EM-1

Product Manual

Revision: 1.0.1412.2

DESIGNCOM TECHNOLOGIES

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Revision History

The latest revision of the product manual can be obtained through the Design-Com Technologies website located at www.designcom.com.au

The following is a list of changes made to this document:

Revision	Date	Description of Changes
1.0.1411.0	2014-12-03	Initial Release
1.0.1412.2	2014-18-03	Minimum levels in scream detection settings updated

Table 1: Revision History

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Contents

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Figures

Tables

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1. Introduction

1.1. Glossary

- *PSTN*
  - Public switched telephone network.
- *PABX*
  - Private automatic branch exchange.
- *DTMF*
  - Dual-tone multi-frequency signalling (DTMF) is used for telecommunication signalling over analogue telephone lines in the voice-frequency band.

1.2. Package Contents

- *EM-1 Emergency Telephone with built in speaker and microphone*
- *Product Manual*
- *Removable Mounting Clips (Backwards compatible with previous emFONE case Installations)*

1.3. System Overview

The EM-1 is an emergency lift telephone with fully programmable features. It comprises a loud-speaking hands free auto-dialing telephone, complete with two alarm button contacts, two on-board relay outputs, built in speaker & microphone and built in battery backup.

Features:

- Auto-Dialing, Hands Free Loudspeaker
- Built-in Speaker and Microphone
- 16 Second Voice Storage Location Identification Message
- Programmable via Remote Telephone Handset and Local Membrane Keypad
- Programmable 3 Number Dialing Capability
- Programmable Speaker and Microphone Gains
- Programmable Relay Options
- Programmable Talk Time
- Programmable Alarm-Button Timer
- Programmable Service Tone Detection Settings
- Dual Alarm Button Options (Dry Contact)
- Two Relay Output Contacts (2 Amps Max)
- Nickel-Metal Hydride (NiMH) Back-Up Battery
- Telephone Line and Power Supply Fault Diagnosis
- Voice Playback of Programmed Parameters
- Voice Playback for Fault Conditions and Call Progress Detection
- Integrated Remote Phone Monitoring System
- Scream Detection Auto-Dialing Capability

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2. Installation

2.1. Wiring Diagram

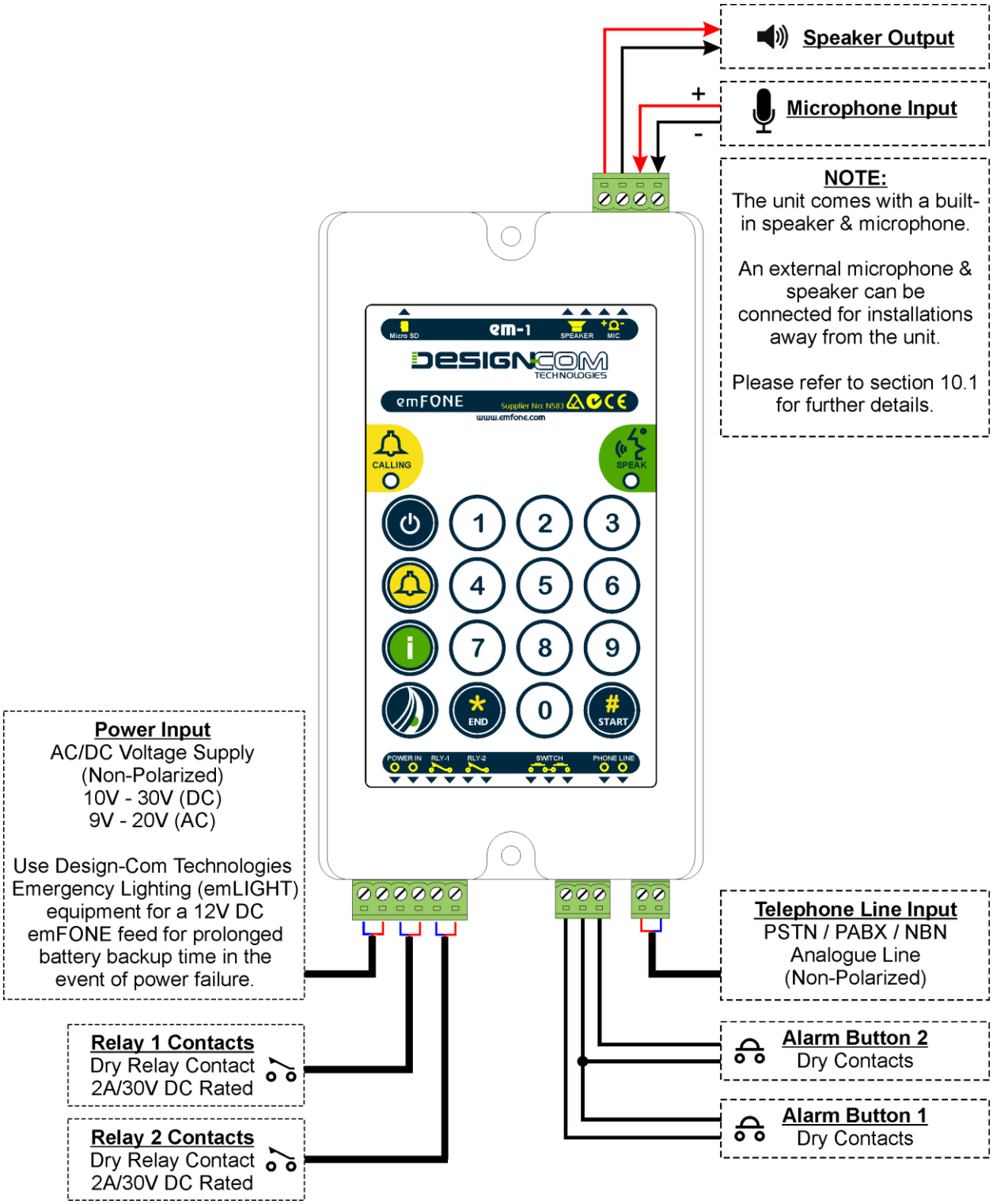

Figure 1- Wiring Diagram

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2.2. Site Requirements

Whilst the telephone in itself is quite simple in its approach to wiring and configuration, it is important to be considerate of the requirements before attempting to install the system on site.

