aircell®

Welcome to

AirCell
Axxess

The Airborne SmartPhone System

Installation Manual

Installation Manual part number D12004
Revision E, March 2010

Aircell
303 South Technology Court, Building A
Broomfield, CO 80021
United States of America

PROPRIETARY NOTICE

This document and the information disclosed herein are proprietary data of Aircell. Neither this document nor the information contained herein shall be used, reproduced, or disclosed to others without prior written authorization of Aircell, except to the extent required for installation of recipient's equipment.

Notice
Freedom of Information Act (5 USC 552) and Disclosure of
Confidential Information Generally (18 USC 1905)

Aircell is furnishing this document in confidence. The information disclosed here falls within exemption (b)(4) of USC 552 and the prohibitions of 18 USC 1905. For further information, please contact:

Corporate Publications Coordinator
Aircell
303 South Technology Court, Building A
Broomfield, CO 80021
Telephone: (303) 301-0200
FAX: (303) 301-0279

© 2010 Aircell
All Rights Reserved.

Information in this document is subject to change without notice and does not represent a commitment on the part of Aircell.

Trademark Acknowledgements

Aircell and Aircell Axxess are registered trademarks of Aircell Business Aviation Services and its affiliates. All rights reserved.

Trademarks and service marks owned by third parties are the property of their respective owners.

Microsoft Windows® is a registered trademark of Microsoft Corporation in the United States and other countries.

MagnaStar® is a registered trademark of Raytheon Company.

Inmarsat® is a registered trademark of the International Maritime Satellite Organization (IMSO) and is licensed by IMSO to Inmarsat® Limited and Inmarsat® Ventures plc. Inmarsat's product names are either trademarks or registered trademarks of Inmarsat®.

Linksys™ is a registered trademark of Cisco systems.

uniHub™ is a registered trademark of On-Go, Inc.

Airshow® (4000 & Genisys) are registered trademarks of Rockwell Collins Corporation.

Unilink® is a registered trademark of Universal Avionics Systems Corporation.

RECORD OF REVISIONS

REVISION	DESCRIPTION	RELEASE DATE	RELEASED BY
Draft	Draft Document	November 2005	Aircell
Draft 2	Draft Document	March 2006	Aircell
A	Original Document	April 2006	Aircell
B	Revised for the addition of the 2-Channel Expansion Transceiver and Custom Retract HS.	December 2006	Aircell
C	Revised for the addition of AHI-1, AHI-2, and ACA components and incorporated miscellaneous editorial comments and revisions.	March 2007	Aircell
D	Revised for the addition of the Low Power CTR, WiFi and LEMO handsets, the Remote Diversity Antennas, ACA II and AHI-2 Revision B.	January 2008	Aircell
E	Revised for the addition of the SIP WiFi Handset GUIs and supporting text; revised Figure 2.1.A to show WLAN connections for the CTR; revised the D12031 reference wiring diagram; added the ACA II WiFi disable feature; added the WiFi handset screens; rewrote the On-Go Faxing Service activation (AHI-2) part of Section 4.11.; clarified the DO-160E and RS-232 requirements in Section 7.0., and incorporated miscellaneous editorial comments and revisions.	March 2010	Aircell

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF FIGURES

LIST OF TABLES

Aircell confidential and proprietary

1.0   INTRODUCTION

1.1.   General

Aircell Axxess® is one of the products in the Aircell family of SATCOM systems. It is a multi-channel, SATCOM system designed for medium-to-large business aircraft. With its "network neutral" design philosophy, Aircell Axxess equips aircraft with a modular, flexible cabin architecture that serves the operator's needs today, and provides the ability to upgrade as new technologies and links become available in the years to come.

Aircell Axxess comes standard with two built-in channels of Iridium satellite communications for quality, worldwide voice and narrowband data services with full PBX functionality. Also standard are Aircell's new Handsets with large-format color displays, advanced noise reduction technology and standard ear bud/headset jacks. Optional wireless capabilities include a full 802.11b/g WiFi "hotspot" which, when paired with a broadband connection, can be used to operate personal laptops, Personal Digital Assistants (PDAs) and other WiFi devices in the cabin.

By using Aircell Axxess integrated expansion ports, additional links can be added to suit an operator's needs. These include up to two additional Iridium channels, Inmarsat® broadband connections. Additional system capabilities are coming on line regularly.

This installation manual (Aircell Axxess manual number D12004) provides the required instructions to install the Aircell Axxess II (Airborne SmartPhone) Satellite Telephone System. This system allows for two-way communications from the aircraft, including voice over Iridium or data connection over Iridium (via the Iridium on-board modem). Please refer to Section 2.1. for Block Diagrams.

General Installation Notes (standard configuration consists of a ST 4200, CTR, and Handsets and/or optional ACA and/or optional Expansion Transceiver)

- The Satellite Transceiver (Aircell Axxess II (ST 4200)): May be installed outside of the pressure vessel. The Aircell Axxess II (ST 4200) unit contains the Internet Protocol (IP)-Private Branch Exchange (PBX) functions and will provide one (1) wired Ethernet connection for system setup, two (2) Iridium voice/data channels, and on-board modems that will accept RS-232 serial data. The RS-232 connections can be used for Iridium dial up data, Short Message Service (SMS), and Short Burst Data (SBD) connections.

    Examples: The following are some examples of products at the time of this publication have passed Aircell compatibility testing. Please contact the listed manufacturers and/or Aircell Technical Support for the latest interface details:

    Personal Computer (PCs): Dial up data service, Iridium's ISP Direct Internet 2.0 software and service recommended due to data compression capabilities;

    Cabin Entertainment Systems: Collins Air Show Genesys and 4000;

    Multi-Function Display Systems: Universal Avionics UniLink 70X;

    Fax Machines: Aircell / On-Go uniHub™ Fax Adapter and service required; and

    Flight tracking: Flight Explorer tracking service's using a Latitude Technologies Corp Skynode LMC, Global Positioning System (GPS) and Iridium data connection module.

- The optional 2-Channel Expansion Transceiver (ST 4020). May be installed outside of the pressure vessel. This is a convenient way to turn your Aircell Axxess 2-channel Iridium system into a 4-channel Iridium system.

- The Cabin Telecommunications Router (Aircell® Axxess™ CTR) must be installed within the pressure vessel; the CTR will provide the system interface options for up to eight (8) wired Session Initiation Protocol (SIP) Handsets, one (1) wired Ethernet connection for system setup, and for WiFi connections.

- Although designed and packaged for airborne use, the Aircell Axxess CTR is a normal router and will accommodate most Ethernet printers. Once connected to an available Ethernet port on the Axxess system and powered on, the printer will receive an IP address and will be accessible from laptop computers connected either wired or wirelessly to the CTR. Printer driver software may have to be loaded on individual computers and your IT department can help with that issue.

- The SIP or Voice over IP (VoIP) Handset (SIP Handsets) must be installed within the pressure vessel; will provide a voice connection to other SIP HSs and over the Iridium satellite network via the Aircell Axxess CTR to the Axxess II (ST 4200).

- Aircell Axxess Call Alerter (ACA and ACA II). The ACA must be installed within the pressure vessel. The ACA provides ten (10) switch outputs to control external call alerting devices/annunciators which can be lights, chimes, Sonalerts, etc. The ACA is powered via Aircell Power-over-Ethernet Data Interface (APoEDI) 48 VDC generated by the CTR for APoEDI. The ACA does not provide power to call alerting devices. The ACA is connected via the CTR. The ACA is controlled by the Aircell Axxess ST 4200 PBX which can configure and program the ACA. The ACA utilizes one (1) of the CTR's APoEDI-wired handset interfaces available. With an ACA installed, Aircell Axxess can operate with a maximum of nine (9) wired SIP handsets. One (1) ACA can be installed in place of any SIP handset (connected to a CTR).

  - ACA II is the same as the ACA except it offers a cockpit handset ringer disable and CTR WiFi functions.

- Iridium-approved antennas are mounted on the top of the aircraft to provide the Radio Frequency (RF) interface for the aircraft-to-satellite connection.

Iridium services are available when the aircraft is in the air or on the ground. The Iridium satellite communications link is provided using the Iridium LEO (Low Earth Orbit or 485 miles altitude) array of 66 satellites that enable total earth coverage.

General Installation Notes (assumes an optional configuration with AHIs installed)

- Aircell Axxess Handset Interface (AHI-1). The AHI-1 must be installed within the pressure vessel. AHI-1 can be daisy-chained to provide up to two (2) handsets per AHI-1 unit. AHI-1 contains an Ethernet switch (5 port), internal power supplies, and a power supply for implementation of the Aircell Power-over-Ethernet Data Interface (APoEDI). APoEDI provides power to handsets or peripheral subsystems. The AHI-1 unit passes Ethernet/IP-based control signals to/from the Aircell Axxess II (ST 4200) and other peripheral subsystems. AHI-1 units utilize and pass through aircraft power allowing daisy-chain configurations, i.e. any unit can be placed downstream. Power for the system is drawn from the 28 VDC aircraft power bus, and utilized by all peripheral subsystems (AHIs, CTR, etc.). An ACA can be hooked up to an AHI-1 in place of a handset.

- Aircell Axxess Handset Interface (AHI-2). The AHI-2 must be installed within the pressure vessel. AHI-2 can only provide up to one (1) handset. The AHI-2 also offers a Plain Old Telephone System (POTS)-to-serial converter and serial-to-Ethernet interface. One (1) POTS line that can be configured as store-and-forward FAX over Iridium port only – same as the On-Go UCH-300 or if SIU is installed, a RT FAX over Inmarsat port. The AHI-2 rev B and up has a RS-232 to Ethernet converter. One (1) RS-232 serial port for Dial up Data applications. The AHI-2 passes Ethernet/IP-based control signals to/from the Aircell Axxess ST and/or peripheral subsystems, such as the Cabin Telecommunications Router (CTR). AHI-2 units utilize and pass through aircraft power. This feature allows a daisy-chain configurations, i.e. a AHI-1 unit can be placed downstream. AHI-2s require secondary 28 VDC power supply for ATA. Internal AHI-2 components still receive 28 VDC power from aircraft bus via the existing wiring.

- Aircell Axxess Call Alerter (ACA and ACA II). The ACA must be installed within the pressure vessel. The ACA provides ten (10) switch outputs to control external call alerting devices/annunciators which can be lights, chimes, Sonalerts, etc. The ACA is powered via APoEDI 48 VDC generated by the R/T for APoEDI. The ACA does not provide power to call alerting devices. The ACA is connected via AHI-1 or AHI-2. The ACA is controlled by the Aircell Axxess ST PBX which can configure and program the ACA. The ACA

utilizes one (1) of the AHIs APoEDI-wired handset interfaces available. ACA II is the same as the ACA except it offers a HS ringer disable and CTR WiFi functions.

- Aircell supports the maximum number of (2) AHI-1s per installation; (3) AHI-2s per installation; and (1) ACA.
- The maximum system interconnect length (between the Aircell Axxess® (ST 4200) and the last Aircell AHI-1/AHI-2/CTR) is 150 ft. (70' to the first AHI, 40' to the second AHI, and 40' to the third AHI).
- AHI-1s and AHI-2s can be installed in any sequence.
- SIP handsets connected to an AHI will be powered from that AHI (via power over Ethernet).
- Maximum number of SIP handsets using AHI interfaces is five (5).
- With an ACA installed, Aircell Axxess can operate with a maximum of four (4) SIP handsets.
- One (1) ACA can be installed in place of any SIP handset (connected to AHI-1 or AHI-2).

AHI-2 Specific Installation Notes

- AHI-2s need separate aircraft 28 VDC power for the use of the J5 and J6 data ports.
- AHI-2 Data Port A (J-5 connection) is designed to be connected to the aircraft Fax via Tip/Ring (On-Go designed software interface using an internal On-Go uniHub™ Iridium Fax Adapter) (Revision C and later AHI-2 On-Go adapter can be used as a POTS over Inmarsat port if SIU Revision E or later is installed).
- AHI-2 Data Port B (J6 connection) is designed to be for RS-232 serial connection.
- For activation of Fax forwarding service with On-Go, the following information must be supplied to Aircell Customer Service: ID of the AHI-2 Port A (J-5 connector ID is the internal On-Go uniHub™'s S/N); and the S/N of the Aircell Axxess II (ST 4200) (the On-Go Fax Adapter will use Iridium channel # 2).
- AHI-2 Data Port B (J-6 connection) RS-232 serial connection designed for a Dial up data PC connection, Airshow Network, Genesys systems, UniLink and Telelink.
- The Aircell Axxess II (ST 4200) RS-232 data connections are also available at the ST 4200 and optional ST 4020 units.

The Aircell Axxess II (ST 4200), the Expansion Transceiver, CTR, RDAs, AHI-1 and AHI-2, ACA, and SIP Handsets were tested to the applicable DO-160E categories of Temperature and Altitude, Temperature Variation, Humidity, Shock and Crash Safety, Vibration, Power Input, Voltage Spike and RF Emission. Various equipment specifications and results are found in Section 7.0.

Install Aircell Axxess components in locations that are free of water, spray, or other fluids, whether by direct contact or condensation. When installing the Aircell Axxess System in the aircraft, carefully follow this Installation Manual.

Any alteration of this product voids the FAA or Federal Communications Commission (FCC) certification and the Aircell warranty. This publication is not to be used in lieu of a Supplementary Type Certificate (STC) or any other FAA approval. FAA Form 337 approval is usually required for installation of this equipment.

Note

WiFi is not activated on unit's ship out from Aircell. Refer to Section 4.9. for WiFi activation details.

Note

The material in this manual is subject to change. Before planning or performing any installation operation, check with Aircell www.Aircelldealers.com Dealer Info website to verify that this manual is complete and is the latest Revision. The Record of Revisions, Record of Temporary Revisions, Service Bulletin List, and List of Effective Pages found at the front of this manual must match that issued as current by Aircell.

www.Aircelldealers.com will have additional information that may be useful such as, Technical Bulletins and Tech Tips and Installation and Troubleshooting Tips.

Aircell welcomes your comments, suggestions, and corrections concerning this manual. Please include in your correspondence the publication number, equipment part number, page or figure number, and a brief description of any problem or consideration you noted. Please send your comments to:

cpc@aircell.com
or
Aircell
Corporate Publication Coordinator
303 South Technology Court, Bldg A
Broomfield, CO 80021

1.2.   Unpacking

Unpack the equipment carefully to save and ensure the integrity of the shipping package. Inspect each component for possible shipping damage. Report any damage to Aircell immediately. Use original packing material to return equipment to Aircell.

1.3.   Planning

Proper and careful planning is essential for reliable system performance and ease of maintenance. The following are some considerations to follow when planning the installation:

→ Study this manual carefully to get the complete picture of the installation process.

→ Visit www.Aircelldealers.com for additional information that may be useful, such as Technical Bulletins and Tech Tips and Installation and Troubleshooting Tips.

→ Plan the location of the required equipment to ensure that the cable restrictions are met.

→ Verify that adequate airflow is provided for equipment cooling.

→ Check cable routing, connector access (90 degree or straight), and determine cable lengths.

→ Ensure easy accessibility to connectors for future repairs.

→ Plan rack or tray layout to accommodate dual (side-by-side) equipment mounting.

1.4.   List of Abbreviations and Acronyms

A	Ampere	IP	Internet Protocol
AC	Advisory Circular	IPL	Illustrated Parts List
ACA	Aircell Axxess Call Alerter	LEO	Low Earth Orbit
AHI	Aircell Axxess Handset Interface	LOS	Line Of Sight
APoEDI	Aircell Power-over-Ethernet Data Interface	LRU	Line Replaceable Unit
ATA	Aircell Axxess Terminal Adapter	mA	milliampere = .001 of an ampere
AWG	American Wire Gauge	MHz	Megahertz
CDR	Call Detail Record	MIL	Military
CFR	Code of Federal Regulations	milliohm	milliohm = .001 of an ohm
CTR	Cabin Telecommunications Router	MSL	Mean Sea Level
dB	Decibel	MTBF	Mean Time Between Failures
DC	Direct Current	mV	millivolt = .001 of a volt
DER	Designated Engineering Representative	NEMA	National Electrical Manufacturers Association
DHCP	Dynamic Host Configuration Protocol	OSHA	Occupational Safety and Health Administration
DISA	Direct Inward System Answer	PBX	Private Branch Exchange

List of Abbreviations and Acronyms (continued)

DTMF	Dual Tone Multi Frequency	PDA	Personal Digital Assistant
ESN	Electronic Serial Number	P/N	Part Number
FAA	Federal Aviation Administration	POTS	Plain Old Telephone System
FCC	Federal Communications Commission	RF	Radio Frequency
GHz	Gigahertz	RMA	Return Material Authorization
GPS	Global Positioning System	RS-232	Serial binary data interconnection
HS	Handset	SAE	Society of Automotive Engineers
HTML	Hyper Text Markup Language	SBD	Short Burst Data
HTTP	Hyper Text Transfer Protocol	SIP	Session Initiation Protocol
ICD	Interface Control Drawing	SMS	Short Message Service
IFE	In-Flight Entertainment	S/N	Serial Number
IMSO	International Maritime Satellite Organization	SSA	Subscriber Service Agreement
ST	Satellite Transceiver	Trunk	Phone Line
ST 4020	Aircell Axxess® Expansion Transceiver unit	V	Volts
ST 4200	Aircell Axxess II Satellite Transceiver unit	VDC	Volts Direct Current
STC	Supplemental Type Certificate	VoIP	Voice over Internet Protocol
URL	Uniform Resource Locator	WiFi	Wireless Fidelity per IEEE 802.11b and 802.11g wireless networking standard
DO-160E	Environmental conditions and test procedures for airborne equipment development are produced by RTCA. The Federal Aviation Administration (FAA) generally accepts these conditions and procedures.		
RTCA	Radio Technical Commission for Aeronautics: a private, not-for-profit corporation that brings industry and government together to address the needs of the aeronautical community.		

1.5. Advisories

WARNING

Statements in this Section contain critical safety information. Read these statements carefully before installing this unit.

WARNING

Observe standard safety precautions and wear safety glasses to prevent personal injury while installing this unit in the aircraft.

WARNING

Shut off power before connecting or disconnecting the Telephone System Components (Aircell Axxess system), as voltage transients may damage the unit or the interface wiring.

WARNING

Follow the manufacturer's safety guidelines when using any solvents, epoxies, flammable liquids, or any other materials during the installation processes. Some of these products are toxic to the skin, eyes, and respiratory tract. Avoid prolonged contact and use only in well-ventilated areas.

WARNING

Components or subassemblies found in this unit may contain materials such as beryllium oxide, acids, lithium, radioactive material, mercury, etc. that can be hazardous to your health. If the component enclosure seal is broken, precautions must be taken against personal contact or inhalation in accordance with Occupational Safety and Health Administration (OSHA) requirements 29 Code of Federal Regulations (CFR) 1910.1000 or superseding documents. **Any alteration of this product voids the FAA or Federal Communications Commission (FCC) certification and the Aircell warranty.**

DNS	Domain Name System	PC	Personal Computer

2. Additional text in user manual

CAUTION

Use Isopropyl Alcohol carefully as it may react with some plastics in the area. Isopropyl Alcohol should be used to clean connector contacts and metal parts, if required.

1.6. FCC Compliance

FCC ID: Y7A-SIPWFHS   Model: SIPWFHS   PN: P12857   WiFi SIP Handset

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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

1.7. List of Related Publications

The following list includes related publications for the Aircell Axxess Telephone system:

Publication	Publication Number
Aircell Antenna Installation Manual	Aircell 800-10355
Aircell ATG 4000 Installation Manual	Aircell D13485
Aircell Axxess® Users Manual	Aircell D12058
Aircell Axxess EZ (MagnaStar® replacement) Installation Manual	Aircell D12169
Aircell Data Interface Unit Installation Manual	Aircell D12357
Aircell Satellite Interface Unit Installation Manual	Aircell D12379
Acceptable Methods, Techniques, and Practices - Aircraft Alterations*	FAA Advisory Circular (AC) 43.13-2A
Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair*	FAA AC 43.13-1B
Environmental Conditions and Test Procedures for Airborne Equipment	RTCA DO-160E

*Installation of the Aircell Axxess shall be performed in accordance with these FAA Advisory Circulars (as applicable).

2.0 DESCRIPTION AND OPERATION

2.1. Introduction

2.1.1. Aircell Axxess® II Standard Installation Block Diagram
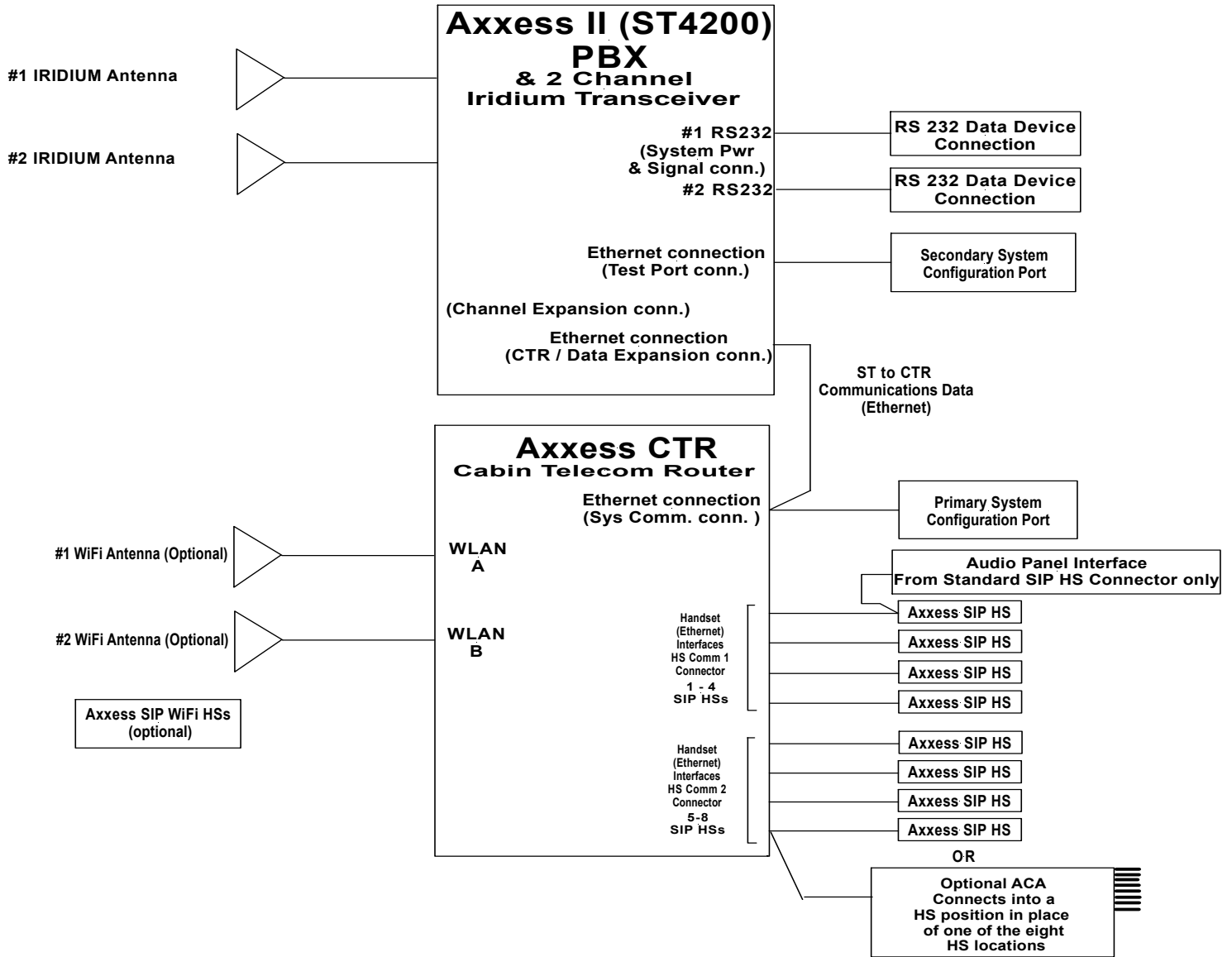
Figure 2.1.A.   Aircell Axxess Standard Installation Block Diagram

2.1.2. Aircell Axxess® II Installation Block Diagram showing optional Expansion Transceiver
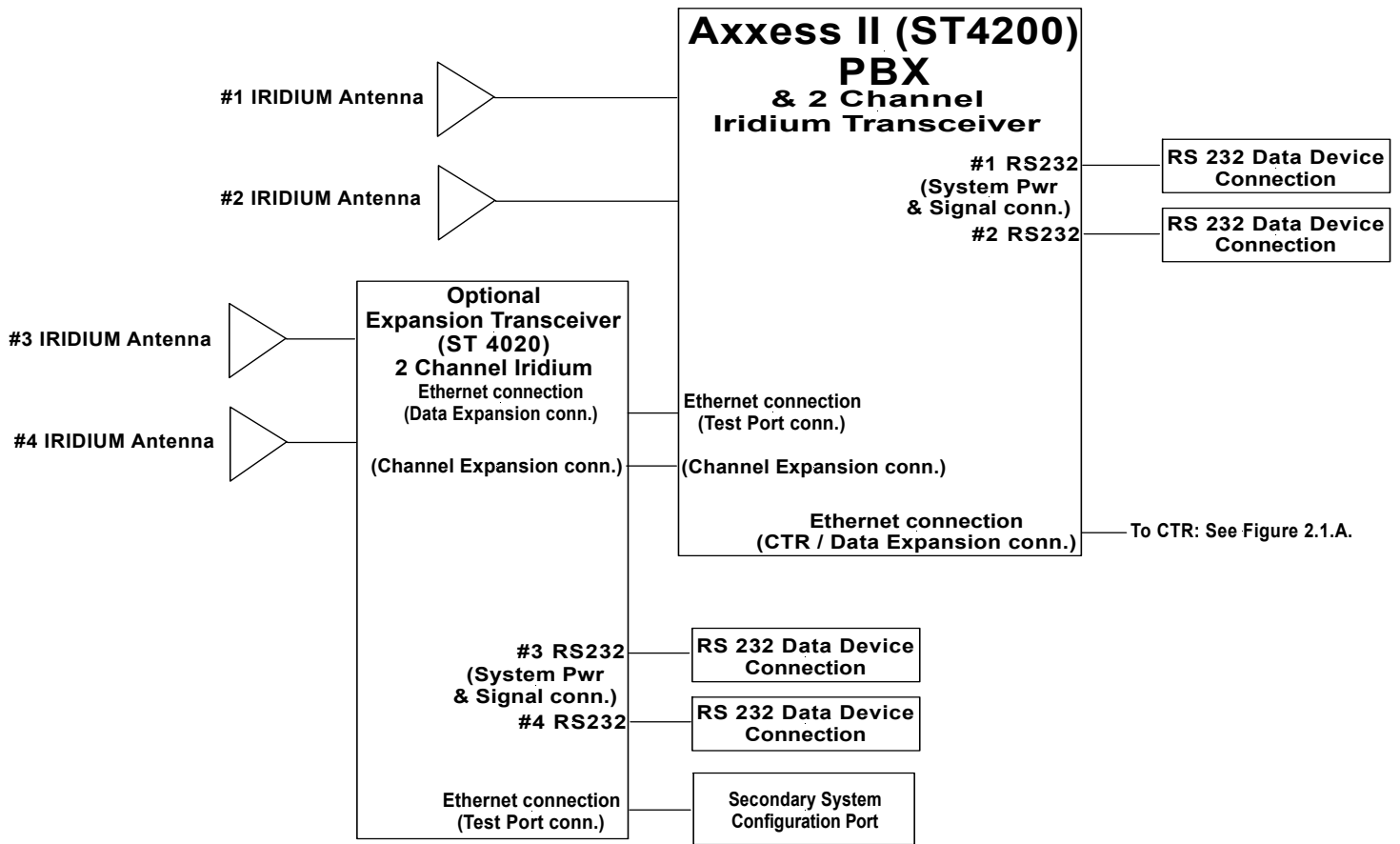
Figure 2.1.B.   Aircell Axxess Installation Block Diagram showing the Expansion Transceiver

Figure 2.1.C.   Aircell Axxess Installation Block Diagram showing optional AHIs and ACA

2.1.4. Aircell Axxess® Standard Components

The Aircell Axxess Telephone System provides both voice and data transfer options. The system enables telephone communications when the aircraft is on the ground or in the air via satellite, plus the option to have multiple Handsets in the aircraft for conference calls.

Aircell Axxess II (ST 4200) Dual-Channel Satellite Transceiver and PBX P/N P12023	Aircell Axxess CTR Cabin Telecommunications Router P/N P12083, P12083-001	Iridium Two-channel Patch Antennas P/N 015-11203-001 (Top Mount Only)	Remote Diversity Antennas P/N P12344
Standard SIP Handset P/N P12248-00X	WiFi SIP Handset P/N P12857-00X	Flush-Mount SIP Handset P/N P12192-00X	Custom-Retractable SIP Handset P/N P12793-00X

LEMO SIP Handset P/N P12865-00X

Figure 2.1.D.   Aircell Axxess Standard Components

<u>Note</u>

Refer to **Aircell Antenna Installation Manual P/N 800-10355** for other antenna options and details.

2.1.5. Aircell Axxess® Optional Components (AHIs in lieu of an Aircell Axxess CTR)

Aircell Axxess Expansion
Transceiver
(ST 4020)
Dual-Channel Satellite
Transceiver
P/N P12679

Axxess
ACA P/N 12347 or
ACA II P/N 12924

Axxess AHI-1
P/N P12339

Axxess AHI-2
P/N P12346

Figure 2.1.E.   Aircell Axxess Optional Components

2.2. Description and Overview

2.2.1. Aircell Axxess® II 2-Channel Satellite Transceiver (ST 4200) and Mounting Tray

The Transceiver is 12.66" long, 4.85" wide, and 7.0" high (1/2 ATR). The finish is textured blue powder-coating over chemical film. The Transceiver's mounting tray secures the unit with a flange at the back and a locking device in the front. Detents provide locking for the knob, to ensure that the Transceiver will stay in place when it experiences vibration. A split-rolled tube provides spring tension to keep the knob locked in position. An optional rail mounting kit is also available. (Refer to Section 6.0, Interface Control drawing (ICD) D12016, for details).

All of the electrical connections to the Transceiver are on the front of the box, which offers convenient access for maintenance. The location of the Transceiver in the equipment rack, may suggest the use of 90º connectors.

The Aircell Axxess II can be either installed in the pressurized cabin area or the non-pressurized area suitible for avionics equiptment. Keep in mind the RF coax lengths and routing.

Refer to Section 7.4.1., Aircell Axxess ST System Specifications, for details regarding the environmental requirements for this unit.

Satellite Antenna Channel 1 and 2 (Type N Female Connector)

Channel Expansion Connector

System Power and Signal Connector

CTR/Data Expansion Connector

Test Connector
PC to System, Configuration and Status Connection

Flange and side retention to secure the Transceiver.

Split tube offers screw tension to the locking device.

Detents

Figure 2.2.   Aircell Axxess II (ST 4200) Transceiver and Mounting Tray

The Mounting Tray is alodine-processed aluminum (Chem Film per Mil-C-5541, class 3 or equivalent) to reduce the possibility of corrosion and to provide a stable grounding path. Four (4) No. 10 Unx / M5 fasteners are used to secure the tray to the aircraft structure. Location considerations for the Mounting Tray (P/N P12107) are: accessibility for maintenance, lengths of required cables, and wiring. Section 7.4.1., System Specifications, identifies the environmental requirements of the Transceiver. The optional Mounting Rails (Kit P/N P12273) are alodine-processed aluminum (Chem Film permit-C-5541, Class 3 or equivalent) also. Optional Rails are mounted to the Transceiver via eight (8) supplied #8 fasteners, six (6) No. 10 Unx / M5 fasteners are used to secure the Mounting Rails to the aircraft structure.

Description and Operation, Section 2

Aircell confidential and proprietary

2.2.2. Aircell Axxess® 2-Channel Expansion Transceiver and Mounting Tray (optional)

>>Install the ST 4020 close to the ST 4200; the expansion connecters wiring between the STs must be less then 6 feet.<<

The Transceiver is 12.66" long, 4.85" wide, and 7.0" high (1/2 ATR). The finish is textured blue powder-coating over chemical film. The Transceiver's mounting tray secures the unit with a flange at the back and a locking device in the front. Detents provide locking for the knob, to ensure that the Transceiver will stay in place when it experiences vibration. A split-rolled tube provides spring tension to keep the knob locked in position. An optional rail mounting kit is also available. (Refer to Section 6.0, ICD D12155, for details).

All of the electrical connections to the Transceiver are on the front of the box, which offers convenient access for maintenance. The location of the Transceiver in the equipment rack may suggest the use of 90º connectors.

The Aircell ST 4020 can be either installed in the pressurized cabin area or the non-pressurized area suitible for avionics equiptment. Keep in mind the RF coax lengths and routing.

Refer to Section 7.4.2., Aircell Axxess ST 4020 System Specifications, for details regarding the environmental requirements for this unit.

Satellite Antenna Channel 3 and 4 (Type N Female Connector)

Channel Expansion Connector

System Power and Signal Connector

Data Expansion Connector

Test Connector
PC to System, Configuration and Status Connection

Split tube offers screw tension to the locking device.

Flange and side retention to secure the Transceiver.

Detents

Figure 2.3.   Expansion Transceiver (ST 4020) and Mounting Tray

The Mounting Tray is alodine-processed aluminum (Chem Film per Mil-C-5541, class 3 or equivalent) to reduce the possibility of corrosion and to provide a stable grounding path. Four No. 10 Unx / M5 fasteners are used to secure the tray to the aircraft structure. Location considerations for the Mounting Tray (P/N P12107) are: accessibility for maintenance, lengths of required cables, and wiring. Section 7.4.2., System Specifications, identifies the environmental requirements of the Transceiver. The optional Mounting Rails (Kit P/N P12273) are alodine-processed aluminum (Chem Film permit-C-5541, Class 3 or equivalent) also. Optional Rails are mounted to the Transceiver via eight (8) supplied #8 fasteners, six (6) No. 10 Unx / M5 fasteners are used to secure the Mounting Rails to the aircraft structure.

2.2.3. Aircell Axxess® Cabin Telecommunications Router (CTR) and Mounting Tray

The CTR is 12.44" long, 2.25" wide, and 7.62" high (1/4 ATR). The finish is textured blue powder-coating over chemical film. The CTR's mounting tray secures the unit with a flange at the back and a locking device in the front. Detents provide locking for the knob, to ensure that the CTR will stay in place when it experiences vibration. A split, rolled tube provides spring tension to keep the knob locked in position. An optional rail mounting kit is also available. (Refer to Section 6.0, ICD 12017, for details).

All of the electrical connections to the CTR are on the front of the box, which offers convenient access for maintenance. The location of the CTR in the equipment rack, may suggest the use of 90° connectors.

