

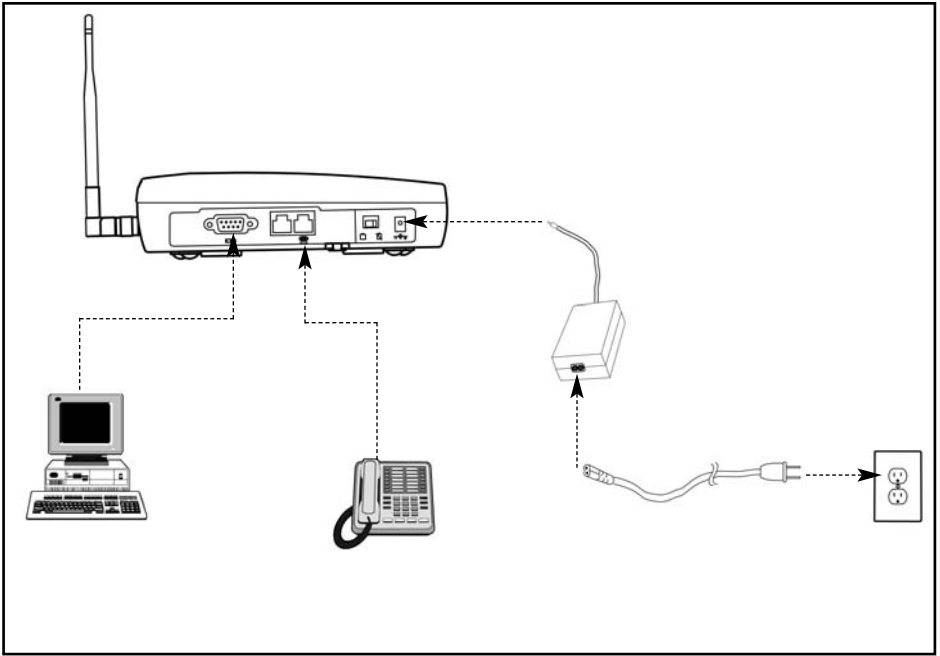
PHONECELL® SX5e GSM

- **Fixed Wireless Terminal**
- **Fixed Wireless Terminal with Fax**
- **Fixed Wireless PBX Terminal**
- **Fixed Wireless Modem**

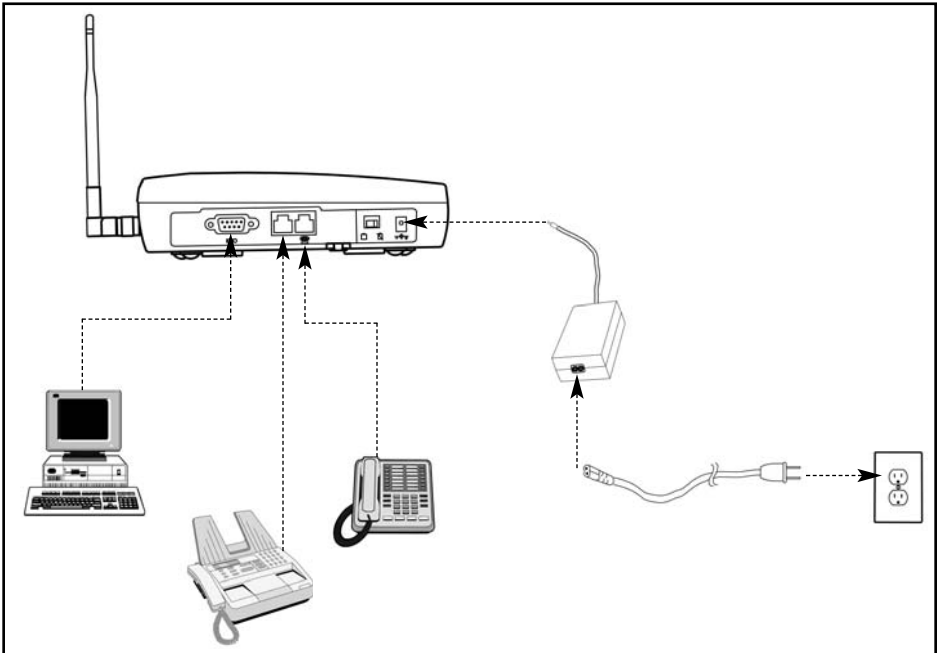
**900/1800 MHz GSM (DUAL BAND)
1900 MHz GSM**

