 In the box

This item is shipped with the following items.

- 1 x Hmi-5 access panel
- 1 x Product Manual

1.7 Recommended spares

This item is sold as a complete module therefore, no spares are necessary.

2 About the product

The Sonix Hmi-5 Ex is an intrinsically-safe Human Interface access panel for connection into the Sonix PA/GA system from harsh and hazardous locations. It can provide operators with the ability to interface with the system to activate and control alarms and make announcements, both routine and emergency speech. The units are remotely configurable using the Sonix administration software with several features that can be tailored to the needs of system installation.

The unit is an A & B duplicated unit with independent and isolated circuits for A side and B side. Each side is typically phantom powered from the PA/GA system rack and has been designed to be a low power solution. The unit is in an IP66 rated enclosure.

2.1 Available features

- Atex / IECx EExi certified when installed with Sonix Hmi-Barrier
- Up to 5 Manual activation buttons with built-in low power LED status indication
- Hand-Held or Flush mount microphone options
- Alarm activation and control options including:
 - Alarms 1-6
 - Alarm Cancel
 - Alarm Attenuate
- Routine speech
 - With pre-set zoning
- Emergency speech
 - All-Call or with pre-set zone control
- Zone buttons
- LED Lamp test
- Unit self-monitoring and fault reporting
- Remote configuration using Sonix software

2.2 Unit ordering and configuring

Due to the multitude of button permutations for the limited number of buttons and indicators available on the Hmi-5, each unit is customised for the required system functionality. The specific functionality needs to be discussed and specified before and during ordering with your local Eaton representative.

2.3 Conditions for use in hazardous areas

2.3.1 ATEX / IECEx Certification

ATEX Certificate	ITS 13 ATEX 27897 X
Certified to	EN 60079-0, EN 60079-11, EN 60079-26
IECEx Certificate	IECEx ITS 13.0048X
Certified to	IEC 60079-0, IEC 60079-11, IEC 60079-26

2.3.2 ATEX / IECEx Classification

ATEX



II 1 G Ex ia IIC T4 Ga

Tamb: -40°C up to +60°C

IECEx

Ex ia IIC T4 Ga

-40°C ≤ TA ≤ +60°C

2.3.3 Entity Parameters (Terminals 1 to 4 with respect to 5, I.S safety earth)

Between connection points:				
Entity Parameter	1 to 5	2 to 5	3 to 5	4 to 5
Ui	26.1 V	26.1 V	7.9 V	7.9 V
Ii	138 mA	138 mA	37 mA	37 mA
Pi	897 mW	897 mW	72 mW	72 mW
Ci	0 F	0 F	0 F	0 F
Li	0 H	0 H	0 H	0 H

Table 1 – ATEX / IECEx Connection parameters

2.3.4 Special conditions for safe use

- The metallic screw fastener used to anchor the cable to the enclosure of the handheld microphone is electrically isolated from all surrounding materials and has a capacitance of 10.8pF. The installer/user must ensure the suitability of the equipment for the application and take precautions to ensure that this part does not accumulate an electrostatic charge.
- All cable glands, blanking elements and threads adapters must be certified Ex e or Ex d components designed for use in Gas Group IIC and giving a minimum degree of protection IP64.
- Entity parameters of the equipment are guaranteed by the associated safety interface board “HMI Br” certified under certificate ITS13ATEX27896X. In order to ensure the integrity of safety components inside or outside the hazardous area, the Hmi 5 shall not be used without the “Hmi Br”. Use of the Hmi 5 without connection of the Hmi Br invalidates the type of protection stated within this certificate.
- Installation shall be in accordance with the manufacturer’s instructions. Use of terminal J2, J4, J16, J6 J8 or J17 even whilst in a non-hazardous area invalidates the type of protection stated within this certificate.
- The installer and user of this equipment must make provision for the avoidance of accumulation of electrostatic charge on the surface of the equipment.

3 Overview of unit



Figure 1 - Unit layout

Item	Description
1	IP66 Enclosure
2	Configurable Buttons (up to 5) with integrated flap guard
3	Flush Microphone (Option)
4	Hand-Held Microphone (option)
5	Hand-Held Microphone hanger
6	Certification label

3.1 Weight and dimensions

Un-packed: up to 2.0 Kg, 160 x 90 x 260 mm

3.2 Power and utility

Voltage: 24 V dc phantom powered from partner equipment in the PA/GA system

Current: 50 mA max consumption

4 Installation and connectivity

4.1 Mounting

The unit should be installed securely using appropriate fixings, not supplied.

