§2.1033 (b) (3) Installation & Operating Instructions

<u>Requirement:</u> §2.1033(b) (3) A copy of the installation and operating instructions to be furnished the user.

Aircell does not produce CWAP specific operating instructions; rather it produces an Aircell Broadband System (ABS) operating guide, attached. The ABS will be operated on aircraft and meets the FAA Supplemental Type Certificate (STC) procedures under 14 CFR 21. To maintain the STC, Aircell controls the software and configuration of the CWAP. In addition to the ABS operating guide, the flight crew is properly trained on disabling the system when needed.

Aircell does not produce generic installation instructions. As part of the FAA STC process, Aircell produces specific installation drawings for the various aircraft types. These drawings are used by certified professionals to install the ABS on to an aircraft.

CURRENT REVISION			
REV	ECO NUMBER	EFFECTIVE DATE	ORIGINATOR
A	C01395	2008-01-16	Brad Schnair
B	C01462	2008-02-21	Brad Schnair
C	C01794	2008-08-18	Brad Schnair
D	C02220	2008-11-20	Brad Schnair
E	C02249	2008-11-30	Joe Tobin

Aircell LLC
1250 N. Arlington Heights Rd.
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APPROVALS

PREPARED BY
Brad Schnair

DEVELOPMENT ENGINEERING
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Adnan Mazhar

MANUFACTURING
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QUALITY
Steve Thompson

CONFIGURATION CONTROL
Peola Mills

TITLE

ABS OPERATIONAL
USER'S MANUAL

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A	**1NQ67**	**D12751**	**E**	**SH 1 OF 28**

Change History

Revision	Date	Description of Change	Approval
A	2008-01-16	New/Initial Release	Brad Schnair
B	2008-02-21	Added menu-based software reset, section 12	Brad Schnair
C	2008-08-18	ABS Master Switch: Added statement regarding system start-up time Section 4 - Placing a Call: Added statement regarding availability of Direct Dialing Section 10 - Setup Menu, Option 2 ABS Status: Added description of features now available Section 11 - ABS Corded SIP Handset Icons: Added description of ABS Link Status Icon	Brad Schnair
D	2008-11-20	ABS Master Switch: Removed reference to switch illumination Section 1 - Powering On: Added statements for Rev E (or earlier) handsets and Rev F (or later) handsets Section 1 - Added instructions for powering Off Section 2 - Idle Displays: Added description of Display Blanking and recovery Section 4 - Placing a Call: Added instructions for ending a direct-dialed call that has been blocked Section 7 - Receiving a Call: Added statement regarding the availability of incoming calls Section 10, Option 1, Item 6 - Display Blanking Timer: Added statement that the "Never" option is not recommended Section 13 (new) - Comm Control Menu: Inserted section that adds description of FCN 8 menu for control of WiFi SSIDs	Brad Schnair
E	2008-11-30	Added CWAP information on page 6	Joe Tobin

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ABS Operational User's Manual

Revision E
November 30, 2008

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ABS Master Switch

The ABS Master Power Switch is utilized to enable and disable the ABS System. When the Master Power Switch is disabled, power is removed from all components of the ABS System. When the Master Power Switch is enabled, power is applied to all components of the ABS System. After power is applied to the ABS system, it may take up to 15 minutes for the system to become operational.

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ABS Cabin Wireless Access Point

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions : (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation."

RF Exposure Requirements
To comply with FCC exposure essential requirements, a minimum separation distance of 20cm (8 inches) is required between the equipment and the body of the user or nearby persons.

Operation of this device in the frequency band 5150-5250 MHz is approved for indoor use only.   Use within aircraft is considered indoor.

CWAP

Note: Silkscreen logo may vary

CWAP Antenna

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ABS Corded SIP Handset

The Aircell ABS Corded SIP Handset ("the handset") is a full-sized handset used to support Air-to-Ground telephone communications when using the Aircell ABS system. The handset is also capable of displaying ABS system status and controlling a limited number of ABS system functions.

The handset approximate dimensions are: 7.8" Length, 2.1" Width, 1.8" Height, not including the coil cord.

Aircell ABS Corded SIP Handset

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1. Powering On and Off

Powering ON

Handsets of Revision F (or higher): After ABS system power is applied, briefly press and hold the **SND** key on the handset until the screen illuminates.