The EM-1 telephone requires the following:

- 1 x Twisted Pair Telephone Cable.

All cabling for this system should **never** be run along with high voltage cabling. All efforts must be made to ensure the cabling is protected from induced noise from external systems.

A shielded cable does not guarantee immunity from noise.

Design-Com Technologies assumes no responsibility for incorrect or incomplete cabling installed onsite. A qualified electrician / telecommunications engineer must always approve and install all components of a network that are connected to Design-Com equipment. Consult individual product manuals for electrical specifications[1].

[1] Product manual electrical specifications are for a single product only

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3. Configuration

The EM-1 can be configured from the onboard membrane keypad or alternatively by dialing in remotely and entering programming sequences using a touch tone telephone or mobile handset.

NOTE: After successfully entering a programming sequence an audible message "Sequence Accepted" will be played. If this message is not played back, this is an indication that the sequence was entered incorrectly and has not been registered into memory.

Whilst entering a programming sequence the unit will allow 3 seconds between each key press and the next. If this time lapses the sequence is reset and you will need to commence the sequence from the beginning.

3.1. Security Auto-Answer

The Security Auto-Answer mode allows the unit to answer an incoming call if the auto-answer feature has been disabled as detailed in section 3.6.6 of the Advanced System Settings.

To enter security auto-answer mode follow the steps below:

1. Dial into the unit and hang up after one ring tone.
2. The unit is now in Security Auto-Answer mode for 20 seconds.
3. Dial into the unit during this period and it will auto-answer an incoming call.
4. You are now ready to program the unit.

NOTE: If a call to the unit is not made within the 20 second window, it will return to normal mode, and the process will need to be repeated.

After connecting to the unit, enabling the auto-answer feature can be achieved, refer to section 3.6 Advanced System Settings for further details.

3.2. Programming PIN Code

The factory default PIN code required to successfully enter a programming sequence is **123**.

To change the PIN code, enter the following sequence:

NOTE: New PIN must be 3 digits long.

#	PIN	#	3	NEW PIN	*

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3.3. Alarm Button Settings

Alarm button contacts can be configured to perform different functions depending on the installation requirements. These programmable settings are defined below:

3.3.1. Alarm Button Mode (A)

The alarm button mode defines how the alarm button contacts will operate. There are four options to choose from as detailed below.

3.3.1.1. Alternate Number Dialing

In this mode Alarm Button 1 is used to make an alarm call. Alarm Button 2 will enable switching between the two groups of numbers. When Alarm Button 2 is 'OFF' Alarm Button 1 will dial the first group of numbers. When Alarm Button 2 is 'ON' Alarm Button 1 will dial the second group of numbers.

3.3.1.2. Individual Alarm Calls

In this mode Alarm Button 1 will dial the first group of number's whilst Alarm Button 2 will dial the second group of number's.

3.3.1.3. Maintenance Number Dialing

In this mode Alarm Button 1 will dial the first group of numbers, once a call is complete it will then proceed to dial the second group of numbers. Alarm button 2 is disabled in this mode.

3.3.1.4. Breakdown Alarm Call

In this mode Alarm Button 1 will dial the first group of numbers. Alarm Button 2 will dial the second group of numbers, when a call is answered the unit will play the voice identification message, if enabled (please refer to section 3.8.1), it will then proceed to play the breakdown message 'failed'.

3.3.2. Alarm Button Contacts (B)

The alarm button contacts can be set to be normally open or normally closed contacts.

3.3.3. Programming the Alarm Button Settings

To program the alarm button settings, once values are defined, enter the following complete sequence:

 # PIN 2 # 3 A B *

	Setting	Setting	Minimum	Maximum	Default Value
A	Alarm Button Mode	Alternate Number Dialing = 0 Individual Alarms Calls = 1 Maintenance Number Dialing = 2 Breakdown Alarm = 3	0	3	1
B	Alarm Button Contacts	Normally Open = 0 Normally Closed = 1	0	1	0

Table 2 - Alarm Button Settings

To hear an audible playback of the alarm button settings, enter the following sequence:

*** # 3**

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3.4. Help Numbers

There are multiple ways to program these numbers depending on the installation and dialing requirements.

3.4.1. Help Number Programming Rules

- Telephone help numbers cannot exceed 16 digits.
- A '#' within the telephone number will be replaced with a 3 second pause when dialing. This becomes a useful entry when dialing out on a PABX system, giving the system time to establish an external line before dialing the telephone number.
- The unit will not dial 000 emergency services. *(Please contact the manufacturer to enable this feature).*

3.4.2. Programming a Single Telephone Number

To program the same number into all three memory locations of the first group of telephone numbers enter the following sequence:

#	PIN	9	#	0	TELEPHONE NUMBER	*

3.4.3. Programming Multiple Telephone Numbers

To program three different help numbers into their individual memory locations enter the following set of sequences:

	GROUP 1					
LOCATION 1	#	PIN	#	0	TELEPHONE NUMBER	*
LOCATION 2	#	PIN	#	1	TELEPHONE NUMBER	*
LOCATION 3	#	PIN	#	2	TELEPHONE NUMBER	*

	GROUP 2					
LOCATION 1	#	PIN	2	#	0	TELEPHONE NUMBER	*
LOCATION 2	#	PIN	2	#	1	TELEPHONE NUMBER	*
LOCATION 3	#	PIN	2	#	2	TELEPHONE NUMBER	*

To hear an audible playback of each programmed telephone number, enter the following set of sequences for each group:

	GROUP 1		GROUP 2		
LOCATION 1	*	0	*	#	0
LOCATION 2	*	1	*	#	1
LOCATION 3	*	2	*	#	2

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3.4.4. Programming for PABX Installation

When connecting to a PABX system and the number the unit is required to dial is not an extension within the PABX system, but an external number on the PSTN network, then a PABX access code will need to be entered to access an outside line.