TECHNICAL MANUAL

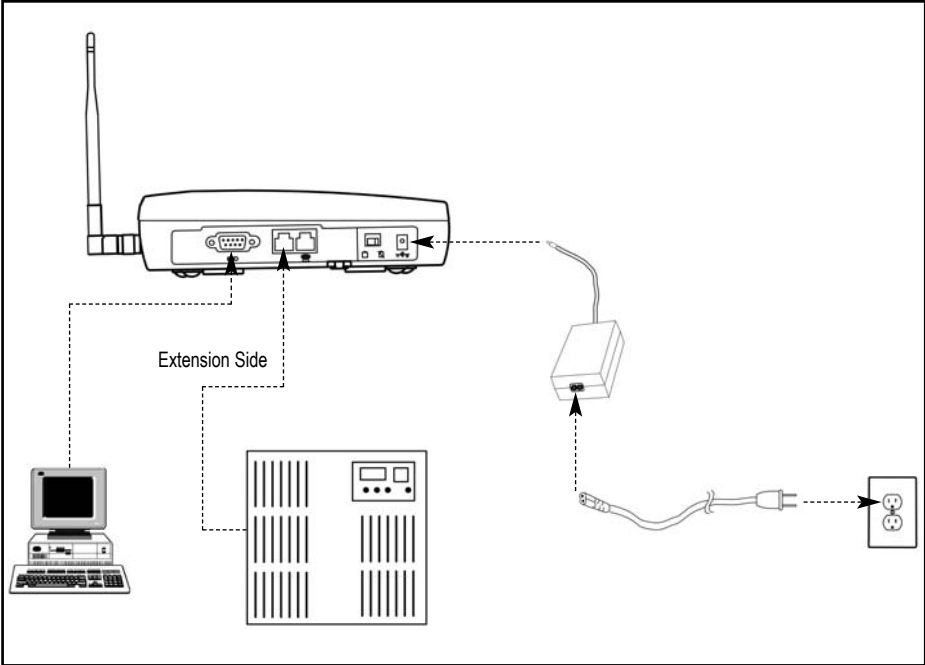
QUICK CONNECTION GUIDE



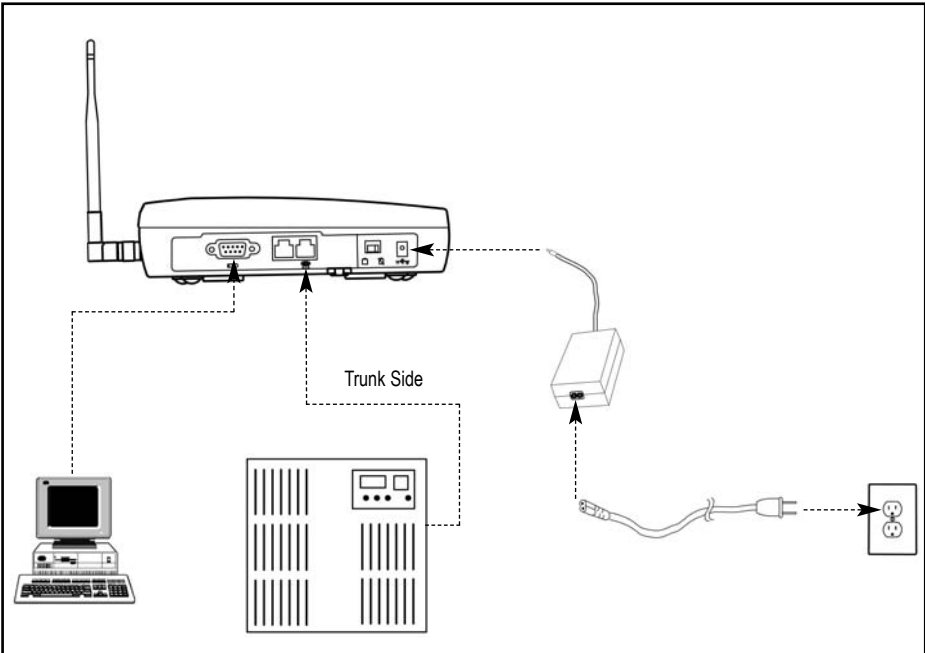
SX5e Fixed Wireless Terminal



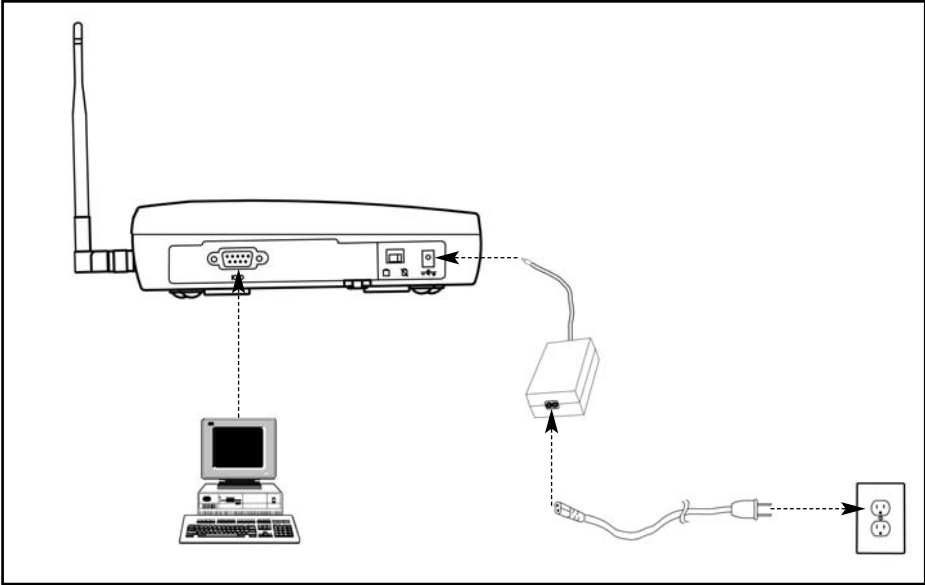
SX5e Fixed Wireless Terminal with Optional Analog Fax



SX5e Fixed Wireless PBX Terminal (attached to Extension side of PBX)

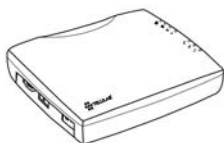


SX5e Fixed Wireless PBX Terminal (attached to Trunk side of PBX)



SX5e Fixed Wireless Modem

CONTENTS



Phonecell® SX5e GSM FWT



Spike Antenna



Power Supply



AC Power Cord

Before installing the **Phonecell® SX5e**, carefully remove the contents from the shipping carton and check for evidence of shipping damage. **If damage is found, contact your Authorized Telular Distributor or shipping agent immediately.**

SAFE OPERATION INSTRUCTIONS

IMPORTANT! Before installing or operating this product, read the **SAFETY INFORMATION** section of this manual.

- Install the unit indoors.
- Install the unit on a hard, flat surface for proper ventilation.
- Do not expose the unit to rain or moisture.
- Do not place the unit on or close to sources of heat.

PLEASE SEE THE *IMPORTANT NOTICES* SECTION OF THIS MANUAL FOR IMPORTANT INFORMATION ON USE, WARRANTY AND INDEMNIFICATION

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Telular Corporation

Corporate Headquarters

647 North Lakeview Parkway
Vernon Hills, Illinois 60061, USA

Technical Support

Tel: 847-247-9400 • Fax: 847-247-0021

E-mail: support@telular.com • http://www.telular.com

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SETUP

Install the SIM Card

The SX5e requires a Subscriber Identity Module (SIM) for normal operation. The service provider supplies the SIM card, which carries the account information needed to operate the SX5e. If you don't have a SIM card, contact your service provider. The SIM compartment is on the back of the SX5e - *see Figure 1*.

HINT: Make sure your carrier disables SIM PIN1 or you will have to enter the PIN every time the unit powers on. See the *SX5e User Features* section of this manual for more information.

1. Disconnect the power supply. The power supply must be disconnected whenever a SIM Card is installed.
2. Remove the SIM compartment cover by removing the screw - *see Figures 1 and 2*.
3. Open the SIM compartment holder.
4. Line up the SIM card with the arrow on the SIM card holder - *see Figure 2*.
5. Gently insert the SIM card in the slot of the SIM card holder.
6. Close the SIM card holder.

NOTE: Do not force the SIM card holder shut. Make sure the SIM card is aligned properly with the directional arrow on the holder.