Handsets of Revision E (or lower): The handset automatically powers on when ABS system power is applied.

While the handset is initializing (approximately 20 seconds), the following screen will be displayed:


Display #1 - Initializing

After initialization, the handset will attempt to register with the Aircell VoIP server. During this process, one of two screens will be displayed depending upon whether or not the handset has been locked. (See section 3 for details on handset locking and unlocking.)

NOTE: It is possible that the handset display may go blank after Display #1. Should this occur, the screen may be recovered by pressing **FCN**, then **3**, then ▼ (down arrow), then **STO**.

Unlocked: The handset is attempting to connect to the Aircell VoIP server. Phone calls are not supported while this screen is displayed, but the Setup Menu is accessible.
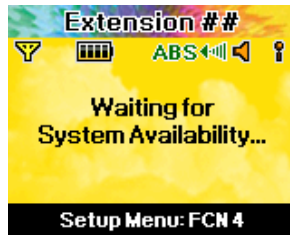
Display #2 - Handset is unlocked, Waiting to connect to VoIP Server

Locked: Whenever the handset is locked, this screen is displayed. Usage of the handset is prevented until the handset is unlocked.
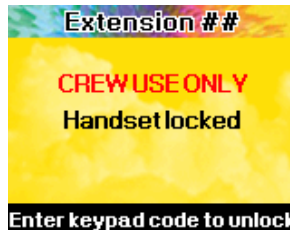
Display #3 - Handset is locked

Once the handset has attempted to connect to the Aircell VoIP server, the handset will enter an Idle mode. See section 2.

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1. Powering On and Off (continued)

Powering OFF
Handsets of Revision F (or higher): Press and hold the **END** key on the handset until the screen goes dark (approximately 7 seconds). The handset will also power off when ABS system power is removed.
Handsets of Revision E (or lower): The handset powers off only when ABS system power is removed.

2. Idle Displays

Blank Display
After 30-60 seconds of inactivity, the Display Blanking Timer (Section 10, Option 6) will cause the handset display to go dark. Press the **END** key to recover the display.

IMPORTANT! - Always use the **END** key first to recover the display. Use of other keys may trigger a handset function, such as last number redial.

> **Handsets of Revision F (or higher) only:** If the **END** key does not recover the display, it is likely that the handset is powered Off. Briefly press and hold the **SND** key to power On.

Active Displays
When the handset is powered on and is not involved in a phone call or menu session, the handset will be in one of four possible Idle modes as shown below.

> **Locked:** Usage of the handset is prevented until the handset is unlocked. See **Display #3** on the previous page.

> **Unlocked, Connected:** The handset is unlocked and can communicate with the Aircell VoIP server. This is the only mode that supports phone calls. All user menus are accessible. This mode is possible only when the ABS system has established an external connection via the ATG or TM radio links.

Display #4 - Idle mode (Unlocked, Connected)

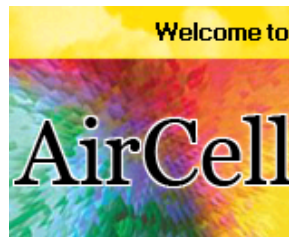|	SIZE	CAGE CODE	DOCUMENT NUMBER	REV	
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2. Idle Displays (continued)

Unlocked, Disconnected: The handset is unlocked, but cannot communicate with the Aircell VoIP server. (ATG or TM radio link not established.) Phone calls are not supported, but all user menus are accessible.

Display #5 - Idle mode (Unlocked, Disconnected)

Unlocked, No IP Address: The handset is unlocked, but has not been assigned an IP Address by the ABS system. Phone calls are not supported. User menus are accessible, but most functions will not be available.

Display #6 - Idle mode (Unlocked, No IP Address)

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3. Locking and Unlocking the Handset

To prevent unauthorized usage, the handset supports a manual LOCK function. It is not possible to use the handset when it is locked. The handset remains locked even after a exercising a power cycle (power off, then on).

Lock the handset: The handset must be in an Unlocked Idle mode. Press **FCN**, then **5**, to access the Lock screen. Press **STO** to lock the handset (Display #3), or press **END** to cancel the lock request.