The CTR will need to be installed in the pressurized cabin. Locate the CTR in a non-metallic encloser facing the cabin area intended for WiFi use. This will help with RF data device comunication to the built in WiFi antennas. Optional remote-mounted WiFi antennas are available.

Refer to Section 7.4.3., Aircell Axxess CTR System Specifications, for details regarding the environmental requirements for this unit.

System Communications Data Connector
PC to System, Configuration and Status Connection

Power / Control Connector

Internal WiFi and Optional External WiFi Antenna TNC Female Connectors.
P/N P12284 TNC 50 ohm Load Plugs (not shown) are installed if WiFi is not required.
2 coax assemblies P/N 12017 (TNC to TNC), Internal Antenna 1 & 2 to WLAN A & B for Internal Antenna use.
WLAN A & B to External Antennas for optional External Antenna Use.

Internal WiFi Antennas
WiFi is not activated on unit's ship out from Aircell. Refer to Section 4.9 for WiFi activation details.
Locate in a non-metallic encloser facing the cabin area intended for WFi use.
Optional remote-mounted WiFi antennas are available.

Handset Comm 1 and 2 Connectors
Handset (Ethernet) Interfaces
Handset Comm 1 for up to 4 HSs and Comm 1 & 2 for up to 8 HSs

Split tube offers screw tension to the locking device.

Detents

Flange and side retention to secure the Transceiver.

Figure 2.4.   Cabin Telecommunications Router (CTR) and CTR Mounting Tray

The Mounting Tray is alodine-processed aluminum (Chem Film per Mil-C-5541, class 3 or equivalent) to reduce the possibility of corrosion and to provide a stable grounding path. Four (4) No. 6 Unx / M3.5 Machine Screws are used to secure the tray to the aircraft structure. Location considerations for the Mounting Tray (P/N 310-10949-001) are: accessibility for maintenance, lengths of required cables, and wiring. Section 7.4.3., System Specifications, identifies the environmental requirements of the CTR. The optional Mounting Rails (Kit P/N P12273) are alodine-processed aluminum (Chem Film permit-C-5541, Class 3 or equivalent) also. Optional Rails are mounted to the CTR via eight (8) #8 supplied fasteners, six (6) No.10 Unx / M5 Machine fasteners are used to secure the Mounting Rails to the aircraft structure.

Description and Operation, Section 2

2.2.4. Aircell Axxess® Remote Diversity Antenna (RDA)

The Remote Diversity Antenna (RDA) is Aircell part number P12344. Two (2) are required for use on the CTR when the included antennas are not used. The antenna is low profile that provides coverage at 2.4 GHZ 802.11 (WiFi) protocol. Mechanical configuration is spherical-radius molded radome intended solely for use in the aircraft cabin. It has a cable with a TNC Male. Refer to Section 7.4.4., Aircell Axxess RDA System Specifications, for details regarding the environmental requirements for this unit.

Figure 2.5.   Remote Diversity Antenna

2.2.5. Aircell Axxess® Handset Interface (AHI-1) (optional in lieu of CTR)

The AHI-1 is 4.12" long, 3.07" wide, and 1.0" high (Refer to Section 6.0, ICD D12105, for full details).

Must be installed within the pressure vessel. AHI-1 can be daisy-chained to provide up to a maximum of five (5) SIP handsets – one (1) or two (2) handsets per AHI-1 unit. AHI-1 contains Ethernet switch (5-port), internal power supplies, and a power supply for implementation of the Aircell Power-over-Ethernet Data Interface (APoEDI). APoEDI provides power to handsets or peripheral subsystems. The AHI-1 unit passes Ethernet/IP based control signals to/from the Aircell Axxess ST and other peripheral subsystems. AHI-1 units utilize and pass through aircraft power allowing daisy-chain configuration; i.e. any unit can be placed downstream. Power for the system is drawn from the 28 VDC aircraft power bus, and utilized by all peripheral subsystems AHIs, etc. An ACA can be hooked up to an AHI-1 in place of a handset.

Figure 2.5.   AHI-1

The Aircell Axxess Handset Interface 1 (AHI-1) is a subsystem that is used in conjunction with Aircell Axxess-series products for implementation of air-to-ground telecommunication services, including voice and data communications. The AHI-1 provides interfaces between the Aircell Axxess System Communications backbone and two Aircell Axxess Corded SIP handsets or other peripheral subsystems. Figure 2.1.C. is a block diagram of the AHI-1 interface.

The Aircell Axxess Handset Interface AHI-1 is intended for installation and operation in the aircraft cabin. It is not designed for operation in areas of the aircraft that are exposed to extreme environmental conditions, very high or very low temperatures, conditions where condensation may occur, or very high altitude conditions.

Refer to Section 7.4.5., Aircell Axxess AHI-1 System Specifications, for details regarding the environmental requirements for this unit.

2.2.6. Aircell Axxess® Handset / Fax Interface (AHI-2) (optional in lieu of CTR)

The AHI-2 is 8.5" long, 5.05" wide, and 1.8" high
(Refer to Section 6.0, ICD DD12159, for details).

Must be installed within the pressure vessel. The AHI-2 is composed of a POTS-to-Serial converter and serial-to-Ethernet interface. The POTS line can be configured as store-and-forward FAX port, same as On-Go UCH-100/300 or as an Inmarsat real time FAX connection if Aircell SIU also installed. The serial-to-Ethernet interface can be used as an RS-232 dialup data port. The AHI-2 passes Ethernet/IP based control signals to/from the Aircell Axxess ST and/or peripheral subsystems, such as the Cabin Telecommunications Router. AHI-2 units utilize and pass through aircraft power. This feature allows a daisy-chain configuration, i.e., any unit can be placed downstream. AHI-2 also requires a secondary 28 VDC power supply for ATA (internal On-Go adapters). Internal AHI components still receive 28 VDC power from the aircraft bus via the existing wiring.

Figure 2.6.   AHI-2

The Aircell Axxess Handset Interface 2 (AHI-2) is a subsystem that is used in conjunction with Aircell Axxess Satellite Transceiver products for implementation of air-to-ground telecommunication services, including voice and data communications. The AHI-2 module includes all of the functions of the smaller AHI-1 module with the exception that it has only one Handset Interface, and it also contains two (2) Aircell Axxess Terminal Adapter (ATA) functions. The AHI-2 provides interfaces to the Aircell Axxess ST System Communications backbone for one Aircell Axxess Corded SIP handset or Aircell Axxess Call Alerter (ACA) and one (1) POTS device. The POTS devices may be standard FAX machine. The two (2) ATA functions connect the POTS devices to the Aircell Axxess ST backbone by providing central office emulation, protocol conversion, buffering, and FAX store-and-forward functions. The ATA functions also provide a reliable end-to-end data link to the appropriate ground server via the Aircell Axxess satellite transceiver product and the Iridium satellite communication network. The AHI-2 also contains a five-port Ethernet switch (with two (2) ports allocated to the ATA functions), internal power supply(s), and a power supply for implementation of the Aircell Power over Ethernet Data Interface (APoEDI), which provides power to a handset or ACA. The AHI-2 passes through power and communications to other subsystems that are connected to the Aircell Axxess System Communications backbone. Figure 2.1.C. is a block diagram of the AHI-2 interface. The Aircell Axxess handset interface is intended for installation and operation in the aircraft cabin. It is not designed for operation in areas of the aircraft that are exposed to extreme environmental conditions, very high or very low temperatures, conditions where condensation may occur, or very high altitude conditions.

Refer to Section 7.4.6., Aircell Axxess AHI-2 System Specifications, for details regarding the environmental requirements for this unit.

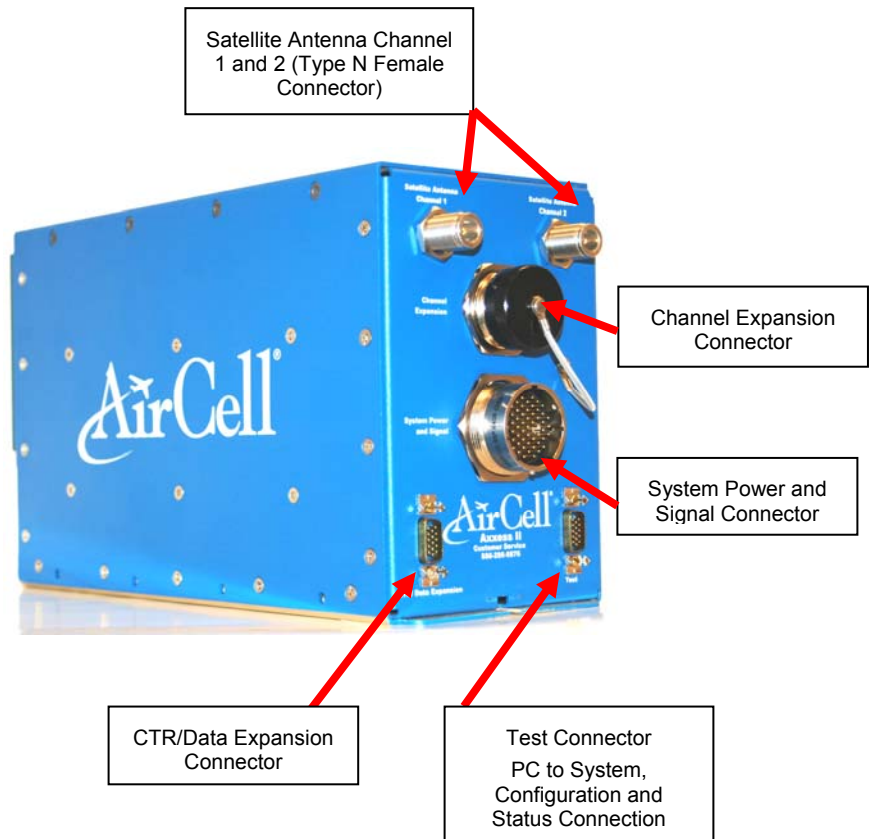**Description and Operation, Section 2**

Aircell confidential and proprietary

2.2.7. Aircell Axxess® Call Alerter (ACA) (optional)

The ACA is 4.12" long, 3.4" wide, and 1.0" high (Refer to Section 6.0, ICD D12160, for details).

Aircell Axxess Call Alerter (ACA). The ACA must be installed within the pressure vessel. Provides 8 switch outputs to control external call alerting devices/annunciators which can be lights, chimes, Sonalerts, etc. Powered via APoEDI 48VDC generated by the CTR or AHI for APoEDI. ACA does not provide power to call alerting devices. ACA is connected via CTR, AHI-1 or AHI-2. The ACA is controlled by the Aircell Axxess ST PBX which can configure and program the ACA. The ACA utilizes one of the eight (8) APoEDI-wired handset interfaces available from the CTR or one of the five (5) available handset ports from an AHI.

Figure 2.7.   ACA

The Aircell Axxess ACA is a subsystem that is used in conjunction with Aircell Axxess-series products for implementation of air-to-ground telecommunication services, including voice and data communications. The ACA provides call alerting functions. The ACA provides eight (8) switch ports to control external call alerting devices. Each alerter switch port circuit consists of an isolated switch. It should be noted that the ACA provides switches for enabling call alerting devices; it provides no power to the alerter device. Any power that is required for operating call alerting devices must be externally provided. Each of the ACA switches has a maximum current capability of 0.5 amperes, and the switch is sensitive to voltage polarity. The ACA has two (2) connector interfaces: J1 (system interface connector) and J2 (alerter interface connector). Figure 2.1.C. is a block diagram of the ACA interface. The Aircell Axxess Call Alerter is intended for installation and operation in the aircraft cabin. It is not designed for operation in areas of the aircraft that are exposed to extreme environmental conditions, very high or very low temperatures, conditions where condensation may occur, or very high altitude conditions.

Refer to Section 7.4.7., Aircell Axxess ACA System Specifications, for details regarding the environmental requirements for this unit.

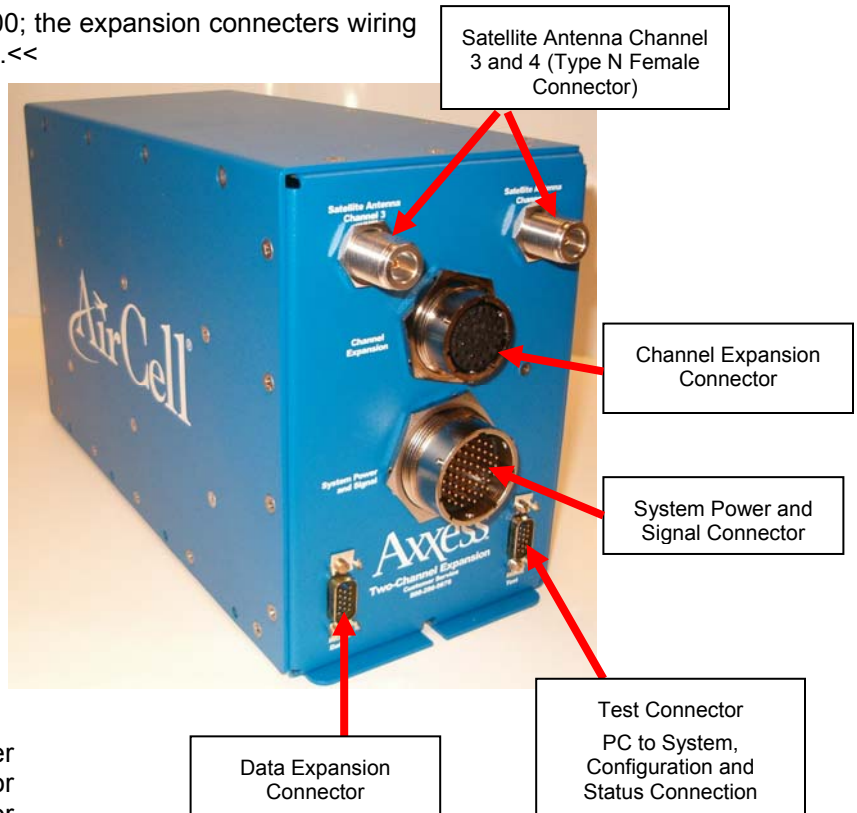### 2.2.8. Aircell Axxess Call Alerter II (ACA II) (optional)

ACA II is the same as the ACA except for the additional capabilities to disable a selectable handset(s) and associated annunciators. These options are selectable during installation. The ACA II is able to detect the status of discrete input ports. A "ground" (ring/CTR WiFi disable) or "open" (ring enabled) is detected and then that status is converted to an Ethernet message and passed on to the ST 4200 via the Ethernet bus. This discrete is then selectable to disable a Handset extension from ringing and/or disable the CTR WiFi operation. This is done via the ST 4200 PBX ACA configuration. Refer to Section 4.8.11.6. for programming details. Refer to Section 6.0, ICD D12329, for details. Refer to Section 10, ICD D12031, for wiring interfaces.

Refer to Section 7.4.7., Aircell Axxess ACA II System Specifications, for details regarding the environmental requirements for this unit.
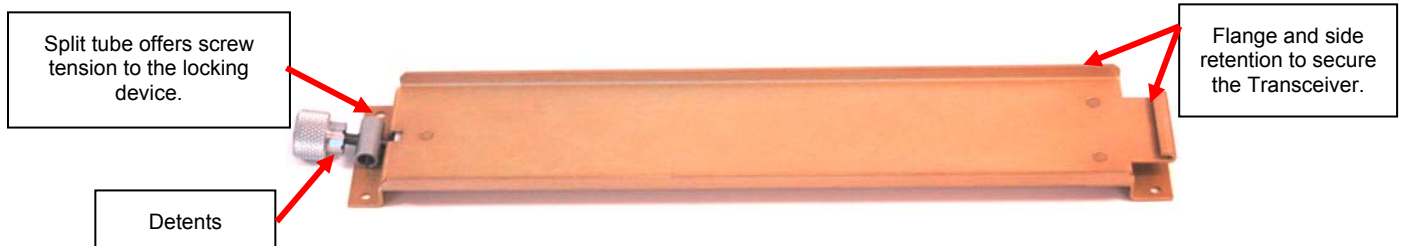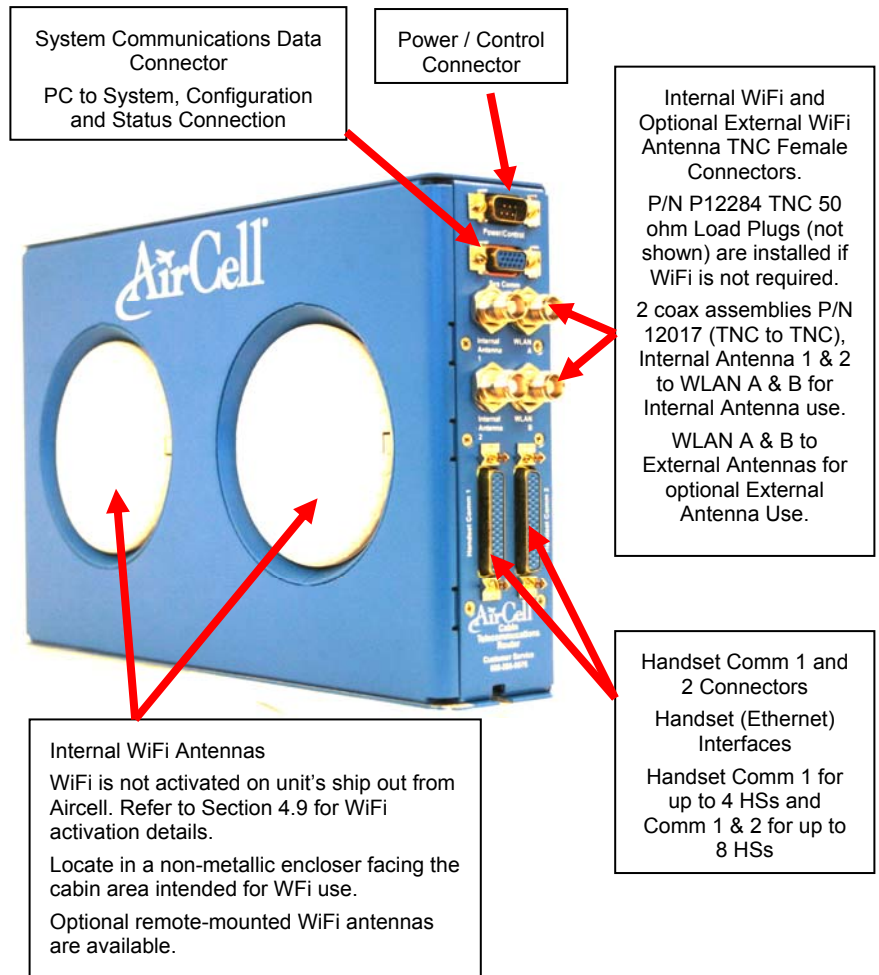
2.2.9. Aircell Axxess® Standard SIP Handset (with Audio Panel Interface)

Figure 2.8.   Standard SIP Handset and Cradle

The Handset provides voice communications and control of the Aircell Axxess System. The Handset supplies and receives information to and from the transceiver through the CTR. The standard 21-inch coil cord will extend to about 100 inches. The Handset and Cradle come in three (3) distinctive colors of your choice: black, beige, or gray. Mount the Handset and Cradle in any position keeping accessibility in mind. Only this HS has an Audio Panel interface option. Refer to Section 7.4.8., Aircell Axxess Standard SIP Handset Specifications, for details regarding the environmental requirements for this unit.

2.2.10. Aircell Axxess WiFi SIP Handset (with no Audio Panel Interface)

Figure 2.9.   WiFi SIP Handset and Base Station

The Handset provides voice communications and control of the Aircell Axxess System. The Handset supplies and receives information to and from the transceiver through the CTR. The Handset and Base Station come in three (3) distinctive colors of your choice: black, beige, or gray. Mount the Handset and Base Station in any position keeping accessibility in mind. Refer to Section 7.4.9., Aircell Axxess WiFi SIP Handset Specifications, for details regarding the environmental requirements for this unit.

Note: This handset requires CTR part number P12083 Rev L or later, or CTR part number P12083-001 Rev B or later.

Note: The Aircell Axxess Wi-Fi Handset will provide about three hours of talk time and over ten hours of standby time. The handset is only charging when placed in the charging cradle and when the avionics are turned on. Fully charging a completed depleted handset will require about two hours. After one hour, the handset will be usable for up to 80% of its rated talk and standby times. It is recommended that all users be advised to always keep the handset in the charging cradle when it is not being used for an actual call. This will ensure that the battery is fully charged during each flight and immediately available for calls at the start of a subsequent flight.

2.2.11. Aircell Axxess Flush-Mount SIP Handset (with no Audio Panel Interface)

Figure 2.9.   Flush-Mount SIP Handset and Cradle

The Handset provides voice communications and control of the Aircell Axxess System. The Handset supplies and receives information to and from the transceiver through the CTR. The retracting cord will extend about 50 inches (Revision L of the Flush-Mount Handset and subs, 65 inches). The Handset and Cradle come in three (3) distinctive colors of your choice: black, beige, or gray. Mount the Handset and Cradle in any position keeping accessibility in mind. Refer to Section 7.4.10., Aircell Axxess Flush-Mount SIP Handset Specifications, for details regarding the environmental requirements for this unit.

2.2.12. Aircell Axxess® Custom-Retractable SIP Handset (with no Audio Panel Interface)

Figure 2.10.   Custom-Retractable SIP Handset and Retractor

The Handset provides voice communications and control of the Aircell Axxess System. The Handset supplies and receives information to and from the transceiver through the CTR. The retracting cord will extend about 50 inches (Revision C of the Custom-Retractable Handset and subs, 65 inches). The Handset comes in three (3) distinctive colors of your choice: black, beige, or gray. Mount the Handset in any position keeping accessibility in mind. Refer to Section 7.4.11., Aircell Axxess Custom-Retractable SIP Handset Specifications, for details regarding the environmental requirements for this unit.

2.2.13. Aircell Axxess LEMO SIP Handset (with no Audio Panel Interface)

Figure 2.11.   LEMO SIP Handset

The Handset provides voice communications and control of the Aircell Axxess System. The Handset supplies and receives information to and from the transceiver through the CTR. The standard 21-inch coil cord will extend to about 100 inches. The Handset comes in three (3) distinctive colors of your choice: black, beige, or gray. Mount the Handset in any position keeping accessibility in mind. Refer to Section 7.4.12., Aircell Axxess LEMO SIP Handset Specifications, for details regarding the environmental requirements for this unit.

2.2.14. Reserved for product expansion

2.2.15. Reserved for product expansion

2.2.16. Reserved for product expansion

2.2.17. Reserved for product expansion

2.2.18. Reserved for product expansion

2.2.19. Reserved for product expansion

2.2.20. Aircell Axxess® Satellite One-Channel Patch Antenna

The Patch Antenna is Aircell P/N 015-10306-001. One is required for each Iridium Satellite channel. This antenna is a low profile Iridium/GPS antenna that provides continuous coverage from 1565 MHz to 1626.5 MHz for excellent Iridium applications. Mechanical configuration is a spherical-radius molded ray dome that provides enhanced protection against rain, ice, and lightening strikes. Qualified for high-speed military aircraft as well as general aviation applications, it has a TNC female connector.

Figure 2.12.A.   Single Patch Antenna

2.2.21. Aircell Axxess Satellite Two-Channel Patch Antenna

The Dual Patch Antenna is Aircell P/N 015-11203-001. Only one is required for a dual Iridium installation. This antenna is a low profile combination Iridium/GPS antenna that provides continuous coverage from 1565 MHz to 1626.5 MHz. The mechanical configuration is an oblong molded radome that provides protection against rain, ice, and lightening strikes. It is qualified for high-speed military aircraft as well as general aviation applications. This antenna has two TNC female connectors.

Figure 2.12.B.   Dual Patch Antenna

Refer to Aircell Antenna Installation Manual P/N 800-10355 for options and installation details.

Requirements of the applicable FARs may stipulate that proper Designated Engineering Representative (DER) engineering documents (8110-3) be supplied or that the installation be performed in accordance with an acceptable Supplemental Type Certificate (STC) for mounting these types of antennas. These are the responsibilities of the Installer.

Note

Antenna Bonding

As with any communication equipment, bonding the Antenna to airframe is essential for optimum performance. Ensure that the Antenna is bonded to the aircraft skin. Properly bonded, there should be 2.5 milliohms or less between the mounting screws and airframe ground. Care in bonding has been shown to eliminate erratic or poor system performance. Iridium Antenna bonding is essential for proper performance (as with any antenna).

2.2.22. Reserved for product expansion

3.0   INSTALLATION PROCEDURES

3.1.   Planning

Careful planning for the install of the Aircell Axxess® will ensure an efficient install with minimum down time for the aircraft and will ensure optimal system performance and easy maintenance access in the future. Study the aircraft for optimal antenna location, plan equipment locations with service in mind, and select the proper cabling before ordering. The Customer will be pleased to get the aircraft back in service promptly as the result of your planning.

Refer to Aircraft manufacturing guidelines and/or to FAA AC 43.13-1B and 2A. FAA AC 43.13-1B (Acceptable Methods, Techniques, and Practices) Chapter 11, and FAA AC 43.13-2A (Acceptable Techniques, and Practices-Aircraft Alterations) Chapters 2 and 3 provide excellent guidelines to ensure a good installation.

A field-approved FAA Form 337 that references a STC as a basis for a follow-on field approval, references to acceptable approvable data and/or DER documentation (Form 8110-3) approving installation data, is the usual required documentation path for the installation of this system.

Note
Requirements of the applicable FARs may stipulate that proper DER engineering documents (Form 8110-3) be supplied or that the installation be performed in accordance with an acceptable STC.

3.2.   Equipment Location

The Aircell Axxess (ST 4200) can either be located in the pressure cabin or out of the pressure cabin (in the avionics bay, where rain or harsh environments will not be present.) Refer to the Systems Specifications Section 7.4.1., for further details regarding the environment requirements, as the Transceiver is not weather proof. Avoid a completely "sealed" chamber, as ambient air movement is required to cool the transceiver. When considering the use of ram-air for cooling, ensure that rainwater will not be ingested and sprayed onto the equipment. Cooling can extend the Mean Time Between Failure (MTBF) of electronic equipment located in a tightly packed avionics bay, so a fan may be a worthwhile consideration.

The optional 2-Channel Expansion Transceiver (ST 4020). May be installed outside of the pressure vessel. It is a convenient way to turn your Aircell Axxess 2-channel Iridium system into a 4-channel Iridium system.

The CTR will need to be installed in the pressurized cabin. Locate the CTR in a non-metallic encloser, preferably upper cabin area, facing the area intended for WiFi use. This will help with RF data device communication to the built in WiFi antennas. Optional remote-mounted WiFi antennas are available.

Note
Wi-Fi is not activated on unit's ship out from Aircell at this time. Refer to Section 4.9. for Wi-Fi activation details.

If this is a new installation of an Aircell Axxess System, select RF cabling as specified in this manual to satisfy the approved requirements of the system. Keep the cable attenuation as low as possible in the cable run from the Transceiver to the Satellite Antenna, as the performance of the system will be greatly affected by this cable attenuation.

3.3.   Cable Routing

Draw a cable routing diagram for the aircraft. Refer to Wiring Diagram in Section 10.0 to determine the required cables, then measure and record the required cable lengths on a worksheet. Consider the use of straight or 90 degree connectors to satisfy the bend radius requirements of the coax and wiring. Allow for adequate bend radius, service loops, and stress relief in all cable routes. Follow the cable specifications of Tables 3.1. Clear

and concise specifications when ordering parts will ensure an efficient install. The Vendors provide coax cable loss decibel (dB) and VSWR data for the aircraft records.

3.4.   Antenna Selection

Refer to **Aircell Antenna Installation Manual P/N 800-10355** for options and installation details.

3.5.   Handset Selection

Five (5) types of SIP HS are available: a standard SIP HS, flush-mount SIP HS, custom-retractable SIP, LEMO SIP and Wireless WiFi SIP HS. All five HSs will mount and look like the previous versions of Aircell® HSs. The difference will be with the wiring type and interface connections. It is advisable to install at least two (2) HSs, one (1) cockpit location and one (1) cabin location.

You can have up to eight (8) HSs (ST 4200 Revision N and subsequent will support 10 HSs) if desired (however, if an ACA is installed to the CTR, the maximum number of wired HSs is seven (7) from the CTR; if the optional AHIs are installed without the CTR, the maximum number of wired HSs is five (5)). Since the CTR will only support eight (8) wired HSs, the additional two (2) HSs will need to be powered by an AHI-1 or an AHI-2, or the HSs need to be WiFi, or some combination thereof. Please refer to Section 6.0, D12059, D12060, D12304, D12305 and D12130/D12398 for the HS details.

<div align="center">

Note

Only the standard SIP HS will have Audio Panel interface capabilities. This interface will be at the HS connector (optional WiFi SIP Handsets are to be part of product expansion).

Note

When up to eight (8) Handsets (or ten (10) HSs for ST 4200 Revision N and subsequent) are installed, only three (3) HS at a time per channel can conference to each other or two (2) HS can conference to a ground caller. The system also provides an Audio Panel interface from a standard SIP HS connection integration into the aircraft communication system. The Wiring Diagram in Section 10.0 provides wiring definitions for the Audio Panel and SIP Handsets.

</div>

3.6.   Component Locations

Refer to Section 7.0, System Specifications, for details regarding the environmental requirements of the Aircell Axxess components. Refer to Section 6.0 for Mechanical installation details.

3.6.1.   Aircell Axxess ® II 2-Channel Satellite Transceiver (ST 4200)

Typically, the transceiver would be located in the avionics equipment bay. However, when choosing the location of the transceiver, the requirement to keep the cable loss below 3.0 dB from the Transceiver to the Satellite Antenna is a major consideration. This requirement is to ensure the best overall system performance. Refer to Table 3.1. to properly select the coax cables required to meet these requirements. Refer to Section 7.4.1., Aircell Axxess ST System Specifications, for details regarding the environmental requirements for this unit. Refer to Section 6.1., ICD D12016, for mechanical installation details.

<div align="center">

Note

Multiple RS-232/Modem connectors are allowed, but only one (1) data appliance can be connected at a time per Iridium channel, to prevent appliance malfunction.

</div>

3.6.2.   Aircell Axxess 2-Channel Expansion Transceiver (ST 4020)

Install the ST 4020 close to the ST 4200; the expansion connecters wiring between the STs must be less then 6 feet. Typically, the transceiver would be located in the avionics equipment bay. However, when choosing the location of the transceiver, the requirement to keep the cable loss below 3.0 dB from the Transceiver to the Satellite Antenna is a major consideration. This requirement is to ensure the best overall system performance. Refer to Table 3.1 to properly select the coax cables required to meet these requirements. Refer to Section 7.4.2., ACA System Specifications, for details regarding the

environmental requirements for this unit. Refer to Section 6.2., ICD D12155, for mechanical installation details.

Note

Multiple RS-232/modem connectors are allowed, but only one (1) data appliance can be connected at a time per Iridium channel, to prevent appliance malfunction.

3.6.3. Aircell Axxess® Cabin Telecommunications Router (CTR)

Typically, the CTR would be located in the cabin/pressurized cabin keeping in mind that the WiFi antennas located on the CTR should be located facing the main area of intended use, as high up as practical, in a non-metallic enclosure / area. However, when choosing the location of the CTR there is the option of remote mountable WiFi antennas, the requirement would then be to choose a location that will allow a coax run from the CTR to the remote WiFi antennas. Refer to the Systems Specifications Section 7.4.3. Refer to Section 6.3., ICD D12017, for mechanical installation details.

Note

WiFi is not activated on unit's ship out from Aircell at this time. Refer to Section 4.9. for WiFi activation details.

3.6.4. Aircell Axxess Remote Diversity Antenna (RDA) (optional)

Refer to Section 6.4., ICD D12403, for mechanical installation details.

The Aircell Axxess RDA will need to be installed in the pressurized cabin.

Refer to Section 7.4.4., RDA System Specifications, for details regarding the environmental requirements for this unit.

Note

The coaxial cables from the CTR to the Remote Diveristy Antennas need to be equal in length, even though the Remote Diversity Antennas may be in different locations. The total coax RF loss should not exceed 3dB @ 2.450 Gigahertz (GHz) and the VSWR should be less than 1.3 when the cable is terminated in a 50-ohm load.

3.6.5. Aircell Axxess Handset Interface (AHI-1) (optional)

Refer to Section 6.5., ICD D12105, for mechanical installation details.

The Aircell Axxess AHI-1 will need to be installed in the pressurized cabin.

Refer to Section 7.4.5., AHI-1 System Specifications, for details regarding the environmental requirements for this unit.

3.6.6. Aircell Axxess Handset / Fax interface (AHI-2) (optional)

Refer to Section 6.6., ICD D12159, for mechanical installation details.

The Aircell Axxess AHI-2 will need to be installed in the pressurized cabin.

Refer to Section 7.4.6., AHI-2 System Specifications, for details regarding the environmental requirements for this unit.

3.6.7. Aircell Axxess Call Alerter (ACA) (optional)

Refer to Section 6.7., ICD D12160, for mechanical installation details.

The Aircell Axxess ACA will need to be installed in the pressurized cabin.

Refer to Section 7.4.7., ACA System Specifications, for details regarding the environmental requirements for this unit.

3.6.8. Aircell Axxess® Call Alerter II (ACA II) (optional)

Refer to Section 6.8., ICD D12329, for mechanical installation details.

The Aircell Axxess ACA II will need to be installed in the pressurized cabin.

Refer to Section 7.4.7., ACA II System Specifications, for details regarding the environmental requirements for this unit.

3.6.9. Aircell Axxess Standard SIP Handset (with Audio Panel Interface)

Typically, the HSs would be located in the main cockpit area. However, when choosing the location of the SIP HS it is advisable to at least install two (2) HSs, one (1) in the cockpit and one (1) in the cabin. The handset user access is an important consideration. If the Audio Panel interface is used, the HSs should be located in the cockpit area. However, when choosing the location of this HS to be used with an Audio Panel interface, it is advisable to install it at a location that the flight crew can see the display and access the keypad while HS is in its locking cradle.

Refer to Section 6.9., ICD D12059, for mechanical installation details and Section 10.0 for Wiring interface details. Refer to Section 7.4.8., Standard SIP Handset, for details regarding the environmental requirements for this unit.

3.6.10. Aircell Axxess WiFi SIP Handset and Base Station (with no Audio Panel Interface)

Typically, the WiFi HSs would be located in the main cockpit area. However, when choosing the location of the WiFi HS, it is advisable to at least install two (2) HSs, one (1) in the cockpit and one (1) in the cabin. The handset user access is an important consideration.

Refer to Section 6.10., ICD D12031 and D12398, for mechanical installation details and Section 10.0 for Wiring interface details. Refer to Section 7.4.9., WiFi SIP Handset, for details regarding the environmental requirements for this unit.

3.6.11. Aircell Axxess Flush-Mount SIP Handset (with no Audio Panel Interface)

Typically, the HSs would be located in the main cabin area. However, when choosing the location of the SIP HS it is advisable to at least install two (2) HS, one (1) in the cockpit and one (1) in the cabin. The handset user access is an important consideration.