To program the same number into all three memory locations of group 1, enter the following sequence:

NOTE: Group 2 numbers will need to be entered individually, including the PABX access code and a '#' before the telephone number.

3.4.5. Programming for HOTLINE Operation

A HOTLINE, or pre-programmed self-dialing telephone line, is a telephone line which will automatically connect to a single predetermined number when the phone goes off-hook. This feature is controlled by the service provider.

NOTE: To change the number the hotline is configured to dial please contact your service provider.

When connecting to a HOTLINE, disable the unit from dialing a number when an alarm call is raised by entering the following sequence:

3.4.6. Changing the GET Number

The GET number is dialled when the 'i' (information) button on the unit's keypad is pressed. This number by default is '12722123', which is Telstra's own number recorded voice announcement feature. It will allow the user to identify the line number in which the unit is connected to.

To change the GET number, enter the following sequence:

To hear an audible playback of the GET number, enter the following sequence:

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3.5. Voice Identification Message

A built-in voice message is played upon answering of the emergency call. The unit comes with a factory default message although this message will need to be re-recorded to identify the calling location of the unit installed. The message will act as an aid to those with communication difficulties when an alarm call is raised.

3.5.1. Recording the Voice Identification Message

Recording can be achieved by using either a remote telephone handset by dialing into the emFONE or by using the membrane keypad onboard via its local microphone.

- Ensure that there is minimal background noise.
- Speak approximately 2-6 inches from the microphone.

NOTE: The maximum message length is 16 seconds. If the message is shorter than 16 seconds, press the '0' digit to end the recording process, otherwise the unit will play 4 audible beeps when the 16 second time elapses.

1. Enter the following sequence, wait until 2 audible beeps are played then begin recording:

#	PIN	#	9

2. To stop the recording process enter '0'.
3. Once the voice message has been recorded it can be played back at anytime by entering the following sequence:

*	9

If a voice identification message is not required, refer to section 3.7 to disable this feature.

3.5.2. Restoring the Factory Default Message

To restore the factory default voice identification message to its original message enter the following sequence:

#	5	5	*

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3.6. Advanced System Settings

3.6.1. Dial Time (A)

The time the unit will dial a help number before it proceeds to the next help number.

3.6.2. Talk Time (B)

The maximum length of conversation time during a call.

3.6.3. Silence Time (C)

The unit will end a call when there is no conversation detected for the duration of the silence time.

3.6.4. Alarm Button Timer (D)

The period the alarm button will need to be pressed and held before a call is initiated.

3.6.5. Auto-Answer Ring Count (E)

When dialing in remotely to the unit, and if the auto-answer feature has been enabled, the ring count will determine how many rings the unit will detect before picking up the call.

3.6.6. Auto-Answer (F)

The unit will auto-answer a call if this feature is enabled. If disabled it will not pick up a call. This feature should be disabled when multiple units are sharing the same telephone line.

3.6.7. Ringer Control (G)

The audible onboard ringer played when a call is made to the unit can be enabled or disabled.

3.6.8. PABX Continuous Tone Detector (H)

Certain PABX systems send a continuous tone as opposed to a busy tone when a call ends, the unit can sample this tone and disconnect the call when enabled.

3.6.9. Programming the Advanced Settings

To program the advanced settings, once values are defined, enter the following complete sequence:

#	PIN	#	5	A	B	C	D	E	F	G	H	*

	Setting	Formula	Minimum	Maximum	Default Value
A	Dial Time	A x 5 seconds	1	9	5
B	Talk Time	B x 2 minutes	1	9	2
C	Silence Time	C x 5 seconds 0 = Disabled	0	9	4
D	Alarm Button Timer	D x 1 second	0	9	3
E	Auto-Answer Ring Count	E x 2 rings	1	9	2
F	Auto-Answer	Disabled = 0 Enabled = 1	0	1	1
G	Ringer Control	Silent = 0 Audible = 1	0	1	1
H	PABX Continuous Tone Detector	Disabled = 0 Enabled = 1	0	1	1

Table 3 - Advanced System Settings

To hear an audible playback of the advanced system settings, enter the following sequence:

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*	5

3.7. Audio Device Settings

The unit is provided with a built-in internal speaker and microphone.

If the installation requires an external speaker and microphone, a Design-Com speaker and microphone can be connected externally to the unit. The unit will automatically detect whether an external speaker and microphone has been connected, hence disabling the internal speaker and microphone.

Overriding the auto detect feature can be set manually as detailed below.

3.7.1. Speaker Type (A)

Internal or external speaker type connected to the unit.

3.7.2. Microphone Type (B)

Internal or external microphone type connected to the unit.

3.7.3. Reserved (C)

3.7.4. Programming the Audio Device Settings

To program the audio device settings, once values are defined, enter the following complete sequence:

#	PIN	#	6	A	B	C	*

	Setting	Formula	Minimum	Maximum	Default Value
A	Speaker Type	Auto Detect = 0 Internal Speaker= 1 External Speaker = 2 Both Channels = 3	0	3	0
B	Microphone Type	Auto Detect = 0 Internal Microphone= 1 External Microphone = 2	0	2	0
C	RESERVED		N/A	N/A	1

Table 4 - Audio Device Settings

To hear an audible playback of the audio device settings, enter the following sequence:

*	6

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3.8. Audio Level Control & Relay Settings

3.8.1. Voice Identification Message (A)

The built-in digital voice message can be disabled or set to play automatically when a call is answered or by a remote DTMF sequence of '*9'.

3.8.2. Line Receive Level (B)

The line receive level adjusts the level of the incoming signal. This should be adjusted to achieve a nominal 80dB level at the speaker when the unit is in conversation. Adjust this level at single increments until the best result is achieved.

3.8.3. Microphone Level (C)

The microphone level adjusts the output level of the microphone when in conversation.

3.8.4. Relay 1 and Relay 2 Options (D and E)

The relay options can be set to energise the specific relay at a different state of operation. There are 3 options to choose from as detailed in Table 5.

3.8.5. Relay ON Time (F)

The relay 'ON' time is configurable, this sets the duration of which the relay will remain energised.

