

# EM-2

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## Product Manual

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Revision: 1.0.1513.4

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## Revision History

The latest revision of the product manual can be obtained through the Pixel Technologies website located at [www.pixeltechnologies.com.au](http://www.pixeltechnologies.com.au)

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

Revision	Date	Description of Changes
1.0.1430.0	2014-24-07	Initial Release
1.0.1510.2	2015-12-03	Configuration Update
1.0.1513.4	2015-30-3	Alarm Button Setting Update

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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-2 emFONE*
- *Product Manual*
- *Removable Mounting Clips (Backwards compatible with previous emFONE case Installations)*

### 1.3. System Overview

The EM-2 is a line powered auto dialing telephone designed to help a person unable to communicate with the service provider either through physical disability or language difference. A programmable digital voice message is played upon answer of the distress call and is used to identify the calling location to the control center.

Features:

- Auto-Dialing, Hands Free Loudspeaker
- Built-in or External Speaker and Microphone Options
- 16 Second Voice Storage Location Identification Message
- Programmable via Remote Telephone Handset and Local Membrane Keypad
- Programmable 3 Number Dialing Capability
- Programmable Speaker Volume
- Programmable Relay Options
- Programmable Talk Time
- Programmable Alarm-Button Timer
- Alarm Button (Dry Contact)
- Two Relay Output Contacts (2 Amps Max)
- Voice Playback of Programmed Parameters
- Integrated Remote Phone Monitoring System (RPMS)