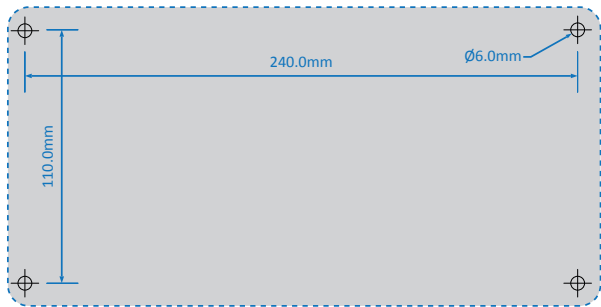


Figure 2 - Hmi-5 Mounting holes
Note: The Hand-held microphone hanger can be damaged by rough handling, take care when mounting the unit.

4.2 Glanding

The Sonix Hmi-5 is typically supplied with 2 or more M20 tapped holes for cable gland terminations.

Warning: Cable glands must be installed and inspected correctly to maintain Ex and IP ratings.

4.3 Data and Audio connections

Data and audio connections to the unit should be wired with 2 pair and screen cable, with both individual and overall screen for improved noise performance. The unit uses 1 pair for outgoing audio with incoming phantom power superimposed on the top. The second pair is used for bi-directional serial communications at 9,600 8-N-1 baud for control and status reporting. The screen connection is required as part of the 0V return. The maximum cable distance that the system can support for an Hmi-5 is 300 m, connections longer than this are not supported and are likely to result in un-reliable operation.

Connections to a Sonix Hmi-Barrier should be wired pin-to-pin without any crossover.

A side PA/GA	Assignment	Hmi-5 Connection
	Audio +	J1 – 1
	Audio -	J1 – 2
2off Twisted pair, individual and overall screen.	Data In	J1 – 3
1.5 mm² to 2.5 mm² (max ferruled) SWA / SWB	Data Out	J1 – 4
	Screen	J1 – 5

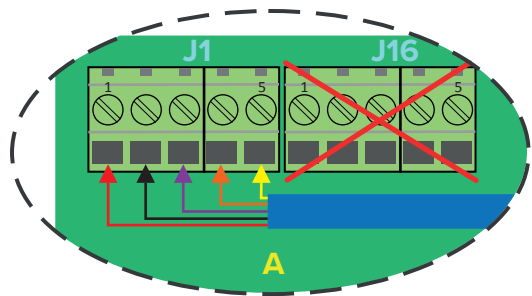


Figure 3 - A-Side Data and Audio connections

B side PA/GA	Assignment	Connection
	Audio +	J5 – 1
	Audio -	J5 – 2
2off Twisted pair, individual and overall screen.	Data In	J5 – 3
1.5 mm² to 2.5 mm² (max ferruled) SWA / SWB	Data Out	J5 – 4
	Screen	J5 – 5

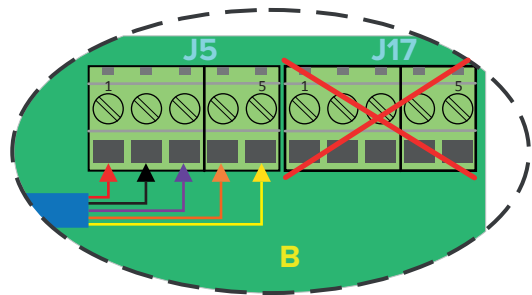


Figure 4 - B-side Data and Audio connections

4.3.1 Local Mute / Local Attenuate unit

Connections to activate a local mute and/or local attenuate unit are made into the corresponding A or B PA/GA rack, driven from the associated Hmi-Tu (see Hmi-Tu and Mute manuals).

Warning: Do NOT connect a Mute control line to an Hmi-5 unit.

4.3.2 Local Power

The Sonix Hmi-5 unit is not intended to be powered locally and should only be powered via the phantom feed.

4.3.3 Un-used connectors

The unit has connectors which are not certified for intrinsically safe installations and must not be used in the hazardous area. It is recommended the unit be removed from the hazardous area if reprogramming the functionality of the unit is required. The connectors are listed below:

Connector	Function	For use by Eaton Personnel only
J2, J6	Local power	Yes
J16, J17	Audio and data expansion	Yes
J4, J8	Programming	Yes

Table 2 - List of un-used connectors

5 Unit operation

5.1 Data communications

The Hmi-5 unit communicates with the Sonix PA/GA system rack via an Hmi Tu using a low power serial and a balanced audio pathway. The protocol used is a proprietary Sonix datagram format with messages exchanged every 100ms. The datagrams contain system status and activity from the PA/GA and access panel status and activity going to the PA/GA rack. While idle the Hmi-5 access panel is transmitting low level audio that is monitored by the PA/GA rack to detect degradation in the audio pathway.

