IA4100 Speakerphone

Installation | Configuration | Operation | Troubleshooting

Administrator Guide

Code Blue®

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Notice

Every effort was made to ensure that the information in this document was complete and accurate at the time of printing. However, information is subject to change.

IA4100 Full Duplex Disclaimer

This mode of operation is dependent on the systems/services that the IA4100 is connected to. Various systems, including VoIP systems, Analog Terminal Adapters, etc. may cause adverse functionality due to multiple acoustic echo cancelling points throughout the system configuration.

TCP/IP

Customers may experience differences in product performance, reliability and security depending upon network configurations/design and topologies, even when the product performs as warranted.

2 Introduction

Thank you for choosing the Code Blue IA4100 analog speakerphone(s), intercom(s) and paging device(s) for indoor and outdoor applications. These speakerphones are part of our Emergency Signaling group of products that are built to meet the latest regulations, withstand the harshest elements and be proactive solutions for when you need them most. This guide provides basic and advanced programming information for obtaining the best performance with the IA4100 speakerphone(s).

IA4100 Single Button

IA4100 Double Button

IA4100 Double Button + Keypad

Call Privacy Laws

Some states require all parties to be aware that they are being recorded. Code Blue phones offer the ability to play a message stating that the caller is being recorded and giving the caller the option to continue or end the recorded call.

3 Getting Started

The IA4100 speakerphone is a hands-free, ADA-compliant emergency speakerphone designed for outdoor or indoor use. Code Blue's latest generation of speakerphones establishes a new industry benchmark for both features and reliability. It is a highly vandal resistant unit incorporating a .125" stainless steel faceplate, a self-healing, aluminum 1.5" piezoelectric push button, self-monitoring ability and fault reporting for loss of power and low battery voltage.

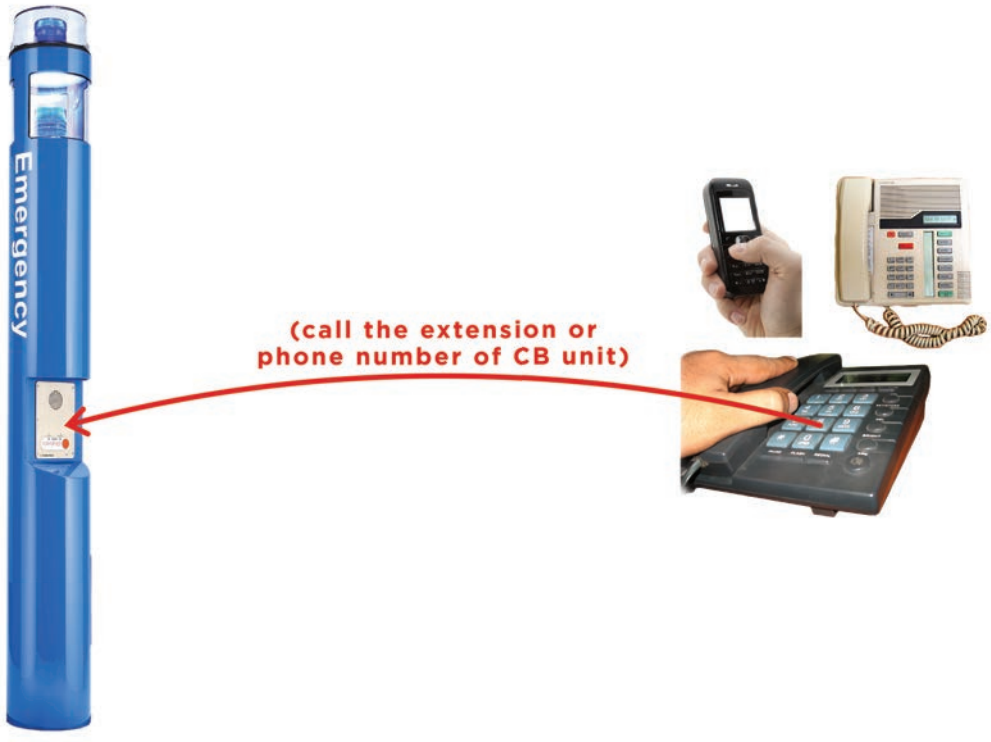
The IA4100 is designed to automatically dial any one of the pre-programmed numbers (determined by priority programming) or initiate a PBX Private Line Automatic Ringdown (PLAR) circuit and illuminate a .375" diameter vivid red LED indicating "Call placed." Upon receipt of the call, the IA4100 identifies itself with a digital recorded voice message and illuminates a separate .375" diameter green LED indicating "Call received." The IA4100 is also capable of activating peripheral devices such as CCTV or strobe lights via one of its three normally open or three normally closed auxiliary outputs. All functions of the IA4100 speakerphone are remotely programmable via any touch-tone phone or Code Blue's Unit Programming and Diagnostic (UPD) software package, and are protected by a user defined security code.

NOTE: Programming via a cell phone is subject to the quality of the call's DTMF tone transmission.

Throughout this guide you will see the following two references:

Caller: This is the person activating the IA4100 speakerphone by pressing a button or activating the auxiliary input.

Callee: This is the person receiving the call from the IA4100; typically a guard, 911 operators, dispatch officer, etc.



Note: If the IA4100 is purchased separate from an enclosure, the following parts are included:

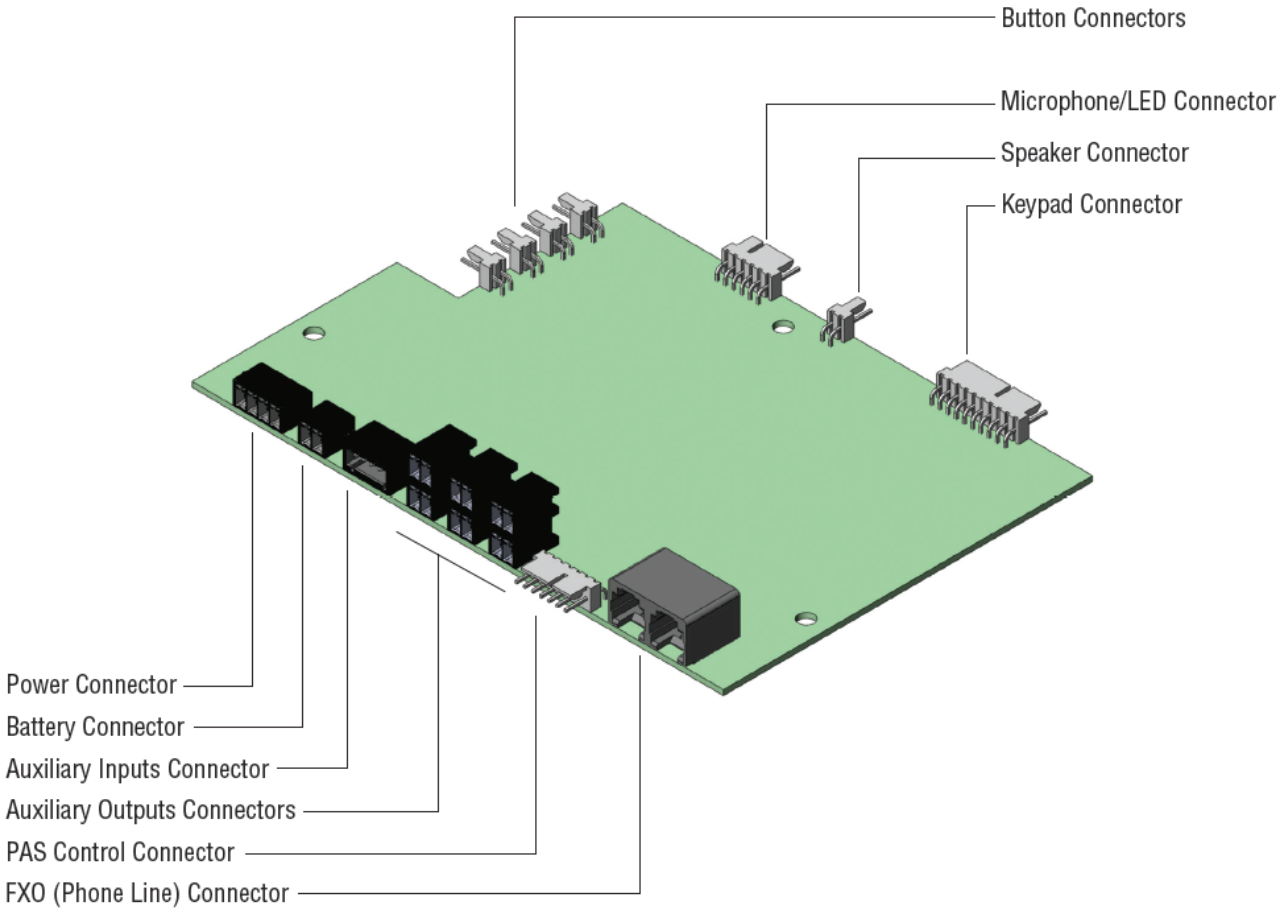
Quantity	Part #	Description	
1	50001	PUSH FOR HELP single button	Included
1		42” Power Harness	Included
1		10’ Phone Cord w/RJ11	Included
6		Faceplate Security Screws	Included
1		Security Bit	Included

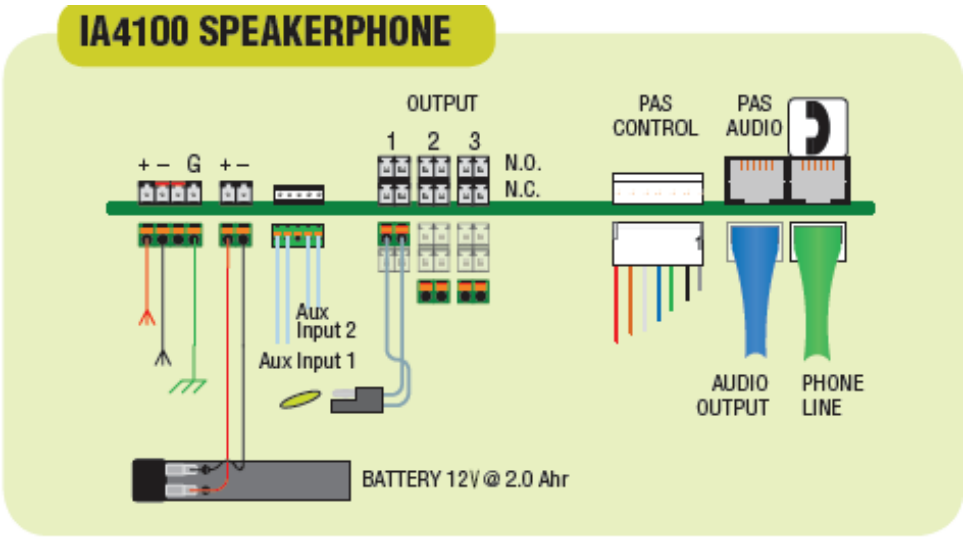
Note: The following are optional parts available for the IA4100

Part #	Description	
50002	PUSH FOR HELP Double Button	Optional
50003	PUSH FOR HELP Double Button w/Keypad	Optional
41471	Analog Modular Phone Line Surge Suppressor	Optional
40064	4 Ohm Speaker - 3 Pack	Optional
40354	Microphone Assembly	Optional

4 Circuit Board Connector List

The IA4100 speakerphone comes with your choice of single button, double button or double button with keypad faceplate. The internal components consist of a speaker, microphone, PCB and mounting hardware.