## 2. Installation

### 2.1. Wiring Diagram

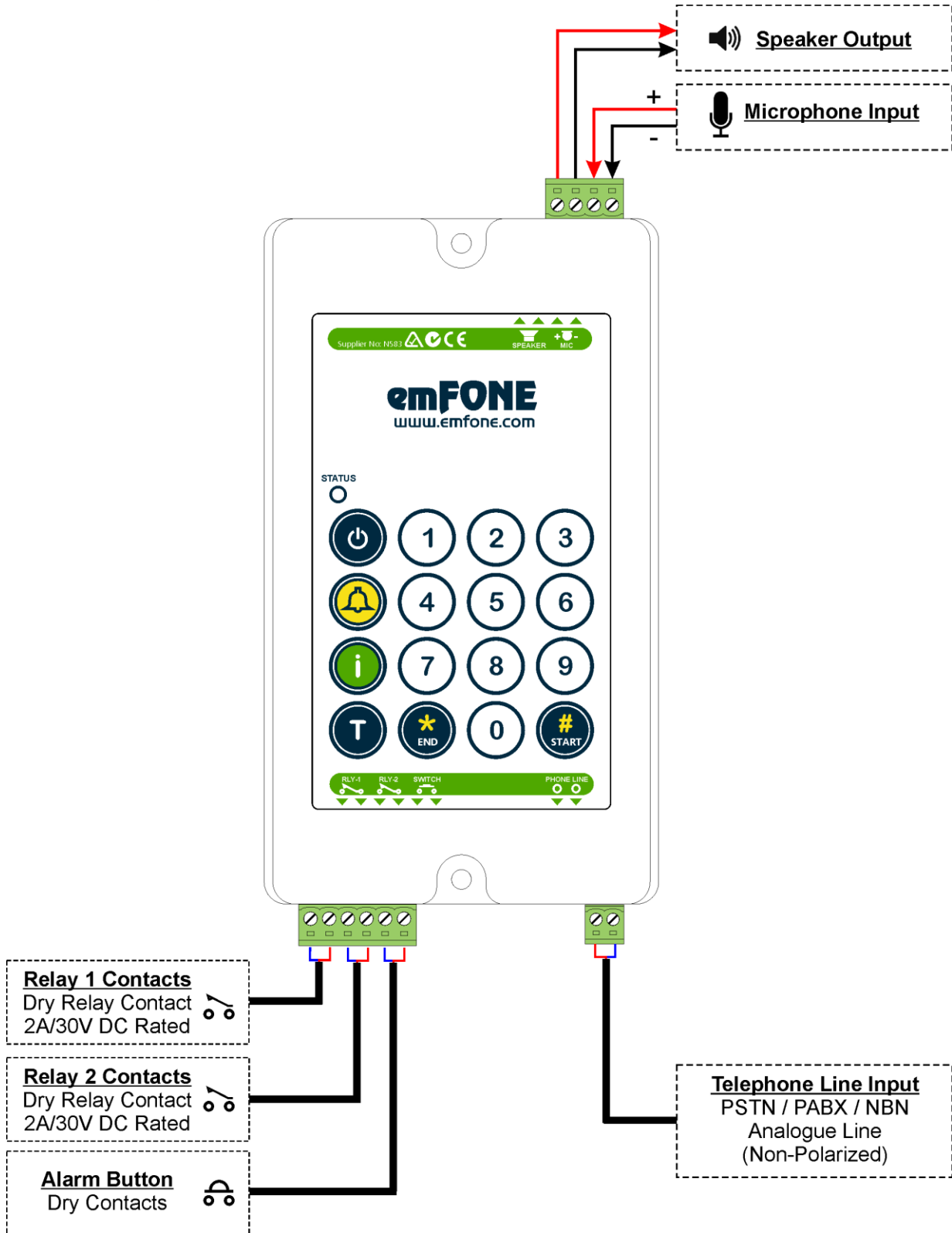


Figure 1 - Wiring Diagram

## 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-2 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.


Pixel 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 Pixel Technologies equipment. Consult individual product manuals for electrical specifications<sup>1</sup>.

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<sup>1</sup> Product manual electrical specifications are for a single product only

### 3. Configuration

The EM-2 can be configured from the on board membrane keypad or alternatively by dialing in remotely and entering programming sequences using a touch tone telephone or mobile handset.

To enter any configuration sequence via the onboard keypad the unit must first be turned on by holding down the  button for 1 second.

NOTE: After successfully entering a programming sequence the unit will play 4 beeps. If you do not hear these beeps, this indicates that the sequence was entered incorrectly and has not been registered.

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 3.5 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 3.5 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	*
---	-----	---	---	---------	---

### 3.3. Help Numbers

There are three individual telephone help numbers that the unit can dial.

#### 3.3.1. 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).*

#### 3.3.2. Programming a Single Telephone Number

To program a single number into all three memory locations enter the following sequence:

#	PIN	9	#	0	TELEPHONE NUMBER	*
---	-----	---	---	---	------------------	---

#### 3.3.3. Programming Multiple Telephone Numbers

To program three individual telephone help numbers enter the following set of sequences:

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

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

LOCATION 1	*	0
LOCATION 2	*	1
LOCATION 3	*	2

#### 3.3.4. 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 external PSTN line.

To program a single number into all three memory locations enter the following sequence:

= 3 Second Pause

#	PIN	9	#	0	PABX CODE	#	TELEPHONE NUMBER	*
---	-----	---	---	---	-----------	---	------------------	---

### 3.3.5. 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:

#	PIN	9	#	0	*
---	-----	---	---	---	---

### 3.3.6. Changing the GET Number

The GET number is dialed when the 'i' (information) button on the unit's keypad is pressed.

The number by default is '12722123', which dials the 'own number recorded voice announcement' feature allowing the user to identify the telephone line number in which the unit is connected to.

To change the GET number to dial a different service provider, enter the following sequence:

#	PIN	#	4	GET NUMBER	*
---	-----	---	---	------------	---

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

*	4
---	---

### 3.4. Voice Identification Message

A built-in voice message is played upon answering an 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.

#### 3.4.1. Recording the Voice Identification Message

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

When recording;

- 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 two audible beeps when the recording time elapses.

1. Enter the following sequence, wait until two 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 any time by entering the following sequence:

\* 9

If a voice identification message is not required, refer to section 3.6 to disable this feature.

## 3.5. Advanced System Settings

### 3.5.1. Dial Time (A)

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

### 3.5.2. Talk Time (B)

The maximum length of conversation time during a call.