Refer to Section 6.11., ICD D12060, for mechanical installation details and Section 10.0 for Wiring interface details.

Refer to Section 7.4.10., Flush-Mount SIP Handset, for details regarding the environmental requirements for this unit.

3.6.12. Aircell Axxess Custom-Retractable SIP Handset (with no Audio Panel Interface)

Typically, the HSs would be located in the main cabin area. However, when choosing the location of the SIP HS it is advisable to at least install two (2) HSs, one (1) in the cockpit and one (1) in the cabin. The handset user access is an important consideration.

Refer to Section 6.12., ICD D12304, for mechanical installation details and Section 10.0 for Wiring interface details.

Refer to Section 7.4.11., Custom-Retractable SIP Handset, for details regarding the environmental requirements for this unit.

3.6.13. Aircell Axxess® LEMO SIP Handset (with no Audio Panel Interface)

Typically, the HSs would be located in the main cabin area. However, when choosing the location of the SIP HS it is advisable to at least install two (2) HSs, one (1) in the cockpit and one (1) in the cabin. The handset user access is an important consideration.

Refer to Section 6.13., ICD D12304, for mechanical installation details and Section 10.0 for Wiring interface details.

Refer to Section 7.4.12., Custom-Retractable SIP Handset, for details regarding the environmental requirements for this unit.

3.6.14. Reserved for product expansion

3.6.15. Reserved for product expansion

3.6.16. Reserved for product expansion

3.6.17. Reserved for product expansion

3.6.18. Reserved for product expansion

3.6.19. Reserved for product expansion

3.6.20. Iridium Satellite Antenna

For installation details and options, refer to **Aircell Antenna Installation Manual P/N 800-10355.**

3.7. Power, Handset, and Audio Cabling

When considering the location of the Aircell Axxess CTR and Aircell Axxess ST Transceiver, longer CTR-to-Transceiver and longer handset cabling, rather than longer antenna cable runs, will enhance the performance of the system. Use shielded twisted pairs of wire, as shown in the Wiring Diagrams (Section 10.0) to reduce interference. Size the power leads to maintain the proper supply voltage within the limits identified in the System Specifications (Section 7.0) and satisfy the requirements of FAA AC 43.13-1B. The telephone system will detect low battery voltage and shut the system off.

3.8. Ring Detect

The Ring Detect (refer to Wiring Diagrams, Section 10.0) offers an annunciator function to be made available in the aircraft. The operating conditions are as follows:

Pin U on the Aircell Axxess ST system Power and Signal connector will go low (ground) when the telephone rings for any (Iridium channel 1-4) incoming call. Use this logic for a visual annunciator or a Sonalert. Pin U will be low (ground) for 2-second and off (open) for four (4) seconds. This cycle will continue until the telephone is answered or the call attempt is terminated.

Note

Refer to the Axxess Call Alerter (ACA) for a programmable ringing option. The ACA Aircell Axxess Call Alerter will drive up to 8 programmable alerting devices. Refer to Section 2.2.6.

3.9. Reserved for product expansion

3.10. Cabling

Note
Wire and Coax Installation

Installation of wire and antenna coax cables should be installed according to approved aircraft manufacturing guidelines and/or FAA procedures documented in Advisory Circular 43.13-1B. Consider cable slack, protection from heat, and protection from chafing when installing system wiring.

Good installation practices will ensure maximum performance from the Aircell Axxess® System. Advisory Circular 43.13-2A (Acceptable Techniques, and Practices - Aircraft Alterations), Chapter 2.27, and Advisory Circular 43.13-1B (Acceptable Methods, Techniques, and Practices), Chapter 11, provide excellent guidelines to ensure a good installation. When building the system wire harness and RF cables, observe the following:

1. Plan the Aircell Axxess cable routing so that it does not interfere with flight control cables or follow heavy current-carrying cables, hydraulic lines, or fuel lines.

2. It is essential to use military specification connectors or connectors approved for use on aircraft.

3. This document and attached ICDs only shows a suggested circuit breaker size, wire size and type for a typical installation:

   - It is the responsibility of the Installation Agency to ensure proper wire type and size and the use of a properly rated circuit protection device (circuit breaker). In addition, ensure that the 28 VDC bus the equipment is to be connected to can handle the additional electrical load.

   - Install circuit protection (circuit breaker) of the proper amperage to handle the power requirements and protect the wiring.

   - Refer to Aircraft manufacturing guidelines and/or refer to FAA Advisory Circular 43.13-1B, Section 11 (Aircraft Electrical Systems) for the proper wire types and circuit protection recommendations. All wiring and coax cabling shall conform to the flammability requirements of FAR 25.869.

   - Single wire conductors shall conform to Aircraft manufacturing guidelines and/or Fluoropolymer-Insulated Society of Automotive Engineers (SAE)-AS22759, also known as Military (MIL)-W-22759.

   - Shielded wire conductors shall conform to Aircraft manufacturing guidelines and/or Fluoropolymer-Insulated National Electrical Manufacturers Association (NEMA) WC 27500, also known as MIL-DTL-27500.

   - These wires shall be used for Power, Ground, Low Speed Signal, and Shield Drains.

   - Aircell Axxess Satellite Transceiver (ST 4200) - size power wires and circuit protection to handle six (6) ampere current draw @ 28 VDC.

   - Aircell Expansion Transceiver (ST 4020) - size power wires and circuit protection to handle six (6) ampere current draw @ 28 VDC.

   - Aircell Axxess CTR - Size power wires and circuit protection to handle four (4) amp current draw @ 28 VDC.

   - AHI-1 - Size power wires and circuit protection to handle 0.15 A @ 28 VDC max. with no Handsets attached; each SIP HS connected to this AHI will add 0.35 A max.

   - AHI-2 - Size power wires and circuit protection to handle 0.15 A @ 28 VDC max. with no Handsets attached; each SIP HS connected to this AHI will add 0.35 A max.; **Note**: an additional 0.25 A @ 28 VDC max will be required for Data/Fax Terminal Adapters .

   The Wiring Diagrams in Section 10.0 provide manufacturing instructions for the wire harnesses. Notes on the wiring diagrams provide essential instructions that will save you needless rework during installation.

4. Provide proper grounding of the equipment by isolating chassis, power return wires, signal wires and shield grounds.

Note

Component Bonding

As with any communication equipment, bonding the equipment to airframe ground is essential for optimum performance and lightning protection. Ensure that the equipment mounting provisions are bonded to the shelf, and the shelf is bonded to airframe ground. Properly bonded, there should be 2.5 milliohms or less between the mounting tray and airframe ground. Care in bonding has been shown to eliminate erratic or poor system performance.

Additional Shield Drain information

As an option, up to four (4) 22 American Wire Gauge (AWG) 7" drains may be combined on a single grounding strap and then routed to airframe chassis. The ground strap should be as short as possible, but may be realized with a maximum of 24" of insulated (18 AWG or larger).

5. To reduce EMI/RFI to an acceptable level, all signal and power lines require shielded cables. Refer to the wiring diagrams in Section 10.0.

6. Antenna coaxial cables are required for this installation. Part 25 aircraft must meet FAR 25.1359 requirements, which does not allow for the use of PVC-type insulation. Refer to Section 3.11. for coax recommendations.

7. Ethernet Cable (Hi-Speed Data) (Tensolite P/N NF24Q100 or equivalent) will be required for all Ethernet connections.

Note

Refer to Section 10.0. D12031, for specific information regarding selection of high speed Ethernet cable.

Ethernet and Hi-Speed Data Conductors

*   Ethernet, Hi-Speed Data Conductors shall conform to Fluoropolymer-Insulated, 24 AWG, Two-Pair (Minimum), 100 Ohm, Copper Braid-Shielded Cable meeting both the Transmission Performance Specifications of TIA/EIA-568B, Category 5e, and the Flammability Requirements of FAR 25.869. Note at the time of this publication Aircell has found Tensolite P/N NF24Q100 acceptable. There may be Other Ethernet, Hi-Speed Data Conductors that meet the same criteria to be found acceptable.

*   Coax and Ethernet cables can be costly. Prior to bidding the installation, it is advisable that you evaluate how much cable will be required and the related cost.

Sample: Ethernet, Hi-Speed Data Conductors and shield ground termination shown. It is advisable and important for EMI considerations to carry the shields into the connecter housing, and then break out a shield drain that will connect to the provided connector housing bonding screw.
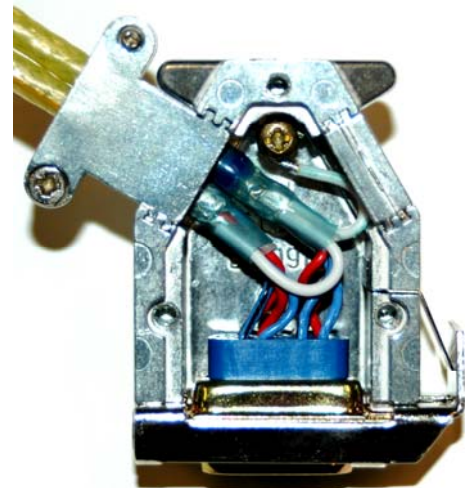
Figure 3.1.   Shield Ground Termination

Good wiring practices can be obtained from Advisory Circular 43.13-1B and should be followed. Here are a few reminders. Know the harness routing and equipment location before you begin fabricating the harness. Measure and record the harness and coax lengths required and add a few feet for good measure. It is easy to cut to fit, but hard to stretch the wires. Identify and mark the wires in accordance with Advisory Circular 43.13-1B. Refer to Section 10.0, ICD D12031 for mating connector layouts. Aircell strongly recommends that you purchase coax assemblies from PIC, ECS, or EMTEQ, so that a test record accompanies the installation data. This practice also minimizes those hard-to-track-down cabling problems. Refer to Table 3.1 for coax recommendations.

3.11.   Satellite Antenna Installation Cable Guide

Important

Refer at **Aircell Antenna Installation Manual P/N 800-10355** for details on special Inmarsat® filtering, Iridium to Inmarsat®, and other Antenna separation details.

When the installation requires cable lengths from the transceiver to the Satellite Antenna greater than 110 feet, please contact Aircell Customer Service @ 1-888-286-9876 or your preferred cable Vendor.

The RF coaxial cable performance from the Transceiver to the Satellite Antenna is critical. Keep this cable length as short as practical to enhance the satellite telephone performance. The total RF loss should not exceed 3.0 dB @ 1600 MHz and the VSWR should be less than 1.4:1, when the cable is terminated in a 50-ohm load. Refer to Section 10.0, ICD D12031 (Wiring Diagrams).

Low-loss 50-ohm cable should be used for this interface. Three (3) recommended Vendors are:

Vendors	Phone
PIC	1-800-742-3191
ECS	1-800-327-9473
EMTEQ	1-888-679-6170

Satellite Channel RF Antenna Cable
(One Cable will be required per Satellite Antenna connection)

Transceiver	Cable	Satellite Antenna
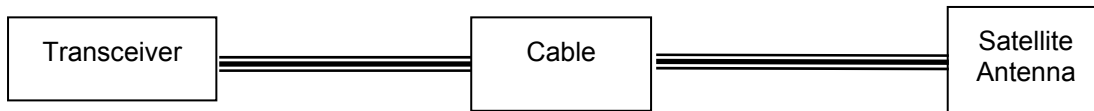
Refer to Table 3.1, Satellite Channel RF Antenna Cable Guide, on the following page for cable lengths, and suggested Vendors and part numbers for connectors, cables and adapters.

Cable Length	Suggested Vendors	Suggested Part Numbers					
		50-Ω Type "N" Male Connector	50-Ω Double Shielded Coax Cable	Straight TNC Male Connector	Right Angle TNC Male Connector	Straight "N" Male Connector	"N" Female to TNC Male Adapter
0-20 feet	ECS EMTEQ PIC	CNS922 NMS240-1 190310	311501 PFLX240-500 S33141	CTS922 TMS240-1 190308	CTR922 TMR240-1 190309		
20-40 feet	ECS EMTEQ PIC	CNS122 NMS400-1 190410	311201 PFLX400-500 S22089	CTS122 TMS400-1 190408	CTR122 TMR400-1 190409		
40-60 feet	ECS EMTEQ PIC	CNS022 NMS500-1 190410	310801 PFLX500-500 S22089	CTS022 TMS500-1 190408	CTR022 TMR500-1 190409		
60-75 feet	ECS	CNS002	310701	CTS002	CTR002		
75-110 feet	EMTEQ	NMS900-1	PFLX900-500			NMS900-1	See Below*

*Requires an Amphenol P/N 79825 or Maury Microwave P/N 8817B

Table 3.1.   Satellite Channel RF Antenna Cable Guide

This Page Intentionally Blank

4.0   TESTING AND SETUP

4.1.   Introduction

Now that the installation is complete and you have complied with the wiring and cabling requirements of this Manual (D12004), perform a final check of the Direct Current (DC) power input connections to the Aircell Axxess® II System. Verify that ground and 28 VDC connections to the unit are correct and on the proper pin numbers. This will ensure confidence when you apply power to the unit for the first time. After verifying that the DC power inputs are on the proper power pins, pull open the circuit breaker and connect the power cable to the Aircell Axxess II (ST 4200) Transceiver. Close the circuit breaker.

CAUTION
Before disconnecting or reconnecting Aircell Axxess components, pull open the power circuit breaker to avoid damage to the Aircell Axxess components or the aircraft wiring.

Notes
Up to eight (8) Handsets (ST 4200 Revision N and subsequent will support 10 HSs) can be connected to the Aircell® Axxess™ system (if an ACA is installed to the CTR, the maximum number of wired HSs is seven (7) from the CTR; if the optional AHIs are installed, the maximum number of wired HSs is five (5)); since the CTR will only support eight (8) wired HSs, the additional two (2) HSs will need to be powered by an AHI-1 or an AHI-2, or the HSs need to be WiFi, or some combination thereof.

Only three (3) HS at a time per Iridium channel can conference to each other, or two (2) HS can conference to a ground caller. The system also provides an Audio Panel interface from a Standard SIP HS connection into the aircraft communication system. Multiple RS-232/modem connections are allowed, but to prevent application malfunction, only one (1) data appliance can be connected at a time per Iridium channel. The wiring diagrams in Section 10.0 provide wiring definitions for the Handsets, Audio Panel and RS-232 connections.

4.2.   Testing

It is advisable to first set up and configure the system via the Handset interfaces per Section 4.10. Part A, and Personal Computer interface per Section 4.8. To test the system, placing calls to and from the Satellite network will be required. Full operational testing of the Aircell Axxess II System should be accomplished in accordance with test procedures outlined in this Installation Manual, Section 4.10., Part C and Section 4.11. Complete the required paperwork to activate the system. **For Iridium telephone activation, be sure that the Subscriber Service Agreement (SSA) have been properly filled out and faxed to Aircell Customer Service @ 1-888-398-1800.**

When the system has passed the operational test, verify that all Handsets are operational and can be used at the same time (maximum three (3) HSs at a time), as in a HS to HS to HS conference call. Include for the aircraft records all cable certifications, wire marking data, special diagrams used for the installation. Be sure to include the Subscriber Service Agreement (SSA) in the documentation paperwork for the aircraft. This ensures that the Owner has a record of the installed serial numbers, corresponding phone number and electronic serial numbers.

4.3.   Test Equipment

- A Laptop PC with an RJ 45 Ethernet connection port (WiFi capabilities if available);
- A Web Browser installed (Internet Explorer); and
- No other special test equipment is required to determine the operational status of the Aircell Axxess System.

4.4. Test Results

Documentation of the test results is important for the aircraft Owner. All paperwork, special drawings, cable routings, and special installation procedures should be included for the aircraft records.

4.5. Maintenance and Continued Airworthiness

Design and manufacturing of the Aircell Axxess® System allows for **"On-Condition Maintenance."** On-condition maintenance means that no periodic service requirements are required to maintain continued airworthiness of the system. No maintenance is required until the equipment does not perform the intended function. Cable harness repair, RF cable maintenance, and antenna replacement can be accomplished in the field. Refer to Appendix B for detailed information on troubleshooting procedures. Please consult Aircell LLC Technical Support to help evaluate any problem that is not resolved by following the troubleshooting procedures in Appendix B. A Return Material Authorization (RMA) is required for all repairs or exchanges on items returned to Aircell. After obtaining an RMA return the Aircell Axxess components to the factory for repair. If you require a loaner unit to maintain telecommunications operation during Aircell repairs, please call Aircell Customer Service and request that a serviceable unit be sent to you before removing the installed unit. After factory repair or receiving the serviceable component, consult the Aircell Installation Manual (D12004) for post-installation checkout and procedures to verify proper system operation in the aircraft. If component is an Iridium transceiver, be sure to activate the replacement serviceable unit (call Customer Service @ 1-888-286-9876) **before** testing it for operation as the previous Electronic Serial Number (ESN) / Phone Number combination will no longer be valid.

4.6. Telephone Operations (Standard Handset Shown)

The operation of the Aircell Axxess® SIP Handset is very similar to that of a typical cell phone. The Aircell phone will power up as the Avionics Master switch is placed in the ON position and remain ON until the Avionics Master is again switched OFF.

To place a call: Verify that the system is in service and note on the Handset that the system has registered on the Satellite network (Extension # and the Dialing instructions indication should be in view.). Enter the telephone number on the keypad, and press **SND**. Note: To place a call, nine (9) must be entered first, then the country code (USA/Canada=1), then the balance of the phone number.

*Example: 9 + 1 303 379 0278 **SND**, this will call* Aircell *Customer Service.*

To receive a call, lift the Handset out of the cradle and press **SND**. If you are holding the Handset and it rings, press **SND** to receive the call.

To adjust the volume in the earpiece, press the **UP/DOWN** arrows in the upper right corner of the Handset.

To end a call, press **END** and return the Handset to the cradle.

4.7. Quick System Check Out

The System can be checked out while the aircraft is on the ground, if the aircraft is outside (clear view of sky).

It is advisable to first Set Up and Configure the system via the PC and Handset interface per Section 4.8. and 4.10.

Full operational testing of the Aircell Axxess System should be accomplished in accordance with test procedures outlined in Section 4.10. and 4.11.

Figure 4.1.   Handset Keyboard

4.7.1. Placing a call from the Aircraft

Lift the Handset from the cradle and observe the following:

- Verify an illuminated display and that the display indicates Extension # and the Dialing instructions. (This usually takes about 70 seconds after power is applied to the system.)
- Place a call by entering 9 + country code + phone number on the keyboard and then press **SND**. *Example: 9 + 1 303 379 0278 **SND,** this will call Aircell Customer Service.*
- Verify that the system is providing a clear communications link, and then press **END** to terminate the call.
- If multiple Handsets are installed, repeat the above procedure for all locations.
- Conferencing Handset-to-Handset and or Handset-to-Audio Panel can also be checked at this time. Audio panel-to-Handset operations will be per the particulars on how the Aircell Axxess ® audio is interfaced to the Audio Panel.

4.7.2. Placing a call to the Aircraft

Two-Stage Calling *to* Aircraft from Ground Phones

(two-stage dialing may be a less-costly alternative to direct dialing).

Calls from USA/Canada

Dial 1 + 480.768.2500 (listen for prompt) +

Aircraft Iridium Telephone Number (8816.XXX.XXXXX).

Calls from Outside USA/Canada

Dial IDD prefix of the country you are calling from

+1 (USA Country Code) + 480.768.2500 (listen for prompt) +

Aircraft Iridium Telephone Number (8816.XXX.XXXXX).

Direct Dialing *to* the Aircraft from Ground Phones

Dial IDD prefix of the country you are calling from

(USA/Canada = 011) + Aircraft Iridium Telephone Number

(8816.XXX.XXXXX).

Note

Cellular or ground phones require international dialing capability.
Some cellular and long-distance providers may not recognize the
8816 Iridium Country Code.

Utilizing Two-Stage dialing will solve this problem in the US, as your
call is placed to a 480 area code (Arizona).

Please refer to Aircell Axxess® User Manual for more details. Copies are available at
http://www.aircell.com/service/serv_manuals.php.

4.8. **Aircell Axxess® II (ST 4200) PBX Configuration and Setup Guide**

The Aircell Axxess ST 4200 unit contains the IP-PBX functions and two (2) Iridium Transceivers. If this is a new installation or a Handset change, please go to Section 4.10., Part A before starting this Section.

Note

The CTR Configuration and Setup is per Section 4.9. and the Handset Configuration and Setup is per Section 4.10. Please refer to these Sections in conjunction with this Section.

Note

If this installation has only AHIs installed with no CTR, proceed to Section 4.12. before starting this Section.

The Aircell Axxess system is customizable and programmable via a PC interface to a Web address, either thru a WiFi connection (if available) or RJ-45 wired Ethernet connection (refer to Section 10.0 for details on the wired RJ-45 provisions).

4.8.1. Product Overview

Aircell Axxess IP-PBX is a next generation IP network PBX based on industry open standard SIP (Session Initiation Protocol).

Key Features:

- Dual Tone Multi Frequency (DTMF) / Call progress tone detection and generation;

- Telephony Features: Direct Inward System Answer (DISA) or Auto-Attendant, Call Transfer, Three Party Call, Call Detail Record (CDR) and CDR save; and

- Management Interface: Full Web Interface.

4.8.2. Configuration with Web Browser (Revision M and previous)

This Section (4.8.2. to 4.8.6.11.) is applicable to ST 4200 Revision M and previous.

The Aircell Axxess IP PBX has an:

1. Embedded Web server that will respond to Hyper Text Transfer Protocol (HTTP) GET/POST requests.

Aircell Axxess IP PBX also has embedded Hyper Text Markup Language (HTML) pages that allow the user to the Aircell Axxess IP PBX through:

2. A Web browser such as "Microsoft's Internet Explorer 5.0" Login-Accessing the Web Configuration Menu.

The IP PBX Web Configuration Menu can be accessed by the following Uniform Resource Locator (URL):

http://192.168.1.200/

The default address of IP-PBX is 192.168.1.200.

The IP-PBX will respond with the following login screen:

Welcome to the AirCell Axxess IP-PBX Configuration

Username: General User

Password: •••••••

OK

Figure 4.2.   IP_PBX Configuration Login Screen

Testing and Setup, Section 4

Aircell confidential and proprietary

There are two categories of users and please remember the password is case sensitive!

1. ***Administrator:*** Access for Aircell use only.
2. ***General User****:* Installer and User access (factory default password for General User is ***"letmein***")*'.*

4.8.3.   Configuration Menu

After login, the main configuration menu will appear:
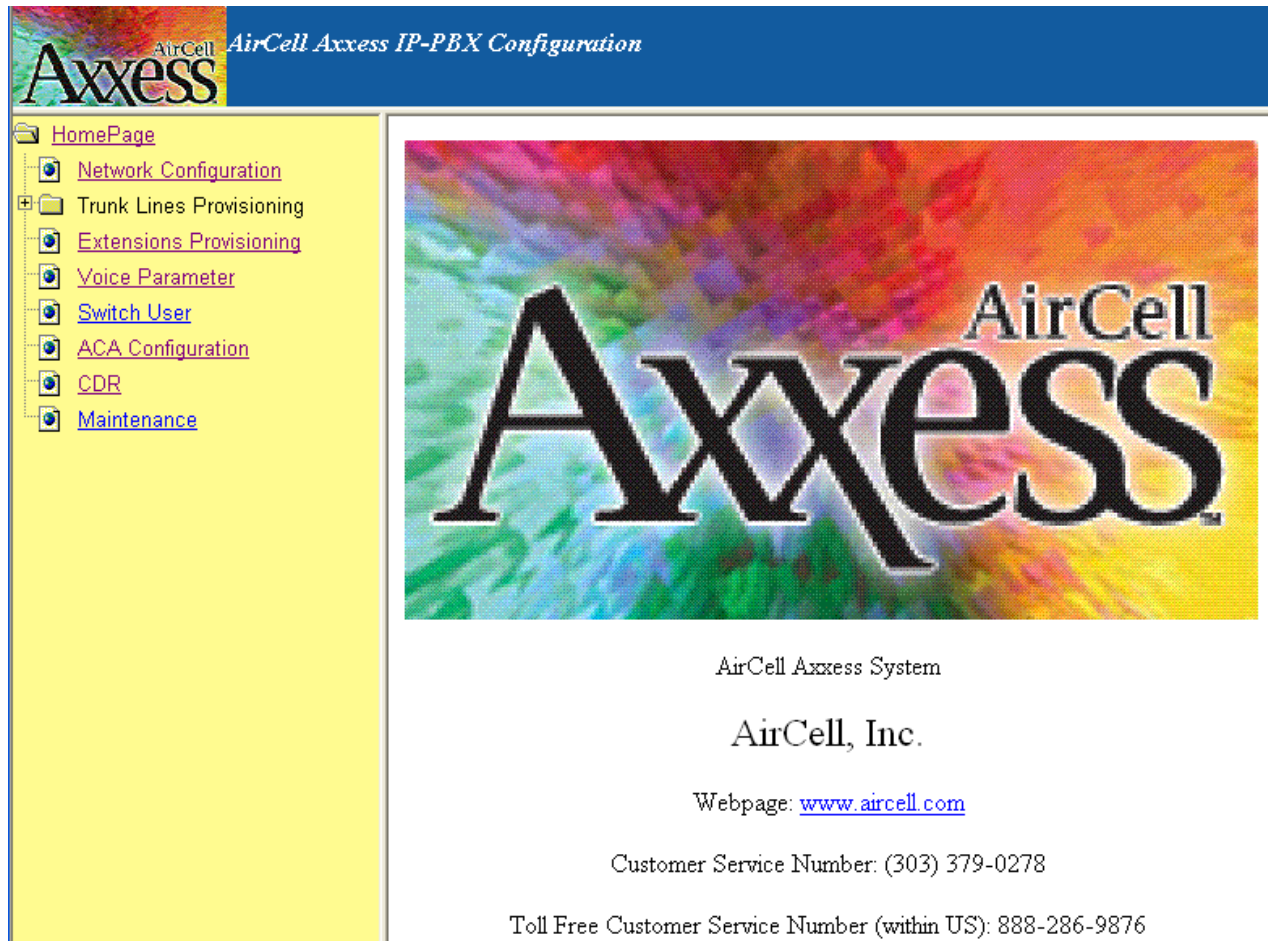
Figure 4.3.   Configuration Menu Screen

<u>Note</u>
To make a change on the following Configuration Menus, do the following:
1.   Use the "**Browse**" buttons to refresh configuration information as required.
2.   Use the "**OK**" buttons to activate the changes for final save.
3.   Use the "**Save**" button on the Maintenance Menu to final save the changes.

4.8.4. Network Configuration

On the menu side bar, click *Network Configuration* and the Network configuration web page will appear. *(Network Configuration has no User Configuration Options; **<u>DO NOT</u>** change the settings.)*
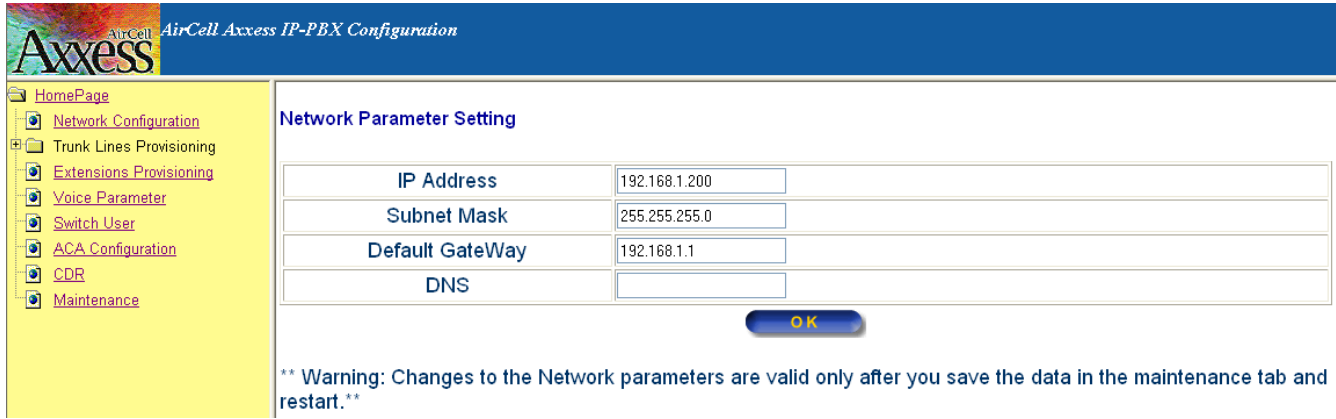
Figure 4.4. Network Configuration Screen

4.8.5. Definitions for the Network Parameters Settings

Dynamic Host Configuration Protocol (DHCP) Server (Default is Disabled)	The IP-PBX will operate in the following two modes: - **1. DHCP server ENABLED**, all field values for Static IP Mode are not used and IP-PBX will acquire an IP address from the first DHCP server it finds on the LAN. **NOTE:** Field values will be saved in flash memory. - **2. DHCP server DISABLED**, IP address, Subnet Mask, Default Gateway, Domain Name System (DNS) will need to be configured (see below). The IP address will be reset to *"192.168.1.200"* by default.
IP Address	The default value is *"192.168.1.200"*.
Subnet Mask	The default value is *"255.255.255.0"*.
Default Gateway	The default value is "*192.168.1.1.*"
DNS	The default value is *blank* and the IP-PBX can only support one (1) DNS Server.

Table 4.1. Network Parameters Settings

Once a change is made, the user will need to press the "OK" button in the Network the Configuration Menu. Changes of the Network parameters are effective only after they are saved and the IP-PBX restarted. The users can save changes and restart the IP-PBX in the Maintenance tab.

4.8.6. Trunk Line Provisioning
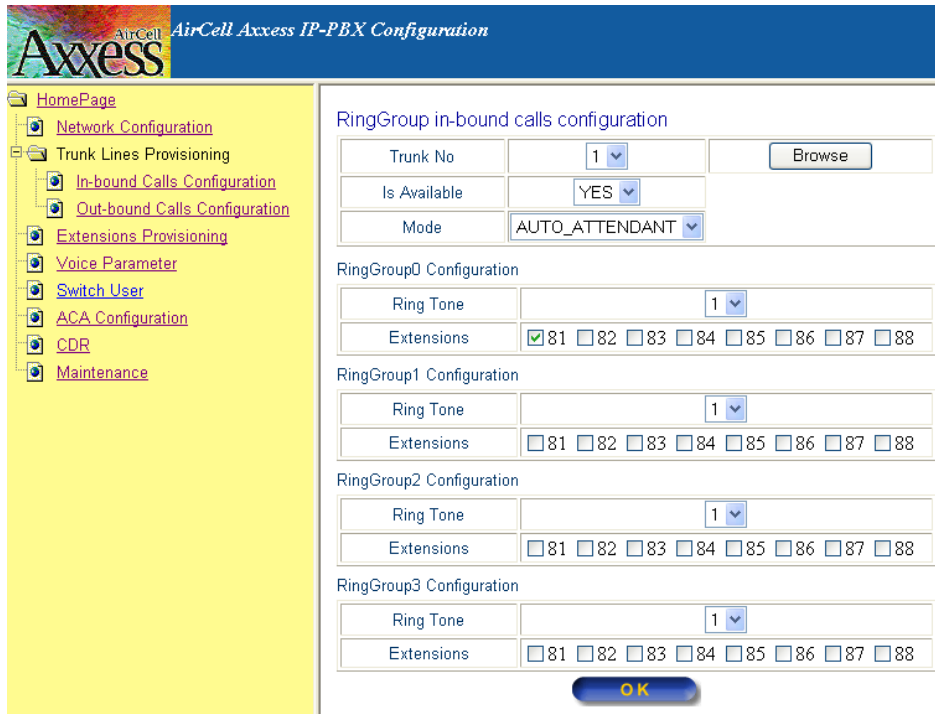
4.8.6.1. In-bound Call Configuration

On the menu side bar, click "**In-bound Calls Configuration**"; the following **In-bound Calls Configuration** web page will appear:

Figure 4.5. DISA (Direct Inward System Answer) Mode Web Page

Figure 4.6. Auto-Attendant Mode Web Page

The definitions of all the In-bound Calls Configuration parameters in the Configuration Menu are:

Trunk # (Trunk # is the Iridium channel #)	Trunk # will be 1, 2, 3, or 4. The "Browse" button will refresh the following configuration information of the selected Trunk.
Is Available	Status of current Trunk: "Yes"- Trunk is installed and available. "No" - Trunk is not installed and unavailable.
Mode (Note: DISA is Direct Inward System Answer) (Default is DISA)	There are two modes for in-bound calling: 1. DISA: The DISA Mode Web Page will show and the ring group will have only one value -- DISA ring group. This ring group includes 8 extensions maximum. 2. AUTO-ATTENDANT: The Auto_Attendant Web Page will show. There are four (4) ring groups in this mode and each ring group includes 8 extensions maximum. User can click the button "OK" to save and update changes of "Mode" and "Is Available" Configuration.
Ring Tone	The *Ring Tone* will be operative when the *Is Available* is set to "Yes". There are four different types of ring tones in this version (default is "1").
Ring group Extensions (**Note**: the Handset Extensions 81 to 88 are identified on the Handsets.)	The *Ring group Extension*s will be operative when the *Is Available* is set to "Yes". It can be set by two modes: 1. DISA: There is one Ring group for DISA mode. It is called DISA Ring group. Check the box of the desired extension to add it to the DISA Ring group and Un-check the box of the unwanted extension to remove it from the DISA Ring group (default is "ALL Extensions" checked). 2. AUTO_ATTENDANT: There are four Ring groups for AUTO_ATTENDANT mode. User can add or remove the extensions included in the Ring group; however, an extension may only be used in one ring group at a time in the same Trunk. Ring group changes will be saved after the "OK" button is pushed.

Table 4.2.   In-bound Calls Configuration Parameters

AUTO-ATTENDANT Voice Message Option (ST 4200 Revision H and subsequent)

A pre-recorded voice will ask you how to direct your call into the aircraft by selecting an extension number.

A customizable recorded voice and message can be recorded over the pre-recorded message (the Aircell pre-recorded voice will ask you how to direct your call into the aircraft by selecting an extension number).

Press *63 on Handset Extension 81 (only extension 81 can pre-record messages); this will start a voice menu process. You will be instructed on how to leave a new voice message to help the incoming caller direct their call.

Procedural steps are:

- Press * 63 then SND on a Handset and instructions will start;
- Press * when asked to start your custom recording;
- Press # then 2 when you are done recording;
- Press End; and
- Call the aircraft to verify your new customized voice message.

Example voice message: "You have reached Aircraft NXXX; if you would like to connect to the cockpit, press 81; if you would like to connect to the cabin, press 82."

4.8.6.2. Out-bound Calls Configuration

On the menu side bar, click "**Out-bound Calls Configuration**"; the **Out-bound Calls Configuration** web page will appear.