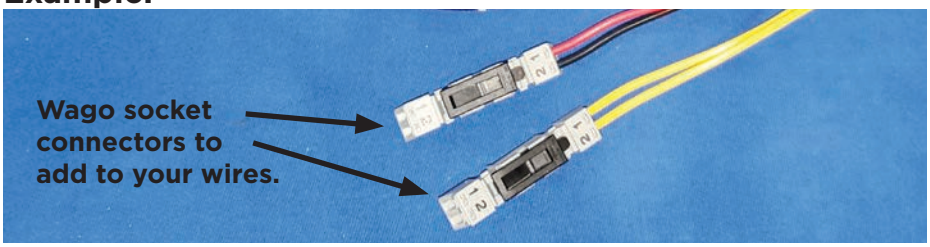




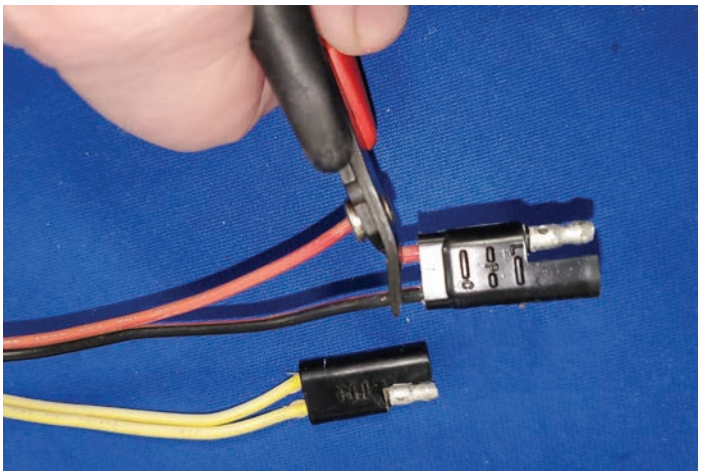
5 How to Update Connectors

As of 2020, many Code Blue products come with Wago connectors. These connectors provide ease of use and a much stronger connection. Below are the steps needed to change to the new connectors.

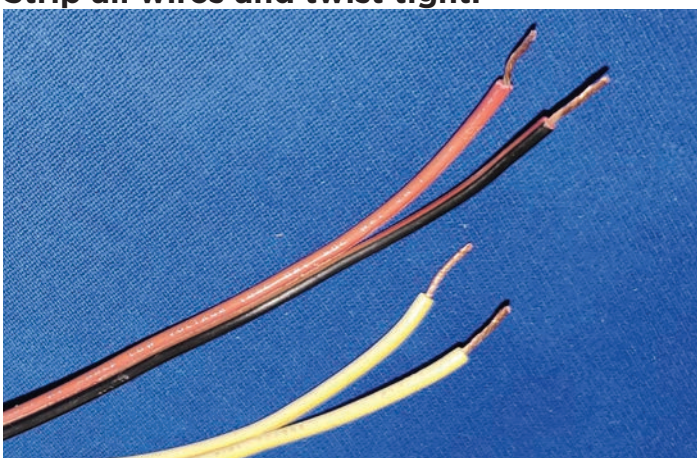
Example:



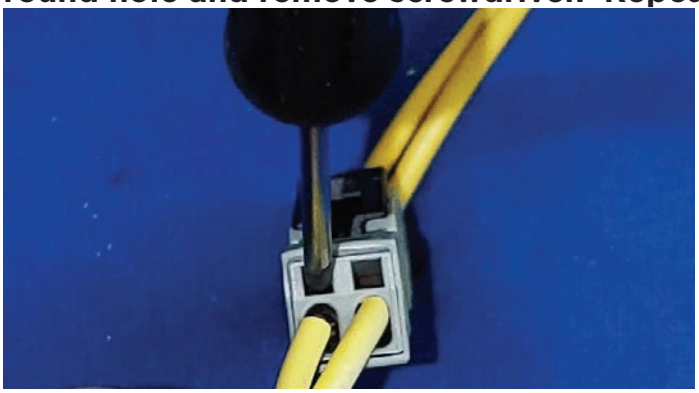
Cut off both wires.



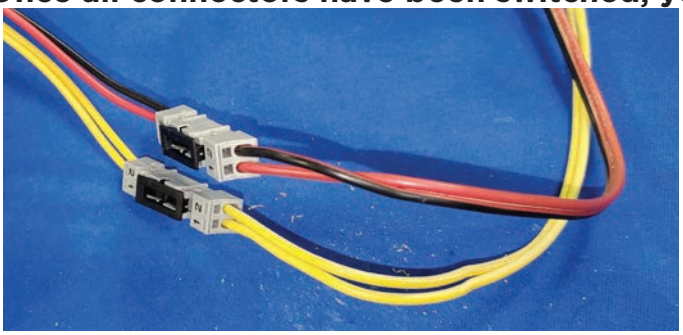
Strip all wires and twist tight.



Place small screwdriver into square hole and push down. Insert cut wire into round hole and remove screwdriver. Repeat on the rest of the connectors.



Once all connectors have been switched, you are ready to apply power.



Please contact **technicalsupport@codeblue.com** if you need further assistance.

6 Quick Installation Guide

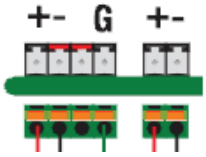
The IA4100 analog speakerphone is designed to fit into any existing or new Code Blue enclosure. It is a direct replacement for the following InterAct legacy series models: IA2000, IA3000, IA3100. Additionally, Code Blue offers custom faceplate sizes that allow the IA4100 to be placed in many different enclosure types.

Code Blue provides the following items with each IA4100: six security screws, one security bit, 7-foot phone line, power harness, surge suppressor and ground wire.

1. Using the provided Velcro, mount the surge suppressor to the back of the enclosure near the grounding lug. Connect the green ground wire to the grounding lug.
2. Insert the phone wire first into the surge suppressor and then to the RJ11 on the IA4100 marked with this symbol:

3. The power harness will have three connections:

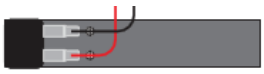
   a. A 4-pin power connector will connect to the 4-pin opening on the IA4100.



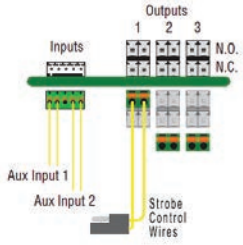
   b. The green wire will run to the grounding lug.

   c. Run the gray-and-black male connector into the female connector on the power supply inside the unit.

4. Plug in the battery wires. They are left unplugged for shipping to prevent running down the battery.



5. If you have a strobe light, run the yellow wires into N.O. output 1.



You are now ready to program your IA4100.

7 Installation

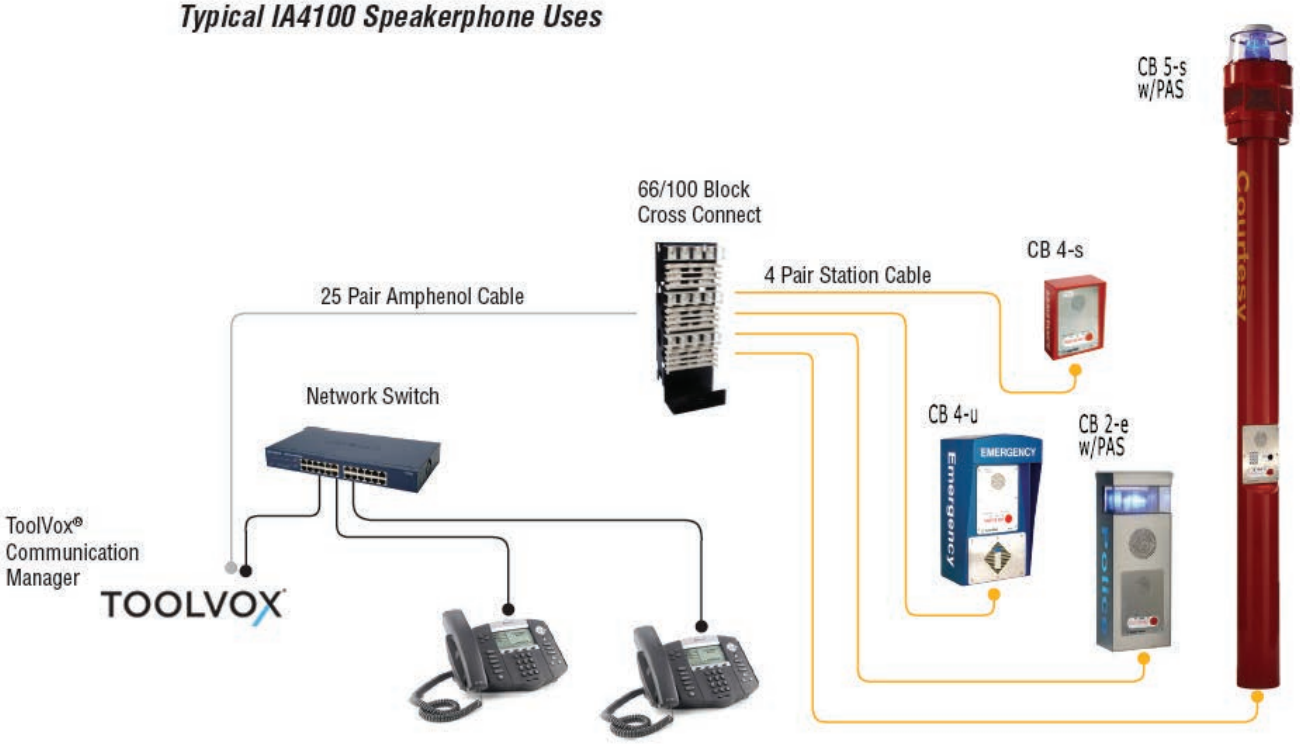
The IA4100 speakerphone is capable of being connected to 12-24 Volts DC or 12-24 Volts AC power sources. Additionally, the IA4100 may also be configured with a 12 Volts DC battery backup system that monitors and reports on the battery voltage for ensured up time.