The Hmi-5 implements different electrical interface to the Sonix Hmi-26 access panel and this requires a hardware link change on the Hmi Tu (see Hmi Tu manual for details).

5.2 A & B duplication

The Sonix Hmi-5 access panel is a duplicated unit with an A and B side. There is a small common section, namely Microphone, Buttons and indicators. The two sides signal each other basic status, this facilitates passing control of the LED indicators to the side in the best state. By default A side will control the LED indicators.



Warning: Both sides of an Hmi-5 need to have identical functionality and configuration to ensure correct operation.

Note: It is not required to use both sides, if non-duplicated operation is required A side should be used in preference.

5.3 Microphone options

The standard Hmi-5 unit is designed and customised for each order, which is then tailored to the user's requirements. Please discuss specific requirements with your local Eaton representative before ordering.

5.3.1 Hand-held microphone

The standard microphone is a hand-held variant on a coiled cord, complete with hanger to place the microphone when not in use. The microphone has an integral PTT button on the side.

In this configuration it is possible to have up to 5 push buttons with built-in LED indicators on the unit itself.

5.3.2 Flush mount microphone

The flush mount variant takes up the space of a normal button, reducing the maximum button count to 4, additionally the one of the buttons will have to be reserved to function as a PTT input.

5.3.3 No microphone

It is also possible to order the Hmi-5 without any microphone at all, this configuration again has a maximum of 5 buttons with built-in LED indicators available.

5.4 Button and LED indicator operation

Each button on the Sonix Hmi-5 can be utilised to perform a pre-set function. The available functions are discussed later in this section.

Each button can also be disabled in configuration, which prevents the button press but does not affect the indicator operation. This can allow for future expansion and protected functionality in insecure/remote locations.

Activity indication styles available on buttons:

Off	Typically used to indicate associated function is not active
Slow flashing (~ 0.5 Hz)	Typically used to indicate associated function is active on the system but not from local access panel-
Fast flashing (~ 5 Hz)	Typically used to indicate associated function is pre-selected on the access panel
Solid	Typically used to indicate associated function is active on local access panel and system
Breathing (see 6.4.1)	Typically used to indicate the access panel is idle

Note: The breathing indication will stop across all indicators on any button or indicator activity.

Each indicator can be one of the following colours:

- Red
- Blue
- Yellow
- Green
- Clear
- Orange
- Black (Non-illuminating)

Note: The standard Hmi-5 push buttons are fitted with long life LED indicators that have a long MTBF and should not require replacement.

Warning: The IP rating of the Hmi-5 unit depends on correct construction of the button and LED indicator, opening the button to change the LED can adversely affect the rating. Please contact your local Eaton representative for guidance on this matter.

The buttons have optional, fitted by default, clear flaps to prevent accidental operation. These must be specified during ordering due to the need to maintain IP66 rating and prevents post-delivery installation.

The flap has a simple operation and will stay open unless closed.

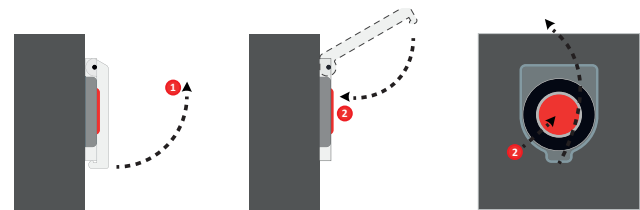


Figure 5 - Button flap guard operation

Warning: The standard Hmi-5 pushbuttons normally closed, open when activated, this means that a broken or loose connection can cause un-intended activations.

5.4.1 System Idle

During system idle the LED indicators are normally set up to slowly 'breathe'. This involves a constantly varying brightness on the LED at a fairly dim level to give confidence that the unit is powered, and the indicators are functional. This has been carefully designed to make it easy to distinguish between idle and active / off.

5.4.2 Indicator Test (LED Test)

Indicator lamp test button is intended to provide a simple mechanism for routine maintenance testing of all indicators on the unit.

On activation all indicators will illuminate solid for at least 1 second and then extinguish and return to indicating the current state; typically idle.

5.4.3 Push to Talk (with System busy indication)

Push to talk can be assigned to be either a standard button or the button incorporated on the hand-held microphone.