Figure 4.7.   Out-bound Calls Configuration Web Page

The definitions of the Out-bound Calls Configuration parameters in the Configuration Menu are:

Access Digit	Numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, or 9 allows calls to be outbound /gives outbound access call is an outbound call. Otherwise the current call is inter-com call. Changes are saved after pushing the button "OK" (default is "9").
Priority	There are four different priorities [1-4] for each Trunk. The priority 1# is the highest and the priority 4# is the lowest and each Trunk has different priority. If we modify a Trunk with priority 1 to priority 2, then the Trunk with priority 2 will be changed to priority 1 automatically. This rule is used to ensure each Trunk has a different priority.
Enable Outgoing	"Yes"- enabled for outbound "No" - the opposite (default is "YES").
Ring Group Extensions	Extensions that are included in the *Ring Group Extensions* will use this Trunk to make an outbound call. "OK" saves (default is "ALL EXTENSIONS" checked).

Table 4.3.   Out-bound Calls Configuration Parameters

4.8.6.3. Extension Provisioning

On the menu side bar, click "**Extension Provisioning**"; the web page **Extension Provisioning** will appear.

(Extension Provisioning has no User Configuration Options; <u>DO NOT</u> change settings.)

Status OnLine: Shows Handsets Extensions that are recognized and available for use by the Aircell Axxess PBX.

Status _____: Shows Handsets Extensions that are not available to the Aircell Axxess PBX.

Status IDLE: Shows Trunk # (Iridium channel #) is available to the Aircell Axxess PBX.

Status BUSY: Shows Trunk # (Iridium channel #) is not available to the Aircell Axxess PBX. That channel might be in use, aircraft does not have a clear view of sky, service is not activated, or has a transceiver, coax, or antenna problem.

Figure 4.8.   Extension Provisioning Screen

Testing and Setup, Section 4

Aircell confidential and proprietary

The definitions of Extension Provisioning configuration parameters in the Configuration Menu are:

Username	The username of the current extension.
Used	The status of extension. The "Yes" means that the current extension is enabled and the IP-PBX will accept its register. The "No" means that the current extension is not enabled and the IP-PBX will refuse to register.
NAT transfer	Not supported now.
Status Table	Status Table displays the status of all extensions and Trunks. Register column states whether the extension or Trunk has registered successfully.

Table 4.4.   Extension Provisioning Configuration Parameters

The definitions of all the SIP Authentication configuration parameter in the Configuration Web are:

Username	The field contains the SIP username used for SIP authentication
Authentication Password	The field contains the SIP password used for SIP authentication, it is used together with the above SIP Username

Table 4.5.   SIP Authentication Configuration Parameters

4.8.6.4.   Voice Parameter

(This area can is only accessible by Aircell and it is highly advisable that these settings stay at recommended defaults.)
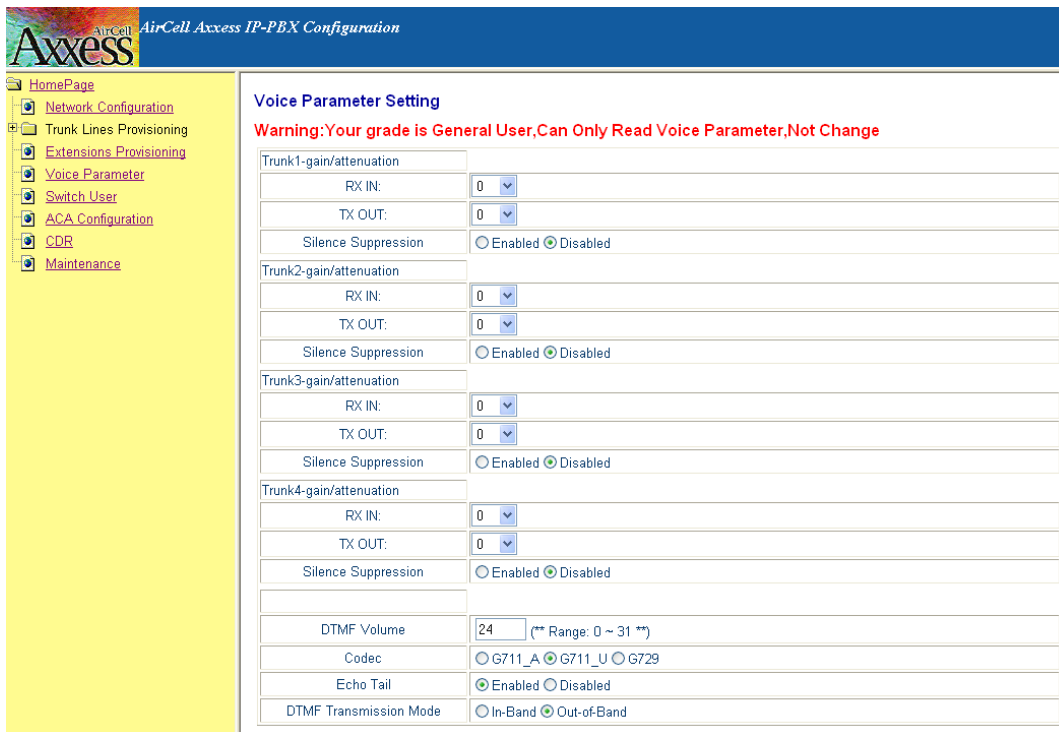
Figure 4.9.   Voice Parameter Screen

4.8.6.5. Switch User

On the menu side bar click **Switch User**, the **Switch User** web page will appear:

Figure 4.10.   Switch Current User Screen

Web Server will tell user which grade is enabled. User inputs the correct password *"letmein"* for General User and click the *"OK"* button.

4.8.6.6. ACA Configuration (Aircell Axxess® Call Alerter)

On the menu side bar, click "**ACA Configuration";** the web page **ACA Configuration** will appear.
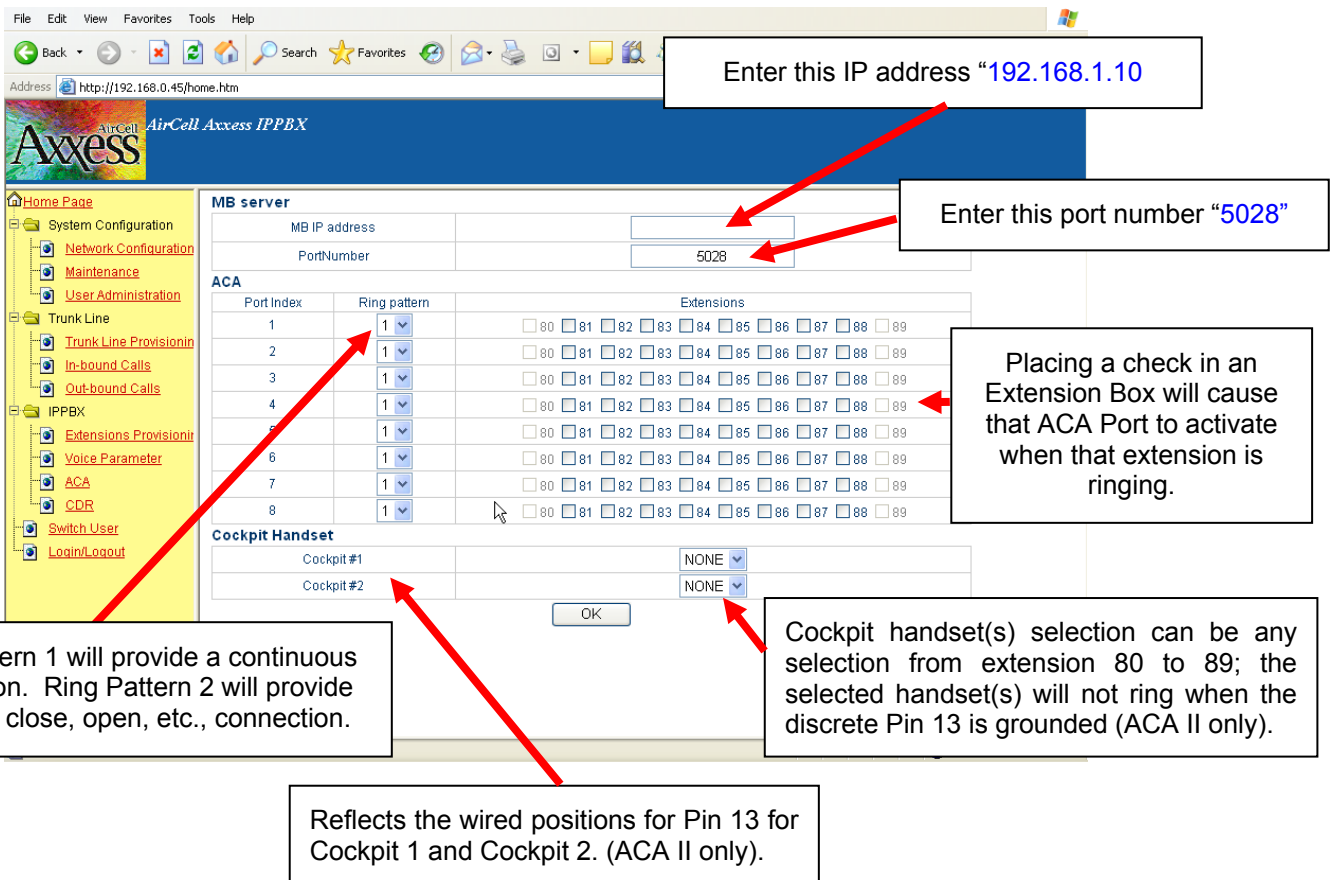
Figure 4.11.   ACA Configuration Screen

4.8.6.7. Call Detail Record (CDR)

General User click "**CDR**" in the menu side bar; the **CDR** web page will show as follows:

AirCell Axxess IP-PBX Configuration

- HomePage
  - Network Configuration
  - Trunk Lines Provisioning
    - In-bound Calls Configuration
    - Out-bound Calls Configuration
  - Extensions Provisioning
  - Voice Parameter
  - Switch User
  - ACA Configuration
  - CDR
  - Maintenance

CDR

Call Number	Start Time	Stop Time	Total Time	In/Out	Caller ID	Extension
1	2029-06-23 13:26:12	2029-06-23 13:26:16	00:00:04	Inbound	24	13
2	2029-06-23 13:26:12	2029-06-23 13:26:17	00:00:05	Outbound	881631013515	81
3	2006-07-08 01:47:08	2006-07-08 01:47:12	00:00:04	Outbound	881631013515	84
4	2006-07-08 01:47:08	2006-07-08 01:47:12	00:00:04	Inbound	22	11
5	2006-07-27 15:39:46	2006-07-27 15:39:57	00:00:11	Outbound	13033790255	88
6	2006-07-27 15:53:55	2006-07-27 15:53:59	00:00:04	Inbound	1 303	379
7	2006-07-27 15:53:08	2006-07-27 15:54:10	00:01:02	Inbound	1 303	379
8	2006-08-02 21:39:35	2006-08-02 21:42:53	00:03:18	Outbound	13033790236	87
9	2006-08-02 21:38:37	2006-08-02 21:43:25	00:04:48	Outbound	13033790236	88
10	2006-08-02 21:44:05	2006-08-02 21:45:10	00:01:05	Outbound	13033790236	88
11	2006-08-02 21:44:40	2006-08-02 21:45:19	00:00:39	Outbound	13033790236	87
12	2006-08-21 15:56:07	2006-08-21 15:57:58	00:01:51	Outbound	13033010325	83
13	2006-09-21 21:38:28	2006-09-21 21:39:00	00:00:32	Inbound	1 303	379
14	2006-09-21 21:39:55	2006-09-21 21:41:34	00:01:39	Inbound	1 303	379
15	2006-09-22 20:29:53	2006-09-22 20:32:03	00:02:10	Inbound	1 303	379
16	2006-09-22 20:37:57	2006-09-22 20:39:08	00:01:11	Outbound	13033790272	81
17	2006-09-29 15:37:48	2006-09-29 15:37:54	00:00:06	Inbound	1 303	379
18	2006-09-29 20:17:55	2006-09-29 20:18:01	00:00:06	Outbound	13033010325	81
19	2006-09-29 20:24:32	2006-09-29 20:24:41	00:00:09	Inbound	1 303	379
20	2006-10-01 23:26:38	2006-10-01 23:27:16	00:00:38	Outbound	13033454569	82
21	2006-10-12 21:43:52	2006-10-12 21:44:30	00:00:38	Outbound	13033790236	82
22	2006-10-13 22:40:17	2006-10-13 22:41:34	00:01:17	Outbound	13033790272	82
23	2006-10-13 22:40:48	2006-10-13 22:41:44	00:00:56	Outbound	13033010325	83

[BACKUP]   [DEL]

Figure 4.12.   CDR Screen

The CDR will show user the Start Time, Stop Time, Total Time, Inbound / Outbound, Caller ID and Extension of every call (both call out and call in). "DEL" selection: Use this to delete the CDR.

Backup selection: To record all or part of the CDR. This function will convert the data to a text file that you can View / Cut / Paste / Copy and then use as required.

AirCell Axxess IP-PBX Configuration

- HomePage
  - Network Configuration
  - Trunk Lines Provisioning
    - In-bound Calls Configuration
    - Out-bound Calls Configuration
  - Extensions Provisioning
  - Voice Parameter
  - Switch User
  - ACA Configuration
  - CDR
  - Maintenance

CDR Backup

Backup

Click Backup to download current CDR as a file.

[Backup]   [Cancel]
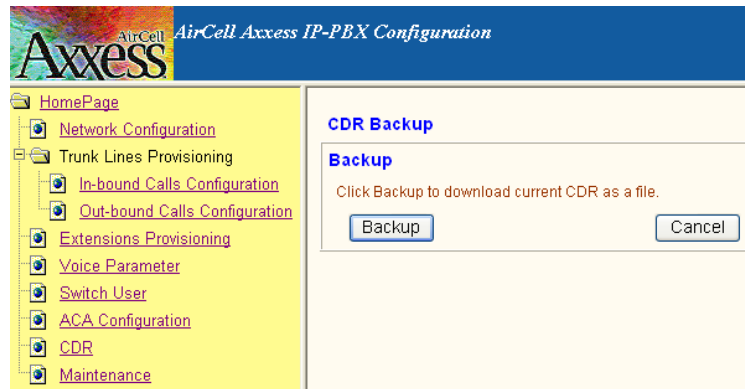
Figure 4.13.   CDR Backup Screen

4.8.6.8. Maintenance

On the menu side bar, click **"Maintenance";** the **Maintenance** web page will appear.
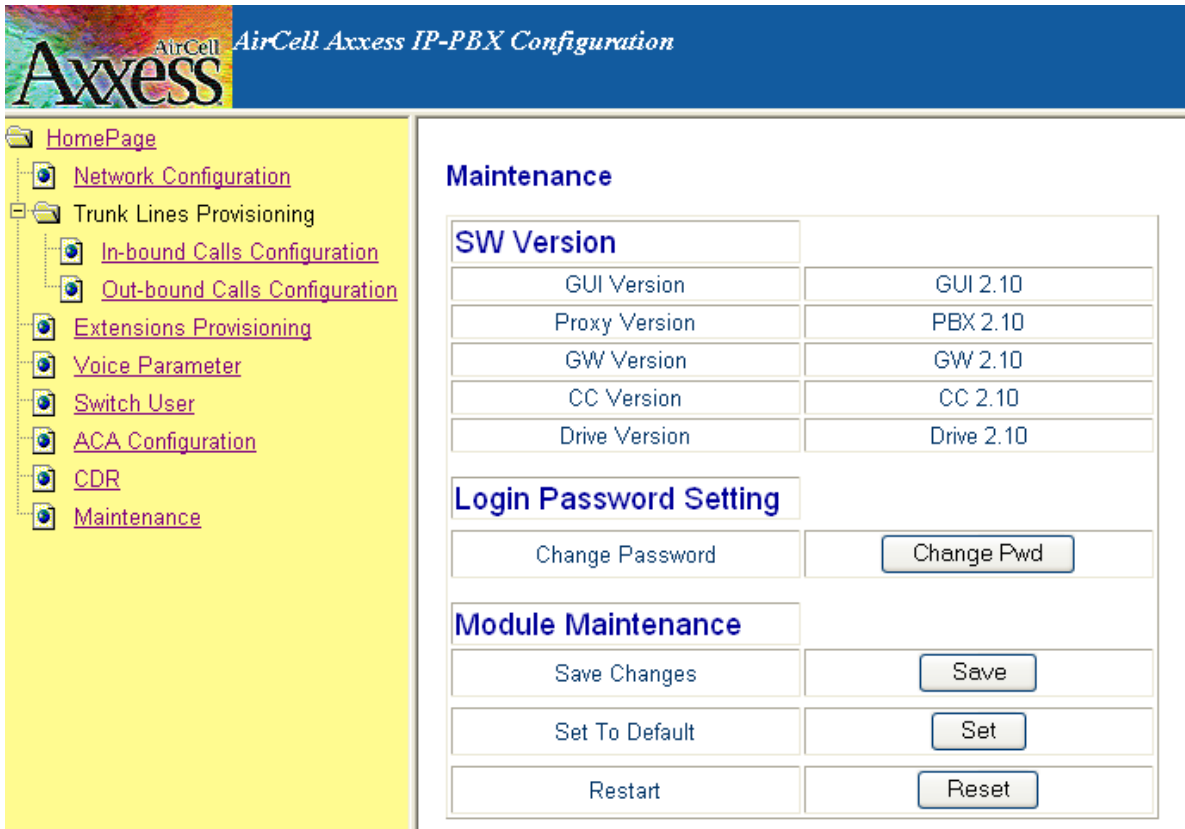
Figure 4.14.   Maintenance Screen

It will show user the current version of the IP-PBX software.

User can change web login password when *"Change Password"* is activated. Web Server will show the following page.

Figure 4.15.   Login Password Screen

Input of correct current password is required before new password change can be made. User grade **Administrator** may modify the password of both Administrator and General User grades.

4.8.6.9. Saving the Configuration Changes

Once a change is made, the user will need to press the **"Save"** button in the **"Maintenance"** Configuration Menu. The IP-PBX will then display the following screen to confirm that the changes have been saved.

Success-Save Configure File Success!

Transferring to Maintenance Page

Figure 4.16.   Saving the Configuration Change Screen

4.8.6.10. Set to Defaults

User can press the **"Set to Defaults"** button in the **"Maintenance"** Configuration Menu. This will set all the factory defaults back to there original positions.

<u>Note</u>

It is advised NOT to press "Set to Defaults" on the Rev G ST 4200. This will reconfigure the Voice Parameter settings to undesirable settings.

4.8.6.11. Rebooting the phone remotely

User can press the **"Reset"** button in the **"Maintenance"** Configuration Menu. At this point, the user can re-login to the IP-PBX after waiting for about 70 seconds.

4.8.7. **Configuration with Web Browser (Revision N and subsequent)**

This Section (4.8.7. to 4.8.11.11.) is applicable to ST 4200 Revision N and subsequent.

The Aircell Axxess® IP PBX has an:

1. Embedded Web server that will respond to Hyper Text Transfer Protocol (HTTP) GET/POST requests.

Aircell Axxess IP PBX also has embedded Hyper Text Markup Language (HTML) pages that allow the user to the Aircell Axxess IP PBX through:

2. A Web browser such as "Microsoft's Internet Explorer 5.0" Login-Accessing the Web Configuration Menu.

The IP PBX Web Configuration Menu can be accessed by the following Uniform Resource Locator (URL):

http://192.168.1.200/

The default address of IP-PBX is 192.168.1.200.

The IP-PBX will respond with the following login screen:
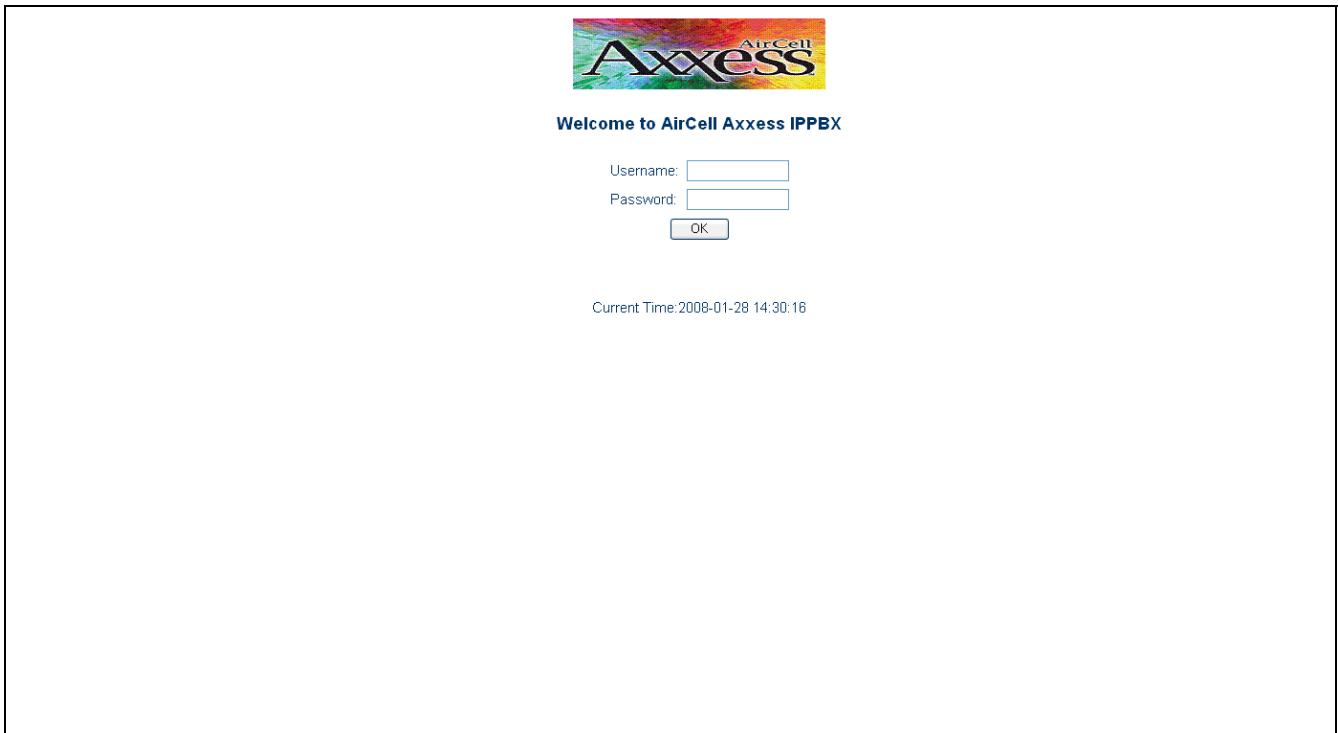
Figure 4.17.   IP_PBX Configuration Login Screen

There are two categories of users and please remember the password is case sensitive!

1. *Administrator:* Access for Aircell use only.
2. *General User:* Installer and User access (factory default password for General User is *"letmein"*)*'*.

Note

This screen is also utilized for the Switch User feature.

4.8.8. Configuration Menu

After login, the main configuration menu will appear:
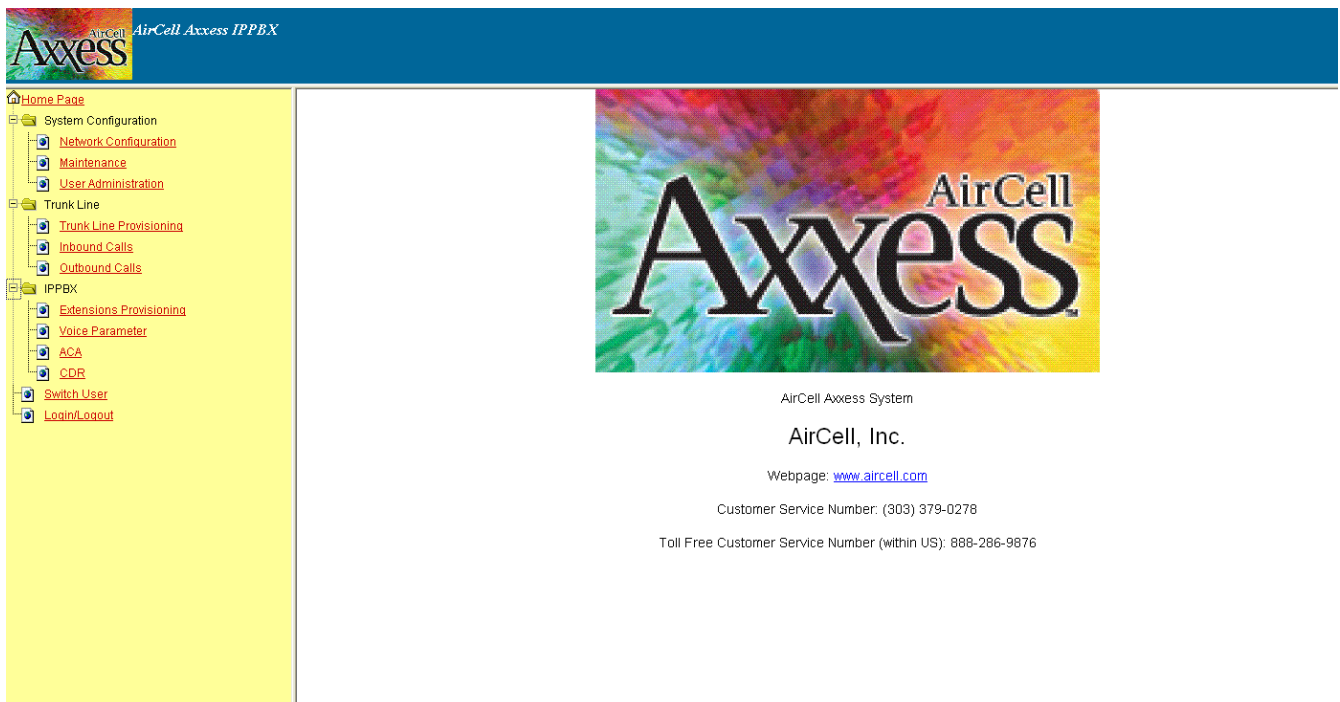
Figure 4.18.   Configuration Menu Screen

<u>**Note**</u>

To make a change on the following Configuration Menus, do the following:

1.   Use the "**Browse**" buttons to refresh configuration information as required.

2.   Use the "**OK**" buttons to activate the changes for final save.

4.8.9. Network Configuration

On the menu side bar, click **Network Configuration** and the **Network Configuration** web page will appear.
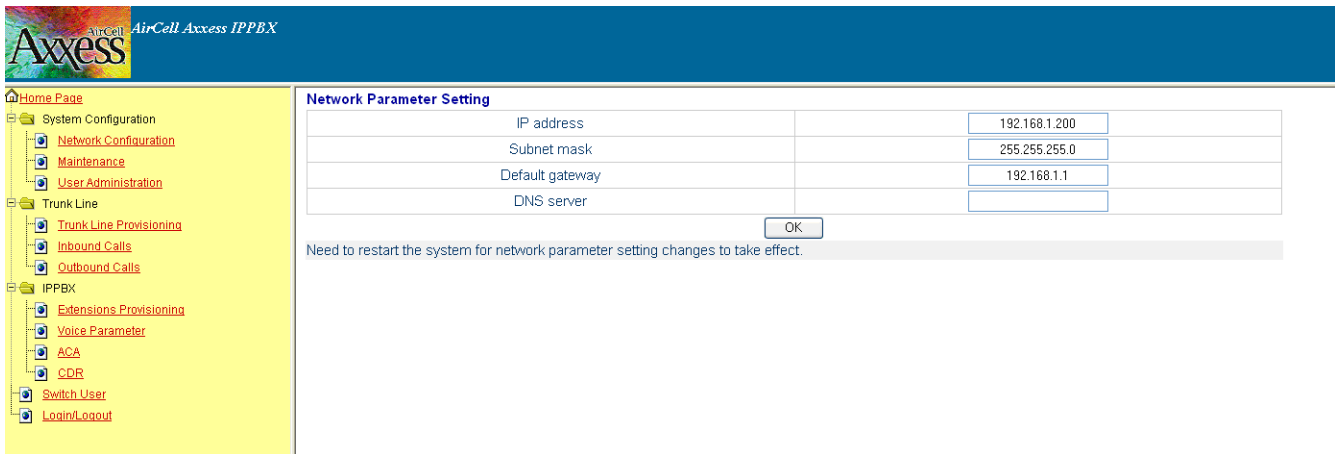
(Network Configuration has no User Configuration Options; <u>DO NOT</u> change the settings.)

Figure 4.19.   Network Configuration Screen

4.8.10. Definitions for the Network Parameters Settings

Dynamic Host Configuration Protocol (DHCP) Server (Default is Disabled)	The IP-PBX will operate in the following two modes: - **1. DHCP server ENABLED**, all field values for Static IP Mode are not used and IP-PBX will acquire an IP address from the first DHCP server it finds on the LAN. **NOTE:** Field values will be saved in flash memory. - **2. DHCP server DISABLED**, IP address, Subnet Mask, Default Gateway, Domain Name System (DNS) will need to be configured (see below). The IP address will be reset to *"192.168.1.200"* by default.
IP Address	The default value is *"192.168.1.200"*.
Subnet Mask	The default value is *"255.255.255.0"*.
Default Gateway	The default value is "*192.168.1.1.*"
DNS	The default value is *blank* and the IP-PBX can only support one (1) DNS Server.

Table 4.6.   Network Parameters Settings

Once a change is made, the user will need to press the "OK" button in Network the Configuration Menu. Changes of the Network parameters are effective only after they are saved and the IP-PBX restarted. The users can save changes and restart the IP-PBX in the Maintenance tab.

4.8.11. Trunk Line Provisioning

On the menu side bar, click **Trunk Line Provisioning** and the **Trunk Line Provisioning** web page will appear.
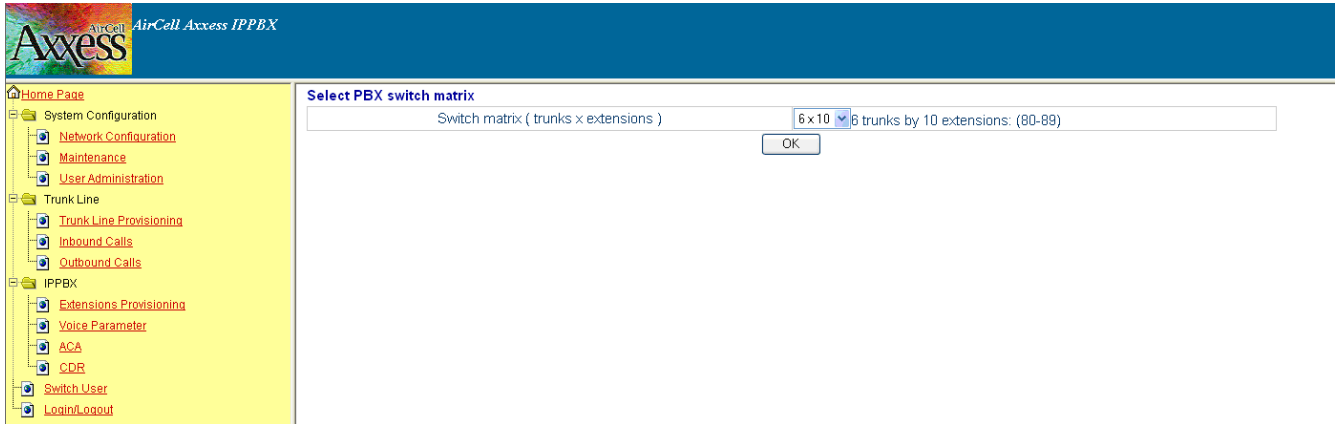
Figure 4.20.   Select PBX Switch Matrix Web Page

The Select PBX switch matrix is selectable between 6 trunks x 10 extensions or 8 trunks x 8 extensions.

Note

Select this option first before continuing with other configurations. If you change this setting, you will need to redo all other configuration settings.