### 3.5.3. Silence Time (C)

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

### 3.5.4. Alarm Button Timer (D)

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

### 3.5.5. Auto-Answer Ring Count (E)

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

### 3.5.6. Auto-Answer (F)

The unit will auto-answer a call if this feature is enabled. If disabled it will not pick up a call. Disable when multiple units are sharing the same line, and incoming calls are answered from another handset.

### 3.5.7. PABX Continuous Tone Detector (G)

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.

### 3.5.8. Programming the Advanced System Settings

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

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

	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	1	9	3
E	Auto-Answer Ring Count	E x 2 rings	1	9	3
F	Auto-Answer	0 = Disabled 1 = Enabled	0	1	1
G	PABX Continuous Tone Detector	0 = Disabled 1 = Enabled	0	1	1

Table 2 - Advanced System Settings

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

\* 5

## 3.6. Audio & Relay Settings

### 3.6.1. 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'.

### 3.6.2. Speaker Volume (B)

The speaker volume alters the output level of the speaker when in conversation.

### 3.6.3. Relay 1 and Relay 2 Options (C and D)

There are three programmable options to choose from as detailed in Table 3, section C & D.

### 3.6.4. Relay ON Time (E)

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

### 3.6.5. Relay Type (F)

The relay contact configuration can be set to either normally open (N/O) or normally closed (N/C).

### 3.6.6. Programming the Audio & Relay Settings

To program the audio & 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
<b>A</b> Voice Identification Message	0 = Disabled 1 = Play upon call being answered 2 = Play when (*9) is entered	0	2	1
<b>B</b> Speaker Volume	-	0	9	9
<b>C</b> Relay 1 Options	0 = ON when unit is on 1 = ON when call is answered 2 = ON when DTMF code (#81) is sent	0	2	2
<b>D</b> Relay 2 Options	0 = ON when unit is on 1 = ON when call is answered 2 = ON when DTMF code (#82) is sent	0	2	0
<b>E</b> Relay ON Time	D x 2 seconds	1	9	2
<b>F</b> Relay Type	0 = Normally Open 1 = Normally Closed	0	1	0

Table 3 - Audio & Relay Settings

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

**\* 7**

## 3.7. Telephone Line Settings

### 3.7.1. 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.

### 3.7.2. 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.

### 3.7.3. 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	-	0	9	4
B	Busy Tone Cadence	0 = 210ms - 750ms (long beeps) 1 = 60ms - 750ms (short beeps)	0	1	0

Table 4 - Telephone Line Settings

To hear an audible playback of the telephone line settings, enter the following sequence:

\* 8

### 3.8. Remote Phone Monitoring System (RPMS)

RPMS is an auto self-test and health check feature designed to report system status to a remote communication centre.

#### 3.8.1. Reporting Conditions

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

- After an alarm call has been raised.
- When a manual report is initiated.
- Automatically as per the periodic report specified in section 3.8.3.

#### 3.8.2. 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 5 - RPMS Settings

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

\* # 7

#### 3.8.3. Periodic Reports

Enter the sequence below to set the frequency of which the unit will perform an auto self-test report:

# PIN 2 # 7 N N \*

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

Table 6 - RPMS Settings

To hear an audible playback of the periodic reports settings, enter the following sequence:

# 0 7 \*

### 3.9. Reset to Factory Default

To reset programmable setting to factory default, press and hold the '0' key for 3 seconds until 4 audible beeps are heard then enter;

# \*

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

## 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 in which the unit is connected
	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 of programming sequence

Table 7 - Membrane Keypad Buttons

### 4.2. Raising an Alarm Call

To make a call press the 'Alarm' button on the unit's onboard keypad or close the alarm button dry contacts connected to the units Alarm button input. The unit will dial the pre-programmed help number, or if configured for a HOTLINE as detailed in section 3.3.5 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 3.6.3, enter the following individual sequences:

RELAY 1	#	8	1
RELAY 2	#	8	2

#### 4.3.4. Manual Report

A manual system report can be requested during a call, when the call ends, the unit will proceed to make a manual report. To request a manual report, enter the following sequence:

# 0 0 \*

## 5. LED Diagnostic Indicators

The onboard LED will illuminate to indicate its state as detailed below:


LED	NAME	LED COLOUR	'ON' STATE
	STATUS	RED	When the unit has been turned 'ON' or an alarm button call has been acknowledged.