If assigned to a standard button the associated indicator has the following states:

Off	PTT is not active
Slow flashing (0.5 Hz)	System is busy
Solid	PTT is active

Note: The Hand-held microphone push to talk button is recommended as it allows for increased functionality on the unit.

Note: The default PTT action is for Routine Speech broadcast. To broadcast emergency speech an Important message button needs to be available or the required functionality to be defined during ordering.

Warning: The default zoning of PTT must be specified as part of unit ordering.

5.4.4 Important Message (Emergency Speech)

Important Message is a toggle action button. It will normally self-clear after ~30 seconds of no action of either a button press or PTT broadcast. The standard set up is to require a second action to broadcast Emergency Speech, i.e. to actively select Important Message then begin broadcast with PTT.

If assigned to a standard button the associated indicator has the following states:

Off	Important Message is not active
Slow flashing (0.5 Hz)	An Important Message is being broadcast on the system
Solid	Important Message is active on the local panel (may or not be broadcasting)

Note: An important message broadcast is to all areas unless specified as part of the unit ordering.

5.4.4.1 Combined Important Message and PTT

A combined PTT and Important Message button will broadcast Emergency Speech while activated.

The indicator will follow the same pattern as for standard PTT.



Warning: Check regulatory requirements regarding Emergency Speech broadcasts as some require a two-step process to avoid accidental activation.

5.4.5 Zone button

Zone buttons can be used to give the Hmi-5 access panel increased speech broadcast flexibility by allowing the pre-selection of broadcast zones before activation of PTT.

Zone buttons have a timeout of ~6 seconds. If no PTT or additional zone button activation occurs within this time window, they all self-clear. Each button activation resets the timeout counter.



Warning: The default zoning of PTT and zone buttons must be specified as part of unit ordering.

If assigned to a standard button the associated indicator has the following states:

Off	Associated Zone(s) are not active
Slow flashing (0.5 Hz)	Associated Zone(s) are being broadcast into by the system
Fast flashing (5 Hz)	Associated Zone(s) are pre-selected by the local panel (PTT not active)
Solid	Associated Zone(s) are selected by the local panel (may or not be broadcasting)

5.4.6 Alarm activation

Alarm activation buttons can be set to activate any one of Alarms 1 to 6. Alarms by default are all areas, but fixed function zoned alarms are possible (see 6.4.6.1 Zoned alarms).

Typical associated indicator function:

Off	Associated Alarm is not active
Slow flashing (0.5 Hz)	Associated Alarm is active on the system but not from the local access panel
Solid	Associated Alarm is active from the local access panel

Note: Alarm activation function within Sonix PA/GA is NOT a toggle action, clearing the alarm requires activation of Alarm Cancel.

5.4.6.1 Zoned Alarms

Alarm activation function on the Sonix Hmi-5 are usually All-Call, i.e. activates the alarm into all areas. It is possible to change the default action to be a zoned alarm

Note: This is not recommended but if zoned alarm activation is required please discuss with local Eaton representative.

5.4.7 Alarm Cancel

Alarm Cancel button is provided to allow a user to clear or 'cancel' active alarms on the system. Please note that once pressed there is no method of un-actioning an Alarm Cancel.

Activating Alarm Cancel button will send a signal to the 2Mx requesting a clear out of any currently active alarms. If the activation input is still active, for example a remote push-button connected into the IO-Tu, then the alarm will immediately re-activate (although the audio will pause for up to a second). The alarm cancel signal self clears after ~ 200 milliseconds to prevent a broken or stuck button from acting as an un-intended alarm inhibit.

If assigned to a standard button the associated indicator has the following states:

Off	Alarm Cancel is not active
Fast flashing (5 Hz)	Alarm Cancel is active on the system
Solid	Alarm Cancel is active locally but not on the system

Note: : As part of system design for un-attended access panels in public spaces; consideration should be taken as to whether Alarm Cancel is a protected function.

5.4.8 Alarm Attenuate

Alarm attenuate is a toggle action function, it will only latch on if an Alarm is active on the PA/GA system. The alarm attenuate action operates at a system level, activating this button toggles the current system state independent of the access panel.

If assigned to a standard button the associated indicator has the following states:

Off	Alarm Attenuate is not active
Fast flashing (5 Hz)	Alarm Attenuate is changing state
Solid	Alarm Attenuate is active

5.4.9 Alarm Inhibit

Alarm Inhibit is used to prevent automated activation of alarms from external systems such as Fire & Gas. It does not prevent manual activation from any access panel.