The IA4100 has one FXO port for connectivity to POTS/1MB/Station Ports from a Local Exchange Carrier, PBX system, etc.

The IA4100 has three normally open and three normally closed auxiliary output contacts for connecting devices, such as the LED beacon/strobe, camera preset activation inputs, third party controllers, etc. There are also two normally open auxiliary input contact closures for connecting devices, such as door contacts, relays, etc. which can be programmed to perform various functions of the phone.

The IA4100 speakerphone has been designed to be mounted in any Code Blue enclosure. Custom faceplates are available for mounting in other product enclosures. Contact your local dealer for additional information and availability of custom options.

Typical IA4100 Speakerphone Uses



8 Optional Flush Mount Enclosure Installation

PRE-INSTALLATION

1.0 **Electrical preparation** – The unit may have supply wires run from either (a) behind the unit through the wall, or (b) below the unit by using an external conduit through the bottom of the unit's back plate. Mounting holes in the back, bottom or side of unit to be administered by the installer.

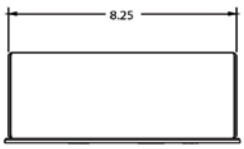
IMPORTANT: If wiring is coming in from the bottom or back, insure that the conduit is aligned at this time. Connect electrical and communications wiring (see wiring instructions). Follow all national and local codes that apply.

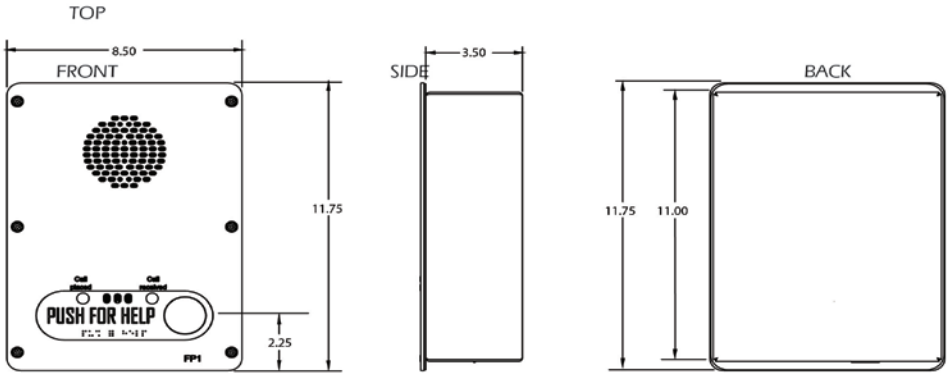
1.1 **Prepare Wall** – FME enclosure mounting hole in wall should except the housing dimensions below and must be smaller than the faceplate dimensions to ensure clean flush mount look.

INSTALLATION PROCEDURES

1.2 **Mark the flush mount mounting hole** – In order to comply with the Americans with Disabilities Act (ADA) of 1990, the speakerphone button(s) should be positioned between 34 and 48 inches from grade level. (Consult an ADA specialist in your area to verify local and federal guidelines.)

1.3 **Secure the housing to the wall** – The Flush mount enclosure can be mounted from the back, bottom or side by drilling the mounting holes where needed per the installers application while still keeping the unit within ADA compliance height. (1.2) Mounting hardware to be supplied by installer.





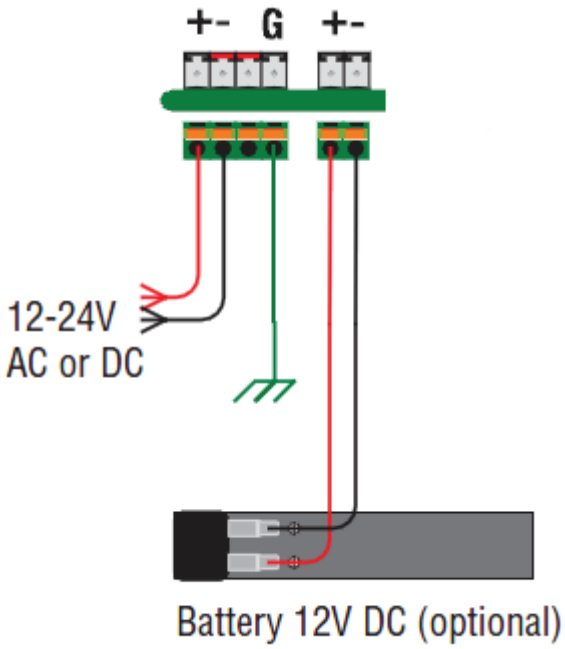
NOTE: mounting holes and conduit hole by others

Specifications subject to change without notice or obligation on the part of the manufacturer

9 Connecting Power Sources

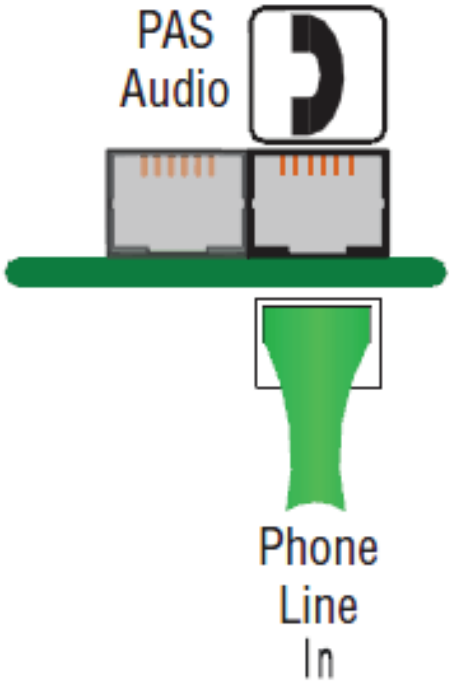
The IA4100 speakerphone is capable of being connected to any power source that provides 12-24 Volts AC or DC with a minimum of 400 mA current rating. Optionally, a battery can be connected to the secondary power input and the IA4100 speakerphone will monitor the battery for low voltage conditions, typically utilized in solar or NightCharge® applications. It is strongly recommended that you disconnect any power to the unit prior to installation. Consult your local electrician for proper power connectivity to your Code Blue equipment.

NOTE: When powered by solar or NightCharge option, the IA4100 battery circuit becomes the main power input.



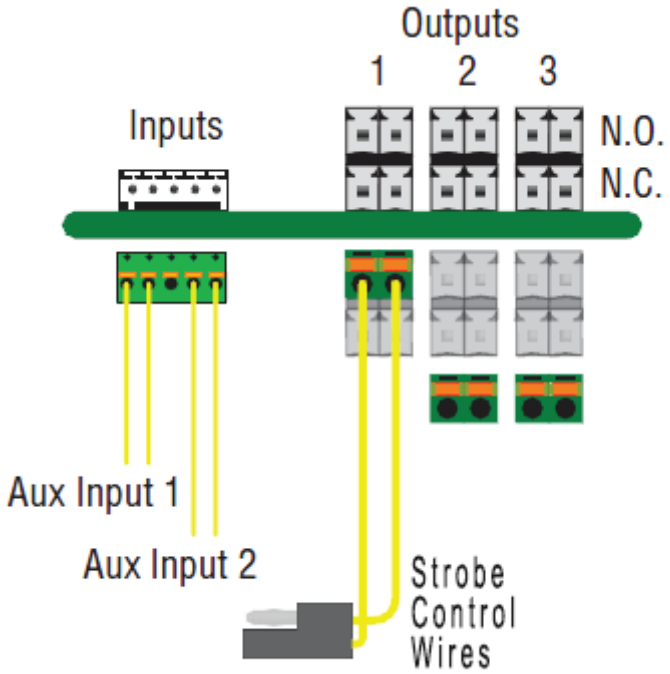
10 Connecting PSTN/PBX Services

The IA4100 speakerphone has one FXO port for connectivity to POTS/1MB/Station Ports from a Local Exchange Carrier, PBX system, etc. Each Code Blue phone requires its own line or PBX extension of one pair of shielded twisted pair for the telco line (telco wire size varies depending on the distance required; 22 gauge is standard).