Table 8 - LED Diagnostic Indicators

## 6. Unit Testing Procedure

### 6.1. Test the Programmed Help Number

1. Press and hold the ALARM button for 3 seconds on the unit's keypad.
2. The telephone line will turn ON and the STATUS LED will illuminate RED.
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 communication can begin.
6. To end the call, press the ON/OFF button.

### 6.2. 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 and hold the ON/OFF button for 3 seconds on the unit's keypad.
2. The telephone line will turn ON and the STATUS 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 communication can begin.
5. To end the call, press the ON/OFF button.

## 7. Troubleshooting

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

PROBLEM	SOLUTION
Telephone line fault	Test the standby telephone line voltage <ol style="list-style-type: none"> <li>1. Connect a DC meter across the line terminals</li> <li>2. PABX line voltage should read 24V DC</li> <li>3. PSTN/NBN line voltage should read 48V DC</li> </ol> Test the ON telephone line voltage <ol style="list-style-type: none"> <li>1. Turn the unit on by pressing the ON/OFF button</li> <li>2. Connect a DC meter across the line terminals</li> <li>3. Line voltage will be approximately 7V - 12V DC</li> </ol>
No dial tone	<ul style="list-style-type: none"> <li>• Check the telephone line voltage</li> <li>• Service may have been disconnected from the service provider.</li> <li>• Try connecting a standard telephone handset across the line to test for dial tone.</li> <li>• If the unit automatically dials when the line is ON the line is connected to a HOTLINE. Refer to section 3.3.5 for further details.</li> </ul>
Alarm button does not work	<ul style="list-style-type: none"> <li>• Ensure the Alarm button is wired to the switch contacts correctly and that there is no open circuit condition.</li> <li>• Alarm button needs to be a dry contact connection.</li> </ul>
'i' (Information Button) not working	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Please note that this feature will not work if connected to a PABX system.</li> </ul>
Noise on the telephone line	<ul style="list-style-type: none"> <li>• Noise is usually induced from the trailing cables.</li> <li>• Microphone leads may be too close to high voltage cabling.</li> <li>• 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.</li> <li>• Swap the telephone line to another pair of wires.</li> <li>• Earth the shield of the trailer cable.</li> </ul>
Acoustic feedback	<ul style="list-style-type: none"> <li>• 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 unit.</li> </ul>

**Table 9 - Troubleshooting**

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

## 8. Reference

### 8.1. Technical Specifications

<b>Telephone Line Voltage</b>	24V - 50V DC
<b>Telephone Line Current</b>	25mA - 90mA
<b>Dialing Method</b>	DTMF
<b>Relay Contact Rating</b>	2A/30VDC
<b>Relay Contact Type</b>	N/O and N/C Programmable contact type
<b>Speaker Volume</b>	Programmable - 80dB at 1 meter 425Hz
<b>Speaker</b>	32Ω 1W
<b>Microphone</b>	2K Impedance, operating range 5 meters
<b>Alarm Button</b>	Dry Contacts
<b>Memory</b>	Non Erasable Memory - 20 year message retention and 10,000 record cycles per sector
<b>Digital Voice Message Length</b>	16 seconds maximum
<b>Operating Temperature</b>	0°C - 75°C
<b>Dimensions</b>	157mm x 80mm x 19.5mm
<b>Manufactured</b>	Melbourne, Australia