Display #7 - Locking the handset
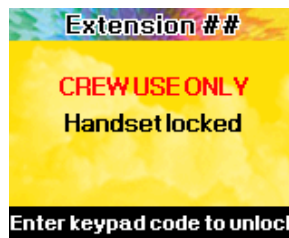
Display #3 - Handset is locked

Unlock the handset: When the handset is locked, enter the correct 3-digit Unlock code to unlock the handset and return to an Unlocked Idle mode. If the wrong code is entered, the handset will display "**Unlock code incorrect**" and return to Display #3.

Display #8 - Entering the Unlock code

Display #9 - Incorrect Unlock code

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4. Placing a Call

The Aircell ABS Corded SIP Handset is operated in a manner similar to a cellular telephone. There is no dial tone, and the **SND** and **END** keys are used to start/stop a phone call.

There are three methods for placing a phone call, as shown below.

Direct Dialing: From the Unlocked, Connected Idle mode (Display #4), enter a phone number using the keypad. Use the **CLR** key to backspace and erase incorrect digits. Press **SND** to place the call, or press **END** to cancel and return to Unlocked Idle mode.

NOTE: Direct-dialed calls may be blocked by the Aircell ground network at the discretion of Aircell or the airline customer. Press **END** to abort a direct-dialed call that has been blocked.

Display #10 - Direct Dialing

Phonebook Dialing: From the Unlocked, Connected Idle mode (Display #4), press **RCL** to access the Phonebook. Use the ▲/▼ keys to scroll the blue highlight bar up/down until the desired entry is selected. Press **SND** to place the call, or press **END** to cancel and return to Unlocked Idle mode.
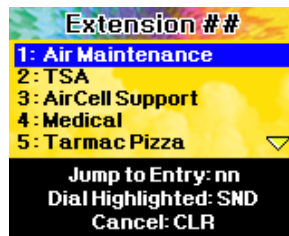
Display #11 - Phonebook Dialing

Last Number Redial: From the Unlocked, Connected Idle mode (Display #4), press **SND** to place a call to the last number that was dialed.

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5. Call Progress

As the call is being set up through the Aircell VoIP network, and when the called party is ringing, the following screen is displayed. The word "Dialing" flashes at a slow rate. Press **END** to cancel the call and return to Unlocked Idle mode.

Display #12 - Call Setup (Dialing)

After call setup is complete and the called party has answered, the following screen is displayed.

Display #13 - Call in Progress

6. Ending a Call

Press **END** to hang up and return to Unlocked Idle mode. All other methods of call termination, including called party hung up and loss-of-signal, will end the call and return to the Unlocked Idle mode.

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7. Receiving a Call

If the handset has a connection to the Aircell VoIP server, it is capable of receiving an incoming phone call. The handset display and keypad will illuminate when an incoming call is received. While ringing, the handset is capable of providing an Audible Ringer, a Visual Ringer, or both. See sections 9, 10, and 11 for ringer options.

NOTE: Incoming calls may be blocked by the Aircell ground network at the discretion of Aircell or the airline customer.

While Unlocked: If the handset is unlocked, the following screen is displayed. The words "Incoming Call" flash at a slow rate. Press **SND** to answer the incoming call, or press **END** to reject the incoming call.
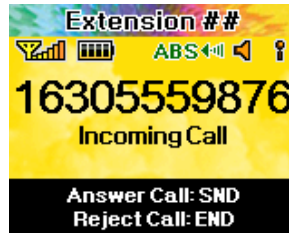
Display #14 - Incoming Call (Unlocked)

While Locked: If the handset is locked, the following screen is displayed. The words "Incoming Call" and "Handset Locked" flash at a slow rate. The handset must be unlocked by entering the correct 3-digit Unlock code before the incoming call can be answered. Once the handset is unlocked, the incoming call will proceed as shown above (Display #14).

Display #15 - Incoming Call (Locked)

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8. In-Call Functions

The following functions are available when a phone call is in progress.