If assigned to a standard button the associated indicator has the following states:

Off	Alarm Inhibit is not active
Fast flashing (5 Hz)	Alarm Inhibit is active on the system
Solid	Alarm Inhibit is active locally

Note: Not a recommended action for an Hmi-5 access panel. Eaton recommends that a key switch connected to Sonix Io would be a more rigorous solution.

5.4.10 Ms12 message initiation

Initiation of a pre-recorded message from the Ms12. The message can only be initiated if it is loaded (recorded) and enabled on the Ms12.

If assigned to a standard button the associated indicator has the following states:

Off	Button is not active
Fast flashing (5 Hz)	Button is active, message playback requested

Note: There is no success/failure feedback to the user on the access panel.

5.4.11 Local Attenuate

Local attenuate is a toggle action function, it can be used at any point to reduce the output of the local loudspeaker(s).

Typically, Local Attenuate will be implemented with a pre-set timeout window to prevent permanent latch up, values between 5 and 30 minutes.

If assigned to a standard button the associated indicator has the following states:

Off	Local Attenuate is not active
Fast flashing (5 Hz)	Local Attenuate is changing state soon
Solid	Local Attenuate is active

5.4.12 Background Music control

Background music is an optional feature of the Sonix PA/GA system, its management and control are not covered in this manual. Please the 2Mx and SAS manuals for more information.

BGM control is a change state request action function that allows remote control of BGM. It requires a number of Sonix components to be correctly configured to work.

If assigned to a standard button the associated indicator has the following states:

Off	Button is not active
Solid	Button is active, BGM state change requested

Note: There is no success/failure feedback to the user on the access panel.

Note: Replaces Local Attenuate, cannot be used together.

5.5 Indication only options

Any of the features above with indicator states can be used as an indicator only with the push button disabled in configuration.

The following are options for using a button as indication only without any on-press event associated.

5.5.1 System busy

System busy indicator is used to show when the system has active.

If assigned to a standard button the associated indicator has the following states:

Off	System is currently idle
Fast flashing (5 Hz)	Engineers panel active on the system
Solid	System is busy with an Alarm, Routine or Emergency speech

5.5.2 System Health / System comms health

System health indicator is used to show the system health and local access panel communications health status. Due to the single indicator colour, the indicator can be used to show either a system healthy or a system fault.

If assigned as a system fault light the indicator has the following states:

Off	System is currently healthy, or access panel is powered
Fast flashing (5 Hz)	Local communications issue
Solid	System is not healthy

Note: Eaton recommends this mode, especially when combined with idle indicator breathing (see 6.4.1) and suggests a Red button cover/indicator colour.

If assigned as a system healthy light the indicator has the following states:

Off	System is NOT healthy, or access panel is powered
Fast flashing (5 Hz)	Local communications issue
Solid	System is currently healthy

Note: Green button cover/indicator colour would be suitable for this mode.

5.5.3 Auto-initiated alarm

Auto initiated alarms are alarms that originate from third-party interfaces into the Sonix Io unit. Example might include Fire & Gas systems.

Off	System has NO active auto-initiated alarm
Solid	System has an active auto-initiated alarm

5.6 Making a speech broadcast

Speech broadcasts on Sonix systems are made of up three parts:

- the audio from the user (see section 6.6.3),
- a priority set by the access panel/source (see section 6.6.1),
- a zone map to define where the broadcast needs to go (see section 6.6.2).

5.6.1 Priority

The priority within the Sonix PA/GA system is two-part system:

1. Firstly, the activity type has a basic priority order:
 - a. Emergency Speech (Higher)
 - b. Alarms
 - c. Routine Speech (Lower)
2. Secondly, the audio source unit has priority number ranging from 1 to 31, where 1 is the lowest and 31 is the highest priority.



Warning: Priority is configured on a unit basis and must be unique across the system to the controller it is connected to. The Hmi-5 should have both A & B sides, if both are in use, set to the same priority.

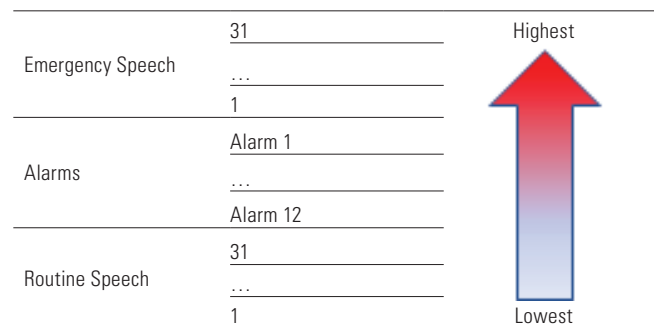


Figure 6 - PA/GA System broadcast priority

5.6.2 Zoning

Before activating PTT to make an announcement, the user can either use the default configured zones or select the required zoning for the broadcast.