Table 10 - Technical Specifications

## 8.2. Dimensions

### 8.2.1. Top and Side View

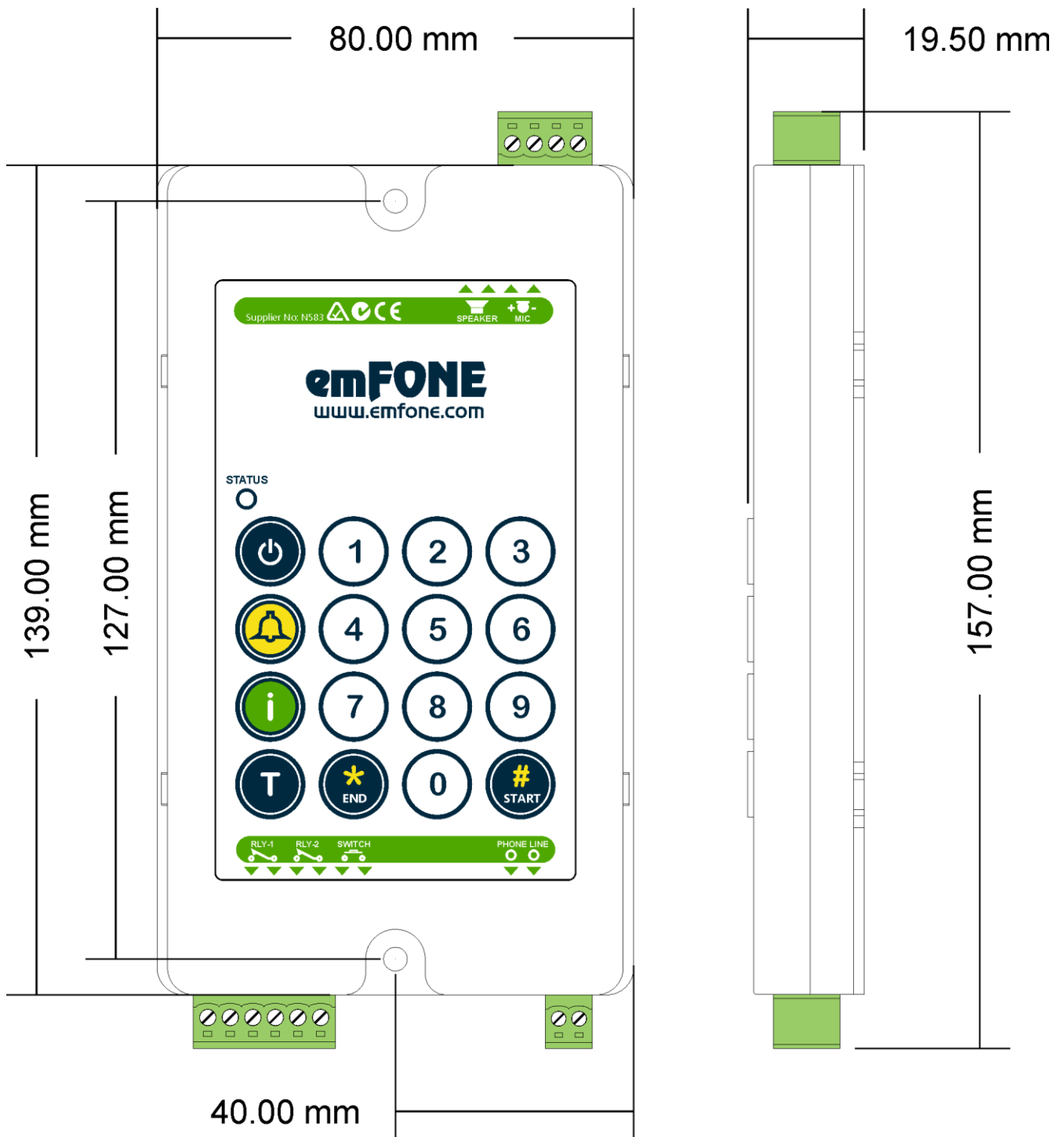


Figure 2 - Top and Side View

### 8.2.2. Stud Mounting & Grill Cut-out Positioning

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