7. Reattach the SIM compartment cover with the screw.

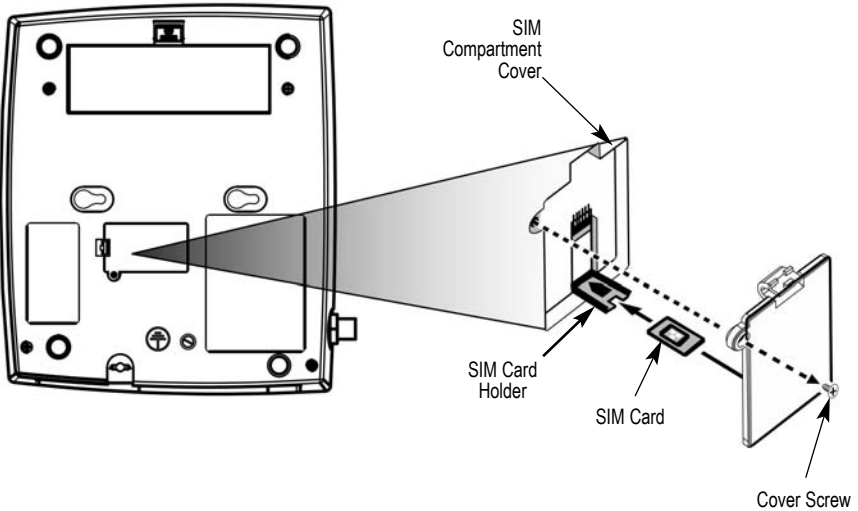


Figure 1 - SIM compartment.

Figure 2 - Install the SIM Card.

Emergency Batteries

Install Batteries

1. Remove the battery access door screw located on the bottom of the unit - *see Figure 3.*
2. Press the battery access door tabs and remove the battery access door.
3. Install 4 "AA" alkaline batteries (not supplied) - *see Figure 3.*
4. Reinstall the battery access door using the screw.
5. Turn the AC/Battery switch to battery operation - *see Figure 4.*

NOTE: The SX5e does not support rechargeable batteries.



WARNING!

Only "AA" alkaline batteries are to be used with the Phonecell® SX5. Use of any other batteries may result in fire and/or other damage to the unit.

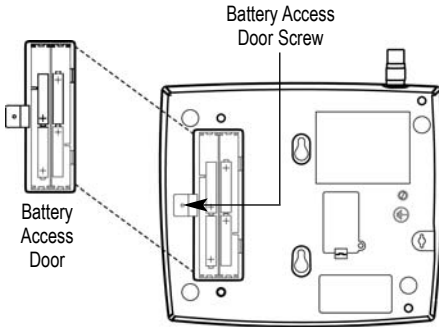


Figure 3 – SX5e battery installation.

Battery Operation

The unit will not automatically switch from AC to battery upon loss of AC power. The AC/Battery switch must be changed manually - *see Figure 4.* Battery power will provide up to three hours of standby and 90 minutes of talk time, depending on the SX5e model.

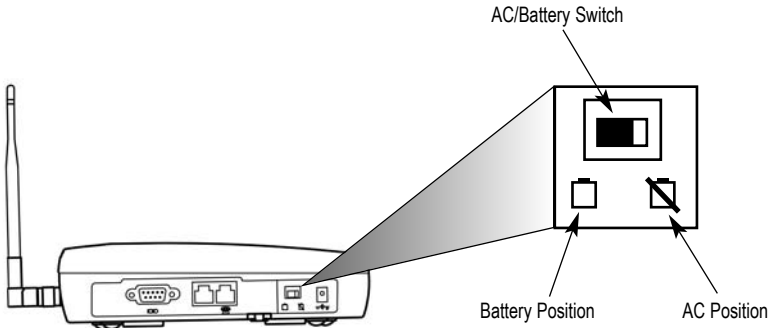


Figure 4 – SX5e AC/Battery switch.

SX5e Location and Installation

The SX5e comes with a standard spike antenna (TNC) - *see Figure 5*. For optimal signal strength, choose a location that is above ground and as close to windows (or exterior walls) as possible - *see Figure 6*. Cellular signal strength is displayed by the Received Signal Strength Indicator (RSSI) LED on the unit - See the *How to Use the LED Status Indicators* section of this manual.

1. Connect the antenna to the terminal - *see Figure 5*.
2. Finger-tighten the antenna. Do not over-tighten the antenna.

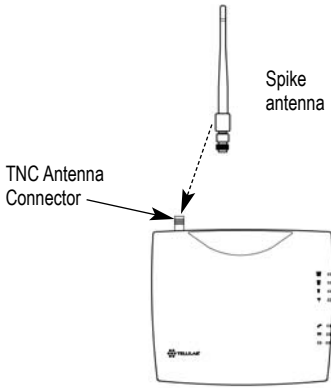


Figure 5 – SX5e antenna connection.

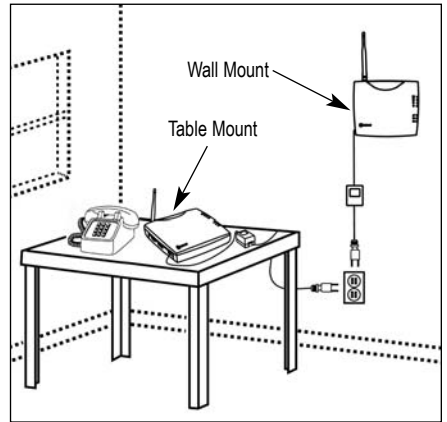


Figure 6 – Typical SX5e installation.