Microphone (mouthpiece) Mute: Press **FCN**, then **6** to mute the microphone. The other party will no longer be able to hear the handset. Press **FCN**, then **6** again to unmute the microphone and allow the other party to hear the handset. The current microphone status is shown as an icon near the upper-right corner of the display (see section 11).
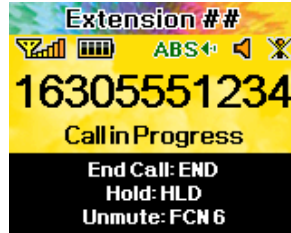
Display #16 - Microphone muted

Call Hold: Press **HLD** to place a call on hold. The words "Call Holding" flash at a slow rate. Press **HLD** again to restore the call, or press **END** to hang up the call.

Display #17 - Call on hold

Display Blanking: 90 seconds into a phone call, the Handset display will go blank (go dark). This is normal behavior.

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9. Volume and Brightness

The following volume and screen brightness adjustments are available during handset operation.   These adjustments may be accessed as described here, or via the **FCN 4** setup menu (section 10).

Earpiece Volume: During a phone call or Unlocked Idle mode, use the ▲/▼ keys to access the Earpiece Volume screen and adjust the earpiece volume up/down. When the desired volume is reached, press **STO** to save the new volume setting.   Press **END** to abort volume adjustment and return to the previous volume setting.
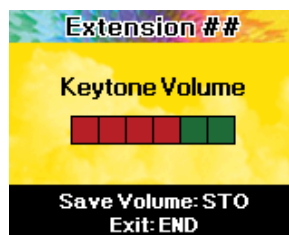

Display #18 - Earpiece Volume adjustment

Audible Ringer Volume: From an Unlocked Idle mode, press **FCN**, then **1** to access the Ringer Volume screen. Use the ▲/▼ keys to adjust the ringer volume up/down. The minimum setting (all bars green) will mute the audible ringer. When the desired volume is reached, press **STO** to save the new volume setting. Press **END** to abort volume adjustment and return to the previous volume setting. The current audible ringer status is shown as an icon near the upper-right corner of the display (see section 11).

Display #19 - Ringer Volume adjustment

Keytone Volume (sound when keys are pressed): From an Unlocked Idle mode, press **FCN**, then **2** to access the Keytone Volume screen. Use the ▲/▼ keys to adjust the keytone volume up/down. The minimum setting (all bars green) will mute the keytones. When the desired volume is reached, press **STO** to save the new volume setting. Press **END** to abort volume adjustment and return to the previous volume setting.

Display #20 - Keytone Volume adjustment

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9. Volume and Brightness (continued)

Display Brightness: From an Unlocked Idle mode, press **FCN**, then **3** to access the Display Brightness screen. Use the ▲/▼ keys to adjust the display brightness up/down. When the desired brightness is reached, press **STO** to save the new brightness setting. Press **END** to abort brightness adjustment and return to the previous brightness setting.

Display #21 - Display Brightness adjustment

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10. Setup Menu

The handset offers access to user-preference settings and system status via the Setup Menu. From an Unlocked Idle mode, press **FCN**, then **4** to access the Setup Menu.

Display #22 - FCN 4, Setup Menu (Top Level)

While traversing menu screens, the following navigation methods are available.

(▲/▼ keys): Scroll the blue highlight bar up/down until the desired option is selected. Press **SND** to access or set the desired option.

(Keypad Digit): Instead of scrolling and using **SND** to choose a menu option, press a number on the keypad that corresponds to the desired menu option to directly access it.

CLR: Abort the current menu and go back to the previous menu screen.

END: Abort all menus and return to Unlocked Idle mode.

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Setup Menu, Option 1 - User Configuration

This option contains user-preference settings.

Display #23 - FCN 4_1, User Configuration Menu

1: Ring Pattern - This option chooses the ring pattern (ringtone) used for the audible ringer during an incoming call. This setting may be overridden via signaling from the Aircell VoIP server.

Display #24 - FCN 4_1_1, Ring Pattern

2: Earpiece Volume - This option is identical to Section 9, Display #18.

3: Ringer Volume - This option is identical to Section 9, Display #19.

4: Keytone Volume - This option is identical to Section 9, Display #20.

5: Display Brightness - This option is identical to Section 9, Display #21.

6: Display Blanking Timer - This option sets the length of time after the last keypress (in any Idle mode) before the handset display goes blank. The "Never" option will keep the handset display visible at all times when idle, but this will result in appreciable screen burn-in and is not recommended.