4.8.11.1. In-bound Call Configuration

On the menu side bar, click "**In-bound Calls**"; the following **In-bound Calls Configuration** web page will appear:
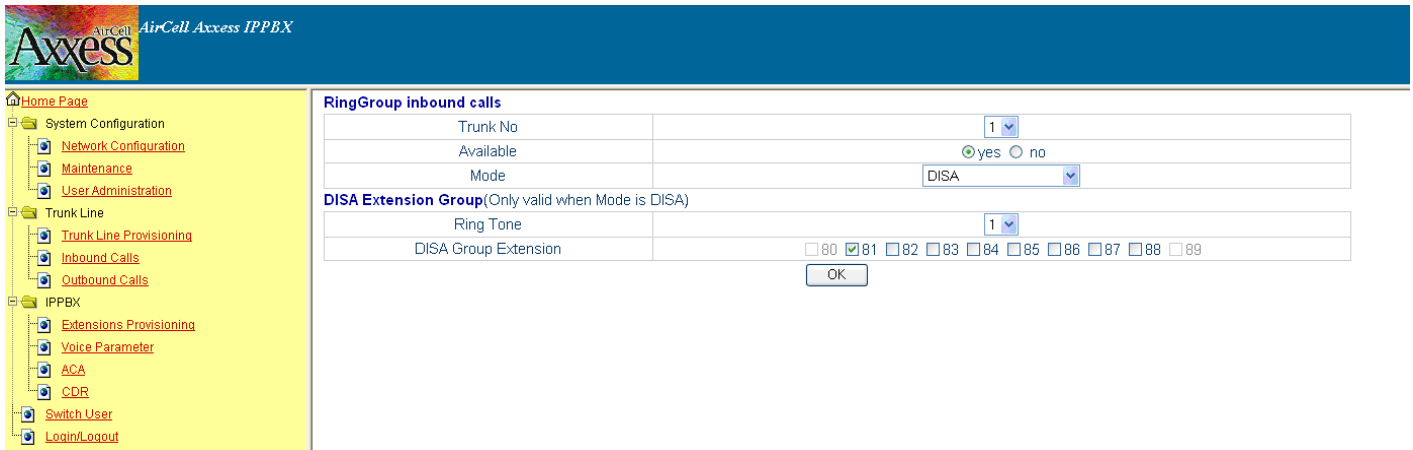
Figure 4.21.   DISA (Direct Inward System Answer) Mode Web Page
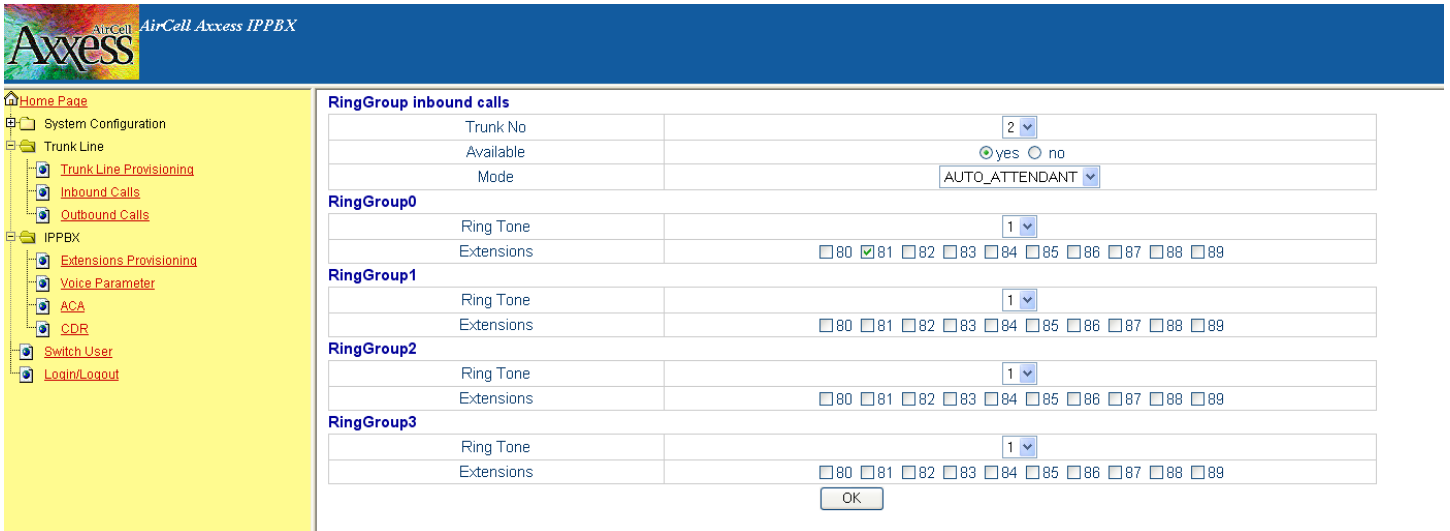
Figure 4.22.   Auto-Attendant Mode Web Page

The definitions of all the In-bound Calls Configuration parameters in the Configuration Menu are:

Trunk # (Trunk # is the Iridium channel #)	Trunk # will be 1, 2, 3, or 4. The "Browse" button will refresh the following configuration information of the selected Trunk.
Is Available	Status of current Trunk: "Yes"- Trunk is installed and available. "No" - Trunk is not installed and unavailable.
Mode (Note: DISA is Direct Inward System Answer) (Default is DISA)	There are two modes for in-bound calling: 1. DISA: The DISA Mode Web Page will show and the ring group will have only one value -- DISA ring group. This ring group includes 8 extensions maximum. 2. AUTO-ATTENDANT: The Auto_Attendant Web Page will show. There are four (4) ring groups in this mode and each ring group includes 8 extensions maximum. User can click the button "OK" to save and update changes of "Mode" and "Is Available" Configuration.
Ring Tone	The *Ring Tone* will be operative when the *Is Available* is set to "Yes". There are four different types of ring tones in this version (default is "1").
Ring group Extensions (**Note**: the Handset Extensions 81 to 88 are identified on the Handsets.)	The *Ring group Extension*s will be operative when the *Is Available* is set to "Yes". It can be set by two modes: 1. DISA: There is one Ring group for DISA mode. It is called DISA Ring group. Check the box of the desired extension to add it to the DISA Ring group and Un-check the box of the unwanted extension to remove it from the DISA Ring group (default is "ALL Extensions" checked). 2. AUTO_ATTENDANT: There are four Ring groups for AUTO_ATTENDANT mode. User can add or remove the extensions included in the Ring group; however, an extension may only be used in one ring group at a time in the same Trunk. Ring group changes will be saved after the "OK" button is pushed.

Table 4.7.   In-bound Calls Configuration Parameters

AUTO-ATTENDANT Voice Message Option (ST 4200 Revision H and subsequent)

A pre-recorded voice will ask you how to direct your call into the aircraft by selecting an extension number.

A customizable recorded voice and message can be recorded over the pre-recorded message (the Aircell pre-recorded voice will ask you how to direct your call into the aircraft by selecting an extension number).

Press *63 on Handset Extension 81 (only extension 81 can pre-record messages); this will start a voice menu process. You will be instructed on how to leave a new voice message to help the incoming caller direct their call.

Procedural steps are:

- Press * 63 then SND on a Handset and instructions will start;

- Press * when asked to start your custom recording;

- Press # then 2 when you are done recording;

- Press End; and

- Call the aircraft to verify your new customized voice message.

Example voice message: "You have reached Aircraft NXXX; if you would like to connect to the cockpit, press 81; if you would like to connect to the cabin, press 82."

4.8.11.2. Out-bound Calls Configuration

On the menu side bar, click "**Out-bound Calls**"; the **Out-bound Calls Configuration** web page will appear.
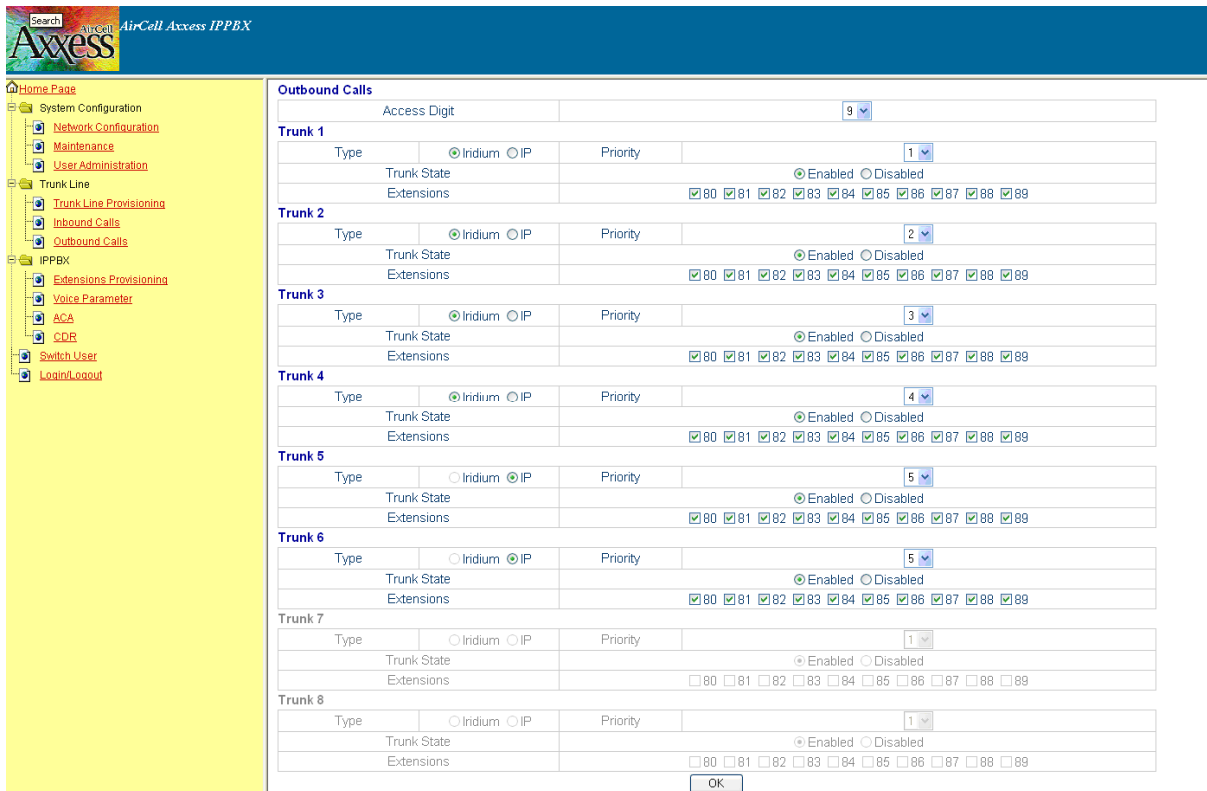
Figure 4.23.   Out-bound Calls Configuration Web Page

For information regarding Trunks 5-8, refer to **Aircell Axxess Satellite Interface Unit Installation Manual P/N D12694**.

Testing and Setup, Section 4

Aircell confidential and proprietary

The definitions of the Out-bound Calls Configuration parameters in the Configuration Menu are:

Access Digit	Numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, or 9 allows calls to be outbound /gives outbound access call is an outbound call. Otherwise the current call is inter-com call. Changes are saved after pushing the button "OK" (default is "9").
Priority	There are four different priorities [1-4] for each Trunk. The priority 1# is the highest and the priority 4# is the lowest and each Trunk has different priority. If we modify a Trunk with priority 1 to priority 2, then the Trunk with priority 2 will be changed to priority 1 automatically. This rule is used to ensure each Trunk has a different priority.
Enable Outgoing	"Yes"- enabled for outbound "No" - the opposite (default is "YES").
Ring Group Extensions	Extensions that are included in the *Ring Group Extensions* will use this Trunk to make an outbound call. "OK" saves (default is "ALL EXTENSIONS" checked).

Table 4.8.   Out-bound Calls Configuration Parameters

4.8.11.3. Extensions Provisioning

On the menu side bar, click "**Extensions Provisioning**"; the web page **Extensions Provisioning** will appear.

(Extension Provisioning has no User Configuration Options; <u>DO NOT</u> change settings.)

Status OnLine: Shows Handsets Extensions that are recognized and available for use by the Aircell Axxess PBX.

Status _____: Shows Handsets Extensions that are not available to the Aircell Axxess PBX.

Status IDLE: Shows Trunk # (Iridium channel #) is available to the Aircell Axxess PBX.

Status BUSY: Shows Trunk # (Iridium channel #) is not available to the Aircell Axxess PBX. That channel might be in use, aircraft does not have a clear view of sky, service is not activated, or has a transceiver, coax, or antenna problem.

Figure 4.24.   Extensions Provisioning Screen

The definitions of Extension Provisioning configuration parameters in the Configuration Menu are:

Username	The username of the current extension.
Used	The status of extension. The "Yes" means that the current extension is enabled and the IP-PBX will accept its register. The "No" means that the current extension is not enabled and the IP-PBX will refuse to register.
NAT transfer	Not supported now.
Status Table	Status Table displays the status of all extensions and Trunks. Register column states whether the extension or Trunk has registered successfully.

Table 4.9.   Extension Provisioning Configuration Parameters

The definitions of all the SIP Authentication configuration parameter in the Configuration Web are:

Username	The field contains the SIP username used for SIP authentication
Authentication Password	The field contains the SIP password used for SIP authentication, it is used together with the above SIP Username

Table 4.10.   SIP Authentication Configuration Parameters

4.8.11.4. Voice Parameter

This area can is only accessible by Aircell and is shown for reference only (at the time of publication ST 4200 Revision L and subsequent).
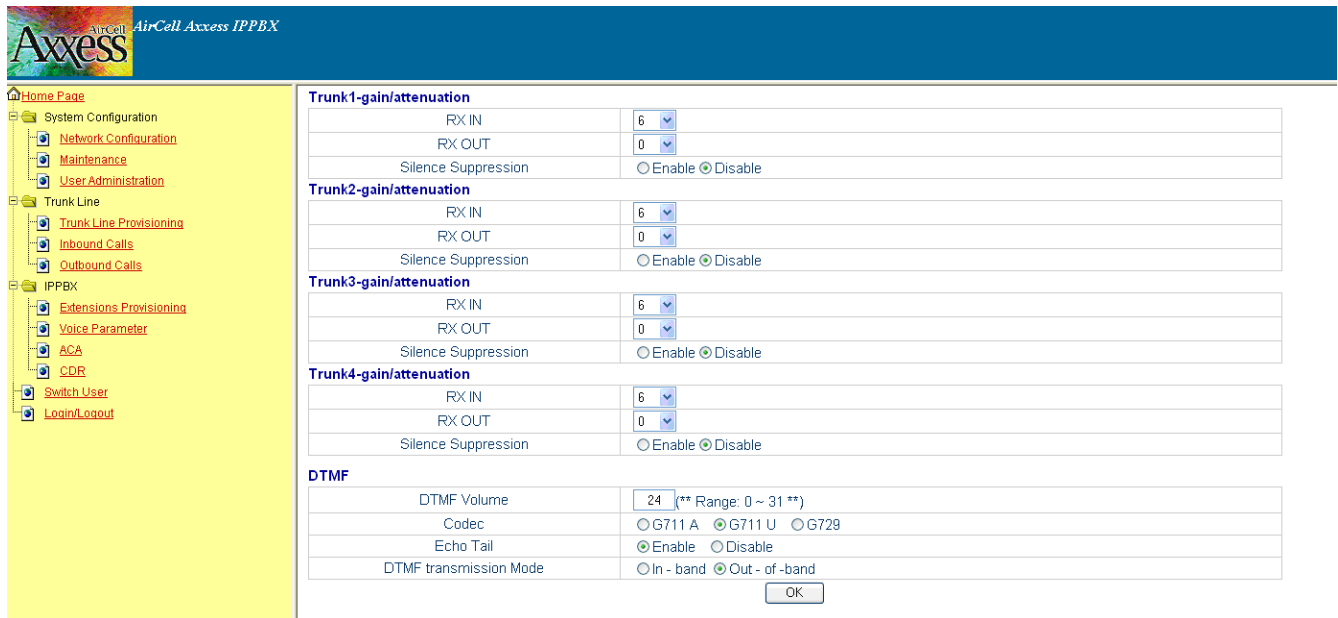
Figure 4.25.   Voice Parameter Screen

4.8.11.5. Switch User

On the menu side bar click Switch User, the Main Login page appears.

Web Server will tell user which grade is enabled. User inputs the correct password *"letmein"* for General User and click the *"OK"* button.

4.8.11.6. ACA Configuration (Aircell Axxess® Call Alerter)

Note

ST 4200 Revision M and subsequent are required for ACA II ringer disable functions.

Enter this IP address "192.168.1.10:5028"

Placing a check in an Extension Box will cause that ACA Port to activate when that extension is ringing.

Ring Pattern 1 will provide a continuous connection. Ring Pattern 2 will provide an open, close, open, etc., connection.

Cockpit handset(s) selection can be any selection from extension 80 to 89; the selected handset(s) will not ring when the discrete Pin 13 is grounded (ACA II only).

Reflects the wired positions for Pin 13 for Cockpit 1 and Cockpit 2. (ACA II only).

Only select "Standard CTR" for either the Standard CTR or the Low Power CTR.

This is the same username and password used to enter the CTR setup screens; Aircell default is User name "admin" and Password "*aircell1*.

Reflects the wired position Pin 13 (ISO_IN1) for Port 1 and Pin 12 (ISO_IN2) for Port 2 (ACA II only). When the corresponding Pin is grounded, WiFi will be disabled.

Figure 4.26. ACA Configuration Screen

4.8.11.7. Call Detail Record (CDR)

General User click "**CDR**" in the menu side bar; the CDR web page will show as follows:
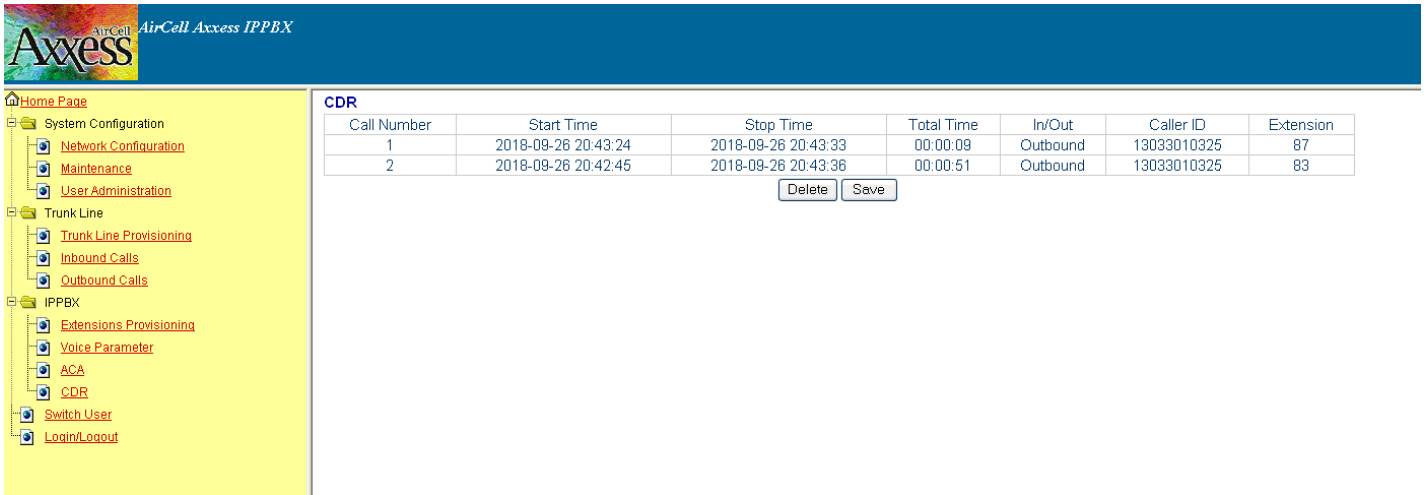
Figure 4.27.   CDR Screen

The CDR will show user the Start Time, Stop Time, Total Time, Inbound / Outbound, Caller ID and Extension of every call (both call out and call in). "Delete" selection: Use this to delete the CDR.

Save selection: To record all or part of the CDR. This function will convert the data to a text file that you can View / Cut / Paste / Copy and then use as required.

4.8.11.8. Maintenance

On the menu side bar, click **"Maintenance";** the **Maintenance** web page will appear.
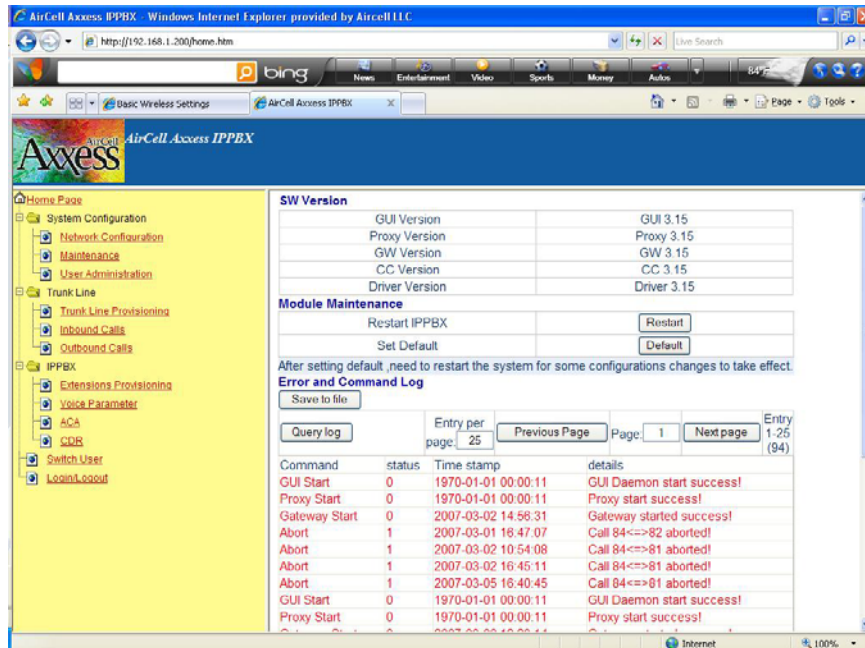
Figure 4.28.   Maintenance Screen

It will show the User the current version of the IP-PBX software.

Testing and Setup, Section 4

Aircell confidential and proprietary

4.8.11.9. Set to Defaults

User can press the **"Set to Defaults"** button in the **"Maintenance"** Configuration Menu. This will set all the factory defaults back to there original positions.

<u>Note</u>

It is advised NOT to press "Set to Defaults" on the Rev G ST 4200. This will reconfigure the Voice Parameter settings to undesirable settings.

4.8.11.10.   Rebooting the phone remotely

User can press the **"Restart"** button in the **"Maintenance"** Configuration Menu. At this point, the user can re-login to the IP-PBX after waiting for about 60 seconds.

4.9. **Aircell Axxess® CTR (router) Configuration and Setup via PC interface**

The Aircell Axxess CTR is the link for wired Handsets, wireless Handsets, PCs and other wireless devices to communicate with the ST 4200 PBX unit.

Note
This Section is shown only as a reference on how to activate and the FAA approval recommendations that may be required.

WiFi is noted in this manual for provisioning details. Product expansion may include such items as WiFi laptop and WiFi SIP handset connectivity.

Note
WiFi is not activated until the following procedures are followed.

1. This product is WiFi capable with the installation of two (2) P/N P12017 jumper coax assemblies (TNC to TNC) for the use the Internal WiFi Antennas, or connection of WLAN A and B connecters to External Antennas for optional External Antenna Use.

4 P/N P12284 TNC 50 ohm Load Plugs shown installed if WiFi is not required.

2 P/N P12017 coax assemblies shown installed, (TNC to TNC), Internal Antenna 1 & 2 to WLAN A & B for Internal WiFi Antenna use.

Figure 4.29.   WiFi Connections

2. The completion of the proper FAA approval will be required for each aircraft when the **Standard Power CTR** (P/N P12083) (less than 100 mW) WiFi is activated. Requirements of the applicable FARs may stipulate that proper DER engineering documents (FAA Form 8110-3) be supplied or that the installation be performed in accordance with an acceptable **STC**. A Flight Manual Supplement may also be required that may place limitations of WiFi use during certain flight profiles. The proper approval is the responsibility of the installing agency prior to activating and using WiFi onboard an aircraft.

OR

3. The completion of the proper FAA approval will be required for each aircraft when the **Low Power CTR** (P/N 12083-001) (less than 25 mW) WiFi is activated. It may be possible to install a Low Power CTR on a FAA **Field Approval 337** document. Requirements of the applicable FARs may stipulate that proper DER engineering documents (FAA Form 8110-3) be supplied. A Flight Manual Supplement may also be required that may place limitations of WiFi use during certain flight profiles. The proper approval is the responsibility of the installing agency prior to activating and using WiFi onboard an aircraft. **Please contact your local FAA office for guidance on obtaining a Field Approval 337 for Low Power CTR installation.**

4. CTR WiFi activation instructions

To access the CTR WiFi router setup page, use the same procedures and RJ-45 connection as described in Section 4.8. of this Manual. Note: you can not connect to this page via WiFi.
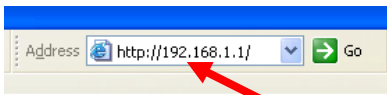
Using a Web browser such as "**Microsoft's Internet Explorer 5.0**", login to access the Web Configuration Menu.

The CTR Router Web Configuration Menu can be accessed by the following URL:

http://192.168.1.1/

The default address of the CTR router is 192.168.1.1.

Log in using User name **admin** and password ***aircell1*** "case sensitive!"
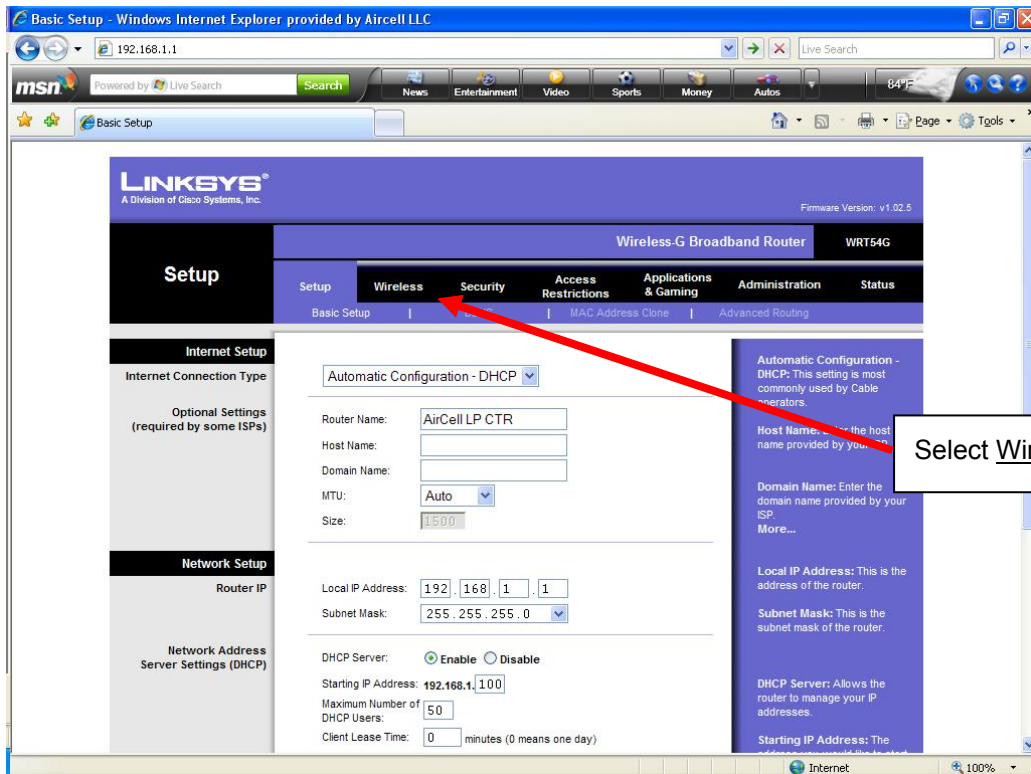
Select <u>Wireless</u> Tab

Figure 4.30.   WiFi Activation Screens
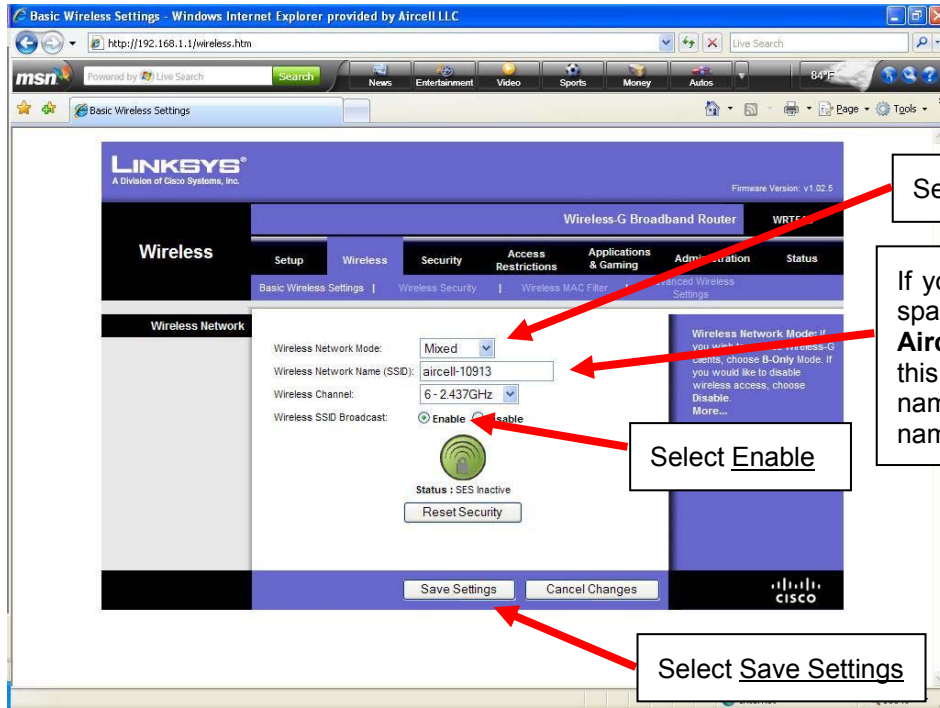
Testing and Setup, Section 4

Aircell confidential and proprietary

Figure 4.31.A. WiFi Tab Activation Screen
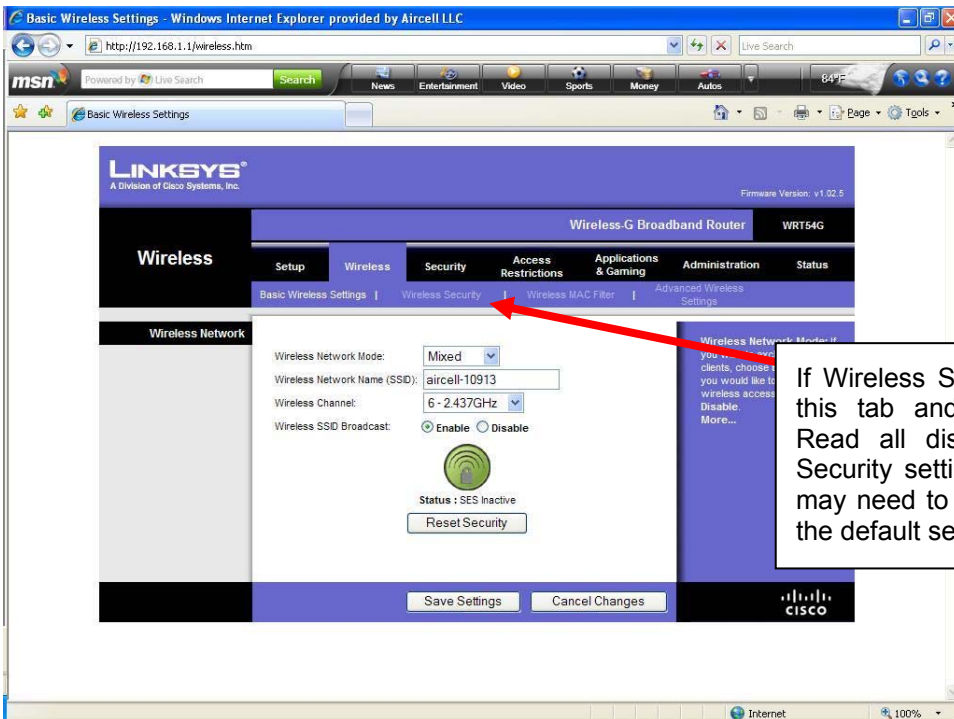
Figure 4.31.B. WiFi Security Activation Screen

When finished, exit the Web Browser.

4.10.   Aircell Axxess® Handset Setup, Menus and Operational Checkout Guide

Part A: Wired SIP Handset Setup

The only handset setup that is required is to set up each Handset for to its own extension Number. Eight (8) extensions (ST 4200 Revision N and subsequent will support ten (10) extensions) are available and are identified as Extension 81 to 88 (or 80 to 89 for ST 4200 Revision N and subsequent):

- The Handset display will show the existing Extension Number.

- Handsets are shipped with a default extension set at 81.

- Each Handset must be assigned a unique Extension Number.

- To properly set up the PBX features as described in Section 4.8., the Handset will need to first be identified with their own Extension Numbers.

- When replacing a Handset you will need to change the replacement Handsets Extension Number to the same Extension Number as the removed Handset (if the Extension Number is not known, look at the other installed Handsets to see what Extension Numbers might be available for use). It is advisable to verify how the Customer may need their Extensions Numbers set up.

SIP Handset Extension Change Procedure
1. From the Main Display, press the **FNC** key, then the **4** key.
2. Use the up and down keys to select Admin Configuration from the Setup Menu, press **SND**.
3. Enter password "1234" using Handset key pad and press **SND** (password # entry is slow to respond, enter a # and pause for the "X" to display before entry of next #)
4. Use the up and down keys to select the Extension Number option from the Admin Configuration Menu; press **SND**.
5. Enter **STO** to edit Extension #, enter new # and press **SND**. The New Extension # will now display.
6. Press **END** to exit back to Main Display.
7. Verify New Extension # is still displayed.

Note

After the Handset Extensions are changed, the following may be required for the PBX to recognize the new Handset Extension Numbers.

Note

For the following Display screens, whenever a **FCN** key and a numeric key are required, press the **FCN** key first, then press the numeric key .

Please cycle the Aircell Axxess System power, or disconnect and reconnect the Handset connectors.

NOTE:

This handset requires Aircell CTR part number P12083 Rev L or later, or Aircell CTR part number P12083-001 Rev B or later.

Pressing SND (green key) for one (1) second will power up the handset.

Pressing END (red key) for ten (10) seconds will power off the handset.

1. If the Handset has already registered with the PBX, continue with step 2; otherwise perform the following sub-steps:
    a. Press "FCN 4" to bring up the setup menu of the Handset.
    b. Press "2" or using the "▲" and "▼" keys select "2: admin configuration" from the list, press "SND".
    c. Enter the password "000000" (6 zeros) (refer to Display 30).
    d. Verify that the display shows "XXXXXX" and you may need to press SND to proceed.
    e. Select option 2 "Network" (refer to Display 31) by pressing "2" or using up/down arrows to highlight Network and press "SND".
    f. Select option 1 "Profile" (refer to Display 32) by pressing "1" or using up/down arrows to highlight Profile (refer to Displays 33-35).
    g. To scan for AP, use up/down arrows to select an empty profile, then press "SND" (you may need to press CLR to first delete all and then rescan).
    h. Use the up/down arrows to highlight the desired SSID of the CTR connected to the ATP, then press "SND" to select.
    i. Cycle power by pressing and holding END until the screen goes blank and then press SND and verify that the handset registers with the PBX.

2. Verify the default extension is set to 81. If not, perform the following sub-steps:
    a. Press "FCN 4" to bring up the setup menu of the Handset.
    b. Press "2" or using the "▲" and "▼" keys select "2: admin configuration" from the list, press "SND".
    c. Enter the password "000000" (6 zeros).
    d. From the Admin Configuration menu, select option 3 "SIP Account" (refer to Display 36).
    e. Highlight "User name" and press STO to edit.
    f. Use FCN key to display "123" on the screen, press CLR to delete characters, and then enter your desired extension number (for example, 81-88).
    g. Press STO to save.
    h. Repeat for "User number" (refer to Display 37).
    i. Press down and verify that the User password is "1234". If not, change to the User password to "1234" and press STO to save.
    j. If any changes are made press SND to save.

3. From the Admin Configuration menu, select option 4 "SIP Server" (refer to Display 38) and verify the following:
    a. Press "FCN 4" to bring up the setup menu of the Handset.
    b. Press "2" or using the "▲" and "▼" keys select "2: admin configuration" from the list, press "SND".
    c. Enter the password "000000" (6 zeros).
    d. Address is set to 192.168.1.200. If not, change the Address by Pressing STO then CLR and the FCN key to display "123" on the screen and then enter "192*168*1*200" and then STO to save.
    e. Domain is blank.
    f. Port is set to 5060.
    g. Use is checked.
    h. If any changes are made, press SND to save.

Part B: SIP Handset Display Menu System

Display 0: While the Handset is booting.

Display 1: After the Handset has booted, but is not ready or not yet registered on the Aircell Axxess® Server.

Display 2: If the Handset has been unable to register with the Aircell Axxess server.
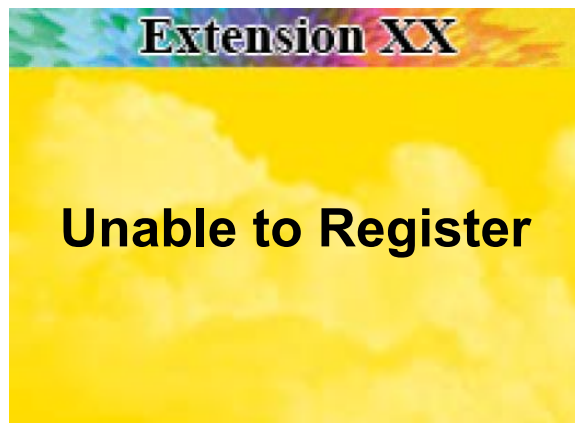
Display 3: After the Handset has registered with the Aircell Axxess® server and is available for calls:

Note

This does not show availability or status of the Iridium Transceivers.