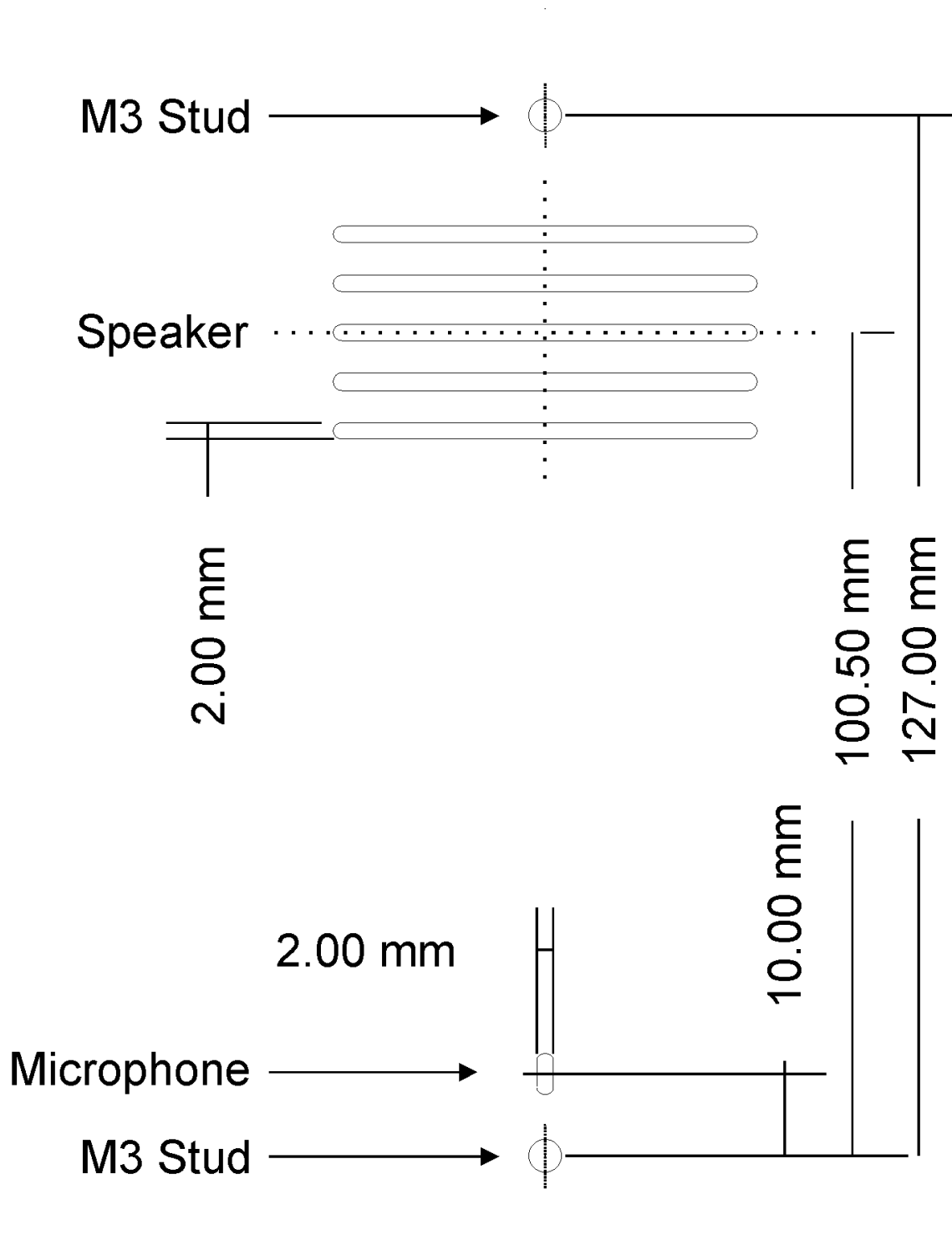


Figure 3 - Stud Mounting & Grill Cut-out Positioning

### 8.2.3. Installation using Mounting Clips

**NOTE:** Only for use with previous emFONE case installations. Please follow the new stud mounting dimension detailed in section 8.2.2 for all new installations.