Display #25 - FCN 4_1_6, Display Blanking Timer

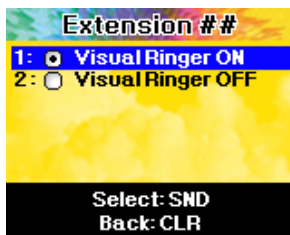|	Aircell LLC 1250 N. Arlington Heights Rd. Suite 500 Itasca, IL 60143	SIZE A	CAGE CODE 1NQ67	DOCUMENT NUMBER D12751	REV E	SH 19 of 28
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Setup Menu, Option 1 - User Configuration (continued)

7: Keypad Backlight Timer - This option sets the length of time after the last keypress (in any mode) before the keypad backlighting (orange LEDs) goes off. The "Never" option will keep the keypad backlighting on at all times.

Display #26 - FCN 4_1_7, Keypad Backlight Timer

8: Visual Ringer - This option controls the Visual Ringer feature. When set to "On", the handset display and keypad will slowly flash when an incoming call is received.

Display #27 - FCN 4_1_8, Visual Ringer

9: Restore Default Configuration - This option will restore User Configuration options 1 through 8 back to factory values. Press **STO** to activate.

Display #28 - FCN 4_1_9, Restore Default Configuration

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Setup Menu, Option 2 - ABS Status

This option displays the operational status of various ABS components. Additionally, a Maintenance Alert message can be sent to the Aircell Network Operations Center (NOC), or a Conditional Reset of the ABS system can be commanded.
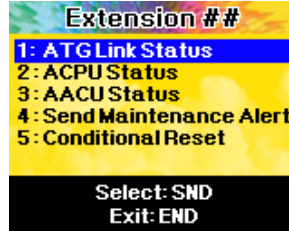
Display #29 - FCN 4_2, ABS Status Menu

1: ATG (Air-to-Ground) Link Status - This option displays the current status of the ATG radio link. This status screen provides the same information as the ATG Link Icon (Section 11), but in a verbose format. Possible displays are:

ABS OK - No ATG Signal - The ABS system is operating normally, but the ATG radio link is not currently established.

ABS OK - ATG Signal Level: (x)/5 - The ABS system is operating normally, and the ATG radio link is currently connected with a relative strength of "x" out of 5 units. (1 = very weak, 5 = very strong)

ABS Fault - The ABS system has detected a fault, and may be attempting auto-recovery procedures. If this condition persists for more than 10 minutes, airline personnel may manually reset the ABS system. If a manual reset does not recover the ABS system, please contact Aircell Airline Technical Support for service. 1-877-GOGO-FLY (1-877-464-6359)

Display #30 - FCN 4_2_1, ATG Link Status

2: ACPU Status - This option displays the current status of the ACPU device. Possible displays are:

Enable - The ACPU device is operating normally.
Disable - The ACPU device has encountered a fault.

Display #31 - FCN 4_2_2, ACPU Status

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Setup Menu, Option 2 - ABS Status (continued)

3: AACU Status - This option displays the current status of the AACU device. Possible displays are:

Enable - The AACU device is operating normally.
Disable - The AACU device has encountered a fault.

Display #32 - FCN 4_2_3, AACU Status

4: Send Maintenance Alert - If airline personnel suspect an intermittent service problem with the ABS system, this option can be used to send a Maintenance Alert message to the Aircell Network Operations Center (NOC) via the ATG radio link. This message will alert the Aircell NOC that the ABS system on a particular aircraft may be experiencing problems. Once this option is selected, press **STO** to send the Maintenance Alert message, or press **CLR** to return to the previous menu.
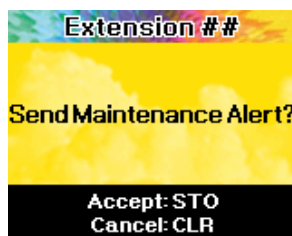
Display #33 - FCN 4_2_4, Send Maintenance Alert

5: Conditional Reset - If airline personnel suspect that the ABS system is in an impaired state, this option can be used to prompt the ABS system to initiate a software reset. The ABS system will then evaluate the current operational state, send an alert message to the Aircell NOC, and initiate a reset if warranted. Once this option is selected, press **STO** to request a reset, or press **CLR** to return to the previous menu.