Corded SIP Version

WiFi SIP Version

Display 4: While user is dialing a phone number.

Press *SND* to place call
Press *CLR* to backspace
Press *END* to cancel

Display 5: While the call is being set up through the telephone network, the word "Dialing" will appear underneath the number.

913033790237

Dialing

Press *END* to end call

Display 6: After call setup is complete and the call is in progress (after the call is ended, return to Display 3):

Corded SIP Version

WiFi SIP Version

Display 7: When there is an incoming call from an external source (the Handset is ringing):

"Incoming Call" flashes on and off. Name and phone number (from the Caller ID function) will not be provided for incoming Iridium calls.

Display 8: When there is an incoming call from another extension (the Handset is ringing).
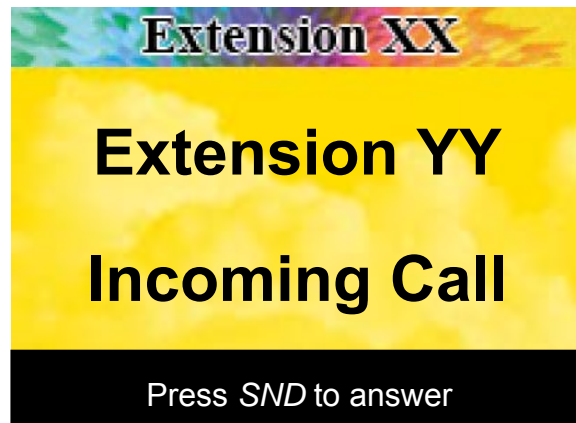
"Incoming Call" flashes on and off. The extension number is displayed.

Display 9: While a call is on hold (user has pressed **HLD** during a call).

Display 10: While a call is on hold, and the user is dialing a new number for a call transfer or call conference.

Display 11: While the call is being set up to the third party (the user may perform a call conference in any case or an attended call transfer if the third party is another extension).

If the call to the third party is ended before the conference is initiated, then the Handset returns to Display 9.

Display 12: While a call is on hold, and the third party has answered the call, and the third party is another extension (the user may perform a call conference in any case or an attended call transfer if the third party is another extension).

<table>
<tr>
<td>

Extension XX

Conference: Waiting

<Display phone # of 3rd party>

Call Holding

Press *FCN 3* for conference

Press *END* to end call to third party

</td>
<td>

Extension XX

Conference: Waiting

93033790238

Call Holding

Press FCN 3 for conference
Press FCN 8 to Transfer
Press END to end call to 3rd party

</td>
</tr>
<tr>
<td align="center">Corded SIP Version</td>
<td align="center">WiFi SIP Version</td>
</tr>
</table>

If the user ends the call to the third party without initiating the 3-way conference, then the Handset returns to Display 9.

Display 13: After the user has initiated the 3-way conference (an attended call transfer may still be performed by ending the call from the user's extension, but only if one of the remaining two parties is another extension).

Extension XX

Call In Progress

Press *END* to end call

(Phone numbers are not displayed because the Handset will not know which of the three parties remain in the conference - one party may drop out without the Handset knowing). After the call is ended, Handset returns to Display 3.

Display 14: Earpiece volume level display, shown for two seconds after earpiece volume level is changed by pressing arrow keys (▲ or ▼), then Handset returns to original display (or returns to original display immediately if **CLR** is pressed) (Note: two second reversion to original display or **CLR** command does not apply to SIP WiFi Handsets).
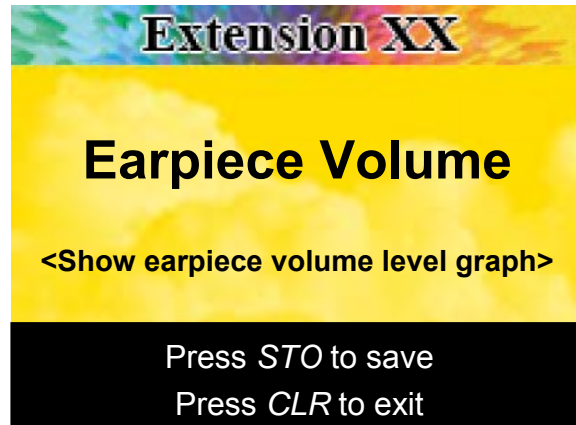
This function works whether a call is in progress or not (but the user can only evaluate the earpiece volume level during a call). The **STO** function saves the earpiece volume level in non-volatile memory; if the user does not press **STO**, the earpiece volume level reverts to the previous setting after a power cycle.

Display 15: Ringer volume level display, shown for two seconds after ringer volume level is changed by pressing **FCN 1** and arrow keys (▲ or ▼), then return to original display (or return to original display immediately if **CLR** is pressed) (Note: two second reversion to original display or **CLR** command does not apply to SIP WiFi Handsets).

If the Handset is not currently ringing, the ringer will be activated (using the ring pattern selected in the user configuration) each time an arrow key is pressed. The **STO** function saves the ringer volume level in non-volatile memory; if the user does not press **STO**, the ringer volume level reverts to the previous setting after a power cycle.

Display 16: Key tone volume level display, shown for two seconds after key tone volume level is changed by pressing **FCN 2** and arrow keys (▲ or ▼), then the Handset returns to original display (or returns to original display immediately if **CLR** is pressed).
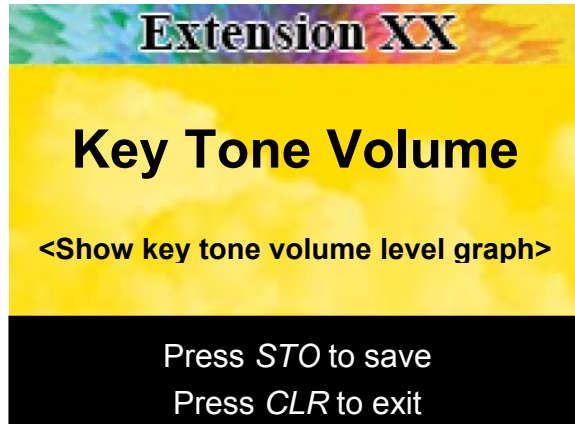
In this mode, the key tone will be heard each time the arrow key is pressed so that the user can evaluate the key tone volume level while he/she is adjusting it. The **STO** function saves the key tone volume level in non-volatile memory; if the user does not press **STO**, the key tone volume level reverts to the previous setting after a power cycle.

Display 17: When microphone mute is activated with **FCN 6**, "**MICROPHONE MUTE**" is added to the display, but the remainder of the display will not be changed (Note: this feature is only enabled in SIP WiFi Handsets during a call).

Corded SIP Version

WiFi SIP Version

Display 18: When the user presses **FCN 5** (to lock the Handset).

Display 19: After the Handset has been locked.
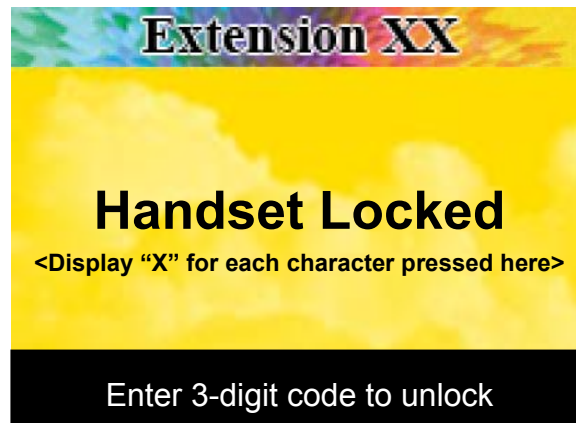
When the keypad unlock code is pressed by the user, the characters will be displayed as "XXX," with one "X" displayed for each character entered. 333 is the default code. The keypad will only respond to numerals; no other functions are available when the lock function is activated. If an incorrect 3 digit code is entered, the "XXX" character display will automatically clear to a blank line.

Display 20: When the user presses **FCN 0** to change the Handset unlock code.

Extension XX

**Enter Security
Code (6 Digits):**

<Display "X" for each key pressed here>

Enter *END* to cancel

Characters will be displayed as "XXXXXX," with one "X" displayed for each key pressed. 888888 is the default code (for SIP WiFi, the default is 000000). Actual characters that were pressed by the user will not display.

Display 21: After the user has entered the security code to change the Handset unlock code (**FCN 0**).

Extension XX

Enter new unlock code:
<Display code as it is entered>

Press *RCL* for current code
Press *STO* to store new code
Press *END* to cancel

Corded SIP Version

Extension XX

Enter new unlock code

—

Press RCL for current code
Press END to cancel

WiFi SIP Version

The code will be exactly 3 digits. Display three character locations with a highlighted cursor that moves to the next character location after the previous character is entered.

Display 22: If the user has pressed **RCL** to view the current Handset unlock code.

Extension XX

CURRENT LOCK CODE:
<display current code>

Press *STO* to change code

Press *END* to cancel

If user presses **STO**, go to display 21.

Display 23: This is the phonebook alphabetic storage display. The user types in a phone number as if he/she is going to dial the number and then presses **STO**, followed by a memory location (1 to 99). After that, this screen is displayed:
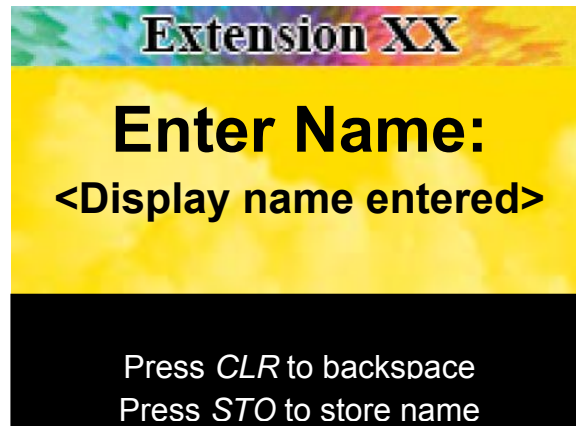
Corded SIP Version
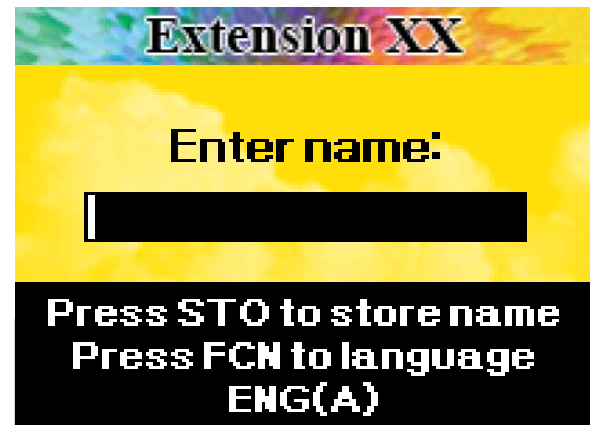
WiFi SIP Additional Displays

Display 7 character locations after the **Enter Name:** prompt. A highlighted cursor will appear in the character location that is being selected. Letters and Numerals may be entered directly from the keypad Keys. "Example, Press 2 for 2, press 22 for A, press 222 for B".

For WiFi SIP Handsets, you must specify a numeric location for the stored number. After selecting a numeric location, enter the desired name for the stored number. Press STO to save the stored number; you may also change the alpha characters prior to saving (capitals, numerics and special characters) by pressing the FCN key.

Display 24: This is the phonebook display that is displayed after the user presses **RCL**, then a memory location (1 to 99).

```
3: <display name #3>…
4: <display name #4>…
5: <display name #5>…

Press ▲ and ▼ to scroll list
Press # to see more info
Press SND to dial number
Press CLR to edit number
Press END to cancel
```
Corded SIP Version
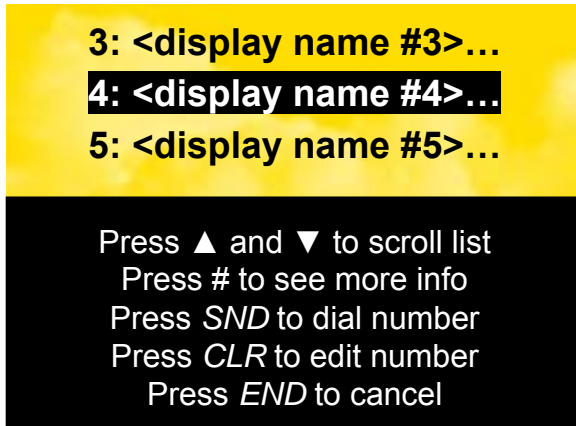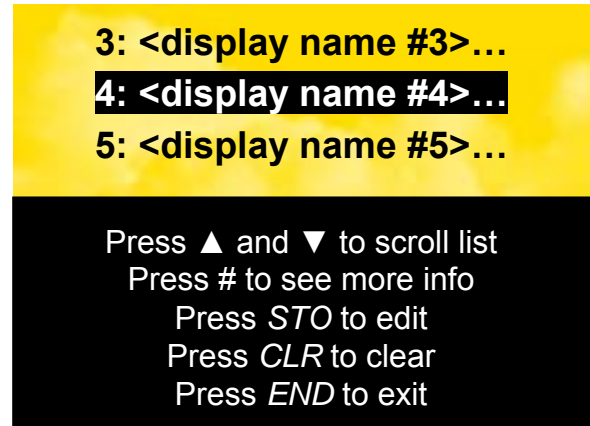
```
3: <display name #3>…
4: <display name #4>…
5: <display name #5>…

Press ▲ and ▼ to scroll list
Press # to see more info
Press STO to edit
Press CLR to clear
Press END to exit
```
WiFi SIP Version

The phone book information from the center of the list is always highlighted (reverse video). The entire list will move up or down with the ▲ or ▼ keys in numerical order by memory location (1 to 99). The stored name will be displayed first, followed by as many characters in the stored phone number as can fit on the display, followed by "…" if there is more information to display. If there is no name stored for a memory location, the stored number will be displayed.

Display 25: Setup menu (accessible by **FCN 4**).

```
AirCell Handset
P12184
1: User Configuration
2: Admin Configuration
   (Password Required)
3: Version Information
Press SND to select
Press END to exit menu
```
Corded SIP Version
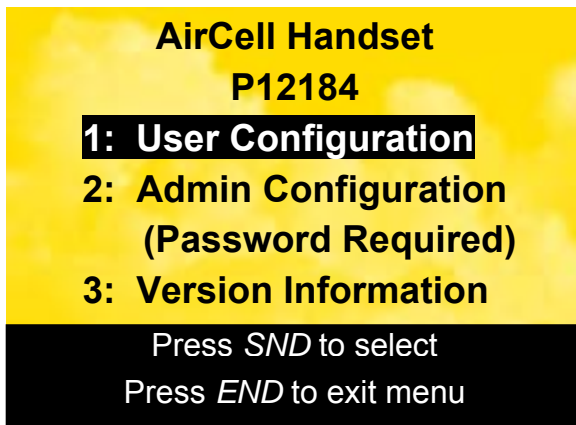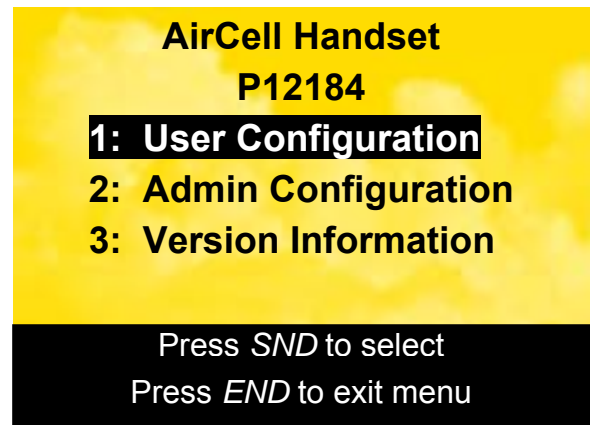
```
AirCell Handset
P12184
1: User Configuration
2: Admin Configuration
3: Version Information

Press SND to select
Press END to exit menu
```
WiFi SIP Version

User can press ▲ or ▼ keys to move highlighted option up or down, or user may select the desired number of the option on the keypad.

Display 26: User Configuration menu.
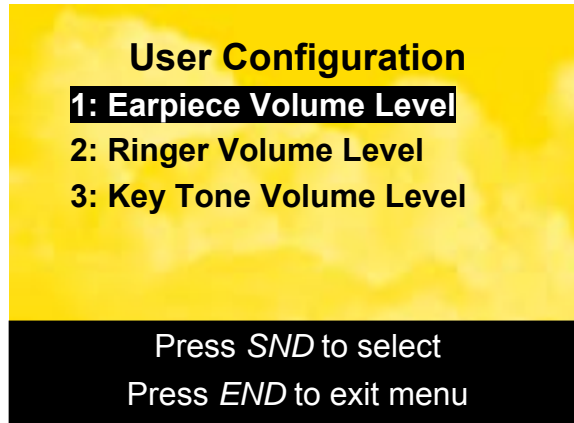
User Configuration

1: Earpiece Volume Level
2: Ringer Volume Level
3: Key Tone Volume Level

Press *SND* to select
Press *END* to exit menu

User can press ▲ or ▼ keys to move highlighted option up or down, or user may select the desired number of the option on the keypad to view the current settings.

Display 27: Admin Configuration Menu:

<u>Note</u>

These instructions pertain to Standard, Flush-Mount, LEMO and Custom-Retractable Handsets. See Displays 30 through 37 for SIP WiFi Handset instructions.

1234 is the default Password to enter Admin Configuration (password number entry is slow to respond, enter a number and pause for the number to display before entry of next number). The only changes required in this area are for Extension Number, such as for first time system setup or a Handset change. It is highly advisable not to change any other settings in this area.
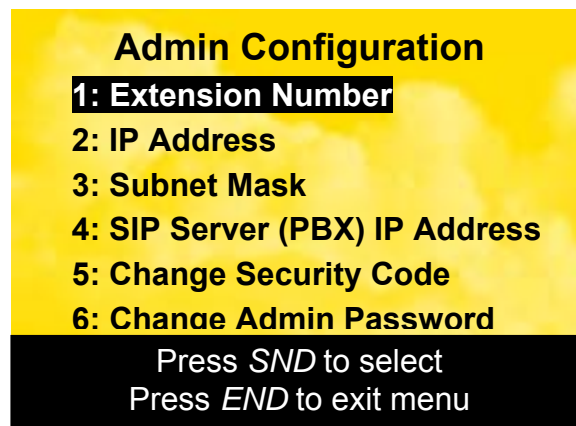
Admin Configuration

1: Extension Number
2: IP Address
3: Subnet Mask
4: SIP Server (PBX) IP Address
5: Change Security Code
6: Change Admin Password

Press *SND* to select
Press *END* to exit menu

Administrator can press ▲ or ▼ keys to move highlighted option up or down, or administrator may select the desired number of the option on the keypad.

Display 28: Advanced User Configuration menu.

> **Advanced Setup**
> **Configuration**
> **Do Not Change Unless**
> **Authorized By AirCell!**
>
> Press *SND* to select
> Press *END* to exit menu

Administrator can press ▲ or ▼ keys to move highlighted option up or down, or administrator may select the desired number of the option on the keypad.

Display 29: The hardware and software version display (from the **Version Information** menu item in Display 25).

> **AirCell Handset**
> **P12184**
>
> **H/W Ver: <display version>**
> **S/W Ver: <display version>**
>
> Press *END* to cancel
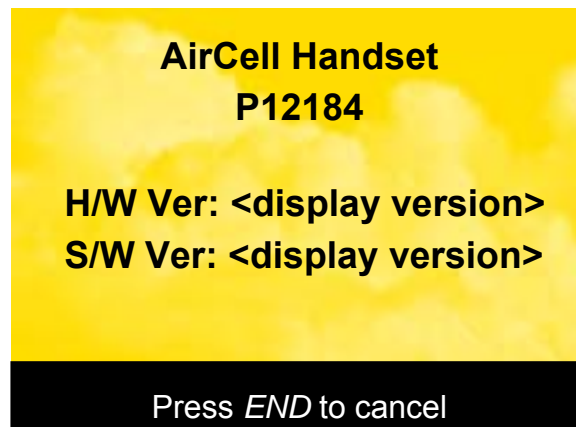
Display 30: Admin Configuration Menu: *These instructions pertain to WiFi handsets*. **000000** is the default Password to enter Admin Configuration. The only changes required in this area are for Extension Number, such as for first time system setup or a Handset change. To use the WiFi handset, you must be registered with the available network. It is highly advisable not to change any other settings in this area.
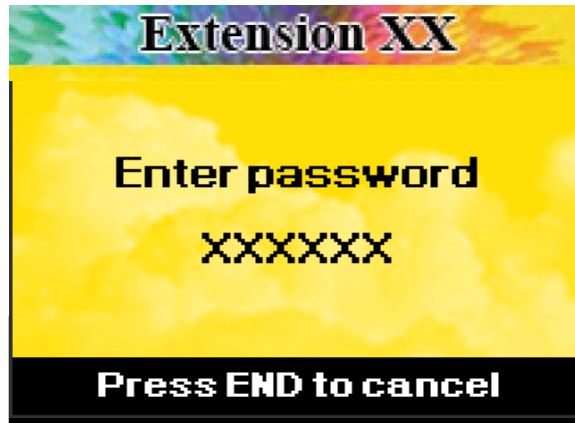
Display 31: Press **2** to register with the available network.
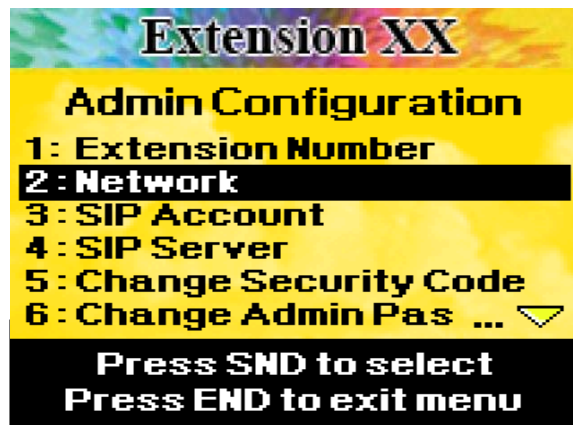
Display 32: Press **1** to set up the network profile.
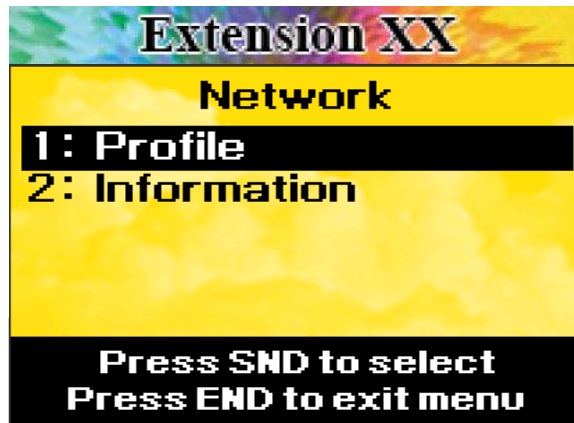
Display 33: Press **SND** to scan for available network access points (AP).
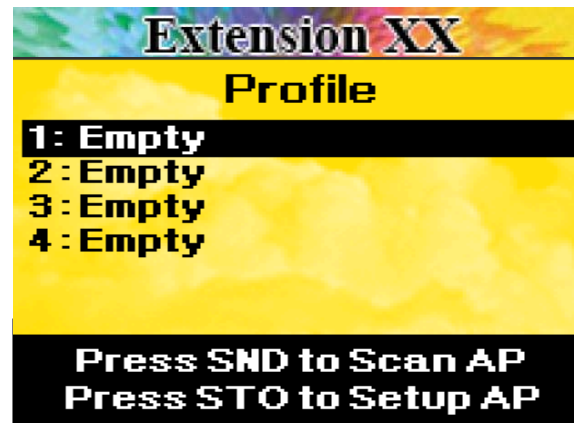
Display 34: Using the up and down keys, select the AP of the CTR that is installed on the airplane. Press **SND**.
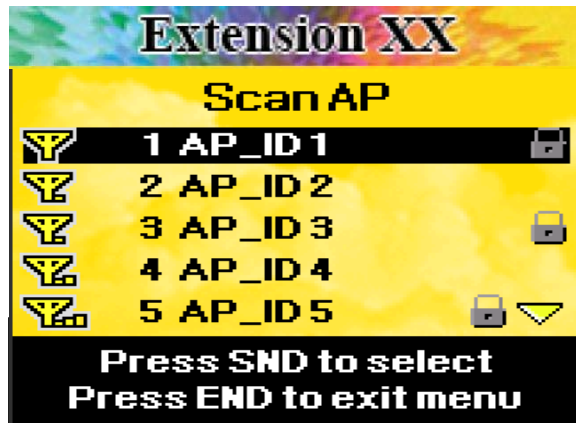
Display 35: Press **SND** to save. It is advisable not to change any settings in this area.

Display 36: Press **3** to set the extension number.
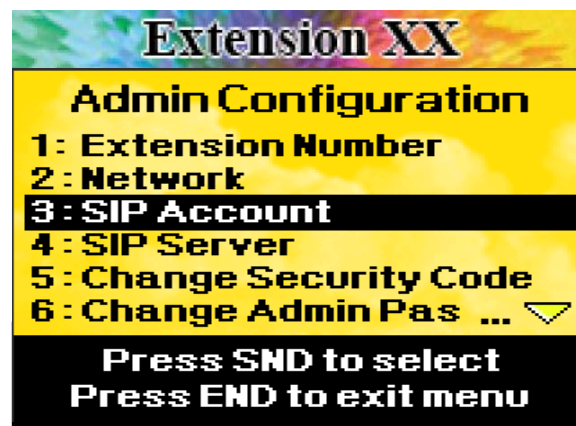
Display 37: Using the up and down keys, highlight **User name** and press **STO**. Enter any desired name and press **STO** to save the name. Using the up and down keys, highlight the **User number** and press **STO**. Enter the desired extension number and press **STO** to save the number.
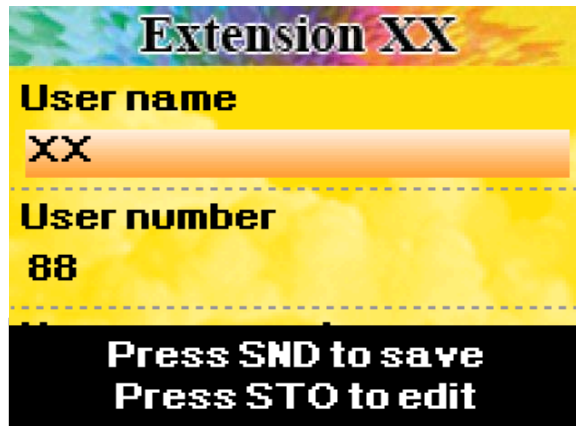
Display 38: This screen is preconfigured prior to shipment. It is advisable not to change any settings in this area.
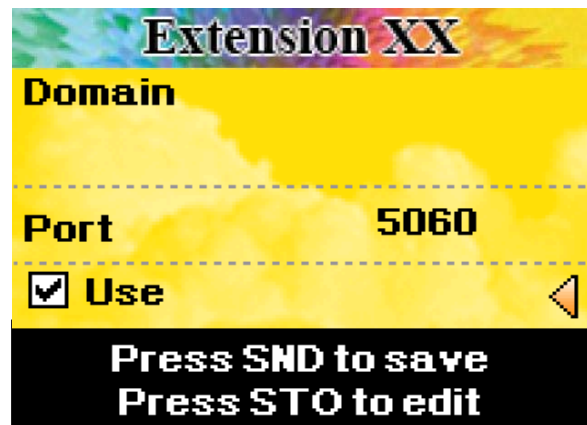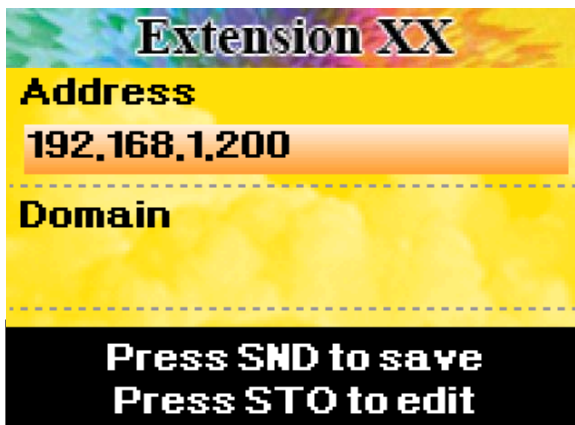
Part C: Iridium Operation through the Aircell Axxess® SIP Handsets

1. Turn power on to the Aircell Axxess system and verify that the SIP Handset has power and the display has stabilized.

2. Using a SIP Handset, place a test call using Iridium to a known local phone number that will be answered, such as a nearby office phone (a test call to a cell phone should only be used if the cell phone is in an area of known good coverage). This first call should default to Channel 1 of the Aircell Axxess system.

   If the call is not processed through using the SIP Handset, proceed to Troubleshooting Procedures in Appendix B.

3. If the first SIP Handset call is successful, maintain that call up and initiate a second Iridium call using a second SIP Handset in the aircraft. This will utilize Channel 2 of the Aircell Axxess.

   If the call is not processed through using the SIP Handset, proceed to Troubleshooting Procedures in Appendix B.

4. If all the test calls are successful, terminate the calls and verify that the system is ready for new call. If data functionality is to be tested, proceed to Section 4.11. Otherwise, turn off the avionics master switch to complete the checkout if no testing of other systems is required.

Placing an Iridium call from the Aircraft:

Lift the Handset from the cradle and observe the following:

- Verify an illuminated display and that the display indicates Extension # and the Dialing instructions. (This usually takes about 70 seconds after power is applied to the system.);
- Place a call by entering 9 + country code + phone number on the keyboard and then press **SND**. **Example: 9 + 1 303 379 0278 SND***, this will call* Aircell *Customer Service*;
- Verify that the system is providing a clear communications link, and then press **END** to terminate the call;
- If multiple Handsets are installed, repeat the above procedure for all locations; and
- Conferencing Handset-to-Handset and or Handset-to-Audio Panel can also be checked at this time. Audio Panel-to-Handset operations will be per the particulars on how the Aircell Axxess audio is interfaced to the Audio Panel.

Placing a Iridium call to the Aircraft:

Two-Stage Calling *to* Aircraft from Ground Phones
Two-stage dialing may be a less-costly alternative to direct dialing.

Calls from USA/Canada
Dial 1 + 480.768.2500 (listen for prompt) +
Aircraft Iridium Telephone Number (8816.XXX.XXXXX).

Calls from Outside USA/Canada
Dial IDD prefix of the country you are calling from
+1 (USA Country Code) + 480.768.2500 (listen for prompt)
+ Aircraft Iridium Telephone Number (8816.XXX.XXXXX).

Direct Dialing *to* the Aircraft from Ground Phones
Dial IDD prefix of the country you are calling from
(USA/Canada = 011) + Aircraft Iridium Telephone Number
(8816.XXX.XXXXX).

<div align="center">

Note

Cellular or ground phones require international dialing capability. Some
cellular and long-distance providers may not recognize the 8816 Iridium
Country Code.

Utilizing Two-Stage dialing will solve this problem in the US, as your call is
placed to a 480 area code (Arizona).

</div>

Please refer to Aircell Axxess® User Manual for more details. Copies are available at
http://www.aircell.com/service/serv_manuals.php

4.11. Aircell Axxess® Data Call Functionality Checkout Guide

Aircell Axxess Satellite Telephone System: this system allows for two-way communications from the aircraft, including voice over Iridium or data connection over Iridium (via the Iridium on-board modem).

There are two (2) Iridium data channels available on the Aircell Axxess II Satellite Transceiver (ST 4200). Two (2) additional data channels are available on the Expansion Transceiver (ST 4020).

Note

Personal Computers Dial up data service, offered by Iridium is highly recommended. Direct Internet 2.0 offers data compression capabilities, easy Installation and Set Up. The software and ISP service is free; you only pay for Iridium connection time.

Please visit http://www.Iridium.com/ and go to the Direct Internet 2.0 Sections for the details.

1. Using a standard serial cable, connect the laptop computer configured per above note to the 9-pin D-type connector wired to Channel 1 of the Aircell Axxess II (ST 4200). Initiate a data call from the laptop computer. While connecting, Call progress can be monitored on the laptop. Once connected, a message will show on the laptop screen indicating connection. Open a web browser and bring in a web page (something simple, Google.com). Note this is a 2.4 Kbps connection that, when using Iridium Direct Internet, can be enhanced up to 10 Kbps.

2. Terminate the data call on Channel 1 by selecting "Disconnect" on the laptop computer and allowing the process to finish completely before further steps.

3. Reconnect the laptop computer to the 9-pin D-type connector wired to Channel 2 of the Aircell Axxess ST.

4. Initiate a data call from the laptop computer. The sequence will be the same as in Step 2 and 3 above. If any anomalies are observed, troubleshoot as described above. Upon completion, terminate the call and allow the process to finish completely.

5. If any In Flight Entertainment (IFE) equipment is connected to the Aircell Axxess ST, this is a good opportunity to attempt an upload/download, as the aircraft does not have to be airborne.

Note

It is suggested that IFE equipment be wired to Channel 2. As voice calls will most likely use Channel 1, this will allow greater availability of Channel 2 for frequent or automatically scheduled data uploads/downloads.)

Note

It is suggested that Dial up Data equipment be wired to Channel 2. As voice calls will most likely use Channel 1, this will allow greater availability of Channel 2.

Note

Only one (1) data device can be connected to a channel at a time. If the channel is provisioned for another data port or another device, please disconnect the device that is not required.

Note

When entering a Dial up Data Call Number, do not use the number nine (9) to access an outside line. The RS-232 wired data connection is dedicated to the Iridium channel it is wired to.

A typical Dial up data number should be entered as:

00 (Iridium IDD prefix + Country Code + Phone number.)

Example 001-303-XXX-XXXX Colorado phone #, and 008816000025 Iridium Internet Server phone #.

If difficulties are unresolved, contact Aircell Customer Support at 1-888-286-9876.

FOR Aircell On-Go Faxing Service ACTIVATION (applies to the external **UCH 100 or UCH 300** fax adapters):

Call Aircell Customer Service 1-888-286-9876, 1-303.301.0278 and provide the following information:
- S/N of the Aircell Axxess® (ST 4200) (Located on the back of the unit)
- The Iridium Channel that the On-Go uniHub™ Fax adapter will be connected to.
- S/N of the On-Go uniHub™ Fax adapter.
- An upFax number will be assigned to the Aircraft.