3.8.6. Programming the Audio Level & Relay Settings

To program the audio level control & relay settings, once values are defined, enter the following complete sequence:

#	PIN	#	7	A	B	C	D	E	F	*

	Setting	Formula	Minimum	Maximum	Default Value
A	Voice Identification Message	Disabled = 0 Play when alarm call is answered = 1 Play when (*9) is entered =2	0	2	1
B	Line Receive Level	-	0	9	6
C	Microphone Level	-	0	9	5
D	Relay 1 Options	ON when unit is on = 0 ON when call is answered = 1 ON when DTMF code (#81) is sent = 2	0	2	2
E	Relay 2 Options	ON when unit is on = 0 ON when call is answered = 1 ON when DTMF code (#82)is sent = 2	0	2	0
F	Relay ON Time	D x 2 seconds	1	9	2

Table 5 - Audio Level and Relay Settings

To hear an audible playback of the audio level control & relay settings, enter the following sequence:

*	7

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3.9. Telephone Line Settings

3.9.1. DTMF Transmit Level (A)

The DTMF transmit level can be adjusted. It is recommended that this feature is not altered from the factory default setting unless the unit is having difficulty dialing.

NOTE: This feature has been included for international telecommunication standards.

3.9.2. Busy Tone Cadence (B)

Some PABX systems have an unusual busy tone cadence that will not be detected by the default setting. This setting can be changed if the unit is connected to a PABX that has a busy tone consisting of short pulses or tone bursts.

3.9.3. Programming the DTMF & Busy Tone Settings

To program the telephone line settings, once values are defined, enter the following complete sequence:

#	PIN	#	8	A	B	*

	Setting	Formula	Minimum	Maximum	Default Value
A	DTMF Transmit Level	A x 1dB	0	9	5
B	Busy Tone Cadence	210ms - 750ms = 0 (long beeps) 60ms - 750ms = 1 (short beeps)	0	1	0

Table 6 - DTMF & Busy Tone Settings

To hear an audible playback of the audio level control & relay settings, enter the following sequence:

*	8

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3.10. Remote Phone Monitoring System (RPMS)

The unit comes with a built in auto self-test and health check reporting feature. Designed to test and report system information to a remote communication centre at regular periods.

3.10.1. Reporting Conditions

The unit will make a health check report when the following conditions are valid:

- After an alarm call has been raised.
- If a power failure has been valid for 20 minutes.
- If a telephone line failure has been valid for 20 minutes.
- If the backup battery level is low.
- When any of the fault reports are rectified and healthy for a period of 20 minutes.
- When a manual report is initiated, see section 4.1 for the Manual Report key.
- Automatically as per the periodic report specified in section 3.13.

3.10.2. RPMS Enable

By default RPMS is disabled. To enable the feature enter the following sequence:

 # PIN 9 # 7 A *

	Setting	Formula	Minimum	Maximum	Default Value
A	RPMS Enable	0 = Disable 1 = Enable	0	1	0

Table 7 - RPMS Settings

To hear an audible playback of the RPMS enable settings, enter the following sequence:

*** # 7**

3.10.3. Periodic Reports

If enabled the unit is set to dial out and report it's health check status back to a Remote Monitoring System. The frequency of which the unit will perform a auto self-test and auto-report is set by the sequence below:

 # PIN 2 # 7 N N *

	Setting	Minimum (Days)	Maximum (Days)	Default Value (Days)
NN	RPMS Enable	01	30	03

Table 8 - RPMS Settings

To hear an audible playback of the RPMS enable settings, enter the following sequence:

 # 0 7 *

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3.11. Scream Detection Settings

Scream detection is a feature that when enabled will automatically raise an alarm call when and if it detects a scream of a person who is in distress.

3.11.1. Scream Detection Enable (A)

By default the scream detection feature is disabled. To enable the feature select either '1' or '2' for this setting. By choosing '2' you are only allowing the feature to function when the unit has an external power supply present, and will not function when the power has failed and is in battery backup mode.

3.11.2. Duration (B)

The duration sets the minimum time required for the unit to detect a scream.

3.11.3. Level Threshold (C)

The level threshold sets the minimum level (dB) required for the unit to detect a scream.

3.11.4. Programming the Scream Detection Settings

To program the scream detection settings, once values are defined, enter the following complete sequence:

#	PIN	5	#	0	A	B	C	*

	Setting	Formula	Minimum	Maximum	Default Value
A	Scream Detection Enable	Disable = 0 Enable = 1 Enable only if power supply present = 2	0	2	0
B	Duration	1 second = 1, increments by 250ms per step, where 9 = 3 seconds	1	9	1
C	Level Threshold	80dB = 1, increments by 2 dB per step, where 9 = 96dB.	1	9	1

Table 9 - Scream Detection Settings

To hear an audible playback of the scream detection settings, enter the following sequence:

#	5	0	*

3.12. Reset to Factory Default

To reset programmable setting to factory default, enter the sequence below:

#	PIN	0	#	9	9	9	*

NOTE: This feature does not revert the voice identification recording, scream detection and RPMS programmed values to the factory default settings.

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4. Operation

4.1. Membrane Keypad Buttons

KEY	Name	Description
	ON/OFF	Switch between standby mode and unit ON mode
	Alarm	Simulate an Alarm Call
	Information	Dials the Get Number to obtain the line number the unit is connected to
	Manual Report	Manual System Fault Report (If enabled, refer to section 3.10.2)
	# / Start	Commence programming sequence when in standby mode. Including other operations.
	* / END	End programming sequence when the unit is in standby mode. Including other operations.

Table 10 - Membrane Keypad Buttons

4.2. Raising an Alarm Call

To make a call press the 'Alarm' button on the units onboard keypad or close the alarm button dry contacts connected to the units Alarm button 1 input. The unit will dial the pre-programmed help number, or if configured for a HOTLINE as detailed in section 3.4.5 will loop the telephone line.

4.3. Commands

The following commands can be used via the onboard keypad or remotely when you have established a call with the unit using a touch tone telephone or mobile handset. Commands are sent via DTMF digits to activate certain features of the telephone as detailed below.