Wall Mounting

1. Mark two hole locations 98,5mm (3-7/8 inches) vertically apart and drill two holes into the wall.
2. Install the screws (not supplied) into the wall, leaving a gap (approximately 3 mm (1/8 inch)) between screw head and wall.
3. Align the mounting holes with the screws and mount the SX5e onto the screws - *see Figures 7 and 8*.

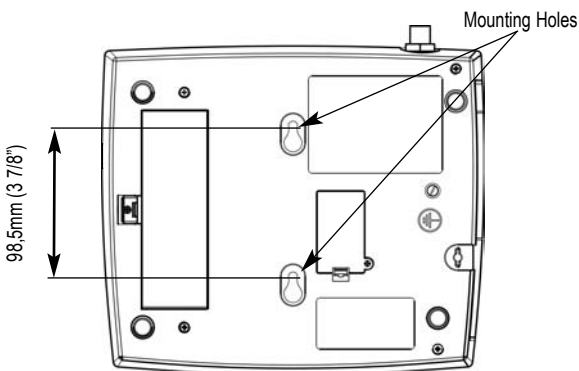


Figure 7 – SX5e mounting holes.

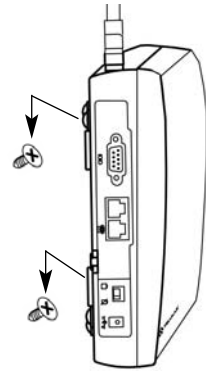


Figure 8 – Mount the SX5e onto the screws.

Connect the SX5e to AC Power

1. A protective earth (safety ground) terminal (screw) marked with a protective earth symbol is provided on the back of the SX5e - **see Figure 9a**. Connect this terminal to a good earth ground (i.e., a cold water pipe) by means of an 18 gauge or heavier insulated wire. The wire insulation should be green with a yellow stripe to indicate that this is a protective earth (safety ground) connection.

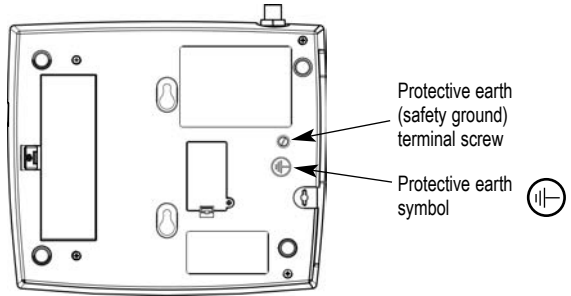


Figure 9a – Earth ground terminal screw.

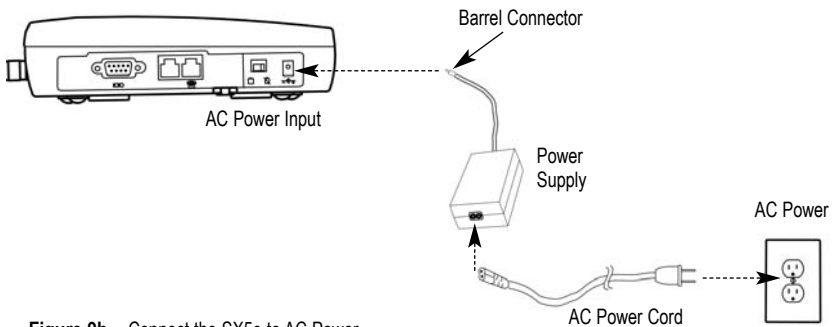


Figure 9b – Connect the SX5e to AC Power.

2. Connect the barrel connector of the power supply to the AC power input receptacle of the SX5e - **see Figure 9b**.
 3. Plug the AC power cord into the power supply.
 4. Plug the AC power cord into the AC Power outlet.
- HINT:** If there are no batteries in the SX5e, it will only power on if the AC/Battery switch is in the AC position - **see Figure 4**.
5. Check the cellular signal strength and move the unit until you achieve the best signal possible - see the *LED Status Indicators* section of this manual.

Attach a Telephone to the SX5e

1. Plug one end of a standard phone cord into a phone- **see Figure 10**.
2. Connect the other end of the phone cord to the telephone port on the side of the SX5e (marked with a phone icon) - **see Figure 10**.