5.6.2.1 Zone configuration

Zone button and zone configuration is calculated as part of system design, please discuss your requirements with your local Eaton representative.

Warning: Zone mapping is built into the firmware and is currently not configurable in the field.



The available zone maps are:

Default Routine Speech	Set on a project level, typically into Process/ External areas
Default Emergency Speech	Typically set to All-Call
Zone map Button(s)	Configured to cover a sub-set of available zones (Multiple buttons are allowed)
Alarm activations	Set to All-Call

5.6.3 Microphone input

The microphone input on the Hmi-5 can be either a flush mounted microphone on the chassis or a Hand-Held microphone on a flexible coiled lead.

The flush mount microphone is intended to be used from between 8 and 12 cm from the user whereas the Hand-Held microphone is intended to be held close to the talker, in the 4-8 cm range.

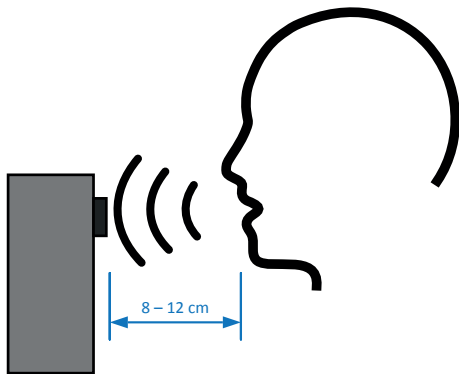


Figure 7 - Suggested microphone positioning

The microphone sensitivity can be adjusted on request, please contact your local Eaton representative.

5.6.4 Routine speech

A Routine speech broadcast is activated by pressing the Push to Talk (PTT) button, either on the unit or in the case of a Hand-Held microphone the PTT button is on the microphone itself.

5.6.4.1 Routine Chime

The Hmi-5 can be configured to play one of three different chimes before each routine speech broadcast, the chimes are referred to as single, double and triple bong. Selection of a chime creates a delay between activating PTT and routing voice to the PA/GA system while the chime plays.

Chime Name	Sound	Notes
Single Bong	660Hz decaying gong over ~4seconds	
Double Bong	660Hz then 550Hz decaying gongs over ~5.5seconds	The decaying gongs have the new gong superimposed over the top after ~1.1s
Triple Bong	660Hz then 550Hz then 400Hz decaying gongs over ~7seconds	
None	No chime	No chime is generated, and voice is routed to the system without delay

Table 3 - Available Routine Speech Chimes

Chime can be disabled for routine speech broadcasts.

5.6.4.2 PTT Timeout

The audio system on the Hmi-5 can be configured to have a maximum transmit time, called PTT Timeout. When this setting is active the access panel will cancel the active PTT session if it exceeds the time set in the configuration. Valid values range from 30 seconds to 120 seconds with no timeout also an option.

If this timeout event occurs, the Hmi-5 access panel will also generate a PTT Timeout fault. This can be used to identify situations where the PTT button has been accidentally depressed or no longer functioning correctly.

The PTT timeout fault can be disabled in configuration.

5.6.5 Emergency speech

Emergency speech, sometimes referred to as Important Message, is a method for increasing the priority of a speech broadcast, combined with a different announcement tone. Within the Sonix PA/GA system emergency speech is the only way to broadcast speech over an active alarm. Flagging a broadcast as an Important message increases its priority.

Emergency speech is selected by pressing the Important Message button, this button is a toggle button with timeout. The timeout is ~30 seconds since the feature was activated or since the last Emergency speech broadcast from the access panel finished.

5.6.5.1 Emergency speech chime

The Hmi-5 can be configured to play one of three different chimes before each emergency speech broadcast, the chimes are different to the routine speech chimes. Selection of a chime creates a delay between activating PTT and routing voice to the PA/GA system while the chime plays.

Available chimes on the Hmi-5 are:

Chime Name	Sound	Notes
Chime 1	1 kHz tone for 1second	Long beep
Chime 2	1 kHz tone 400ms ON 400ms OFF 400ms ON	Double beep
Chime 3	1 kHz tone 100ms ON 100ms OFF repeated 5 times	Multiple fast beeps
None	No chime	No chime is generated and voice is routed to the system without delay

Table 4 - Available Emergency Speech Chimes

Chime can be disabled for emergency speech broadcasts.