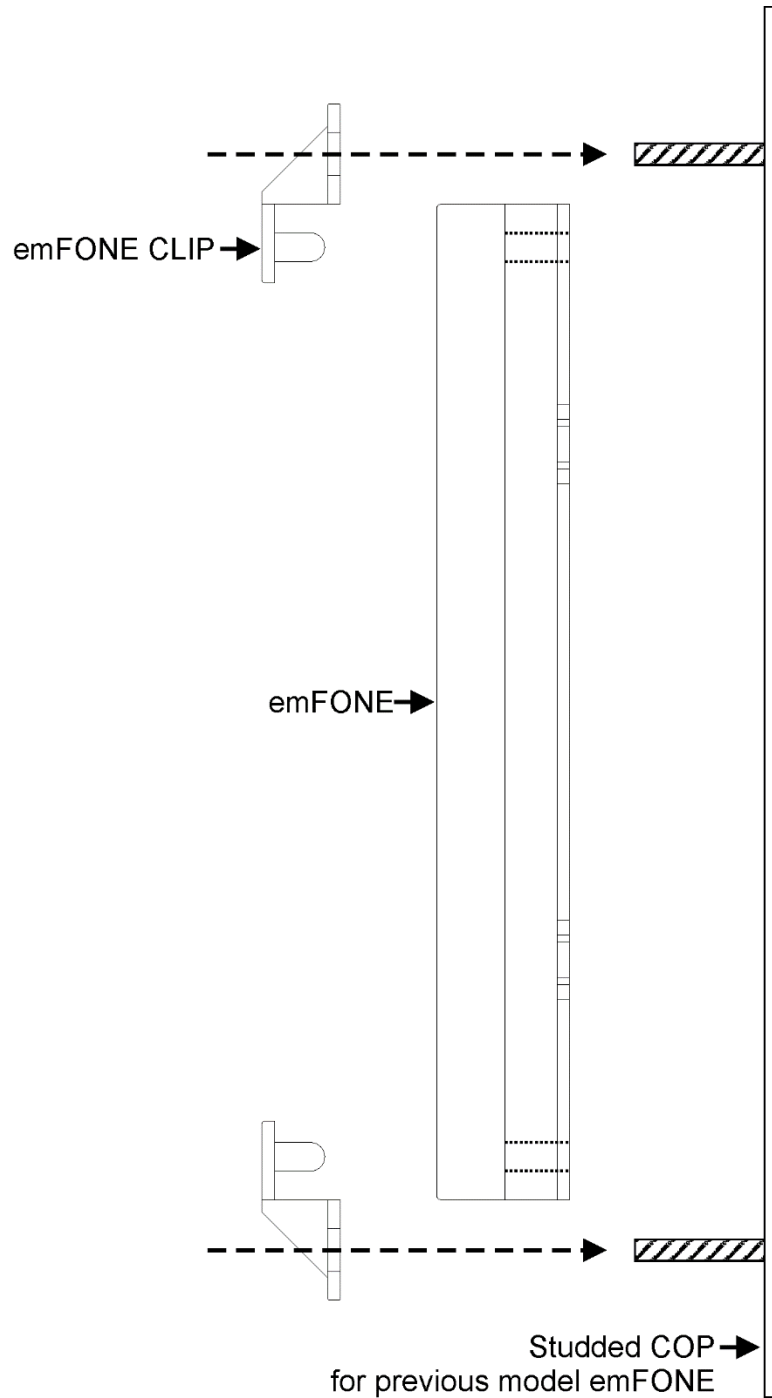


Figure 4 - Installation using Mounting Clips

### 8.2.4. External Speaker & Microphone Stud Mounting and Dimensions (Optional)

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

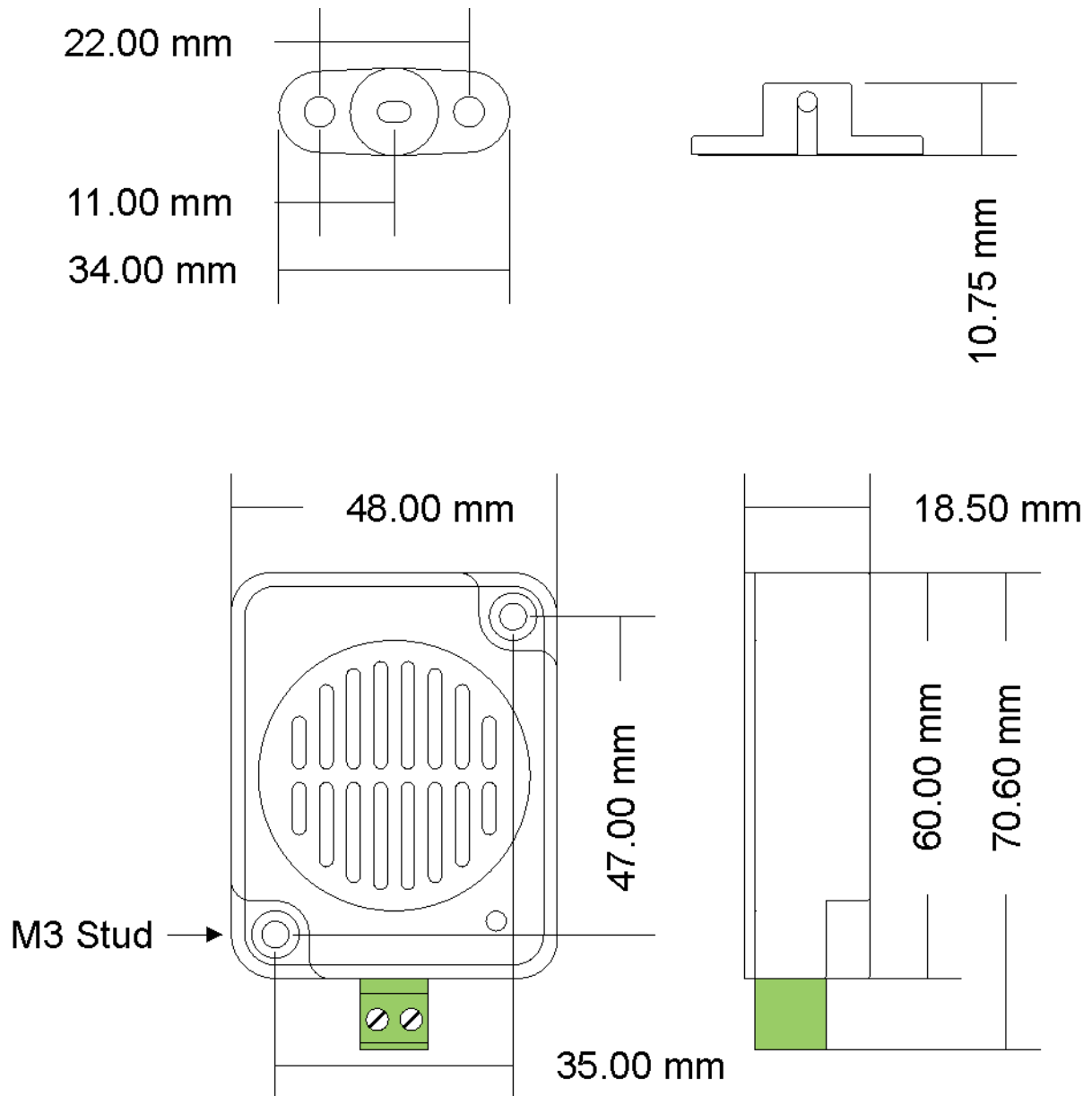


Figure 5 - External Speaker & Microphone Kit Stud Mounting and Dimensions

## 9. Maintenance

### 9.1. 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-SPK/32R	Internal 32 Ohm Speaker (Inc. Wire Connection)
EM-SPK/MIC	External Speaker & Microphone Kit

Table 11 - Replacement Parts

## 10. 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.

## 11. Warranty

Before calling a Service Technician please carefully examine the operating instructions and the warranty terms and conditions. For details on the **Pixel Technologies** Warranty Procedure, please visit [www.pixeltechnologies.com.au](http://www.pixeltechnologies.com.au)

## 12. Contact

For contact details please refer to [www.pixeltechnologies.com.au](http://www.pixeltechnologies.com.au)

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