4.3.1. Reset Talk Time / Stop Playback of Digital Voice Message

To reset the Talk Time during conversation, enter the following:

0

4.3.2. Hang Up a Call

To manually hang up the call, enter the following sequence:

*	*

4.3.3. Activate Relay Contacts

If the relay contacts have been set to turn on via DTMF code sent as detailed in section 3.8.4, to turn on each respective relay contact , enter the following individual sequences:

RELAY 1	#	8	1
RELAY 2	#	8	2

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4.3.4. Increase Microphone Level

To increase the microphone level during a conversation, enter the following:

3

4.3.5. Decrease Microphone Level

To decrease the microphone level during conversation, enter the following:

6

4.3.6. Reset All Volumes

To reset the adjustable volumes during conversation to pre-programmed values, enter the following:

8

4.3.7. Reset Unit / Turn Off Battery Supply

To reset the unit or turn off the internal battery supply when the external power has been removed from the unit, enter the following sequence:

 # 6 6 *

The internal battery supply will re-enable when power to the unit is re-instated.

5. LED Diagnostic Indicators

The onboard LEDs will illuminate to indicate state of events as detailed below:

LED	NAME	LED COLOUR	'ON' STATE
	CALLING	AMBER	When an alarm button call has been acknowledged and unit starts to dial out.
	SPEAK	GREEN	When an alarm call has been answered and is ready for communication.

Table 11 - LED Diagnostic Indicators

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6. Automated Self Diagnosis

The EM-1 performs self diagnostic checks. If the unit detects a problem, an audible message will play through the speaker to alert people of the problem.

6.1. Power Supply Check

The unit will continuously check the power supply input voltage. If the power drops out then the unit will remain powered from the internal backup battery. The following audible message will play every 20 minutes to alert of a power failure:

"Power supply test failed. Please report this failure to building management immediately".

6.2. Telephone Line Check

The unit will continuously check the telephone line voltage. If the telephone line voltage drops then the following audible message will play every 20 minutes to alert of a telephone line failure:

"Telephone line test failed. Please report this failure to building management immediately".

6.3. Battery Check

When there is no power, the unit will monitor the battery voltage. If the battery voltage reaches 4.2V the unit will report the power failure every twenty minutes.

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7. Unit Testing Procedure

7.1. Test the Programmed Help Number

1. Press the ALARM button on the units onboard keypad.
2. The telephone line will turn ON and the CALLING LED will illuminate.
3. The unit will dial the first help number.
4. If the call is not answered, the unit will dial the second, then third help numbers until the call is answered.
5. Once the call has been established the SPEAK LED will illuminate and you can begin communication.
6. To end the call, press the ON/OFF button.

7.2. Dial a Telephone Number and Test the Telephone Line

To dial any telephone number directly from the unit's keypad follow the steps below:

1. Press the ON/OFF button on the membrane keypad.
2. The telephone line will turn ON and the CALLING LED will illuminate.
3. Using the numeric keys on the membrane keypad, dial the telephone number you wish to call.
4. Once the call has been established the SPEAK LED will illuminate and you can begin communication.
5. To end the call, press the ON/OFF button.

7.3. Speaker and Microphone Test

To test the speaker and microphone ensuring they are functioning correctly follow the steps below:

1. Enter the following sequence from the units keypad:

#	3	2	*

2. The unit will play a series of beeps from the speaker. You will need to wait until the unit has stopped playing these beeps for the result to be heard. It will either playback an "Acoustic Test Passed" or Acoustic Test Failed" message.

   PLEASE NOTE: In order for this test to pass you must ensure there is no background noise and the speaker and microphone are within 10cm of each other.

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8. Troubleshooting

If a problem is encountered with this product, before returning it for repair, please check for the following.

PROBLEM	SOLUTION
Power supply fault	Test the Input Voltage to the unit 1. Connect a DC meter across the power input terminals 2. Ensure the voltage is within specification specified in section 9.1.
Telephone line fault	Test the standby telephone line voltage 1. Connect a DC meter across the line terminals 2. PABX line voltage should read 24V DC 3. PSTN/NBN line voltage should read 48V DC Test the ON telephone line voltage 1. Turn the unit on by pressing the ON/OFF button 2. Connect a DC meter across the line terminals 3. Line voltage will be approximately 7V - 12V DC
No dial tone	• Check the telephone line voltage • Service may have been disconnected from the service provider. • Try connecting a standard telephone handset across the line to test for dial tone. • If the unit automatically dials when the line is ON the line is connected to a HOTLINE. Refer to section 3.4.5 for further details.
Alarm button does not work	• Ensure the Alarm button is wired to the switch contacts correctly and that there is no open circuit condition. • Alarm button needs to be a dry contact connection.
'i' (Information Button) not working	• By default, this will prompt the unit to dial the information number (12722123), which if connected to Australia's Telstra network will retrieve the telephone number of the line the unit is connected to. • Please note that this feature will not work if connected to a PABX system.
Line receive signal too low	• If the unit does not auto-detect the call takers voice and proceed to play the units identification message when an alarm call has been made or the signal level at the units speaker during conversation is too low please refer to section 3.8.2 to increase the line receive signal level.
Noise on the telephone line	• Noise is usually induced from the trailing cables. • Microphone leads may be too close to high voltage cabling. • If an external speaker/microphone is installed, disconnect, make a call, if the noise has gone, re-route the microphone cable away from other wire looms. • Swap the telephone line to another pair of wires. • Earth the shield of the trailer cable.
Acoustic feedback	• Acoustic feedback will occur if the speaker and microphone are installed less than 60mm apart. When installing the unit utilizing the built-in internal speaker and microphone, ensure the unit is mounted flush on the panel and panel cutouts are in line with the speaker grill and microphone cutouts of the EM-1.

Table 12 - Troubleshooting

Please note under no circumstances should you attempt to repair this product at a circuit board level yourself as this will void the warranty.