5.6.6 PTT Release Delay

The Hmi-5 has a configuration option called PTT Release Delay, commonly called a 'Slug Time'. This setting makes the access panel internally keep the PTT button active for between 1 and 3 seconds after release. This will allow a user to correct for a digit slipping off the button unintentionally.

Note: Installations using both A & B side of the Hmi-5 should ensure both sides have identical audio configuration to prevent audio artefacts breaking onto the PA/GA system.

This feature can also be disabled by setting the PTT Release Delay to None.

5.6.7 Mute Output

The Hmi-5 access panel has no direct outputs for controlling speaker Mutes and speaker Attenuates, these outputs are instead generated by the Sonix PA/GA system rack via the Hmi Tu.

The Mute output activates when the Hmi-5 is the active PTT broadcast on the PA/GA system. This approach allows the user to hear any overriding broadcasts if they are not the one active on the system.

5.6.7.1 Attenuate output

Additionally, the Hmi-5 can control a second output intended to activate a local speaker attenuate. The attenuate feature is provided to allow operators to reduce the volume of an alarm in the local area. The attenuate output, identical to the Mute output, activates on active PTT broadcast but can additionally be controlled manually by the user.

Note: The Local Attenuate button has an alternative function when disabled and is used to control BGM playback, but the outputs will activate for short periods of time in this mode. See section 6.4.12 on BGM.

5.7 Fault Reporting

5.7.1 Unit Monitoring

The Hmi-5 access panel has built in status monitoring to detect any issues early. The following features are monitored:

- Microphone input is monitored for open (high impedance) and short (low impedance)
- Internal Audio pathways – These are monitored using DTMF signalling while unit is idle
- Incoming Data communications from PA/GA system are monitored for presence and quality
- PTT is monitored for stuck switch – See section 5.6.4.2
- Inter-FPGA health – The independent halves of the Hmi-5 communicate with each other, loss of this communication is considered a fault

Some of these monitoring circuits can be disabled in configuration, see section 7.

5.7.1.1 Fault reporting

The Sonix PA/GA system has a robust fault reporting system; all issues with individual units are reported to the 2Mx central controller using the datagram messages. Communication links and missing units are also monitored by the 2Mx central controller. The 2Mx central controller then forwards the datagrams on to the software and sends a generic fault flag back to all the connected units.

6 Configuration

The Hmi-5, like most of Sonix, has been designed to be configurable via the common Sonix software interface. For most of the configuration options for the Hmi-5 access panel, please see the Sonix Administration Software (SAS) user manual.

6.1 Hardware configuration links

There are no hardware configuration (jumper) links on the Sonix Hmi-5 unit.

6.2 Solo connected access panels

Hmi-5 access panel installed with a single data connection should be installed and configured with the following options:

- Use the A-side terminals, even if intended to be connected as part of a B-system installation. There are common circuits that can only be adjusted by the A side.
- Disable Inter-FPGA fault monitoring.

6.3 Fully connected access panels

An Hmi-5 with data connections to both A and B sides should have the followings settings/considerations:

- Priority must be identical
- Unit ID should be identical but not essential
- Enable Inter-FPGA fault monitoring.
- Ensure the audio options are identical:
 - Routine Chime
 - Important Message Chime
 - PTT Release delay
 - PTT Timeout
 - Microphone volume
- The other setup options should be the same:
 - Fault monitoring
- Firmware controlled functionality should be identical:
 - Available buttons
 - Zoning
 - Alarms

6.4 Unit ID

Each Hmi-5 access panel on a system needs to have a unique identifier, called a Unit ID or number. This number, between 1 and 31, is used to identify the access panel to the 2Mx central controller and SAS software.

To read or change configuration or set the Unit ID, SAS installed on computer and Sonix data connection cable are required. Please see the SAS user manual for more details.

6.4.1 Ping-set (Set new Unit ID)

Note: It is likely that multiple persons will be required due to limited time window to accept the new ID.

To ping-set an Hmi-5 the following procedure needs to be followed:

1. Connect Computer with SAS installed and working to the system via the data connection cable
2. Navigate to Hmi-5 configuration screen
3. Press Ping-set and enter a new Unit ID

Note: Unit ID's need to be unique for Hmi-5's on the system, but same for A/B sides

4. Once the software has sent the ping-set command ALL Hmi-5 access panels that receive the command will illuminate all LEDs for ~10 seconds

Note: If A side is powered up and Ping-set is sent to B-side only the LEDs will NOT illuminate.