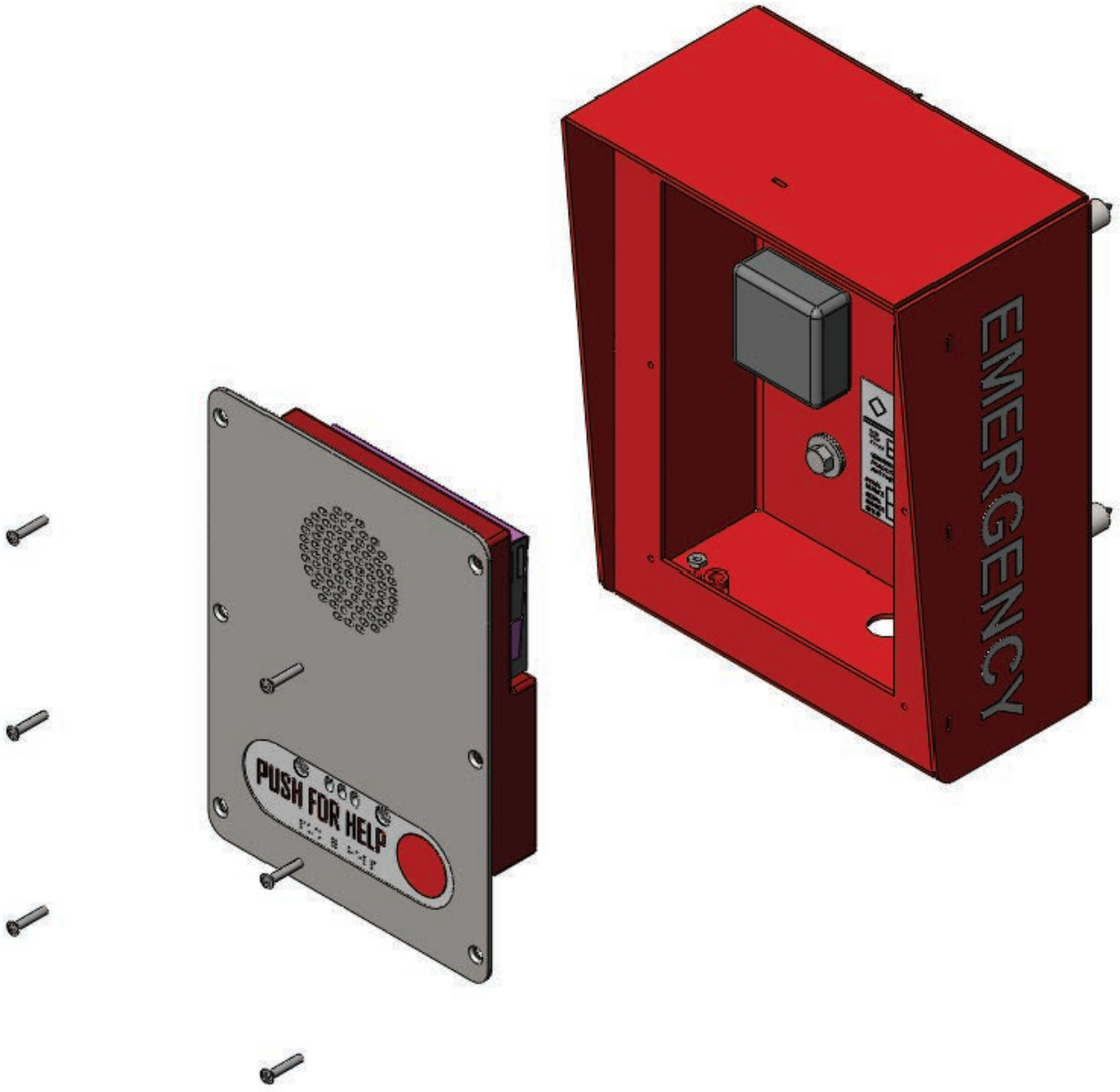
11 Connecting Auxiliary Devices

The IA4100 speakerphone analog auxiliary connections are three normally open or three normally closed outputs and two normally open inputs. Typically, any Code Blue unit with a LED beacon/ strobe will have the trigger connected to Auxiliary Output 1. The Auxiliary Outputs can be programmed to be active during a call or by entering a specific time period. The Auxiliary Inputs can be programmed to perform any script entered into the phone. Auxiliary inputs require power utilizing any voltage between 9 and 32 volts AC or DC.



12 Installation Into Code Blue Units

The IA4100 speakerphone is designed to fit into any existing or new Code Blue unit enclosure. It is a direct replacement for the InterAct analog legacy series: IA2000, IA3000 and IA3100. Additionally, Code Blue offers custom faceplate designs, allowing the IA4100 to be placed in many different enclosure types. Code Blue provides six custom security screws and a security bit with each Code Blue unit for attaching the IA4100 speakerphone. Consult your unit installation instructions for further information.



13 Basic Programming

PROGRAMMING

1. NORMAL PROGRAMMING

Call the extension or phone number of CB unit, after the RFA tone:

12583#	programming mode (required)
99∗99#	defaults the phone (required)
57#	trains the phone on the local loop (required)
4108#	revert to dial tone hangup (required)
4308#	repeating (reorder) tone hangup (required)
1204#	Output 2 (for AED unit ONLY)
351#	Input 1 (for AED unit ONLY)
01 <phone number> #	1st phone number, button #1 dials (required)
02 <phone number> #	2nd phone number, button #1 dials (optional)
04 <phone number> #	1st phone number, button #2 dials (optional)
05 <phone number> #	2nd phone number, button #2 dials (optional)
∗#	hang up and exit programming

Failure to program in any number will result in a failure to operate.

3. PROGRAMMING FOR HOT LINE (RING-DOWN)

Call the extension or phone number of CB Unit, after the RFA tone:

12583#	programming mode (required)
99∗99#	defaults phone (required)
57#	trains the phone on the local loop (required)
5000#	give up waiting for dial tone (required)
4108#	revert to dial tone hangup (required)
4308#	repeating (reorder) tone hangup (required)
∗#	hang up and exit programming

If messages are required see section 4.

2. GSM CELLULAR PROGRAMMING

Call the extension or phone number of CB Unit, after the RFA tone:

12583#	programming mode (required)
99∗99#	defaults phone (required)
57#	trains the phone on the local loop (required)
4108#	revert to dial tone hangup (required)
4308#	repeating (reorder) tone hangup (required)
5145#	unique GSM programming command (required)
5245#	unique GSM programming command (required)
01 <phone number> #	1st phone number, button #1 dials (required)
04 <phone number> #	1st phone number, button #2 dials (optional)
∗#	hang up and exit programming

4. RECORDING MESSAGES

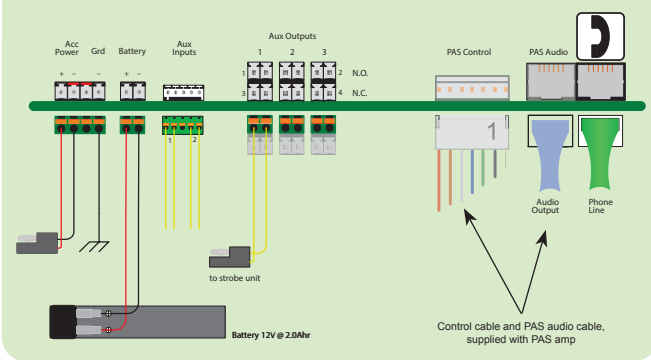
Call the extension or phone number of CB Unit, after the RFA tone:

12583#	programming mode
21# <your message> #	plays to end user at CB unit when HELP activated
22# <your message> #	plays to end user at CB unit AND called party when call is answered
∗#	hang up and exit programming

AUXILIARY OUTPUTS (default settings)

Auxiliary Output #1	closed until the end of the call
Auxiliary Output #3	closed for one second momentary contact closure

IA4100 DIAGRAM



COMMANDS DURING A CALL

The following commands can be used by the called party after the IA4100 places a call. These commands **cannot** be used in Programming Mode.

20	increase microphone gain
21	decrease microphone gain
22	speaker volume up
23	speaker volume down
24	microphone mute
25	speaker mute
41	toggle half/full duplex
01	play message #1
02	play message #2
11	turn on auxiliary output 1
13	turn on auxiliary output 3
14	turn off auxiliary output 1
16	turn off auxiliary output 3

14 Advanced Programming

Information programmed into the phone is represented by <numbers, symbols and/or recording>. When the instructions call for entering 1<programming password>#, simply press 1 and the default password, followed by the # (pound) symbol on your telephone keypad. For example, the default password on the IA4100 is 2583. To put the IA4100 into Program Mode, dial 12583#.

When you enter a command (CMD) correctly, the unit will respond with a single beep (DTMF “B”). If a command has been entered incorrectly, the unit will respond with a rejection triple beep (DTMF “BBB”). When commands are met with a triple beep, the command has not been accepted and will not affect the programming of the unit.

All necessary commands can be entered during one programming session. Any time the unit responds (with either a single beep or a rejection triple beep), it is capable of accepting another command.

When you first dial into the IA4100 speakerphone you will hear a Request For Acknowledgment (RFA) tone. If a response from you is not received within seven (7) seconds the IA4100 will remain in two-way audio mode and accept In Call Commands (section 5.2). Because the unit has not yet been programmed, you should dial 12583# on your touch-tone keypad to enter Program Mode.

The unit can be forced to hang up by depressing the ∗ (star) followed by the # (pound) symbols on the telephone keypad. If the ∗# sequence is not used to hang up the IA4100, the phone is programmed to recognize a Disconnect Supervision such as a WINK or reverse polarity signal from the PBX or PSTN. Also available is a Silent Time Out (CMD 42), reorder tones or revert to dial tone. The speakerphone will hang up once it has received any of these standard end of call signals. If none of those Supervised Disconnects occur, the speakerphone will stay active (i.e., Call received LED light stays on) after the called party has hung up or until the Call Timer expires.

NOTE: You MUST program the speakerphone after installing the Code Blue unit.

14.1 Initial In-Call Commands

The following commands are used after the RFA (Request For Acknowledgement) tone upon initial call in. When calling the extension or phone number of the IA4100 you will hear the RFA tone (DTMF “B”). If a new command mode is not selected within seven seconds, the IA4100 will default to two-way call mode (full monitoring) and will start accepting “Commands During A Call” (see page 8).

Initial Call-In Modes

Command	Explanation	Format	Default
1	Programming Mode	1<programming password> #	1 2583#
3	Full Monitoring, two-way (microphone and speaker)	3<call pass code> #	3#
4	Silent Monitoring, one-way call (speaker is off)	4<call pass code> #	4#
5	Monitoring, one-way call (microphone is off)	5<call pass code> #	5#
8	UPD Fault Reporting Mode[1]	8#	
9	Paging Mode[2]	9#	
∗#	Forced Hang Up	∗#	

NOTES: [1] UPD Fault Reporting Mode allows the UPD software to check the system for faults.
[2] Paging Mode is utilized to send the incoming call output to the attached Public Address System (PAS) amplifier/speaker array.

14.2 Commands During a Call

The following commands may be used by the called party after the IA4100 places a call, or by calling into the IA4100 and entering audio modes 3, 4 or 5. The commands below cannot be used while in programming mode. When issuing a two-digit command, the second digit must follow the first by no more than 0.7 seconds. Failure to complete the command will result in a DTMF "BB" NAK (double beep or rejected tones).

These commands cannot be used in Programming Mode.