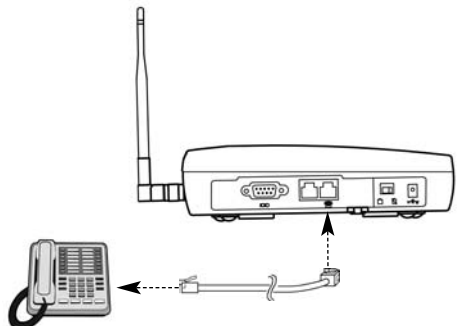


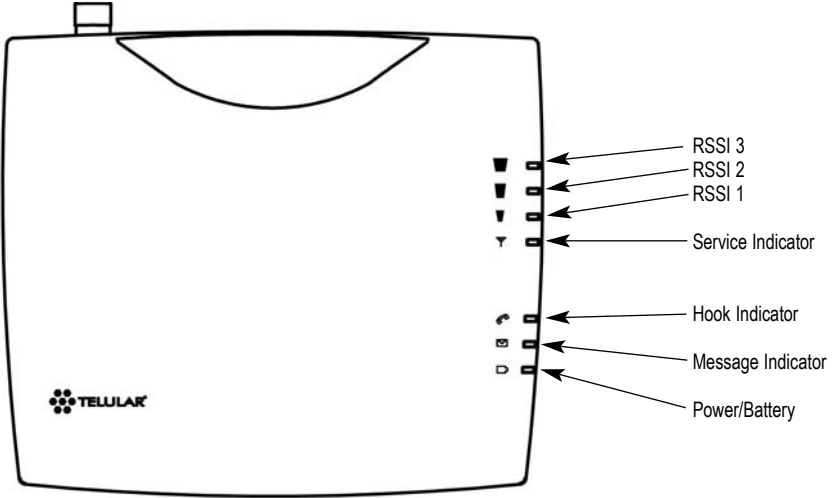
Figure 10 - Connect SX5e to Telephone.

GETTING TO KNOW YOUR SX5e

LED Status Indicators

The LED indicators are activated when the SX5e is powered on. The following tables describe the modes and operation of the indicators.

NOTE: If you are getting no service or limited service, contact your service provider for more information.



Service Indicator

LED Color	Activity	Description
Green	Continuous	Full Service
Amber	Continuous	Limited Service
Red	Continuous	No Service*
Red	Flashing	SIM Error**

* Contact your service provider to verify that service has been activated.

** Indicates that the SIM card is missing or has been improperly installed. If the SIM card is properly installed and the error continues, contact your service provider.

Received Signal Strength Indicator (RSSI)

RSSI LED's	Activity	Cellular Signal Strength
RSSI 1	Flashing	Lowest
	Continuous	Poor
RSSI 2	Flashing	Fair
	Continuous	Good
RSSI 3	Flashing	Very Good
	Continuous	Best

Hook Indicator

LED Color	Activity	Description
Green	Flashing (with ringer)	Incoming call
Green	Continuous	FWT is off hook
Green	Fast Flashing	Processing data call
Green	Slow Flashing	Call on hold

Message Indicator

LED Color	Activity	Description
Green	Slow Flashing	New voice mail or text message

AC Power/Battery Indicator

LED Color	Activity	Description
Green	Continuous	AC power applied
Amber	Continuous	Battery power active (battery switch on)
Red	Continuous	Battery low (battery switch on)
Red	Slow Flashing	Battery low (AC power applied)

Important Dial Tones

Service - Indicates that phone is ready for use (steady tone).

No Service - Indicates that there is no service available (fast beeping tone).

Roam - Indicates service in a roam area.

Not Registered - Indicates inactive or missing SIM card, or need to enter PIN (fast stutter tone).

Supplementary Service - Indicates that supplementary services have been activated.

CALL FUNCTIONS¹

Making Calls

1. Pick up the telephone handset (the phone is now “off-hook”).
2. Listen for dial tone. If service is not available, a No-Service tone is produced. Hang-up the phone and try again. If the No-Service tone continues, contact your service provider to verify that cellular service is available.
3. Dial the phone number. The call will be sent automatically.

HINT: Pressing the Flash key or pressing and releasing the switch-hook after dialing a number will send the call immediately.

Receiving Calls


When the telephone rings, pick up the handset and begin talking.

Ending Calls

Hang-up the phone (place the handset back onto the telephone cradle).

In-Call Features

Place a Call on Hold^{2,3}

To place a call on hold, press the *Flash* key on your phone. If your phone does not have a *Flash* key, press and release the *Switch-Hook*. When the call is on hold, the Hook Indicator LED  will flash and you will hear a dial tone on your phone. If you hang-up your phone when a call is on hold, the call will be disconnected.

Retrieve a Call on Hold

Press the Flash key or press and release the switch-hook to go back to your held call.