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9. Reference

9.1. Technical Specifications

Operating Voltage	10V-30V (DC), 9V-20V (AC) Use Design-Com Technologies Emergency Lighting (emLIGHT) equipment for a 12V DC emFONE feed for prolonged battery backup time in the event of power failure.
Standby Current	10mA
Operating Current	200mA (Maximum)
Telephone Line Voltage	24V - 50V DC
Telephone Line Current	20mA - 90mA
Dialing Method	DTMF
Relay Contact Rating	2A/30VDC
Battery Backup System	Nickel-Metal Hydride (Made in Germany) - Operating Life 5 Years
Battery Operating	12 Hours (Standby), 2 Hours (Continuous Talk Time)
Speaker Volume	Programmable - 80dB at 1 meter 425Hz
Speaker	8Ω 1W
Microphone	2K Impedance, operating range 5 meters
Alarm Button	Dry Contacts
Operating Temperature	0°C - 75°C
Dimensions	157mm x 80mm x 19.5mm
Manufactured	Melbourne, Australia

Table 13 - Technical Specifications

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9.2. Dimensions

9.2.1. Top and Side View

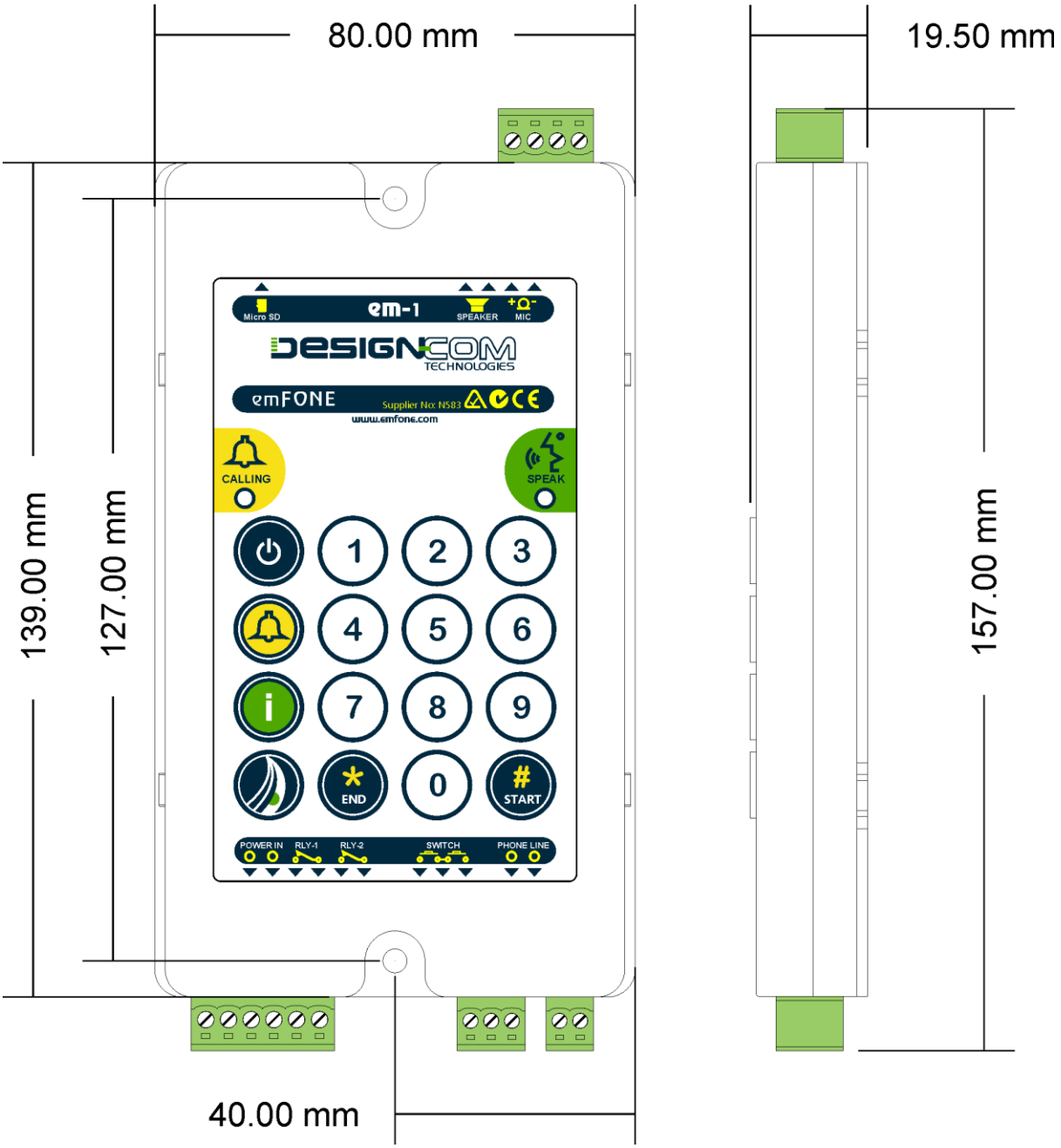

Figure 2- Top and Side View

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9.2.2. Stud Mounting & Grill Cut-out Positioning

NOTE: Speaker and Microphone grill cut-outs to be 2mm minimum.