5. Pressing both left hand buttons* together on the Hmi-5 access panel during this 10 second window will cause that local panel to accept the new Unit ID

This is where a second person standing by the panel is required

6. Any Hmi-5 access panel which has not had the accept procedure pressed during the 10 second window will discard the command and retain their current Unit ID and configuration

Note: The exact button presses required depend on the hardware and firmware on the unit, but standard configuration is both left hand buttons together.

Note:

6.5 Priority

Priority is set on a unit by unit basis as part of the general system configuration. See SAS manual and section 6.6.1 for more details

6.6 Microphone Volume

The Hmi-5 access panel has the ability to reduce the sensitivity of the microphone.

Values range as follows:

Setting	Value	Gain
Full volume	15	0
Mid volume	7	-2.5 dB
Low volume	0	-5.5 dB

Table 5 - Microphone volume gain values

Note: The unit must be fully power cycled after changing the volume setting to allow the gain to be adjusted.

7 Maintenance

The Hmi-5 unit itself does not require any specific maintenance but the following general maintenance should be performed monthly.



Warning: Make sure to follow any local regulations on hazardous area before opening units.

- Check the unit for visible damage (scratches, bumps)
- Check connections and cable integrity - replace damaged cables, tighten terminal connectors loose screws
- Check unit fixing to rack / console – tighten loose screws
- Check microphone for loosening of the Goose-Neck
- Remove dust and dirt from front panel - Clean with a dry cloth



Warning: Remove fuse / power off the unit before proceeding.

Note: Do not use sharp objects, water, aggressive cleaning agent or solvent to clean the unit.

7.1 LED bulb changes



Warning: The IP rating of the Hmi-5 unit depends on correct construction of the button and LED indicator, opening the button to change the LED can adversely affect the rating. Please contact your local Eaton representative for guidance on this matter.

The LED indicators fitted to the Sonix Hmi-5 are long life units designed not to be replaced within the typical lifespan of the unit. If it becomes necessary to change the indicator during service lifetime care must be taken to properly re-assemble the button unit to ensure IP ratings.



Warning: Inserting the new LED indicator will most likely result in a button activation, ensure local procedures have been followed before commencing work.

Replacement LED: EAO 10-2109.1069 12V white

1. Lift flap guard
2. Using medium tack adhesive tape, rotate the coloured lens anti-clockwise
3. Carefully remove lens
4. Remove white diffuser plate
5. Extract LED unit, noting orientation of +ve leg
6. Insert replacement LED unit, matching orientation of removed unit

Note: This will require a firm press on the LED and result in a button activation if enabled/powerd

7. Test LED operation before continuing
8. Carefully re-insert white diffuser plate, chamfered edge inwards, engaging the protrusions in the outer edge with the corresponding pockets
9. Replace lens cover, taking care to avoid cross-threading
10. Tighten lens cover



Warning: The diffuser MUST be fitted and carefully aligned and lens cover fully tightened to maintain IP66

8 Programming units

The Hmi-5 access panels are controlled by a Microsemi ProASIC3 FPGA with instant-on technology for fast and reliable operation.

Required equipment for programming units:

- Computer/laptop with Microsemi FlashPro 11.x installed
- Microsemi Flash Pro 4 or newer programmer
- Connection cable for programmer to unit (2x5 0.1" pitch)
- Eaton firmware for target unit – Verify firmware is for correct unit
- Power source for Hmi-5 access panel, must be powered via Hmi-Barrier



Warning: Unit MUST be powered via Hmi-Barrier or certification will be voided and there is potential for damage to the unit

Procedure for programming units is as follows:

1. Visual inspection of unit to ensure no damage to PCB and components
2. Connect power to A side of unit using either:
 - a. 24 V dc phantom power via Hmi-Barrier into J1 (Audio (+ve) and screen (-ve))
3. Connect Microsemi programmer to J4
 - a. Observe orientation of notch
4. Open FlashPro software on laptop and load firmware file
 - a. See FlashPro documentation for details
5. Program unit firmware
6. Verify unit firmware
7. Power cycle Hmi-5 A Side
8. Using SAS:
 - a. Check / Set Unit ID
 - b. Check / Set Configuration
9. Verify operation
 - a. Alarms
 - b. Speech broadcasts
10. Repeat for B side of Hmi-5
 - a. DC input is into J5 (Phantom)
 - b. Programming connector is J8



Warning: Programming firmware is potentially damaging to the unit if not performed correctly with Eaton tested and approved firmware.

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