Play Recordings

Command	Explanation	Format
01	Play message number 1	01
02	Play message number 2	02
03	Play message number 3	03
04	Play message number 4	04
05	Play message number 5	05
06	Play message number 6	06
07	Play message number 7	07
08	Play message number 8	08
09	Play message number 9	09

NOTE: To stop message playback, press # pound) during the message playback. When the message is finished, the user will hear a single tone (DTMF "#") to signal the end of message.

Audio Adjustments

Command	Explanation	Format
20	Increase microphone gain by 3 dB	20
21	Decrease microphone gain by 3 dB	21
22	Speaker volume up	22
23	Speaker volume down	23
24	Microphone mute toggle	24
25	Speaker mute toggle	25
28	PAS output volume increase	28
29	PAS output volume decrease	29

NOTES: If the audio level being changed has reached its maximum or minimum, you will hear two tones (DTMF "BB").

Microphone/Speaker/PAS audio level changes will be retained until changed or the audio gains are reset (See Programming Commands: Pass Codes and Reset Programming, Commands 95 and 99; page 16).

Microphone or speaker can be toggled between their current level and mute by issuing Commands 24 or 25.

When a mute command is entered, you will either hear a single tone (DTMF "B") to indicate NOT muted or a double tone (DTMF "BB") to indicate a muted condition.

Turn On/Off Outputs

Command	Explanation	Format
11	Turn on auxiliary output 1	11
12	Turn on auxiliary output 2	12
13	Turn on auxiliary output 3	13
14	Turn off auxiliary output 1	14
15	Turn off auxiliary output 2	15
16	Turn off auxiliary output 3	16

NOTES: When an auxiliary output is initiated, it will remain on for the duration of the timed programming or until turned off using Commands 14, 15 or 16 (See Commands 11, 12 and 13).

Normally Closed (N.C.) and Normally Open (N.O.) state changes are separated by 10 milliseconds on each output; they do not happen simultaneously. This is to ensure both the N.C. and N.O. contacts are never closed at the same time.

Miscellaneous

Command	Explanation	Format	Default
31	Extend Call Timer	31	10 minutes
33	Terminate message playback	33	
∗∗	Change from Monitor (3-5) or Paging (9) Mode to Programming Mode	∗∗	
∗∗#	Change from Programming Mode to Monitor (3-5) or Paging (9) Mode	∗∗#	

NOTE: The Call Timer is extended by Call Time Out minutes. (Programming command 44). After this command is entered, the user will hear a single tone (DTMF "B") acceptance.

End Call

Command	Explanation	Format
∗#	Hang up IA4100	∗#

NOTES: After entering ∗∗ or ∗∗# you will have seven seconds to enter a new initial call in command and password if applicable.

After seven seconds with no entry, the IA4100 will hang up.

14.3 Programming Commands

Programming a Phone Number to Dial

Command	Explanation	Format
01	Phone #1 RED button	01<phone number>#
02	Phone #2 RED button	02<phone number>#
03	Phone #3 RED button	03<phone number>#
04	Phone #1 BLACK button	04<phone number>#
05	Phone #2 BLACK button	05<phone number>#
06	Phone #3 BLACK button	06<phone number>#
07	Loss of power phone number	07<phone number>#
08	Loss of battery phone number	08<phone number>#
09	PAS Fault phone number	09<phone number>#

Programming for Hot Line (Ring-Down)

NOTES: HOT LINE (aka ring-down) – If the IA4100 is connected to a private line, automatic ring-down or "hotline," all phone number locations 01 through 09 must be cleared, with 99∗99# so no phone number will be dialed.

Call the extension or phone number of CB Unit, after the RFA tone:

12583#	programming mode
99∗99#	defaults phone / full reset
57#	trains the phone on the local loop
5000#	programs the phone for ringdown
∗#	hang up and exit programming

If messages are required see section 3.

The maximum number of digits including ∗ and # is 45.

A one-second pause when entering phone numbers is the ∗ (star) symbol.

Continued on next page)

Programming Commands *(continued)*

Programming Outputs

Command	Explanation	Format	Default
11	Auxiliary output 1	11<active time>#	91
12	Auxiliary output 2	12<active time>#	01
13	Auxiliary output 3	13<active time>#	01

NOTES: Active Time Values

00 = disabled
01 - 60 = 1 to 60 seconds
61 - 90 = 1 minute to 30 minutes
91 = until the end of the call
92 = until trigger on input 2

Recording Messages

Call the extension or phone number of CB Unit, after the RFA tone:

Programming Recordings

Command	Explanation	Format
12583#		programming mode
21	Message recording #1	21<record message>#
22	Message recording #2	22<record message>#
23	Message recording #3	23<record message>#
24	Message recording #4	24<record message>#
25	Message recording #5	25<record message>#
26	Message recording #6	26<record message>#
27	Message recording #7	27<record message>#
28	Message recording #8	28<record message>#
29	Message recording #9	29<record message>#
∗#		hang up and exit programming

NOTES:

RECORDING STEPS
1. Enter Command 21-29 followed by the # key
2. Wait for the beep
3. Recite your message
4. Enter # to confirm completion
5. The message will be played back for approval
6. Repeat steps 1-4 if your message is not ac ceptable
7. Enter the # key to terminate playback (21-29 Programming Mode only).

Maximum message length is 30 seconds.

To listen to a recorded message, dial ∗∗ <Command 21-29>#

For example: To listen to recording number 4 (Command 24): ∗∗ 24#

Message volume level can be changed with programming Command 67.

(Continued on next page)

Programming Commands *(continued)*

Programming Buttons and Inputs

Command	Explanation	Format	Default
31	Button 1 (RED)	31<phone number>∗<output(s)>∗<recording(s)>#	123∗13∗1#
32	Button 2 (BLACK)	32<phone number>∗<output(s)>∗<recording(s)>#	0456∗2∗#
33	Button 3	33<phone number>∗<output(s)>∗<recording(s)>#	∗∗#
34	Button 4	34<phone number>∗<output(s)>∗<recording(s)>#	∗∗#
35	Input 1	35<button>#	0#
36	Input 2	36<button>#	0#
37	Loss of AC power	37<phone number>∗<output(s)>∗<recording(s)>#	7∗∗7#
38	Low battery	38<phone number>∗<output(s)>∗<recording(s)>#	8∗∗8#
39	PAS Fault	39<phone number>∗<output(s)>∗<recording(s)>#	9∗∗9#

NOTES: For Programming Phone Numbers, see Commands 01 to 09 (page 5).

If the first phone number slot entered is zero and a keypad (i.e., FP2-K faceplate) is connected, then this button (other than RED) will activate as manual call mode. Or if entering a number slot (e.g., 31123∗∗# or 32456∗∗#) has a phone number programmed and a keypad is present, the number will be auto dialed. Upon the call being detected and answered by voice message (auto attendant), the user is allowed keypad access to dial a number allowed by system.

For setting outputs 1 through 3 on, see Programming Outputs, Commands 11 to 13 (page 5).

For recorded messages, see Programming Recordings 1 through 9, see Commands 21 to 29 (page 5).

A message will play over the speaker immediately after a button press in the order in which they were programmed.

For Input Commands 35 and 36, the input associated with the button is as follows:

0 = disabled
1 to 4 = button 1 to 4
Voltage controlled relays = 9-32 volts AC or DC

(Continued on next page)

Programming Commands *(continued)*

Command	Explanation	Format	Default
71	Upon answer of Button 1 calls	71<output(s)>∗<recording(s)>#	∗2#
72	Upon answer of Button 2 calls	71<output(s)>∗<recording(s)>#	∗#
73	Upon answer of Button 3 calls	71<output(s)>∗<recording(s)>#	∗#
74	Upon answer of Button 4 calls	71<output(s)>∗<recording(s)>#	∗#

NOTES: For turning outputs 1 through 3 on, see Programming Outputs, Commands 11 to 13 (page 5).

For recorded messages, see Programming Recordings, 1 through 9, see Commands 21 to 29 (page 5).

Example:

7123∗3# = when a Button 1 call is answered the phone will activate outputs 2 and 3, and play recording 3

Use CMD 72 for Button 2 to play a message to the called party.

Record message in 24.

(Continued on next page)

Programming Commands *(continued)*

Programming Hang Up Methods

Command	Explanation	Format	Default
40	Polarity Reversal/WINK	40<Polarity Reversal/WINK time>#	2#
41	Revert back to dial tone	41<length of dial tone>#	00#
42	Silent time out	42<silence time>#	0#
43	Repeating (reorder) tone	43<number of reorder tones>#	00#
44	Call time out	44<call time># (30-second notifier)	10#
45	WINK Voltage Minimum	45<Voltage>#	0#
46	Minimum Ring Voltage Detection	46<0, 1 or 2>#	0#
47	Maximum Ring Frequency	47<0, 1 or 2>#	0#

NOTES: FORMAT VALUE PARAMETERS

Command 40 = WINK time: 0 - 9
- **0 = disabled**
- **1 - 9 = 100 - 900 milliseconds**

Command 41 = Length of dial tone: 00 - 99
- **00 = disabled**
- **01 - 99 = 1 - 99 seconds**
- **Continuous sound for this period will initiate hang up**

Command 42 = Silent time out: 0 - 9
- **0 = disabled**
- **1 to 9 (10 to 90 in 10-second increments)**

Command 43 = Number of repeating tones: 00 - 99
- **00 = disabled**
- **01 - 99 = 1 - 99 cycles**

Command 44 = Call time out timer: 00 - 99
- **00 = disabled**
- **01 - 99 = minutes**
- **A DTMF "BBBBB" notifier plays to both parties 30 seconds prior to expiration**

Command 45 = Minimum "voltage change" to interpret as a "WINK"
- **0 = 5V thru 9 = 14V**

Command 46 = Minimum Ring Voltage Detection Threshold measured in Vrms
- **0 = 13, 1 = 19**
- **2 = 40**

Command 47 = Maximum Ring Frequency measured in Hz
- **0 = 75, 1 = 50, 2 = 35**

(Continued on next page)

Programming Commands *(continued)*

Programming Call Properties

Command	Explanation	Format	Default
50	Give up waiting for dial tone	50<time>#	5#
51	Call progress detection delay (give up time waiting after dial)	51<time>#	20#
52	Give up time waiting for answer	52<time>#	30#
53	Call connected detection	53<mode>#	0#
54	Call loop cycles	54<cycles>#	2#
55	Force half duplex operation	55<full/half duplex>#	0#
56	Full duplex noise cancellation setting	56<noise setting>#	0#
57	Local loop training	57#	#
58	Answer message repeat playing	58<message repeat>#	0#
59	Request for Acknowledgement beep delay	59<delay>#	15#

NOTES: FORMAT VALUE PARAMETERS

Command 50 = Give up wait for dial tone: 00 -99
00 = ring down
01 - 99 = 1 - 99 seconds
If dial tone is not detected in this time, the phone will hang up (default is 5 seconds).