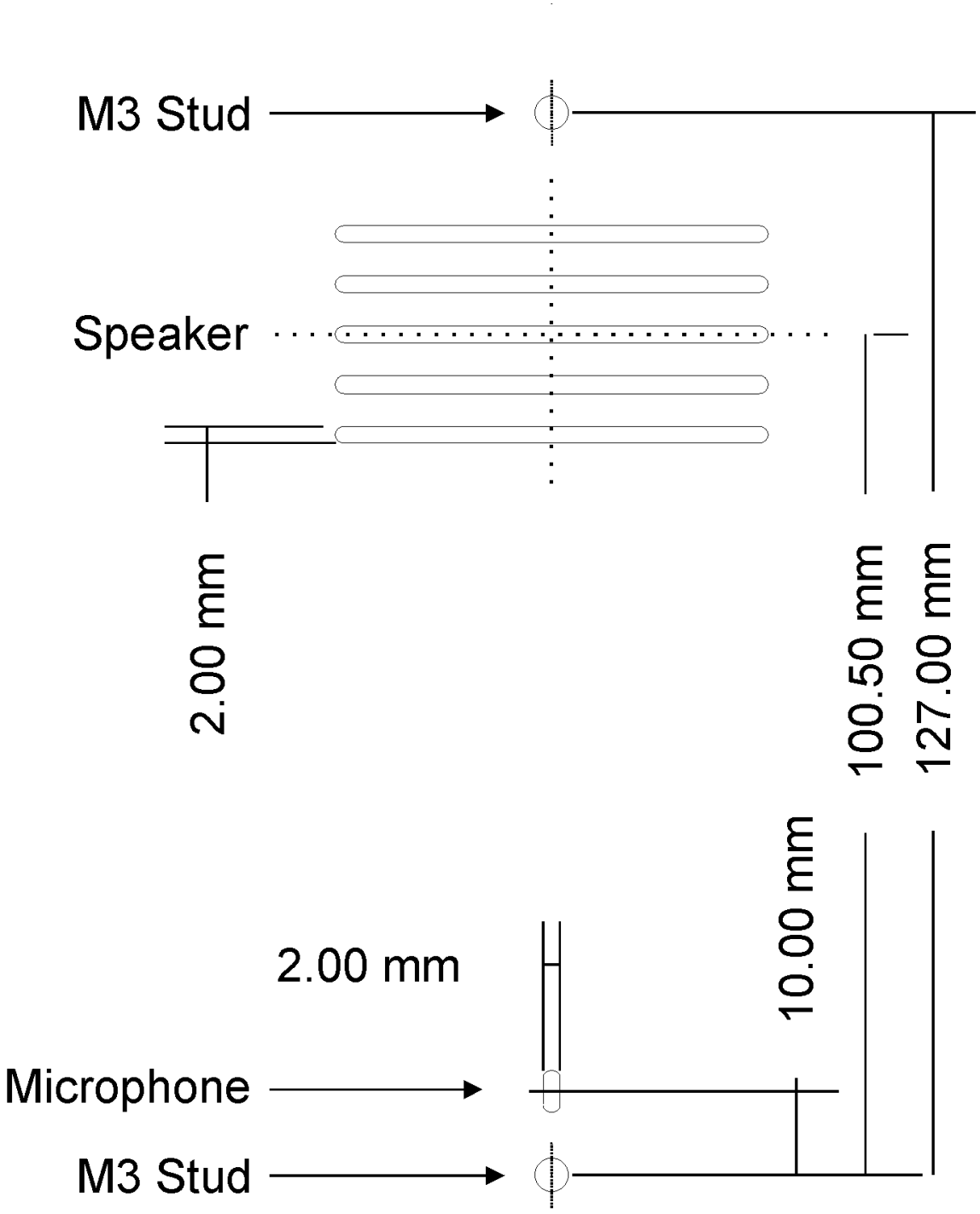

Figure 3- Stud Mounting & Grill Cut-out Positioning

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9.2.3. Installation using Mounting Clips

NOTE: Only for use with previous emFONE case Installations. Please follow the new stud mounting dimension detailed in section 9.2.2 for all new installations.

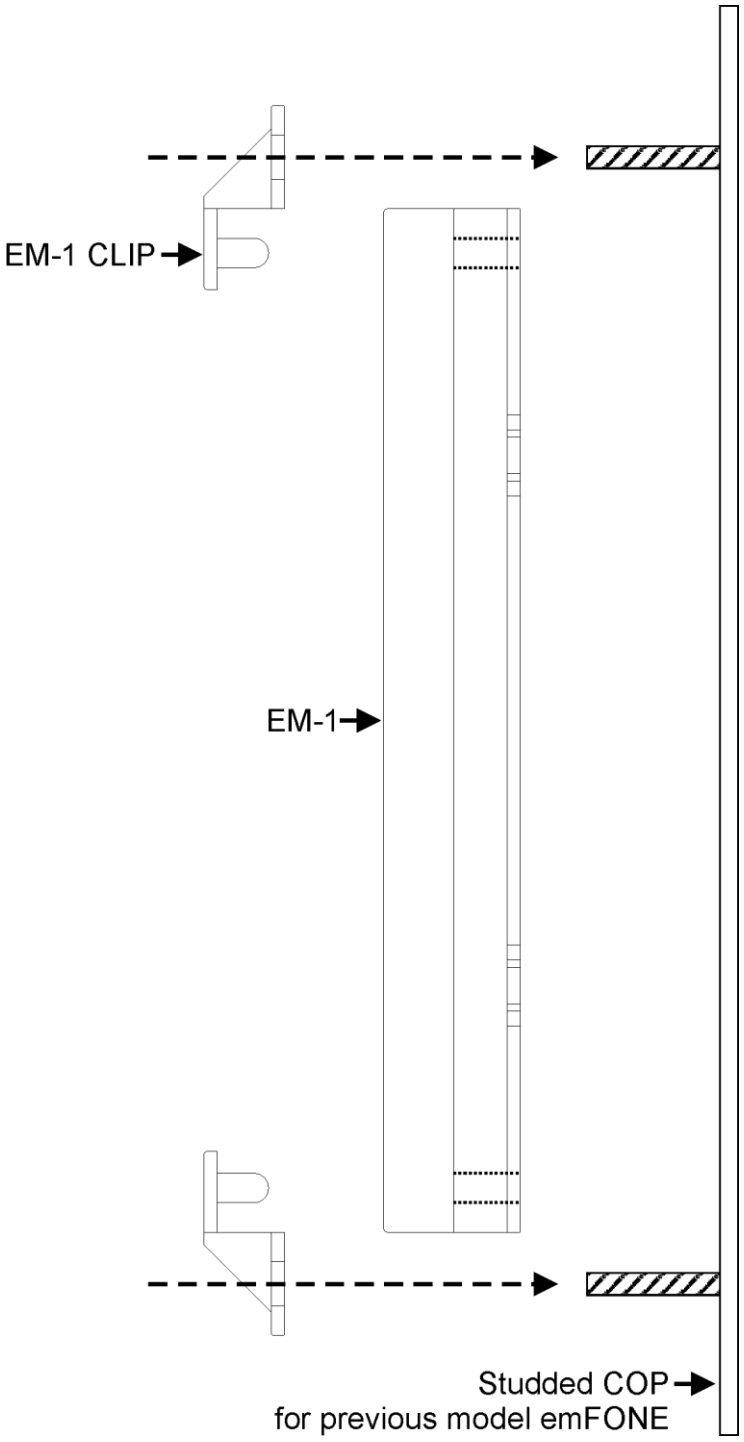

Figure 4 - Installation using Mounting Clips

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9.2.4. External Microphone and Speaker Stud Mounting and Dimensions (Optional)