Display #34 - FCN 4_2_5, Conditional Reset

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Setup Menu, Option 3 - Version Information

This option displays the current hardware (H/W) and software (S/W) versions of the handset. Press **CLR** to return to the previous menu, or **END** to return to Unlocked Idle mode.

Display #35 - FCN 4_3, Version Information

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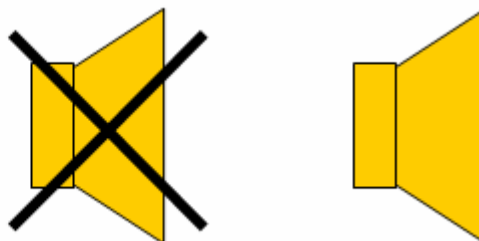
11. ABS Corded SIP Handset Icons

Microphone (mouthpiece) Status: The current microphone status (muted/unmuted, Section 8) is shown as an icon near the upper-right corner of the display.

Microphone Off/On
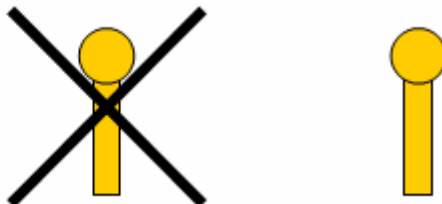
Audible Ringer Status: The current audible ringer status (muted/unmuted, Section 9) is shown as an icon near the upper-right corner of the display.

Audible Ringer Off/On

ATG Link Status: The current ATG Link status is shown as an icon near the upper-center of the display. Note the appearance of the ABS Link Status Icon.

See Section 10, Option 2_1 for a full description of ATG Link states.

ABS OK
No ATG Signal

ABS OK
ATG Signal Level: (x)/5
(x) = number of signal bars

ABS Fault

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12. Handset Software Reboot

If the aircraft is above the ABS service altitude and the Aircell ABS Corded SIP Handset is consistently unable to place or receive phone calls, a Handset Software Reboot may be warranted.

From an Unlocked Idle mode, press **FCN**, then **4** to access the Setup Menu.
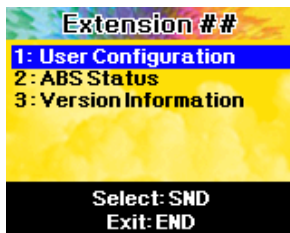
Display #22 - FCN 4, Setup Menu (Top Level)

Press the **4** key again to request the hidden Admin menu. You will be required to supply the Admin Code before proceeding.
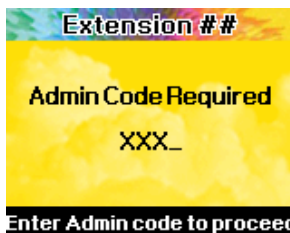
Display #36 - FCN 4_4, Admin menu code entry

An error message will be displayed if the incorrect code is entered. Press **END** at any time to return to an Unlocked Idle mode.

If the correct Admin Code has been entered, a new menu screen will be displayed. Press **9** to reboot the handset. The handset should return to service in approximately 30 seconds.

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13. Communication Control Menu

Via the Communications Control Menu, the handset may be used to selectively enable/disable the WiFi networks that serve the Passengers and the Airline Crew. From an Unlocked Idle mode, press **FCN**, then **8** to access the Communications Control Menu.
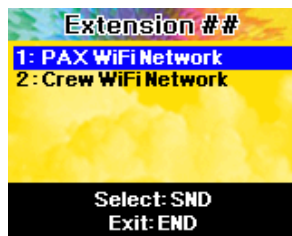
Display #37 - FCN 8, Comm Control Menu (Top Level)

While traversing menu screens, the following navigation methods are available.

(▲/▼ keys): Scroll the blue highlight bar up/down until the desired option is selected. Press **SND** to access or set the desired option.

(Keypad Digit): Instead of scrolling and using **SND** to choose a menu option, press a number on the keypad that corresponds to the desired menu option to directly access it.

CLR: Abort the current menu and go back to the previous menu screen.

END: Abort all menus and return to Unlocked Idle mode.