Command 51 = Call progress detection delay: 1 - 99
1 - 99 = 1 - 99 seconds
Call progress tone detection. Time that the phone will wait monitoring progress tones.

Command 52 = Wait for answer: 00 - 99
00 - 99 = 0 - 99 seconds
Time that the phone will wait from initiation for a call to be answered before dialing the next number

Command 53 = Call connected detection: 0 or 1
0 = When voice or DTMF is detected by the IA4100
1 = After call is placed (non-ADA; forces call to connect)

Command 54 = Call Loop Cycle: 1- 9
1 - 9 = 1 - 9 loops
The number of dialing attempts the phone will perform on all programmed phone numbers, in order, before resetting to standby

Command 55 = Force half duplex operation: 0 or 1
0 = full duplex
1 = half duplex

Command 56 = Full duplex noise cancellation: 0 - 3
0 - 3 = low to high

Command 57 = Local loop training
Train and tune to the local loop length

Command 58 = Answer message repeat playing: 0 or 1
0 = message is played once upon call answered
1 = message is played continuously until DTMF 33 is pressed by guard
See Programming Buttons and Inputs, Commands 71 - 74 (page 12)

Command 59 = RFA tone delay: 00 - 99
00 - 99 = 0 - 1980 milliseconds
The amount of delay when the IA4100 answers and plays the RFA tone
The delay "value" is multiplied by 20 milliseconds. For example, the default value "15" equals 300 milliseconds (15 x 20 = 300) or a "value" of 99 equals 1,980 milliseconds (99 x 20 = 1980).

Programming Commands *(continued)*

Miscellaneous Programming

Command	Explanation	Format	Default
61	RFA Tone Delay from Answer	61<Delay>	5#
62	Preliminary Audio Delay	62<Delay>	9#
63	DTMF timing on	63<DTMF on>#	7#
64	Pause time	64<Pause time>#	7#
65	DTMF dialing volume	65<DTMF volume>#	5#
67	Recording playback level	67<playback level>#	5#
68	Ring count answer	68<ring>#	1✱0#
69	Disable Backup Battery Check	69<0 or 1>#	0#

NOTES: FORMAT VALUE PARAMETERS

Command 61 = RFA Tone Delay from Answer
3 - 9 = 3/10 to 9/10 second

Command 62 = Preliminary Audio Delay
0 - 9 = 0/10 to 9/10 second from RFA beep to initial 2-way audio

Command 63 = DTMF on time: 1 - 9
1 - 3 = 100 - 300 milliseconds
4 - 9 = 40 - 90 milliseconds

Command 64 = Pause time: 1 - 9
1 - 3 = 100 - 300 milliseconds
4 - 9 = 40 - 90 milliseconds

Command 65 = DTMF volume: 1 - 9
1 - 9 = -8dB - +8dB

Command 67 = Playback level: 1 - 9
1 - 9 = -8dB - +8dB

Command 68 = Ring count answer
First digit, ring count = 1 - 9
Second digit, ringing sound: if the First Digit is greater than 1, then after ★ (asterisk key) choose.
0 = NO ringing sound
1 = YES ringing sound

Command 69 = Disable Backup Battery Check
0 = NO
1 = YES

(Continued on next page)

Programming Commands *(continued)*

Command	Explanation	Format	Default
76	Upon call in answer mode	76<answer mode>#	0#

NOTES: FORMAT VALUE PARAMETERS

Command 76 = Answer mode: 0 or 1

0 = automatically enters two-way audio mode without password

1 = requires audio call password or phone will disconnect

Command	Explanation	Format	Default
77	PAS enable	77<pas>✱<output(s)>✱<recordings(s)>#	0✱✱#
78	Enable UPD on call answer	78<upd>#	0#

NOTES: FORMAT VALUE PARAMETERS

Command 77 = Public Address System

First Value Set, enabling PAS: 0 or 1

0 = disabled

1 = enabled

Second Value Set (outputs)

See Programming Outputs (page 10)

Third Value Set (recordings)

See Programming Messages (page 11)

Command 78 = Enable Unit Programming & Diagnostics (UPD): 0 or 1

0 = don't send bit fault on answer menu instead of RFA

1 = send bit fault on answer menu instead of RFA

Pass Codes and Reset Programming

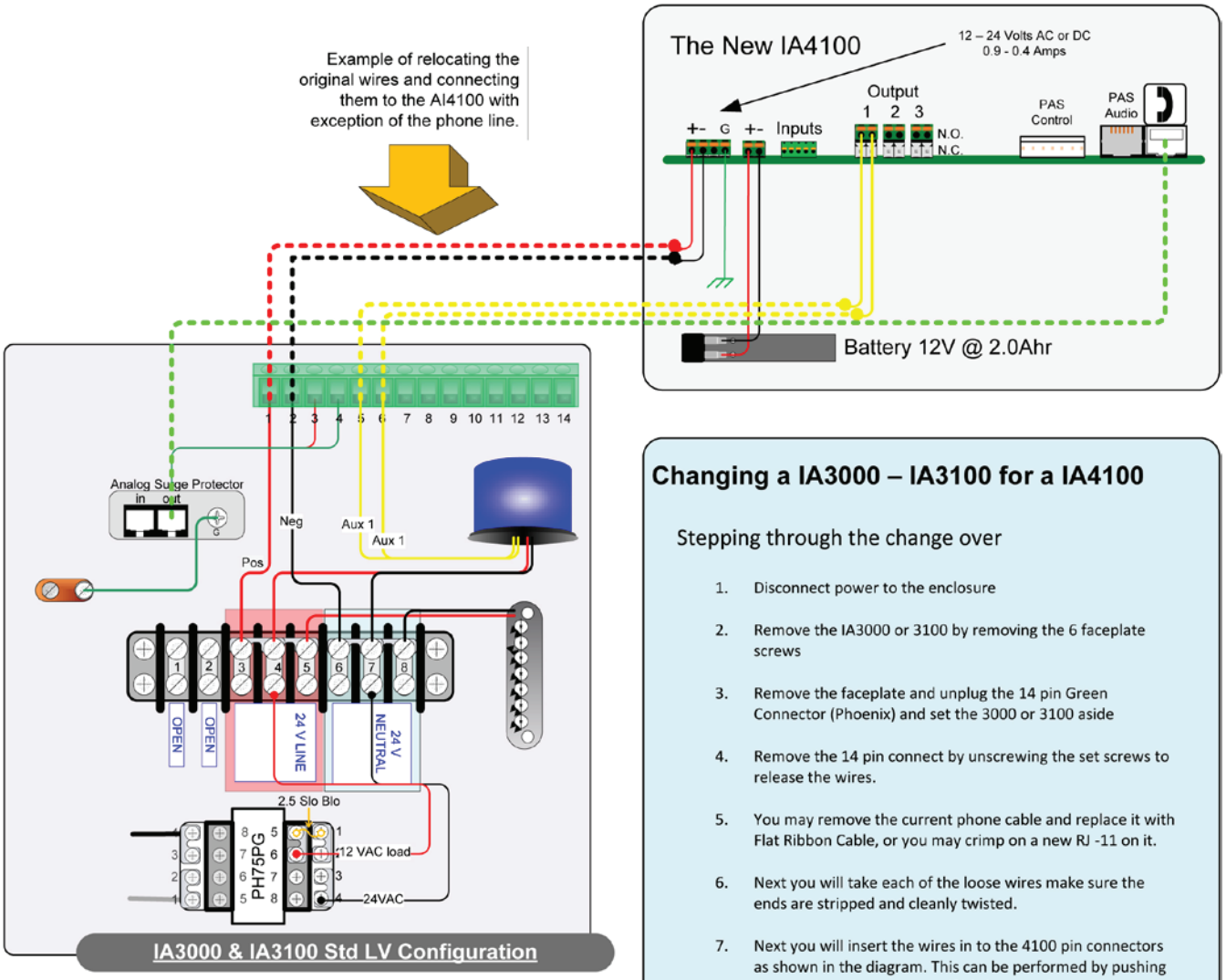
Command	Explanation	Format	Default
90	Programming password	90<new pass code>✱<new pass code>#	2583#
92	Audio call password	92<new pass code>✱<new pass code>#	#
95	Reset audio settings	95✱95#	
96	Reset phone numbers only	96✱96#	
97	Reset recordings only	97✱97#	
98	Default all settings EXCEPT audio, phone and recordings	98✱98#	
99	Full reset (default ALL settings)	99✱99#	

NOTES: FORMAT VALUE PARAMETERS

Command 95 = Reset audio settings

Resets the audio gain for microphone, speaker, PAS and message volume back to default

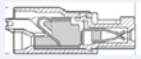
15 IA3000/3100 Changeover to IA4100 Instructions



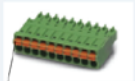
Changing a IA3000 – IA3100 for a IA4100

Stepping through the change over

1. Disconnect power to the enclosure
2. Remove the IA3000 or 3100 by removing the 6 faceplate screws
3. Remove the faceplate and unplug the 14 pin Green Connector (Phoenix) and set the 3000 or 3100 aside
4. Remove the 14 pin connect by unscrewing the set screws to release the wires.
5. You may remove the current phone cable and replace it with Flat Ribbon Cable, or you may crimp on a new RJ -11 on it.
6. Next you will take each of the loose wires make sure the ends are stripped and cleanly twisted.
7. Next you will insert the wires in to the 4100 pin connectors as shown in the diagram. This can be performed by pushing the wire into the connector if it's heavier than a 20 gauge wire. If not then you may need to use a #0 regular flat blade screwdriver and push the orange release tab in on the Phoenix Plug, then push the wire in, then release the orange tab to catch the wire.
   a. Note: if you have an older strobe the wires will be orange and black.
8. Next Phone line: Plug in the new phone cable in to the RJ connector on the 4100 and Phone Line Surge Suppressor.
9. Make sure the back –up battery is reconnected
10. Mount the new IA4100, and turn the power back on.
11. Now you can program the IA4100.