Make a New Call with a Call on Hold (Two-Line Calling)^{2,3}

If you want to make another call when the first call is placed on hold, dial the number when you hear a dial tone after the call has been placed on hold. See *Place a Call on Hold* above. You cannot go back and forth between calls. If you hang-up the phone all calls will be disconnected.

Answer Call Waiting^{2,3}

When you're on an active call, you will hear a beep tone on your phone when a new call is incoming. To answer the new call and place the first call on hold, press *Flash* or press and release the *Switch-Hook*.

Answer a Call when Dialing or Off Hook with Dial Tone

Sometimes you may receive a call as you are dialing or when your just about to dial a number. If this happens, you will hear a call waiting tone (beep tone) on your phone. Press *Flash* or press and release the *Switch-Hook* to answer the call.

Adjust the Volume Level

If the volume level on the phone is too high or too low, adjust the levels using the keypad on the telephone. The telephone must be in Tone-Dial (DTMF) mode to adjust the levels.

- To Increase Volume press: # * 8 #
- To Decrease Volume press: # * 3 #

NOTE: The default setting allows adjustment of the volume three (3) steps from the default in either direction (Up or Down). The volume setting remains in effect for future calls until changed manually. When power to the SX5e is cycled (powered OFF/ON), the default mid-range volume setting will be restored.

¹ Not available on Fixed Wireless Modem models

² Not available on Fixed Wireless PBX Terminal models

³ Call Hold, Call Waiting, and Two-Line Calling are all network dependent features. Contact your service provider for information on activating these features.

SX5e USER FEATURES

The SX5e has many user features and setup options that can be accessed using a telephone connected to the SX5e. To access these features, press the key sequence for the option at any time. Some options are not available while in a call. See the *Call Functions* section of this manual for functions that are allowed while in an active call (In-Call Functions).

All user options have a sequence of digits entered from the telephone keypad. For example, to change to a UK ringer style, press # * 100 * 2 #. After the key sequence is entered, the dial tone will be heard to confirm that the option has been changed or set. If there is an error, three tones will be heard before the dial tone.

HINT: Make sure to use a tone-dial (DTMF) type telephone when accessing any user feature or option that requires a key sequence. Pulse dial or rotary dial telephones will not allow key (DTMF) sequences.

Messages (Voice Mail and Text Messages)

The SX5e is capable of receiving both text and voice mail messages. The Message LED will flash once a message is received indicating that a text or voice message waiting.

Voice Mail Access

To check for voice mail, dial your voice mail access number and follow the prompts. Contact your service provider for more information.

Test Messaging (SMS)

The SX5e allows you to send and receive text messages using a Personal Computer (PC). To do this, you need a PC connected to the SX5e serial port (see the *Connecting to a Computer* section of this manual). The SX5e supports the GSM AT command set defined in GSM 07.05 for Short Message Service (SMS). The SX5 Data Kit contains the AT command set and a data cable. Contact your service provider or the nearest Telular dealer for more information on the Data Kit.

Message Indication Clearing

The Message LED will flash until you remove the message notification from the SX5e. After you have heard or read you messages, you can clear the notification by pressing # * 112 # on your phone.

NOTE: All text messages will be erased when you clear the notification.

Audio Settings

Line Level

The Line Level option controls the handset volume for any telephones connected to the SX5e.

Press: # * 69 * <output level> #

0 = Low

1 = Normal (default)

2 = High

Ringer Styles

The SX5e can be set to use one of three different ringer styles (US, UK, or European). Any phone connected to the SX5e will ring according to the alert type selected. If the Ringer Style is set to Off, there will be no audible alert.

Press: # * 100 * <line alert option> #

1 = US (default for 1900 MHz model)

2 = UK (default for dual-band model)

3 = European

0 = Off

Dial Settings

Dial Delay

The Dial Delay is the time that the SX5e waits after a number is dialed before automatically sending the number.

Press: # * 11 * <delay> #

The delay must be between between 2 and 20 seconds. The default delay time is 3 seconds.

Pulse Dial Option

Press: # * 12 * <pulse-dial> #

0 = disable Pulse Dialing capability (default)

1 = enable Pulse Dialing capability

Auto Dial

The SX5e will recognize frequently called phone numbers and send them without waiting for the Dial Delay. Up to 50 numbers that have been successfully called at least twice will be stored when this feature is enabled. Any loss of power to the SX5e will clear this list.