This optional kit comes complete with a shielded 3 metre speaker and microphone lead for installations away from the EM-1 unit. Dimensions for stud mounting of the external speaker and microphone are detailed below.

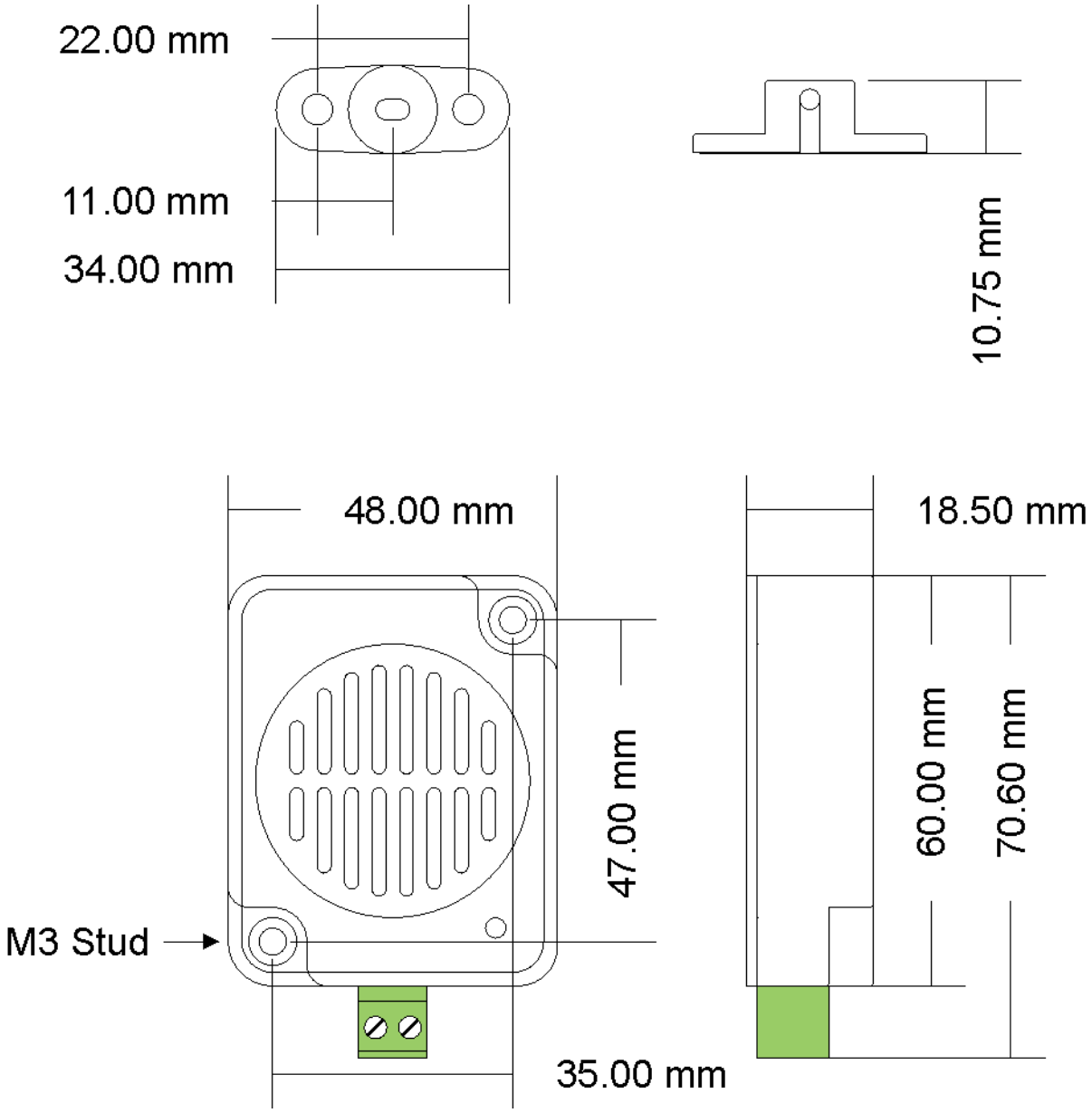

Figure 5 - External Microphone and Speaker Kit Stud Mounting and Dimensions

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10. Maintenance

10.1. Replacement Parts

If the product is out of warranty, replacement parts can be purchased to allow for sub assembly replacements.

The table below details the items that can be purchased for this product:

PART NUMBER	DESCRIPTION
SR-EM/BAT	EM-1 Backup Battery
SR-EM-SPK/8R	Internal 8 Ohm Speaker (Inc. Wire Connection)
EM-SPK/MIC	External Microphone & Speaker Kit

Table 14 - Replacement Parts

11. Safety and Handling Precautions

CAUTION - Permanent Damage will occur if the input/supply voltages exceed the maximum levels specified. Take care to avoid static damage to any component on this product. Transport and/or store the product in its protective static-free packaging until required. When handling an exposed circuit board, avoid touching its connector pins and handle the board by its edges only. All high voltage areas, if present, will be displayed with a danger/caution label, please observe and stay clear of these areas.

12. Warranty

Before calling a Service Technician please carefully examine the operating instructions and the warranty terms and conditions. For details on the **Design-Com Technologies** Warranty Procedure, please visit http://www.designcom.com.au

13. Contact

For contact details please refer to http://www.designcom.com.au

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