FOR Aircell On-Go Faxing Service via Iridium (sffax) or Faxing via Inmarsat (classic_rtfax) (applies to the **optional AHI-2** internal onboard fax adapter) (Faxing via Inmarsat requires Aircell AHI-2 Revision C or later and SIU Revision E or later; refer to Aircell SIU installation Manual D12379):

The following AHI-2 GUI setup pages are from AHI-2 Revision C. Previous revisions have similar GUIs.

Note: Please refer to Technical Bulletin 108 and/or Aircell Axxess Installation Manual D12004, Revision D, for AHI-2 Revision B and earlier detailed setup and configuration instructions.

All AHI-2 ports must have separate IP addresses and only one (1) port, J5 connection can be activated for faxing. If these procedures are not followed, there is a high probability of Iridium channel 2 becoming unavailable, and may additionally cause undesirable data calls and the resulting billable minutes, which Aircell has no liability.

If POTS Faxing connections are not needed, then nothing is required for Handset operation through the AHI-2.

If only a single AHI-2 (recommended), you will have by default settings a 2-wire POTS connection to port A (J5 connection) and a RS-232 data connection to port B (J6 connection).

The following outlines are the procedure for configuring AHI-2 units for aircraft installation. The procedures are detailed for single AHI-2 installation.

Configuration Setup

The following setup is required for configuration of the AHI-2 for FAX operations:

1. Connect the Ethernet port of a set-up computer (typically a laptop) to the Aircell Axxess system configuration and troubleshooting port using an appropriate Ethernet cable (refer to Aircell Axxess Installation Manual D12004 Section 4.8 (Configuration and Setup) and Section 10.0 (Wiring Diagrams) for wiring interface requirements).

2. The set-up computer must have an Internet browser installed to view and change configuration pages (such as "Microsoft Internet Explorer 5.0").

This Section outlines the procedure for configuring an AHI-2. The factory defaults are: Side A (J5) is setup for use with a 2-wire POTS faxing device (RT-Fax) and Side B (J6) is setup for data device use (RT-Data). Aircraft installation containing a single AHI-2 unit will work fine with this configuration.

Note: A MAC address (On-Go Device ID) is assigned to each port (refer to Figure 4.32).
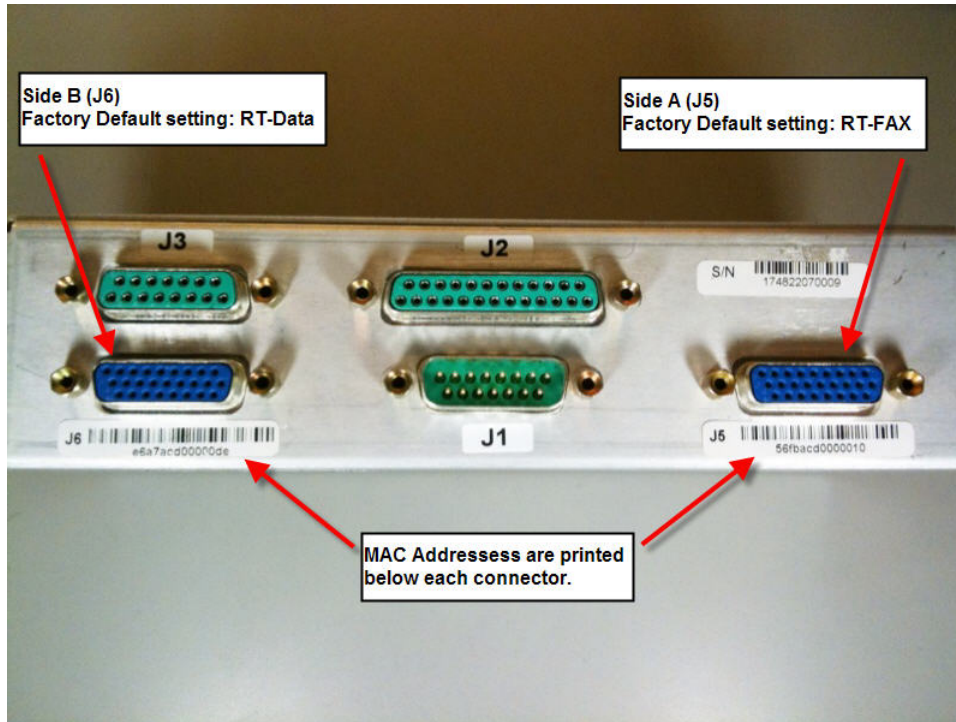
Figure 4.32. AHI-2 Connector view

1. The system must have been powered up for at least 120 to 360 seconds, allowing the system components to boot. When the Handsets show their dialing instructions, the system is fully booted.

2. On the set-up computer, start the Internet browser and enter IP address for one of the ports into the browser address bar: **192.168.1.215 (for Port A J5 connector) and 192.168.1.216 (for Port B J6 connector)**.

3. **AHI-2, Revision C and subsequent, requires a user password ("aircell1ahi2"). Revision B and earlier AHI-2 passwords may be "abcdefg" or "aircell1ahi" (do not type the quotation marks).**

4. Once the initial webpage has loaded, click on the **Configuration** hotlink.
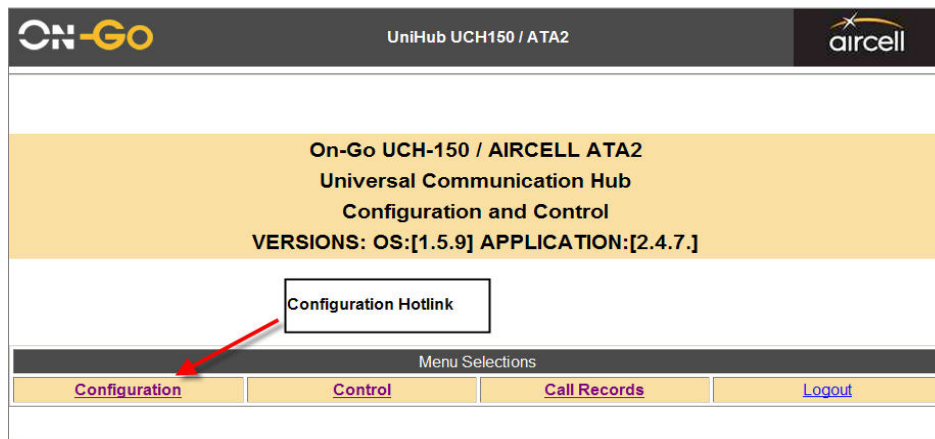
Figure 4.33. Configuration Hotlink Screen

5. Once the Configuration page has loaded, the System Configuration page will be displayed.
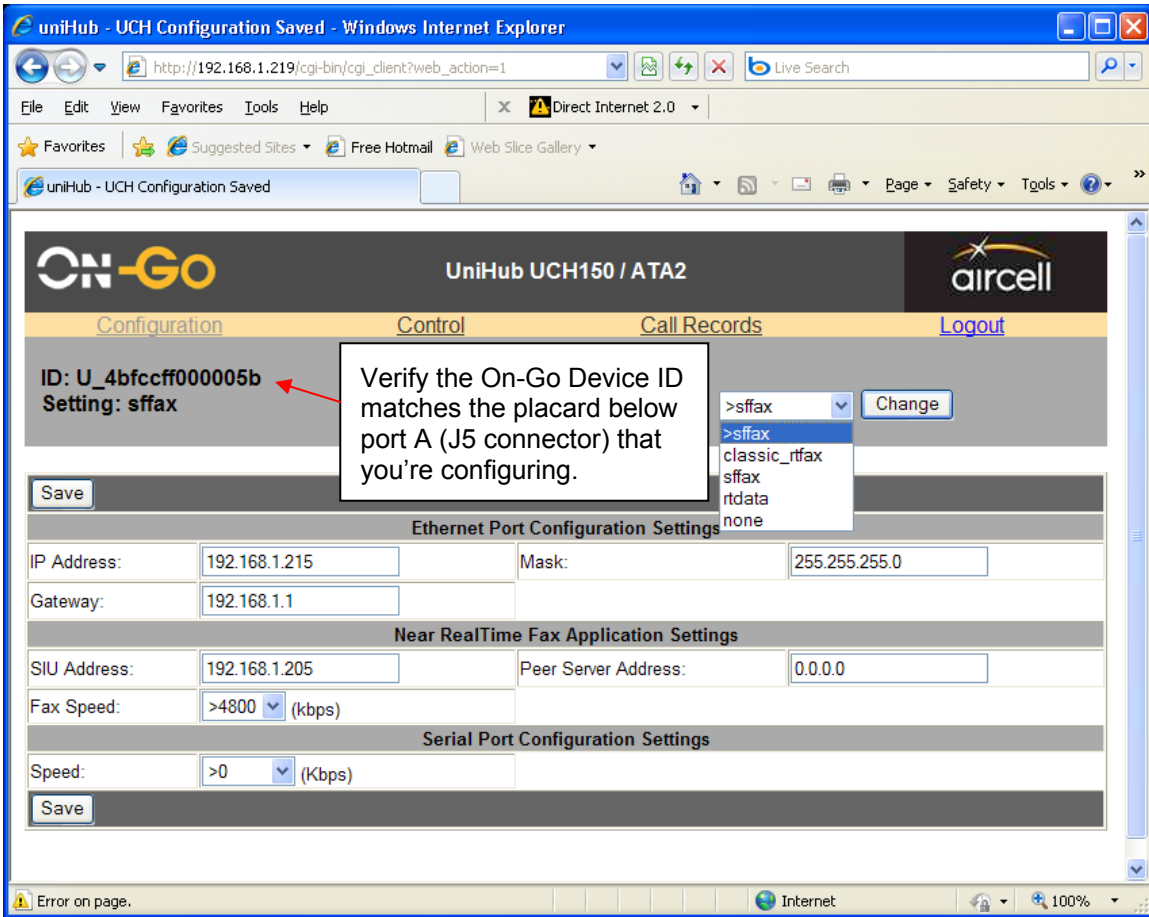
Figure 4.34.A. Main Configuration Screen

6. Once the System Configuration page has loaded, confirm the **On-GO Device ID** matches the placard below port A (J5 connector). Record this number because it will be required for the activation of the Iridium FAX services (sffax).

7. On the left hand side under the IP address are the current settings for the AHI-2 port you're currently accessing.

8. Select the correct fax mode (default is Real Time fax or "classic_rtfax" for FAXing over Inmarsat; select store and forward fax "sffax" for FAX over Iridium) from the drop down menu on the right side of the screen.
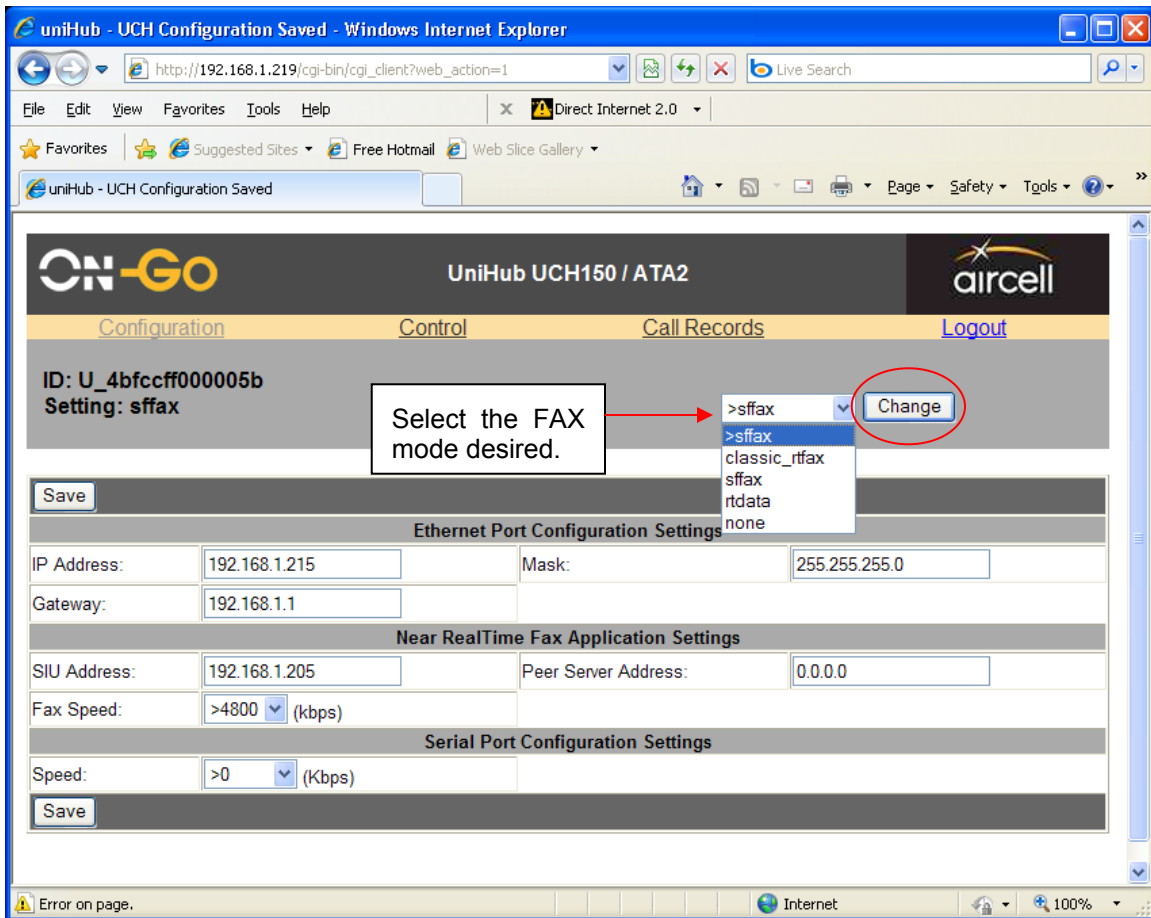
Figure 4.34.B. Main Configuration Screen (continued)

9. Click on the **Change** button after selecting a fax mode. Now wait for AHI-2 to complete the save cycle.

10. After this save is done, click on the displayed "**Reset**" link.

11. After approximately 120-360 seconds, go to the url http://192.168.1.219.

12. Log in using the password "aircell1ahi2".

13. Change the IP address back to 192.168.1.215.

Note: AHI-2 Revision B and earlier you just need to select SF-Fax (for FAXing over Iridium). Select the Local tab; from the Application line, select sffax, then select Save. After save has completed, power cycle the AHI-2. Now log back in 192.168.1.215 to verify your selection have been saved. See Technical Bulletin 108 and/or Aircell Axxess® Installation Manual D12004, Revision D, for AHI-2, Revision B, and earlier configuration details.
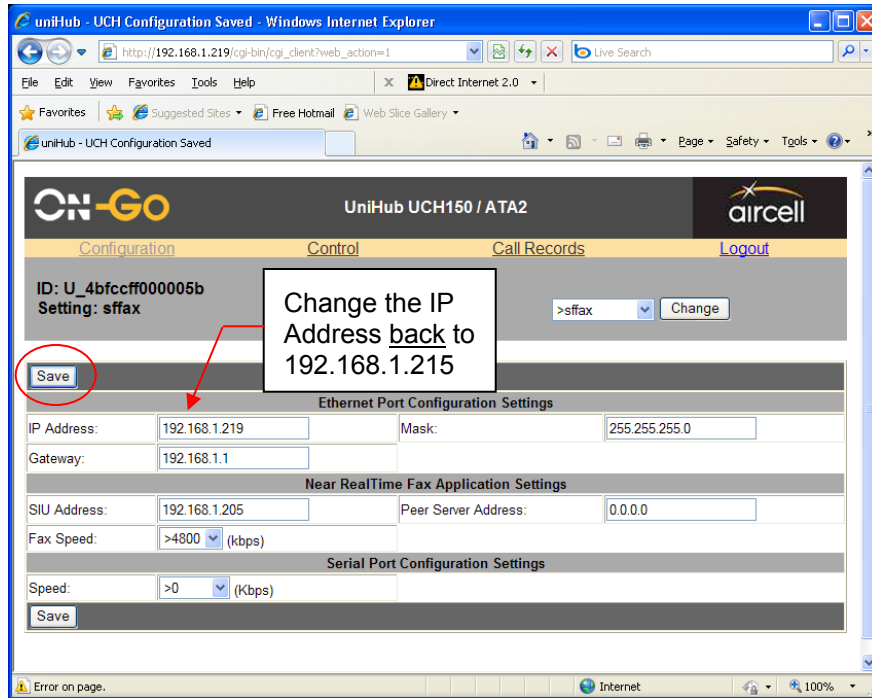
Figure 4.34.C. Main Configuration Screen (continued)

14. Click on the **Save** button. Now wait for AHI-2 to complete the save cycle.

15. After this save is done, click on the displayed "**Reset**" link.

16. After 120-360 seconds have elapsed, go to URL: http://192.168.1.215 to verify your selection have been saved.

17. To set side B, follow the above instructions, choosing the proper option from the dropdown menu (such as rt-data in order to use Airshow) and using url 192.168.1.216 for side B.

    Note: rt-data is the default of side B (J6).

18. The AHI-2 unit is ready for FAX and dial-up data use.

For Aircell On-Go Faxing Service over Iridium (applies to the AHI-2 internal onboard fax adapter):

Call Aircell Customer Service 1-888-286-9876, 1-303.301.0278 and provide the following information:
- S/N of the Aircell Axxess® ST (Located on the back of the unit)
- S/N of the AHI-2 and or the AHI-2 J-5 Data Port ID (ID located just beneath the J-5 Port. This ID is the S/N of the internal On-Go FAX adapter.)
- A upFax number will be assigned to the Aircraft.

Notes

The 2-wire POTS Fax Machine interface can only be connected the AHI-2 J-5 connector. The J-5 POTS connection uses an internal On-Go uniHub™. This Iridium Fax Adapter is the interface to only the #2 Iridium Phone Number (Iridium channel 2).

You can test the FAX machine to AHI-2 interface prior to activating FAX services by taking the Fax machine off-hook entering keys ##8 and then placing FAX machine back on-hook. After 30-60 seconds, the AHI-2's FAX adapter should reply back with an On-Go UniHub status page. This status page will also include port J5 connector Device ID.

AHI-2, Revision C and later, J5 can also be set up for FAX over Inmarsat via an SIU Revision E or later, and FAXing will be through an Inmarsat provider.

Testing and Setup, Section 4

Aircell confidential and proprietary

#1 IRIDIUM Antenna

#2 IRIDIUM Antenna

Axxess II (ST 4200) PBX
& 2 Channel
Iridium Transceiver

#1 RS232
#2 RS232
(System Power and Signal conn.)

RS 232 Data Device Connection

Ethernet connection (Test Port conn.)

ST 4200 Configuration Port

PC / Laptop RJ45 Ethernet connection port to either ST 4200 or CTR

CTR/Data Expansion

CTR Configuration Port

28VDC

CTR

J3

RS-232 Data port B (J6) connection Will use Iridium Channel 2

J6 (Port B)
IP Address >192.168.1.216
Remote Port >2007
Application >None or rt-data (dial-up data call)

J4

Axxess SIP HS

28VDC **J1**

AHI-2

POTS Fax Data port A (J5) connection
Note: There can only be one Fax port in a system.
This FAX Port will be using Iridium Channel 2 or Inmarsat via an SIU.

J5 (Port A)
IP Address >192.168.1.215
Remote Port >2006
Application >None (change to SF-Fax for Fax over Iridium; change to classic_rtfax for Fax over Inmarsat)

J2

Key
28 VDC Power
System Signal (Ethernet)

4.12. Aircell Axxess® ST 4200 DHCP Server Activation (mandatory if no CTR installed)

DHCP will need to be enabled in the ST4200 unit (only for installations with no CTR installed).

If a CTR is installed, the CTR has DHCP enabled, and the CTR hands out the IP addresses to the HSs and other devices.

ST 4200 DHCP activation instructions for an Aircell Axxess installation:

The Aircell Axxess system is customizable and programmable via a PC interface to a Web address, either thru a WiFi connection (if available) or RJ-45 wired Ethernet connection (refer to Section 10.0 for details on the wired RJ-45 provisions).
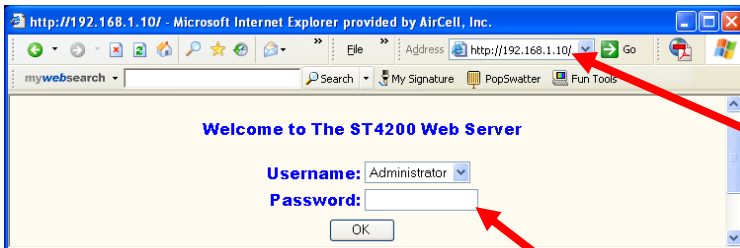
Using a Web browser such as "**Microsoft's Internet Explorer 5.0**" to Login-Accessing the Web Configuration Menu.

The ST 4200MB Web Configuration Menu can be accessed by the following URL: http://192.168.1.10

Log in using User name **Administrator** and password **aircell1mb** "case sensitive!"
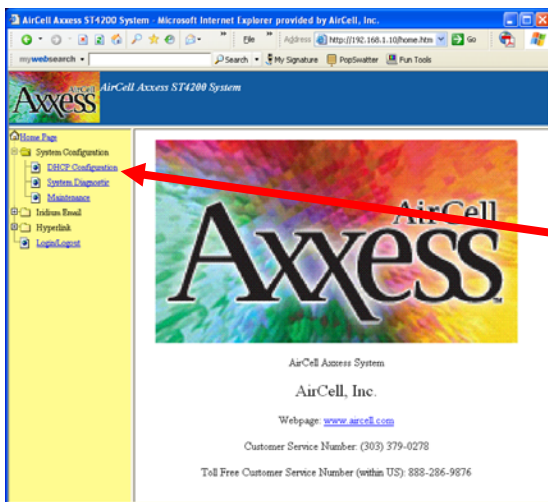
Select DHCP Configuration

Select Enable
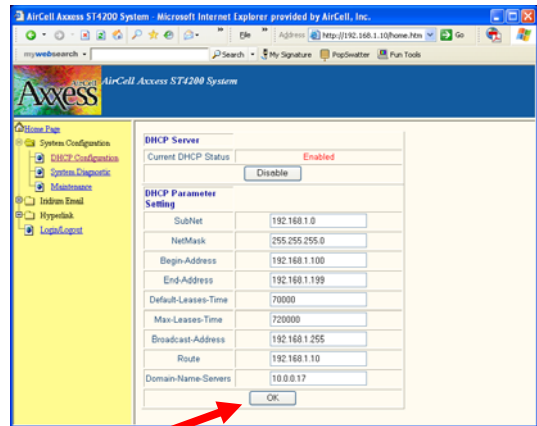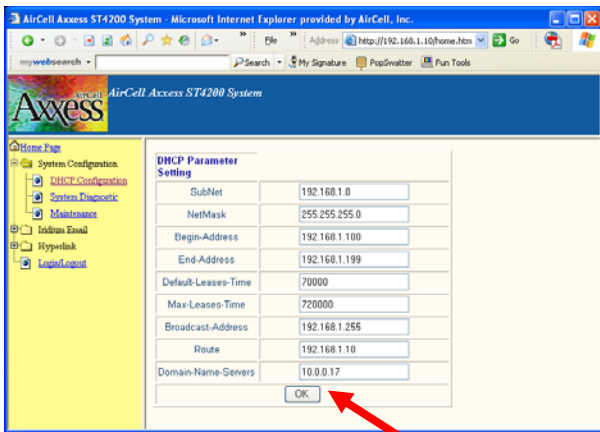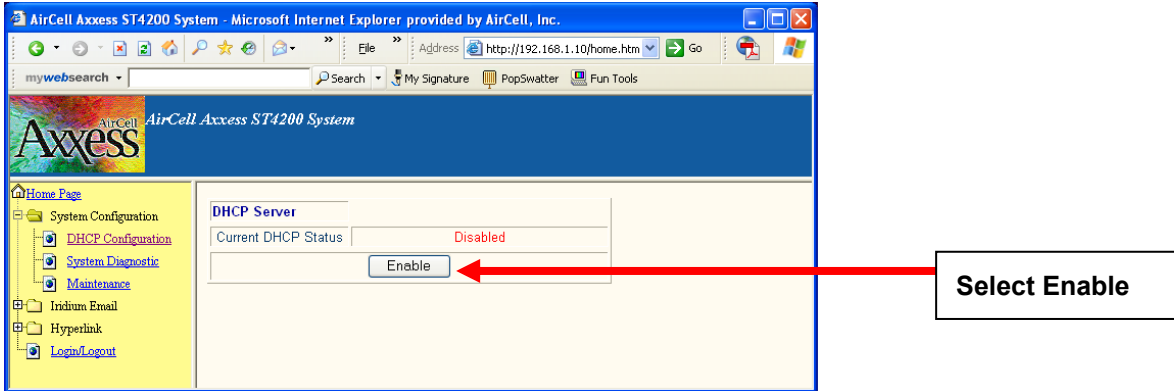
Select OK & OK

When finished, exit the Web Browser.

Note

If you are unable to access the ST4200 MB page, your PC may need to be temporarily set up for a static IP address.

During the following procedures, make note of your existing settings to be able to return your PC to your original configuration. Your PC may have and need these areas set up a certain way for other applications.
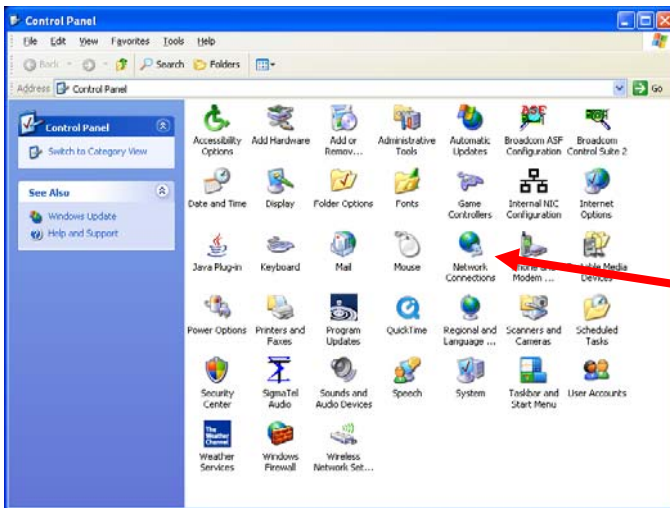
Select "Network Connections" from Control Panel

Select

Select

Local Area Connection Properties dialog — annotations: "Select" (pointing to Internet Protocol (TCP/IP)), "Select "Properties""

Internet Protocol (TCP/IP) Properties dialog — annotations:
- "Select" (Use the following IP address)
- "Enter These Numbers"
  - IP address: 192 . 168 . 1 . 20
  - Subnet mask: 255 . 255 . 255 . 0
  - Default gateway: 192 . 168 . 1 . 1
- "Select" (OK)
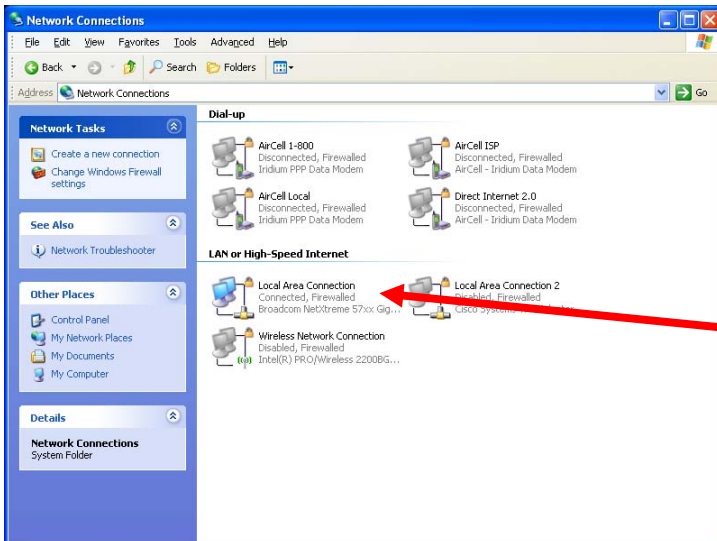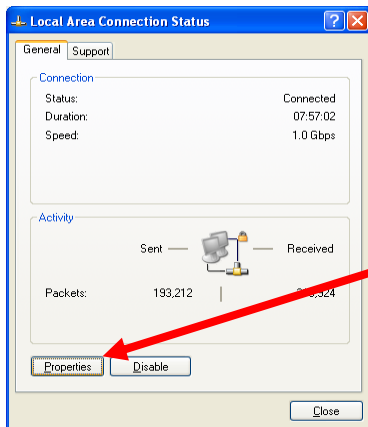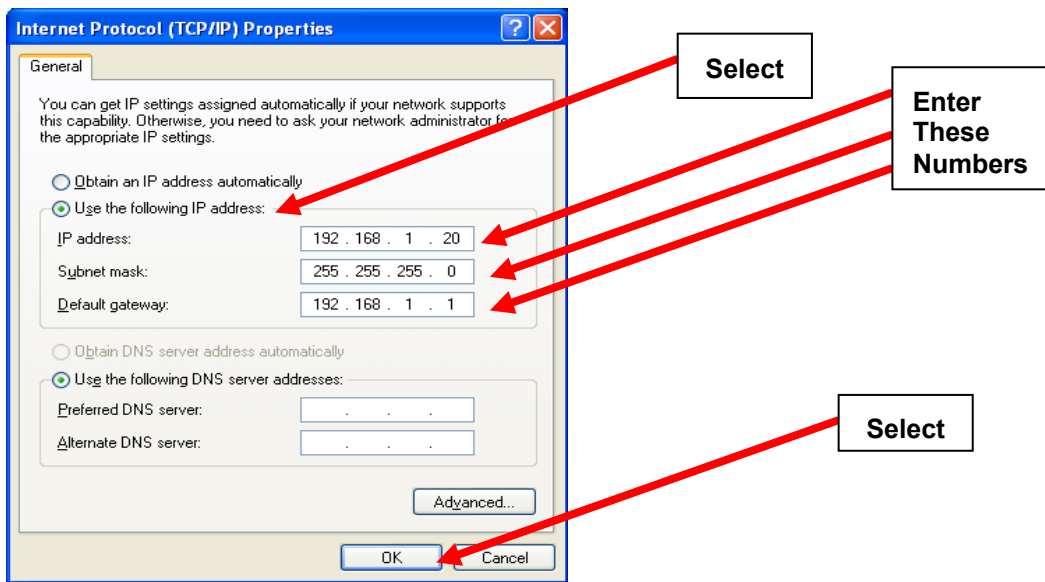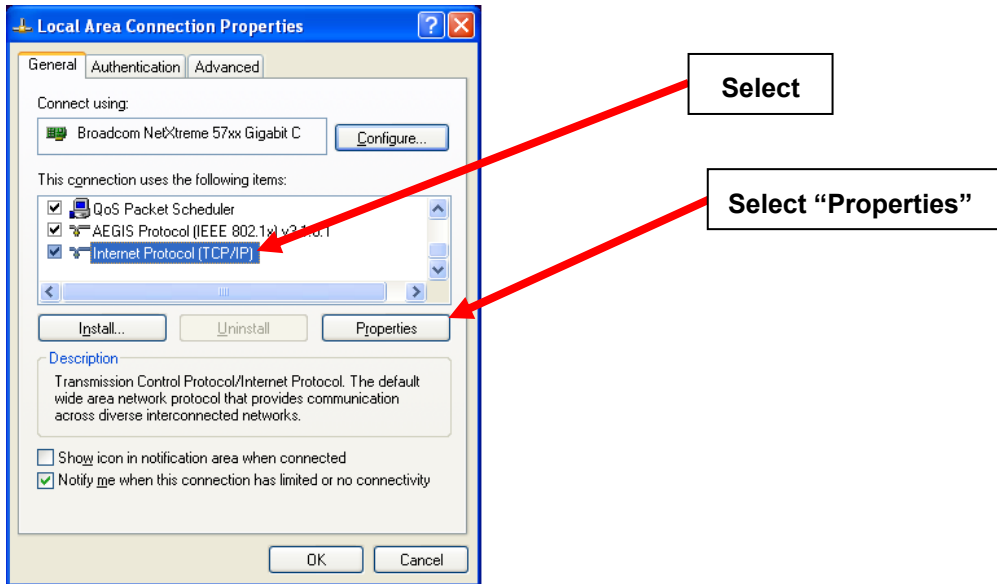
Now enable the ST4200 DHCP as described in the first part of Section 4.12.

Return your PC to its original settings if desired.

Proceed to setting up the HS extensions per Section 4.10. of this manual.

Recycle Power on the to the Aircell Axxess® II System (HS(s) should now show their dialing instruction; this process could take up to six (6) minutes).

Proceed to Section 4.8. of this manual for PBX configuration.

.

Testing and Setup, Section 4
Aircell confidential and proprietary

5.0   CLEANING

5.1.   Introduction

The appearance of a completed installation is an important aspect of Customer satisfaction. Finger prints, smudges, wire clippings, and metal shavings should all be removed before the Customer inspects your work. Vacuum the affected area and clean the surrounding area completely.

5.2.   Recommended Cleaning Materials

Mild soap and water for most plastics is recommended.

CAUTION
Use Isopropyl Alcohol carefully as it may react with some plastics in the area. Isopropyl Alcohol should be used to clean connector contacts and metal parts, if required.

5.3.   Procedure

When Isopropyl Alcohol is used for the cleaning coax connectors, be sure to use a foam type Q-Tip to prevent the residue that can be left by a cotton Q-Tip.

This Page Intentionally Blank

6.0   FITS AND CLEARANCES

The attached sheets provide additional installation instructions for the Aircell Axxess® II System. In addition to general notes, the attached sheets include the unit dimensional information, mounting provision dimensions, connector pin-out and connector orientation diagrams.

Note
The Notes and Tables on these pages are very important; study them carefully.

6.1.   Aircell Axxess II 2-Channel Satellite Transceiver (ST 4200)

ICD D12016 Revision E, 4 pages 11x17 will follow this page.

6.2.   Aircell Axxess 2-Channel Expansion Transceiver (ST 4020)

ICD D12155 Revision C, 4 pages 11x17 will follow this page.

6.3.   Aircell Axxess Cabin Telecommunications Router (CTR)

ICD D12017 Revision M, 5 pages 11x17 will follow this page.

6.4.   Aircell Axxess Remote Diversity Antenna (RDA)

ICD D12403 Revision A, 4 pages 11x17 will follow this page.

6.5.   Aircell Axxess Handset Interface (AHI-1) (optional)

ICD D12105 Revision A, 2 pages 11x17 will follow this page.

6.6.   Aircell Axxess Handset / Fax Interface (AHI-2) (optional)

ICD D12159 Revision A, 2 pages 11x17 will follow this page.

6.7.   Aircell Axxess Call Alerter (ACA) (optional)

ICD D12160 Revision A, 2 pages 11x17 will follow this page.

6.8.   Aircell Axxess Call Alerter II (ACA II) (optional)

ICD D12329 Revision A, 2 pages 11x17 will follow this page.

6.9.   Aircell Axxess Standard SIP Handset (with Audio Panel Interface)

ICD D12059 Revision D, 2 pages 11x17 will follow this page.