IA4100 may come with wires pre attached, these may not be needed, as original wires found on the 14 pin connector can be reused.
To remove the preinstalled wires. press the orange tab on the green connector (see image below) to release the wire and remove it, then install the original wire from the enclosure wiring harness.



16 Button and Activation Specifications

The button requires a force of 3 -5 N (Newton - si units). Another way to explain this:
6 – 18 oz of pressure over time applied, which is between 125 –300ms (0.15 –0.3 seconds).

Slapping or sliding your fingers across the button will not activate it. It requires pressure over time. The outer edge of the button will not be that sensitive. Normal use of the button would be someone rushing to activate it and using their hand, finger, arm, knee, forehead, etc.

No other piezoelectric button on the market will function as well.

The only differences between the analog and IP buttons are the output on the wires and the state of the button, N.O or N.C. The button can and piezo elements are identical. The analog button (2 wire) is N.O. (Normally Open), and closes momentarily when pressed. The digital button (3 wire) is N.C. (Normally Closed) and when pressed the state goes to open momentarily, which is translated to a P then R data output to the IP1500/IP2500/IP5000 boards.

The specification of the button is:

Switching Current: 0.200 A

Actuation Force: 3-5 N : 6 – 18 oz of pressure over time applied. Which is between 125 –300ms (0.15 –0.3 seconds)

Make Impulse Time: 125-300 mSEC

Switch Resistance :	“ON” <20 ohms
Switch Resistance:	“OFF” >5 MOhms
Make Pulse Time:	125-300 mSEC
Surface Deflection:	1 micron - activation
Button Temperature :	-40°C to +85°C (-40°F to 185°F)
Functional Life:	>50 million activations
Functional in Freezing Rain:	Yes

17 Troubleshooting

1.0 Required Tools

1.1 Lineman's Test Set (Buttset)

1.2 Digital Multi-meter

1.3 Phillips Screwdriver

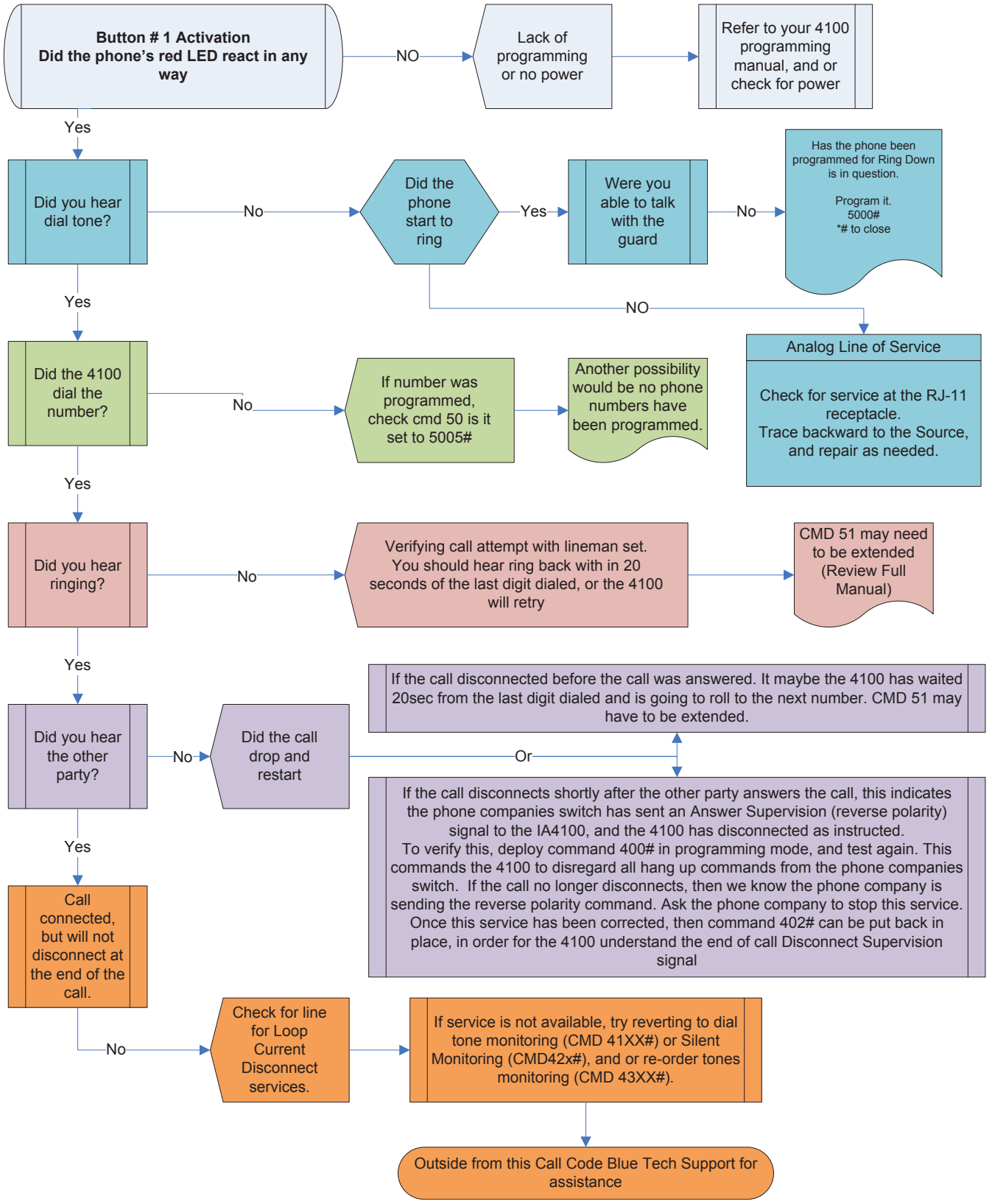
1.4 Code Blue Security Bit

2.0 Begin Troubleshooting

2.1 Begin troubleshooting at the phone's faceplate.

2.2 Press the red button to begin and keep in mind that every step through a call attempt is a timed event. The phone commands referenced in this flowchart are elaborated on the IA4100 programming and operations instruction guide.

FLOWCHART ON NEXT PAGE


Button # 1 Activation
Did the phone's red LED react in any way
NO
Lack of programming or no power
Refer to your 4100 programming manual, and or check for power
Yes
Did you hear dial tone?
No
Did the phone start to ring
Yes
Were you able to talk with the guard
No
Has the phone been programmed for Ring Down is in question.
Program it.
5000#
*# to close
NO
Yes
Did the 4100 dial the number?
No
If number was programmed, check cmd 50 is it set to 5005#
Another possibility would be no phone numbers have been programmed.
Analog Line of Service
Check for service at the RJ-11 receptacle.
Trace backward to the Source, and repair as needed.
Yes
Did you hear ringing?
No
Verifying call attempt with lineman set.
You should hear ring back with in 20 seconds of the last digit dialed, or the 4100 will retry
CMD 51 may need to be extended (Review Full Manual)
Yes
Did you hear the other party?
No
Did the call drop and restart
If the call disconnected before the call was answered. It maybe the 4100 has waited 20sec from the last digit dialed and is going to roll to the next number. CMD 51 may have to be extended.
Or
If the call disconnects shortly after the other party answers the call, this indicates the phone companies switch has sent an Answer Supervision (reverse polarity) signal to the IA4100, and the 4100 has disconnected as instructed.
To verify this, deploy command 400# in programming mode, and test again. This commands the 4100 to disregard all hang up commands from the phone companies switch. If the call no longer disconnects, then we know the phone company is sending the reverse polarity command. Ask the phone company to stop this service. Once this service has been corrected, then command 402# can be put back in place, in order for the 4100 understand the end of call Disconnect Supervision signal
Yes
Call connected, but will not disconnect at the end of the call.
No
Check for line for Loop Current Disconnect services.
If service is not available, try reverting to dial tone monitoring (CMD 41XX#) or Silent Monitoring (CMD42x#), and or re-order tones monitoring (CMD 43XX#).
Outside from this Call Code Blue Tech Support for assistance

Phone Line – Ensure that the phone line is free of static and the electrical characteristics are satisfactory:

Loop Current: 23 mA to 35 mA (required)

Talk Battery: -48V DC to -52V DC (typical)

Ring Voltage: 90 Vrms (typical)

Electrical – Ensure that the unit is powered with 12 to 24V DC or AC power. If the unit is Solar or NightCharge® ensure the battery voltage is above 11.5V DC.

EMI – Some sources of EMI (Electromagnetic Interference) will interfere with the operation and audio quality of the unit. An example would be a bad ballast on a high pressure sodium or metal halide area light, or communication cable run by a transformer or florescent light ballast.

GSM/Cellular – GSM and/or cellular interfaces cause distortion of DTMF tones. You may need to program your IA4100 speakerphone with a line simulator or on a standard analog POTS/PBX station prior to connecting to GSM/Cellular gateway.

Disconnect Supervision – Ensure that supervised disconnect is enabled on any PBX system the IA4100 may be connected to. This will ensure the unit hangs up properly upon call completion. Some systems will provide a momentary Polarity Reversal which will also hang up the speakerphone.

Answer Supervision – If your system provides answer supervision, then it is possible that when the call is connected the IA4100 will disconnect the call. This is due to the IA4100 considering the WINK signal sent for answer supervision to be a disconnect signal.

Default Settings – Ensure your phone is programmed accordingly when connecting to auxiliary outputs. By default the phone may be set to activate or not activate as required by your application. Refer to the programming commands for more information and default settings.

If IA4100 Phone does not answer an incoming call...

1. Verify the phone you're dialing is actually ringing on the correct phone line.
2. To verify if the problem is at the location or the IA4100 phone, swap it with one from a working location. If the problem is at the location, the Ring Voltage and Frequency Hertz can be measured. If the problem follows the phone, call Code Blue TSS. Note the serial number to verify warranty coverage.
3. Ring Voltage - Put your meter on the two wires (Tip & Ring) of the phone line. It does not need to be connected to the phone (no load needed; 0 REN phone). Call the phone line and you should measure an AC Ring Voltage between 50-130 Vrms during the ringing phase of the ring cycle. FCC standard is at least 90 VAC.
4. Frequency Hertz - Change your meter to measure AC or DC, but set for Hz. Put your probes on Tip & Ring again and call the phone number associated to that line and the frequency during the ring cycle. You should see a Hz range somewhere between 17-33 Hz. Not all meters can do this if your phone line is out of spec and does not fall into these ranges. We offer an IA4100 phone with a firmware that opens to greater variances. For more information, please contact Code Blue Technical Services & Support at **tss@codeblue.com.**

General Programming

How do I program an analog emergency speakerphone or "call box"?