1: PAX WiFi Network - This option allows the Passenger WiFi network (SSID) to be turned ON or OFF during flight. Under normal operating conditions, the PAX WiFi network will be ON and should not be changed.

Display #38 - FCN 8_1, PAX WiFi Network

2: Crew WiFi Network - This option allows the Crew WiFi network (SSID) to be turned ON or OFF during flight. Under normal operating conditions, the Crew WiFi network will be ON and should not be changed.
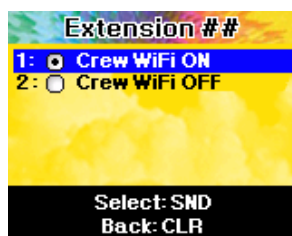
Display #39 - FCN 8_2, Crew WiFi Network

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14. Keypad Function Reference

Aircell ABS Corded SIP Handset Key Functions

KEY	FUNCTION
FCN	**FCN 0**: Toggle Do Not Disturb (DND) Mode **[For Future Use]** **FCN 1**: Ringer Volume Control **FCN 2**: Key Tone Volume Control **FCN 3**: OLED Display Brightness Control **FCN 4**: Setup Menu **FCN 5**: Keypad Lock **FCN 6**: Microphone Mute **FCN 7**: Undefined **FCN 8**: Communication Control Menu **FCN 9**: Undefined
▲	1. Increase audio volume (press ▲ during a call) 2. Increase numeric parameters (volume, brightness, timers, etc) 3. Scroll up through menus and lists
▼	1. Decrease audio volume (press ▼ during a call) 2. Decrease numeric parameters (volume, brightness, timers, etc) 3. Scroll down through menus and lists
●	(Inactive)
● ●	(Inactive)
1	Dialing digit "1"
2 ABC	Dialing digit "2"
3 DEF	Dialing digit "3"
4 GHI	Dialing digit "4"
5 JKL	Dialing digit "5"
6 MNO	Dialing digit "6"
7 PRS	Dialing digit "7"
8 TUV	Dialing digit "8"
9 WXY	Dialing digit "9"
*	Dialing digit "*"
0 Oper	Dialing digit "0"
#	Dialing digit "#"
RCL	Access the Phonebook to allow dialing of a stored name (RCL, ▲ or ▼, SND) or (RCL, ##, SND)
CLR	1. Clear the last digit entered 2. Go to previous menu level without saving settings from current menu screen
SND	1. Initiate a call (direct-dialed or phonebook) 2. Answer a call when the Handset is ringing 3. Last number redial - From idle screen, press once to redial 4. Select highlighted menu item
HLD	1. Place an active call on Hold 2. Return to a call that is on Hold
STO	1. Store audio volume, ringer volume, keypad volume, or OLED display brightness as new value. 2. Initiate storage dialog for direct-dialed number (add to phonebook) 3. Enter/confirm entries during menu and phonebook dialogs
END	1. End the active call (hang up) 2. Cancel menu and dialing operations (return to idle state)

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15. Menu Reference

The following User menus are visible and available via the appropriate FCN key:

FCN 4 - Setup Menu
1. User Configuration
    1.1. Ring Pattern (1-4)
    1.2. Earpiece Volume (1-6) [same as ▲/▼ during call]
    1.3. Ringer Volume (0-6, 0=off) [same as FCN 1]
    1.4. Keytone Volume (0-6, 0=off) [same as FCN 2]
    1.5. Display Brightness (1-4) [same as FCN 3]
    1.6. Display Blanking Timer (30sec/60sec/never)
    1.7. Keypad Backlight Timer (30sec/60sec/never)
    1.8. Visual Ringer (on/off)
    1.9. Reset Default Configuration (items 1.1 through 1.8 only)
2. ABS Status
    2.1. ATG Link Status
    2.2. ACPU Status
    2.3. AACU Status
    2.4. Send Maintenance Alert
    2.5. Conditional Reset
3. Version Information (display HW and SW version numbers)

FCN 8 - Communication Control Menu
1. PAX WiFi Network
    1.1. PAX WiFi Network ON
    1.2. PAX WiFi Network OFF
2. Crew WiFi Network
    2.1. Crew WiFi Network ON
    2.2. Crew WiFi Network OFF

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