6.10.   Aircell Axxess WiFi SIP Handset (with no Audio Panel Interface)

ICD D12130 Revision C, 2 pages 11x17 will follow this page.
ICD D12398 Revision B, 2 pages 11x17 will follow this page.

6.11. <u>**Aircell Axxess Flush-Mount SIP Handset (with no Audio Panel Interface)**</u>

ICD D12060 Revision C, 2 pages 11x17 will follow this page.

6.12. <u>**Aircell Axxess Custom-Retractable SIP Handset (with no Audio Panel Interface)**</u>

ICD D12304 Revision E, 2 pages 11x17 will follow this page.

6.13. <u>**Aircell Axxess LEMO SIP Handset (with no Audio Panel Interface)**</u>

ICD D12305 Revision B, 2 pages 11x17 will follow this page.

6.14. <u>*Reserved for product expansion*</u>

6.15. <u>*Reserved for product expansion*</u>

6.16. <u>*Reserved for product expansion*</u>

6.17. <u>*Reserved for product expansion*</u>

6.18. <u>*Reserved for product expansion*</u>

6.19. <u>**Iridium Satellite Antennas (Standard One-Channel and Dual Two-Channel Patch)**</u>

For installation details and options, refer to **Aircell Antenna Installation Manual P/N 800-10355**.

7.0   SYSTEM SPECIFICATIONS

7.1.   Purpose

This Section provides the specifications for Aircell Axxess® components along with various mounting options.

7.2.   Product Definition

The Aircell Axxess Standard System utilizes the P12023 Dual Satellite Transceiver (Aircell Axxess II (ST 4200)), P12083 Cabin Telecommunications Router (Aircell Axxess CTR), and up to 8 SIP Handsets, P12248-00X (Standard), P12192-00X (Flush Mount), P12793-00X (Custom Retractable) and and P12865-00X (LEMO).. The System is intended for aircraft applications requiring subscriber interface to the Iridium Satellite network. The integral modem provides data communication through an RS-232 Serial Data port for carry on computers and / or wired directly for avionics equipment. Data/Modem speed is typically 2.4 Kbps when operating on the Iridium network. An Audio Panel interface allows the unit to be used with cockpit audio systems and provides microphone bias. High-quality Intercom Conferencing, which includes the Audio Panel interface, has been incorporated. Ring Detect provide notification of incoming call and to pilots and passengers. Various Antenna options and Handset options are available.

7.3.   Associated Reference Documents

RTCA/DO-160E, Environmental Conditions and Test Procedures for Airborne Equipment

7.4.   Technical Specifications

7.4.1.   Aircell Axxess II Satellite Transceiver (ST 4200)

The ST 4200 is comprised of the following items (connector manufacturing P/Ns are shown for reference only):

P12023 ....Dual Satellite Transceiver (ST 4200)

050-11088-55 ....System Power and Signal Connector, Circular 55-SKT MIL-C26482 (MS3126), SIZE 22 (ARRAY CONN PWF06F22-55SA612)

P12690 (with ST 4020 installation) ....Channel Expansion Connector, MIL-C-26482, SIZE 18, 32-PIN, (ARRAY CONNECTOR P/N PWF06F18-32P)

P12190 ....CTR Data Expansion (ETHERNET) Connector, MIL-DTL-24308 (D-SUB), SIZE 1 (HI-DENSITY), 15-SKT W/HOOD (POSITRONIC DD15F10GVL0)

P12190 ....Test (Ethernet) connector, MIL-DTL-24308 (D-SUB), SIZE 1 (HI-DENSITY), 15-SKT W/HOOD (POSITRONIC DD15F10GVL0)

P12107 ....Mounting Tray, 1/2 ATR

Optional in place of Mounting Tray

P12273 ....Kit includes two (2) P12125 Mounting Rails with eight (8) pan-head Phillips screws.

Dimensions

Transceiver Unit ....12.66" L x 4.85" W x 7.0" H

              (32.16 cm x 12.32 cm x 17.78 cm)

Transceiver Unit in ½ ATR Tray.....................................12.83" L x 5.04" W x 7.46" H

              (32.59 cm x 12.80 cm x 18.95 cm)

Largest Connector (System Power and Signal)................2.6" in length from ST to connecter end

Weights

Satellite Transceiver Unit ....8.5 lbs. (3.8 kg)

Mounting Tray ....0.56 lbs. (0.25 kg)

Optional Mounting ....0.5 lbs. / SET (0.23 kg)

System Connectors (All)......................................0.8 lbs. (0.36 kg)

Power Requirements   28 VDC, 6.0 A maximum

Application Note

This note documents the typical current draw requirements for a typical Aircell Axxess® ST system installed. Actual values should be measured and recorded for each system installation.

Description...28 VDC

Standby ....< 0.37 A

Transmit Avg (1 channel) ....< 0.43 A

Transmit Avg (2 channels) ....< 0.50 A

Transceiver Heaters...............................< 2.7 A

- Transceiver Heaters: When the temperature on the inside of the Transceiver is < -20C / -4F, the heaters will turn on. For example, on a 28 VDC system, the heaters will draw an additional 2.7 A. At full power transmit, the average current is 2.7A plus 0.5 A, or 3.2 A. Please note that in general, the transceivers are warm enough, even if located outside of the temperature-controlled cabin. The heaters generally won't be on.

System Connectors

Transceiver Unit ....(ST - Satellite *Antenna* port, Type N Female)

              (ST – *System Power and Signal* port)

              (ST – Channel Expansion Port)

              (ST – *CTR /Data Expansion* port)

              (ST – Test port)

Antenna ....TNC (Female), *Satellite* antenna port at antenna

Mating Connectors ....TNC Male (to the Antenna port)

              Type N Male   (to the ST - Satellite *Antenna* port)

              050-11088-55   (ST – *System Power and Signal* port)

              NA at this time   (ST – Channel Expansion Port)

              P12190   (ST – *CTR /Data Expansion* port)

              P12190   (ST – Test port)

Iridium Operating Frequency Range ....1616-1627 Megahertz (MHz)
Transmit Power ....7 W max

Ring Detector ……………………………Two second ON -Four seconds OFF for incoming calls
Current capability ....2 Amperes DC (SINK only)
Voltage, withstand……………… ....60 VDC

RS-232/Modem Port
Hardware Flow Control………………......RTS and CTS
DTE Speed……………………….............19.2 kbps (8 data bits, one stop bit, no parity)
Data Rate (Iridium)…………………. ....2.4 Kbps, typical
Protocol, Error Correction…...……… MNP4

NOTE

RS-232 ports on the ST 4200 require Hardware Flow Control signals (RTS and CTS) for proper operation. The RS-232 ports behave as Data Communications Equipment (DCE), and will assert CTS when the associated Iridium channel is available. A connected data device (Data Terminal Equipment or DTE) must assert RTS prior to transmitting data or making requests of the Iridium channel (e.g. AT+CSQ?). The DTE must also observe the status of the CTS signal. Any data transmitted from the DTE while CTS is de-asserted will be ignored by the ST 4200.

Environmental (RTCA/DO-160E)
Temperature and Altitude……..................Section 4, Category F2 ((55K ft MSL, -55°C to +70°C
(-67°F to +158°F) operating, -55°C to +85°C (-67°F to +158°F) storage)
Temperature Variation……. ....Section 5, Category B
Humidity……………………….................Section 6, Category A
Shock and Crash Safety.........................Section 7, Category B
Vibration…………………………...............Section 8, Category S (Curves C, L, M, and Y)
Magnetic Effect......................................Section 15, Category Z
Power Input………………………..............Section 16, Category B (22 to 30.3 VDC)
Voltage Spike…………………….................Section 17, Category B
RF Emission………………….................Section 21, Category M

7.4.2. Aircell Axxess® Satellite Expansion Transceiver (ST 4020) (optional)

The ST 4020 is comprised of the following items (connector manufacturing P/Ns are shown for reference only):
P12679 ....Dual Satellite Transceiver (ST 4020)
050-11088-55 ....System Power and Signal Connector, Circular 55-SKT MIL-C26482 (MS3126), SIZE 22 (ARRAY CONN PWF06F22-55SA612)
P12690 ....Channel Expansion Connector, MIL-C-26482, SIZE 18, 32-PIN, (ARRAY CONNECTOR P/N PWF06F18-32P)
P12190 ....CTR/Data Expansion (ETHERNET) Connector, MIL-DTL-24308 (D-SUB), SIZE 1 (HI-DENSITY), 15-SKT W/HOOD (POSITRONIC DD15F10GVL0)

P12190 ....Test (Ethernet) connector, MIL-DTL-24308 (D-SUB), SIZE 1 (HI-DENSITY), 15-SKT W/HOOD (POSITRONIC DD15F10GVL0)

P12107 ....Mounting Tray, 1/2 ATR

Optional in place of Mounting Tray

P12273 ....Kit includes (2 each), P12125 Mounting Rails with eight (8) pan-head Phillips screws.

Dimensions

Transceiver Unit ....12.66" L x 4.85" W x 7.0" H

(32.16 cm x 12.32 cm x 17.78 cm)

Transceiver Unit in ½ ATR Tray......................................12.83" L x 5.04" W x 7.46" H

(32.59 cm x 12.80 cm x 18.95 cm)

Largest Connector (System Power and Signal)...............2.6" in length from ST to connecter end

Weights

Satellite Transceiver Unit ....8.2 lbs. (3.7 kg)

Mounting Tray ....0.56 lbs. (0.25 kg)

Optional Mounting Rails ....0.5 lbs. / SET (0.23 kg)

System Connectors (All)............................0.8 lbs. (0.36 kg)

Power Requirements..............................28 VDC, 6.0 A max.

Application Note

This note documents the typical current draw requirements for a typical Aircell Axxess® ST 4020 system installed. Actual values should be measured and recorded for each system installation.

Description..28 VDC

Standby ....< 0.37 A

Transmit Avg (1 channel) ....< 0.43 A

Transmit Avg (2 channels) ....< 0.50 A

Transceiver Heaters ....< 2.7 A

- Transceiver Heaters: When the temperature on the inside of the Transceiver is < -20C / -4F, the heaters will turn on. For example, on a 28 VDC system, the heaters will draw an additional 2.7 A. At full power transmit, the Average Current is 2.7A plus 0.5 A, or 3.2 A. Please note that in general, the transceivers are warm enough, even if located outside of the temperature-controlled cabin. The heaters generally won't be on.

System Connectors

Transceiver Unit…….….…….…….… ....(ST - Satellite *Antenna* port, Type N Female)

(ST – *System Power and Signal* port)

(ST – Channel Expansion Port)

(ST – *Data Expansion* port)

(ST – Test port)

Antenna……………………………….....................TNC (Female), *Satellite* antenna port at antenna

Mating Connectors ……………….....................TNC Male (to the Antenna port)

                 Type N Male (to the ST - Satellite *Antenna* port)
                 050-11088-55 (ST – *System Power and Signal* port)
                 NA at this time (ST – Channel Expansion Port)
                 P12190   (ST – *Data Expansion* port)
                 P12190   (ST – Test port)

Iridium Operating Frequency Range ....1616-1627 MHz
Transmit Power ....7 W max

Ring Detector……………………………..Two second ON -Four seconds OFF for incoming calls
Current capability ....2 Amperes DC (SINK only)
Voltage, withstand ....60 VDC

RS-232/Modem Port
Hardware Flow Control............................RTS and CTS
DTE Speed..19.2 kbps (8 data bits, one stop bit, no parity)
Data Rate (Iridium)..................................2.4 Kbps, typical
Protocol, Error Correction........................MNP4

NOTE

  RS-232 ports on the ST 4200 require Hardware Flow Control signals (RTS and CTS) for proper operation. The RS-232 ports behave as Data Communications Equipment (DCE), and will assert CTS when the associated Iridium channel is available. A connected data device (Data Terminal Equipment or DTE) must assert RTS prior to transmitting data or making requests of the Iridium channel (e.g. AT+CSQ?). The DTE must also observe the status of the CTS signal. Any data transmitted from the DTE while CTS is de-asserted will be ignored by the ST 4200.

Environmental (RTCA/DO-160E)
Temperature and Altitude……..................Section 4, Category F2 ((55K ft MSL, -55°C to +70°C
                (-67°F to +158°F) operating, -55°C to +85°C (-67°F to +158°F) storage)
Temperature Variation……. ....Section 5, Category B
Humidity……………………….................Section 6, Category A
Shock and Crash Safety.........................Section 7, Category B
Vibration……………………….................Section 8, Category S (Curves C, L, M, and Y)
Magnetic Effect.......................................Section 15, Category Z
Power Input………………… ....Section 16, Category B (22 to 30.3 VDC)
Voltage Spike……………….................Section 17, Category B
RF Emission………………...................Section 21, Category M

7.4.3. Aircell Axxess® Cabin Telecommunications Router (CTR)

The CTR is comprised of the following items (connector manufacturing P/Ns are show for reference only):

P12083 ....Cabin Telecommunications Router (Aircell Axxess CTR)

OR

P12083-001 ....Cabin Telecommunications Router (Aircell Axxess CTR) (Low Power)

P12064 ....(1 each for up to 4 HSs, 2 each for up to 8 HSs), Handset Comm 1 and 2 Data Interface Connector, MIL DTL-24308 (D-SUB), SIZE 3 (HI-DENSITY), 44-PIN W/HOOD (POSITRONIC DD44M10GVLX-923.25)

P12236 ....System Communications Data (ETHERNET) Connector, MIL-DTL-24308 (D-SUB), SIZE 1 (HI-DENSITY), 15-PIN W/HOOD (POSITRONIC DD15M10GVLX)

P12066 ....Power / Control Connector, MIL-DTL-24308 (D-SUB), SIZE 1 (LO-DENSITY), 9-SKT W/HOOD (POSITRONIC SD9F10GVLX)

P12017 ....Two (2) coax assemblies (TNC to TNC), Internal Antenna 1 and 2 to WLAN A and B

310-10949-001 ....Mounting Tray, ¼ ATR

Optional in place of Mounting Tray

P12273 ....Kit includes (2 each), P12125 Mounting Rails with eight (8) pan-head Phillips screws.

Dimensions

CTR Unit...12.44" L x 2.25" W x 7.62" H

....(31.60 cm x 5.72 cm x 19.35 cm)

CTR Unit in ¼ ATR Tray ....13.13" L x 2.43" W x 8.06" H

....(33.35 cm x 6.17 cm x 20.47 cm)

Largest Connector (HS COM 1 and 2).............................1.84" inches in length from CTR to connector end

Weights

CTR Unit...3.85 lbs. (1.75 kg)

Mounting tray...0.25 lbs. (0.11 kg)

Optional Mounting Rails ....0.5 lbs. / SET (0.23 kg)

System Connectors ....1.0 lbs. (0.45 kg)

Power Requirements   28 VDC, 4.0 A max.

Application Note

This note documents the typical current draw requirements for Aircell Axxess® CTR system installed. A typical install would be a CTR with two (2) standard or flush-mount wired SIP Handsets. Actual values should be measured and recorded for each system installation.

Description:...28 VDC

Standby ....<0.43A

- Additional wired Handsets will add about 0.35 A each to the current load of the system.
- ACA will add about 0.12 A to the current load of the system.

System Connectors

CTR Unit...(CTR - Handset Comm 1 and 2 ports)

(CTR - *System* Comm. port)

(CTR - Power /Control port)

Mating Connectors ....P12064   (CTR - Handset Comm 1 and 2 ports)

P12236   (CTR - *System* Comm. port)

P12066   (CTR- Power/Control port)

RF Transmission Characteristics

Operating Frequency Range ....2.400 to 2.483 GHz

Transmit Power (Standard CTR).............Less than 0.1 W max (less than 100 mW)

Radiated Power (Low Power CTR) ....Less than 0.025 W max (less than 25 mW)

Per 802.11 b and 802.11g Wireless Broadband Router FCC Part 15 regs)

Environmental (RTCA/DO-160E)

Temperature and Altitude……................Section 4, Category A4 ((15K ft MSL, -15°C to +40°C

(+5°F to +104°F) operating, -30°C to +70°C (-22°F to +158°F) storage)

Shock and Crash Safety.........................Section 7, Category B

Vibration………………………................Section 8, Category S (Curves C, L, M, and Y)

Magnetic Effect.......................................Section 15, Category Z

Power Input…………………… ....Section 16, Category B (22 to 30.3 VDC)

Voltage Spike………………….................Section 17, Category B

RF Emission…………………...................Section 21, Category M

7.4.4. Aircell Axxess® Remote Diversity Antenna (RDA) (optional)

The RDA is comprised of the following items:

P12344 ....Remote Diversity Antenna (RDA)

Dimensions

RDA..3.75" Diameter x .65" H

(9.53 cm x 1.65 cm)

Weights

RDA..0.175 lbs. (0.08 kg)

System Specifications, Section 7

Aircell confidential and proprietary

System Connectors
P13271 ....Connector, Coaxial, TNC, Plug, Straight, Crimp

Environmental, RTCA/DO-160E
Temperature and Altitude……..................Section 4, Category A4 ((15K ft MSL, -15°C to +40°C)

(+5°F to +104°F) operating, -30°C to +70°C (-22°F to +158°F) storage)

Shock and Crash Safety..........................Section 7, Category B
Vibration………………………...............Section 8, Category S (Curves C, L, M, and Y)
Magnetic Effect......................................Section 15, Category Z
RF Emission………………….................Section 21, Category M

7.4.5. Aircell Axxess Handset Interface (AHI-1) (optional in lieu of CTR)

The AHI-1 is comprised of the following items:

P12339 ....AHI-1 (Aircell Axxess Handset Interface)

Dimensions
AHI-1 Unit..4.12" L x 3.07" W x 1.0" H

(10.46 cm x 7.8 cm x 2.54 cm)

Weights
AHI-1 Unit..49 lbs. (0.22 kg)

Power Requirements...........................28 VDC, 0.15 A max. for APoEDI (Aircell Power-over-Ethernet Data Interface)

Note: each SIP HS connected to this AHI will add 0.35 A max.

System Connectors
P12526 (AHI-1 PoE)...............................J3 and J4 Connector, MIL-DTL-24308 (D-SUB), PLUG, 9-PIN, CRIMP 20-24, WITH EMI HOOD (POSITRONIC RD9M10GEZ)
P12524 (AHI-1 Data In)..........................J1 Connector, MIL-DTL-24308 (D-SUB), PLUG, 15-PIN, CRIMP 20-24, WITH EMI HOOD (POSITRONIC RD15M10GEZ)
P12525 (AHI-1 Data Out).......................J2 Connector, MIL-DTL-24308 (D-SUB), PLUG, 25-PIN, CRIMP 20-24, WITH EMI HOOD (POSITRONIC RD2510MGEZ)

Environmental, RTCA/DO-160E
Temperature and Altitude……..................Section 4, Category A4 ((15K ft MSL, -15°C to +55°C)

(+5°F to +131°F) operating, -30°C to +70°C (-22°F to +158°F) storage)

Shock and Crash Safety..........................Section 7, Category B
Vibration………………………...............Section 8, Category S (Curves C, L, M, and Y)
Magnetic Effect......................................Section 15, Category Z
Power Input………………… ....Section 16, Category B (22 to 30.3 VDC)

System Specifications, Section 7

Aircell confidential and proprietary

Voltage Spike…………………..................Section 17, Category B
RF Emission…………………..................Section 21, Category M

7.4.6. Aircell Axxess® Handset / Fax Interface (AHI-2) (optional in lieu of CTR)

The AHI-2 is comprised of the following items:

P12346 ....AHI-2 (Aircell Axxess Handset Interface)

Dimensions
AHI-2 Unit..8.5" L x 5.05" W x 1.8" H
(21.59 cm x 12.83 cm x 4.57 cm)

Weights
AHI-2 Unit..1.41 lbs. (0.64 kg)

Power Requirements............................28 VDC, 0.15 A max. for APoEDI (Aircell Power-over-Ethernet Data Interface) and 28 VDC, 0.25 A max for Data/Fax Terminal Adapters.
Note: Each SIP HS connected to this AHI will add 0.35 A max.

System Connectors
12527 (AHI-2 Power In)...........................J1 Connector, MIL-DTL-24308 (D-SUB), PLUG, 15-SOCKET, CRIMP, CABLE-MOUNT, WITH EMI STRAIN RELIEF (POSITRONIC RD15F10GT2X)
P12526 (AHI-2 PoE)...............................J4 Connector, MIL-DTL-24308 (D-SUB), PLUG, 9-PIN, CRIMP 20-24, WITH EMI HOOD (POSITRONIC RD9M10GEZ)
P12524 (AHI-2 Data In)...........................J3 Connector, MIL-DTL-24308 (D-SUB), PLUG, 15-PIN, CRIMP 20-24, WITH EMI HOOD (POSITRONIC RD15M10GEZ)
P12525 (AHI-2 Data Out).........................J2 Connector, MIL-DTL-24308 (D-SUB), PLUG, 25-PIN, CRIMP 20-24, WITH EMI HOOD (POSITRONIC RD25M10GEZ)
P12533 (AHI-2 ATA) ....J5 and J6 Connectors, MIL-DTL-24308 (DA-26), PLUG, 22-PIN, CABLE-MOUNT, WITH EMI STRAIN RELIEF (DD26M10GEZ)

Environmental, RTCA/DO-160E
Temperature and Altitude……................Section 4, Category A4 ((15K ft MSL, -15°C to +55°C)
(+5°F to +104°F) operating, -30°C to +70°C (-22°F to +158°F) storage)
Shock and Crash Safety.........................Section 7, Category B
Vibration…………………….................Section 8, Category S (Curves C, L, M, and Y)
Magnetic Effect......................................Section 15, Category Z
Power Input…………………….................Section 16, Category B (22 to 30.3 VDC)
Voltage Spike…………………..................Section 17, Category B
RF Emission…………………..................Section 21, Category M

7.4.7. Aircell Axxess® Call Alerter (ACA) (optional)

The ACA is comprised of the following items:

P12347 ....ACA (Aircell Axxess Call Alerter)
or
P12924 ....ACA II (Aircell Axxess Call Alerter)

Dimensions
ACA Unit...4.12" L x 3.4" W x 1.0" H
(10.47 cm x 8.64 cm x 2.54 cm)

Weights
ACA Unit...0.34 lbs. (0.15 kg)

Power Requirements.............................48VDC, 0.12 A max. from a AHI or CTR, for APoEDI (Aircell Power-over-Ethernet Data Interface (the ACA II needs additional 20 mA max from 28 VDC power)

System Connectors
P12528 (ACA IN).....................................Power/Control Connector, MIL-DTL-24308 (D-SUB), PLUG, 9 SOCKET, CRIMP 20-24, WITH EMI HOOD (POSITRONIC RD9F10GEX)
P12529 (ACA OUT).................................J2 Connector, MIL-DTL-24308 (D-SUB), PLUG, 25-SOCKET CRIMP, CABLE-MOUNT, WITH EMI STRAIN RELIEF (POSITRONIC RD25F10GEX)

Environmental, RTCA/DO-160E
Temperature and Altitude……...................Section 4, Category A4 ((15K ft MSL, -15°C to +55°C)
(+5°F to +131°F) operating, -30°C to +70°C (-22°F to +158°F) storage)
Shock and Crash Safety..........................Section 7, Category B
Vibration…………………………................Section 8, Category S (Curves C, L, M, and Y)
Magnetic Effect.......................................Section 15, Category Z
RF Emission…………………....................Section 21, Category M

7.4.8. Aircell Axxess® Standard SIP Handset (with Audio Panel interface)

The SIP Standard HS is comprised of the following items:

P12248-00X ....SIP HS (Standard) (-001 Black, -002 Beige, -003 Lt. Gray)
P12190 ....Connector, MIL-DTL-24308 (D-SUB), SIZE 1 (HI-DENSITY), 15-SKT W/HOOD (POSITRONIC DD15F10GVLO)

Dimensions
SIP Standard Handset Unit ....7.8" L x 2.10" W x 1.9" H
(19.81 cm x 5.33 cm x 4.83 cm)
SIP Standard Handset Cradle.................4.10" L x 2.70" W x 1.60" H
(10.41 cm x 6.86 cm x 4.06 cm)
Handset Connector, 15 Pin ....1.85" L x 1.25" W x 2.05"H

System Specifications, Section 7

Aircell confidential and proprietary

Weights

SIP standard Handset Unit.......................1.25 lbs. (0.57 kg)

Handset Connector ....0.2 lbs. (0.09 kg)

Power Requirements...........................48 VDC, 0.1 A max. (the SIP HSs receive power from the CTR or AHI)

System Connectors

SIP Handset Unit...................................Connector, High-density, 15 Pin D-Sub (Male)
Mating Connectors ....P12190 Connector, High-density, 15 Socket D-Sub (Female)

Audio Panel Interface

Transmit Mic Bias Voltage.......................+6 VDC (for P12248-00X Revision M and previous, and +12 VDC for Revision N and subsequent)
Transmit Mic Input Level ....100 millivolt (mV) RMS, typical
Transmit Mic Input Impedance................300 ohms

Receive Output Level ....150 mV RMS, typical
Receive Output Impedance.....................75 ohms

Headset Interface (mini jack on Handset)

Transmit Mic Bias Voltage.......................+6 VDC
Transmit Mic Input Level ....100 mV (max)
Receive Output Level ....100 mW (max) into 16 ohms

Environmental (RTCA/DO-160E)

Temperature and Altitude……................Section 4, Category A4 ((15K ft MSL, -15°C to +55°C) (+5°F to +131°F) operating, -30°C to +70°C (-22°F to +158°F) storage)
Shock and Crash Safety.........................Section 7, Category B
Vibration……………………….................Section 8, Category S (Curves C, L, M, and Y)
Magnetic Effect......................................Section 15, Category Z
RF Emission……………………...............Section 21, Category M

7.4.9. Aircell Axxess® WiFi SIP Handset (with no Audio Panel interface)

The WiFi SIP HS is comprised of the following items:

P12857-00X ....WiFi SIP HS (-001 Black, -002 Beige, -003 Lt. Gray)
P12861-00X ....Cradle (Base Station) (-001 Black, -002 Beige, -003 Lt. Gray)
P12190 ....Connector, MIL-DTL-24308 (D-SUB), SIZE 1 (HI-DENSITY), 15-SKT W/HOOD (POSITRONIC DD15F10GVLO)

Talk Time..Provides about three hours of talk time and over ten hours of standby time.

Dimensions

WiFi SIP Handset Unit.............................7.98" L x 2.11" W x 1.93" H

(25.86 cm x 7.62 cm x 6.35 cm)

WiFi SIP Handset Cradle ....4.10" L x 2.70" W x 1.60" H

(10.41 cm x 6.86 cm x 4.06 cm)

Handset Connector, 15 Pin ....1.85" L x 1.25" W x 2.05"H

Weights

WiFi SIP Handset and Cradle ....0.5 lbs. (0.23 kg)

WiFi Handset Cradle ....0.93 lbs. (0.42 kg)

Power Requirements.............................28 VDC, 0.27 A max.

System Connectors

SIP Handset Unit....................................Connector, High-density, 15 Pin D-Sub (Male)

Mating Connectors ....P12190 Connector, High-density, 15 Socket D-Sub (Female)

RF Transmission Characteristics

Operating Frequency Range...................2.400 to 2.483 GHz

Transmit Power ....Less than 0.01 W max (less than 10 mW)

Per 802.11 b and 802.11g Wireless Broadband Router FCC Part 15 regs)

Headset Interface (mini jack on Handset)

Transmit Mic Bias Voltage.......................+6 VDC

Transmit Mic Input Level ....100 mV (max)

Receive Output Level ....100 mW (max) into 16 ohms

Environmental (RTCA/DO-160E)

Temperature and Altitude……..................Section 4, Category A4 ((15K ft MSL, -15°C to +55°C)

(+5°F to +131°F) operating, -30°C to +70°C (-22°F to +158°F) storage)

Shock and Crash Safety.........................Section 7, Category B

Vibration…………………….....................Section 8, Category S (Curves C, L, M, and Y)

Magnetic Effect......................................Section 15, Category Z

Power Input………………… ....Section 16, Category B (22 to 30.3 VDC)

Voltage Spike……………….....................Section 17, Category B

RF Emission…………………....................Section 21, Category M

7.4.10. Aircell Axxess® Flush-Mount SIP Handset (with no Audio Panel Interface)

The SIP Flush-Mount HS is comprised of the following items:

P12192-00X ....SIP HS (Flush-Mount) (-001 Black, -002 Beige, -003 Lt. Gray)

P12190 ....Connector, MIL-DTL-24308 (D-SUB), SIZE 1 (HI-DENSITY), 15-SKT W/HOOD (POSITRONIC DD15F10GVLO)

System Specifications, Section 7

Aircell confidential and proprietary

Dimensions

SIP Flush-Mount Handset Unit................10.18" L x 3.00" W x 2.50" H

        (25.86 cm x 7.62 cm x 6.35 cm)

Handset Connector, 15 Pin ....1.85" L x 1.25" W x 2.05" H

Weights

SIP Flush-Mount Handset Unit................1.5 lbs. (0.68 kg)

Handset Connector ....0.2 lbs. (0.09 kg)

Power Requirements............................48 VDC, 0.1 A max. (the SIP HSs receive power from the CTR or AHI)

System Connectors

Sip Handset Unit ....Connector, High-density, 15 Pin D-Sub (Male)

Mating Connectors ....P12190 Connector, High-density, 15 Socket D-Sub (Female)

Headset Interface (mini jack on Handset)

Transmit Mic Bias Voltage.......................+6 VDC

Transmit Mic Input Level ....100 mV (max)

Receive Output Level ....100 mW (max) into 16 ohms

Environmental (RTCA/DO-160E)

Temperature and Altitude……...............Section 4, Category A4 ((15K ft MSL, -15°C to +55°C)

        (+5°F to +131°F) operating, -30°C to +70°C (-22°F to +158°F) storage)

Shock and Crash Safety..........................Section 7, Category B

Vibration……………………….................Section 8, Category S (Curves C, L, M, and Y)

Magnetic Effect.......................................Section 15, Category Z

RF Emission…………………...................Section 21, Category M

7.4.11. Aircell Axxess® Custom-Retractable SIP Handset (with no Audio Panel Interface)

The SIP Custom-Retractable HS is comprised of the following items:

P12793-00X ....SIP HS (Custom Retractable)

        (-001 Black, -002 Beige, -003 Lt. Gray)

P12190 ....Connector, MIL-DTL-24308 (D-SUB), SIZE 1 (HI-DENSITY), 15-SKT W/HOOD (POSITRONIC DD15F10GVLO)

Dimensions

SIP Custom Retractable Handset Unit.................7.8" L x 2.1" W x 1.9" H

        (19.8 cm x 5.3 cm x 4.8 cm)

Retractable Reel Unit ....2.6" L x 2.6" W x 1.3" H

        (6.6 cm x 6.6 cm x 3.3 cm)

Handset Connector, 15-Pin ....1.85"L x 1.25"W x 2.05"H

Weights

SIP Flush-Mount Handset Unit................1.5 lbs. (0.68 kg)

Handset Connector ....0.2 lbs. (0.09 kg)

Power Requirements............................48 VDC, 0.1 A max. (the SIP HSs receive power from the CTR
or AHI)

System Connectors

Sip Handset Unit ....Connector, High-density, 15-Pin D-Sub (Male)
Mating Connectors ....P12190 Connector, High-density, 15 Socket D-Sub (Female)

Headset Interface (mini jack on Handset)

Transmit Mic Bias Voltage.......................+6 VDC
Transmit Mic Input Level ....100 mV (max)
Receive Output Level ....100 mW (max) into 16 ohms

Environmental (RTCA/DO-160E)

Temperature and Altitude…….................Section 4, Category A4 ((15K ft MSL, -15°C to +55°C)
(+5°F to +131°F) operating, -30°C to +70°C (-22°F to +158°F)
storage)
Shock and Crash Safety..........................Section 7, Category B
Vibration………………………..................Section 8, Category S (Curves C, L, M, and Y)
Magnetic Effect.......................................Section 15, Category Z
RF Emission………………….................Section 21, Category M

7.4.12. Aircell Axxess® LEMO SIP Handset (with no Audio Panel interface)

The SIP LEMO HS is comprised of the following items:

P12865-00X ....SIP HS (Standard) (-001 Black, -002 Beige, -003 Lt. Gray)
P12531 ....Connector, Circular, LEMO, Plug, 4-socket (LEMO
FGG.1B.304.CYCD42)

Dimensions

SIP LEMO Handset Unit..........................7.8" L x 2.10" W x 1.9" H
(19.81 cm x 5.33 cm x 4.83 cm)
Handset Connector, LEMO ....1.85" L x 1.25" W x 2.05"H

Weights

SIP LEMO Handset Unit..........................0.7 lbs. (0.3 kg)

Handset Connector ....0.05 lbs. (0.02 kg)

Power Requirements............................48 VDC, 0.1 A max. (the SIP HSs receive power from the CTR
or AHI)

System Connectors

SIP Handset Unit.....................................Connector, High-density, 4 Pin LEMO

Mating Connectors ....P12532 Connector, Circular, LEMO, Receptacle, 4-socket

Headset Interface (mini jack on Handset)

Transmit Mic Bias Voltage.......................+6 VDC

Transmit Mic Input Level ....100 mV (max)

Receive Output Level ....100 mW (max) into 16 ohms

Environmental (RTCA/DO-160E)

Temperature and Altitude……..................Section 4, Category A4 ((15K ft MSL, -15°C to +55°C)

(+5°F to +131°F) operating, -30°C to +70°C (-22°F to +158°F) storage)

Shock and Crash Safety..........................Section 7, Category B

Vibration………………………..................Section 8, Category S (Curves C, L, M, and Y)

Magnetic Effect.......................................Section 15, Category Z

RF Emission………………….................Section 21, Category M

7.4.13. *Reserved for product expansion*

7.4.14. *Reserved for product expansion*

7.4.15. *Reserved for product expansion*

7.4.16. *Reserved for product expansion*

7.4.17. *Reserved for product expansion*

7.4.18. *Reserved for product expansion*

7.4.19. **Iridium Satellite Antenna**

For specifications details and options, refer to **Aircell Antenna Installation Manual P/N 800-10355**.

This Page Intentionally Blank

8.0   SPECIAL TOOLS, FIXTURES, AND EQUIPMENT

8.1.   **Introduction**

No special tools are required for the installation of the Aircell Axxess® II Satellite Transceiver (ST 4200), Aircell Axxess 2-Channel Expansion Transceiver (ST 4020), Cabin Telecommunications Router (CTR) or SIP Handsets.

8.2.   **Test Setup and Calibration**

- A Laptop PC with a RJ 45 Ethernet connection port; or
- A Laptop with WiFi capabilities if WiFi connections are available; and
- A Web Browser installed (Internet Explorer)

No other special test equipment is required to determine the operational status of the Aircell Axxess System.

Refer to Section 4.0 on testing for the procedure to verify that the unit is serviceable.

This Page Intentionally Blank