To program an IA4100, IA3100 and IA500 series phone, you need to use an analog phone or an IP phone that pushes DTMF tones and call the extension or phone number of the Emergency phone. When you dial the phone number to the Code Blue speakerphone you're trying to reach, you will hear an acknowledgement tone or RFA tone to let you know that the phone has picked up and is ready to be programmed. Then press the programming password for that particular model phone to enter programming mode and configure the phone.

For example, to program an IA4100:

Call into the speakerphone or "call box", press 12583# and wait for acknowledgement tone,

01 <phone number> #, wait for acknowledgement tone, then press * # to hang up.

Where can I find speakerphone programming manuals?

http://codeblue.com/Support/TechnicalSupport/downloads or Email tss@codeblue.com)

IA4100 Speakerphone

How do I program the IA4100 to work on a ring-down line?

5. Call Code Blue speakerphone's phone number and enter program mode (1<password>#).
6. Enter 5000 #. This will set the IA4100 to operate in ring-down mode.
7. Enter * # to save and exit programming.

How do I get the IA4100 phone to hang up after the called party hangs up?

By default, the IA4100 is looking for a 200-millisecond WINK to hang up the call. If your phone system is not issuing a 200-millisecond WINK there are additional hang-up methods available, such as monitoring for dial tone, reorder tones or silence. If you know the type of disconnect or hang-up method your phone system uses, then just enable the one you need via programming. If not, you can turn them all on.

The alternate hang-up methods available are:

Revert to dial tone: CMD 41 (Default=00)
Continuous sound for this period will initiate hang-up
Recommended 4108#

Silent Time Out: CMD 42 (Default=0#)
1 to 9 (10 to 90 in 10-second increments)
Recommended 422#

Reorder tones "busy tones": CMD 43 (Default= 00#)
Number of reorder tones (01 – 99 = 1 -99 cycles)
Recommended 4308#

For example, to enable an alternate hang-up method:

Call the speakerphone. After you hear the acknowledgement or RFA tone, press 12583#. Wait for acknowledgement tone, then press 4108# (monitor 8 seconds of reorder tones). Wait for acknowledgement tone, then press * # to save and hang up.

How do I record a message in the IA4100 speakerphone to play to the caller at the unit and called party?

Call the speakerphone to enter programming mode. After acknowledgement tone, press 1 <password> #, then wait beep, then press 22# <record message> #. Press* # to hang up.

How do I record a message in the IA4100 speakerphone to play to the caller at the unit when HELP button is activated?

If you record a message in 21# <your message>#, it will play to the caller only while the call is in progress or before the called received light comes on.

IA4100 Ghost Calls

Generally, this behavior most frequently occurs on phones that are on ring down/hotline phone lines.

This can be caused by a short or moisture on the phone line or connector, which will cause the phone to ring down and act like a ghost call. Another cause can be crushed conduits with moisture in them.

1. Confirm that the IA4100 is in ring down/hotline mode.

2. If the blue strobe activates when a ghost call happens then the problem most likely is coming from the IA4100. If not, then it's probably a moisture or connector issue.

If the issue is in the phone line, it may be costly to repair. You can ask a telephone provider to change the phone line from ring down/hotline to a standard dial-up phone line. When they do that, you will need to change the IA4100 programming. See the basic programming chapter in this guide.

IA4100 phone will not recognize call as Answered

If an IA4100 delays or never switches to call answered after the called party answers, take the following steps:

1. Until the light on the phone switches from red to green, the person at the Code Blue phone will not be heard. The phone listens on the line for audio from the called party. The IA4100 is not hearing enough audio to mark the call as answered.

    a. The person answering the call needs to speak up and say something longer then "hello".

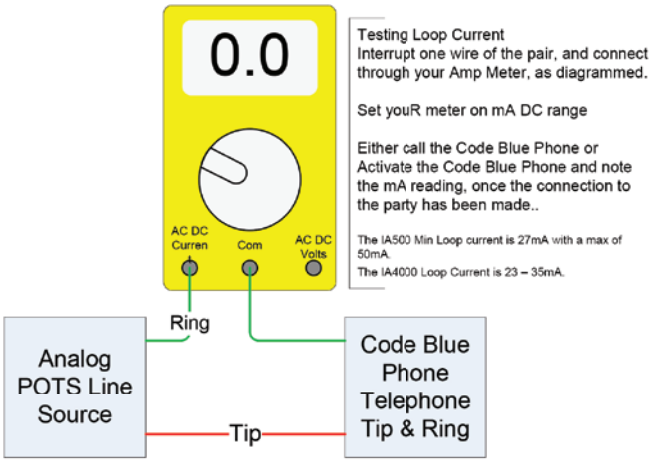
    b. The person answering can enter any DTMF digit from their keypad, which will mark the call as answered. This works immediately and extremely well. (Just don't press *# since it may hang up the phone.)

c. The customer can increase the transmit gain on their PBX as well.

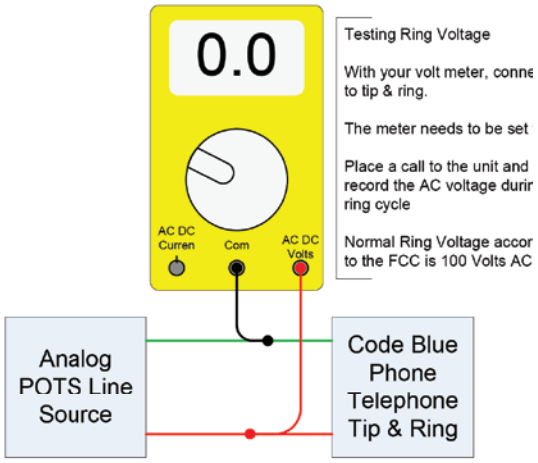
d. If all else fails, program 531# (this is not ADA compliant). This marks the call as answered when it dials out, whether the call is answered or not. Two-way audio will occur immediately. It will not roll to a secondary number or redial the first number programmed. This is a good option if the IA4100 is calling one number and that party always answers.

If the IA4100 doesn't seem to be functioning properly, follow the steps below to test line loop current, ring voltage and talk battery. These line levels are important to the proper function of the IA4100.

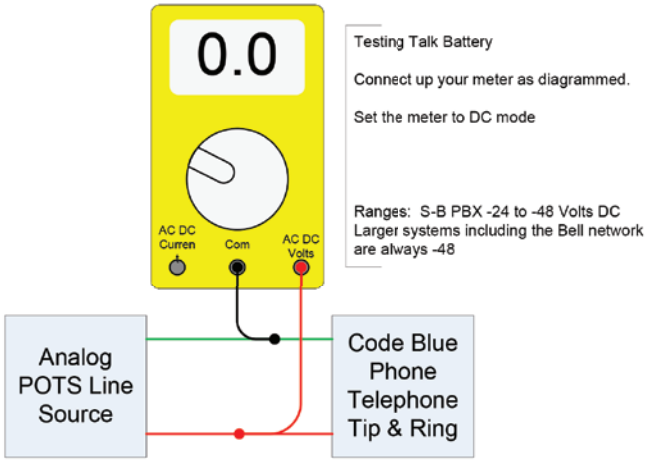
Loop Current Test Configuration



Ring Voltage Test Configuration



Talk Battery



Note

For those using non auto ranging meter. Please make sure you have proper polarity set up for each test.

For those with Fluke Meters, they are generally auto-ranging. Also they're bidirectional, meaning polarity is not an issue.

Code Blue Technical Support: 800.205.7186, opt 3
Technical Support Hours: 8am - 5pm Monday - Friday. ET

18 Warranty & Regulatory

Regulatory

The IA4100 Emergency Phone conforms to the following list of directives and product safety standards as applicable:

USA:

Class A digital device pursuant to part 15 of the FCC Rules

FCC part 68 compliant

Registration #51STE00B410

CANADA:

IC #2889A-IA4100

FCC & IC Ren #0.01

Warranty

Code Blue Corporation provides a limited warranty on this product. Refer to your sales agreement to establish the terms. In addition, Code Blue's standard warranty language, as well as information regarding support for this product while under warranty, is available at **www.codeblue.com/support**.

Notice: Every effort was made to ensure that the information in this document was complete and accurate at the time of printing. Information is subject to change.

19 Download Information

Code Blue now has a centralized location where you can find installation, setup, information, configuration and operation instructions.

1. Centry® Administrator Guide: www.codeblue.com/resources/guides
2. CB 1 Series Administrator Guide: www.codeblue.com/resources/guides
3. CB 2 Series Administrator Guide: www.codeblue.com/resources/guides
4. CB 4 Series Administrator Guide: www.codeblue.com/resources/guides
5. CB 5 Series Administrator Guide: www.codeblue.com/resources/guides
6. CB 9 Series Administrator Guide: www.codeblue.com/resources/guides
7. CB RT Administrator Guide: www.codeblue.com/resources/guides
8. Phone Enclosures Administrator Guide: www.codeblue.com/resources/guides
9. Stainless Steel Maintenance Guide: www.codeblue.com/support
10. IA4100 Administrator Guide: www.codeblue.com/resources/guides
11. IP5000 Administrator Guide: www.codeblue.com/resources/guides
12. IP1500/2500 Administrator Guide: www.codeblue.com/resources/guides
13. ToolVox® X3 Administrator Guide: www.codeblue.com/resources/guides
14. Public Address Administrator Guide: www.codeblue.com/resources/guides
15. Blue Alert® MNS User Guide: www.codeblue.com/resources/guides
16. Blue Alert® EMS User Guide: www.codeblue.com/resources/guides
17. IP1500/IP2500 Firmware: www.codeblue.com/support/firmware
18. IP5000 Versions 1.X & 2.X Firmware: www.codeblue.com/support/firmware

For Legacy Product Information:

www.codeblue.com/legacy-products

These guides should contain all the information needed for your application. If further information is required, please contact **customerservice@codeblue.com**.