Press: # * 21 * <auto dial> #

0 = disable Auto Dial option (default)

1 = enable Auto Dial option

SIM Settings

The SIM card used in the SX5e allows a PIN to be used to protect the unit from unauthorized use. The PIN can be between 4 and 8 digits in length and any combination of digits 0 through 9. If you are concerned about your SIM card being used in other devices without your knowledge, you may use one of the Mobile Equipment Personalization (MEP) locks of the SX5e. Ask your service provider about for more information

SIM PIN 1 Setup

When enabled, a PIN must be entered every time the SX5e is powered on. The SX5e will not operate until the PIN is entered. To avoid having to enter the PIN each time the SX5e is powered on (including after power interruptions or power outages), be sure to disable the SIM PIN when the SIM card is installed.

• To **enable** SIM PIN 1, pick up the telephone handset and press: # * 104 * 1 * <PIN 1> #

• To **disable** SIM PIN 1, pick up the telephone handset and press: # * 104 * 0 * <PIN 1> #

HINT: It is recommended that SIM PIN 1 be **disabled** so that it is not required to enter the PIN each time the SX5e is powered on. Enable SIM PIN 1 only if it is certain that no one else should use the SX5e to make calls. Be sure to inform your service provider if you do **not** want SIM PIN 1 enabled when you get your SIM card.

Auto SIM PIN Entry (PIN 1 Only)

When SIM PIN 1 is enabled and the SX5e is powered on, entry of the PIN will be required. To by-pass the requirement to always enter the PIN every time power is cycled (power outages, relocation of the unit, etc.), enable Auto SIM PIN Entry. If SIM PIN 1 is not enabled, enabling this feature has no effect. **Enable** Auto SIM Pin Entry is the factory default.

• To **enable** Auto SIM PIN Entry, pick up the telephone handset and press: # * 65 * 1 * <pin 1> #

• To **disable** Auto SIM PIN Entry, pick up the telephone handset and press: # * 65 * 0 * <pin 1> #

NOTE: If you enable this feature and change the SIM card in the unit, you will have to enter the SIM PIN of the new card before the SX5e will be operational.

Caller ID

The SX5e will support Caller ID device operation. The default format setting is designed to work for most Caller ID devices.

Change Caller ID Format

The following key sequence is used to select the Caller ID (CID) format:

Press: # * 84 * <CID format> # <Flash>

1 = MDMF (Multiple Data Message Format) (Factory default setting)

2 = SDMF (Single Data Message Format)

3 = OFF

Reset User Factory Defaults

Reset all user programmable options back to the factory defaults.

Press: # * 107 * 1 #

SUPPLEMENTARY SERVICE FEATURES (NETWORK DEPENDENT)

The SX5e is compatible with a variety of supplementary services. Contact your service provider for availability and dialing instructions.

Different commands and information may be necessary to set up supplementary services.

Commands

- Register: Input information necessary for the operation of a service. In the case of call forwarding, for example, this will include the number to which incoming calls will be forwarded.
- Erase: Clear information stored for a particular service by a previous registration.
- Activate: Enable the operation of a service that has been registered.
- Deactivate: Stop the operation of a service that has been activated.

Information

- Teleservice: Voice = 11
Data = 12
Fax = 13
SMS = 16
All Teleservices = 10
All Teleservices except SMS = 19
- Delay: 5-30 seconds.
- Ph No: Phone number (up to 20 numerical digits).

NOTE: The <Flash> function is used to send a command string. To use the <Flash> function, press the Flash key, or press and release the switch-hook on the telephone.

Call Waiting

Enables notification of an incoming call when the phone is off-hook, whether on another call or while dialing a call.

Activate: * 43 # <Flash>

Deactivate: # 43 # <Flash>

Calling Line Identification Presentation (CLIP)

Allows you to view the identification information (name and number) of the person calling you.

Register: * * 30 # <Flash>

Activate: * 30 # <Flash>

Deactivate: # 30 # <Flash>

Erase: # # 30 # <Flash>

Calling Line Identification Restriction (CLIR)

Prevents the display of your identification information (name and number) to the person you call. If you subscribe to this option in permanent mode, the network will prevent the display of your identity for every outgoing call. If you subscribe with temporary mode, you can set a default option, then manually hide or display information for the next call you make.

Register: * * 31 # <Flash>

Activate: * 31 # <Flash>

Deactivate: # 31 # <Flash>

Erase: # # 31 # <Flash>

For temporary mode only:

• If the default is "presentation restricted." To display your information for the next call only:
Press: * 31 # Ph No <Flash>

• If the default is "presentation not restricted," To hide your information for the next call only:
Press: # 31 # Ph No <Flash>

Connected Line Identification Presentation (COLP)

Allows you to view the identification information for the number you call.

Register: * * 76 # <Flash>

Activate: * 76 # <Flash>

Deactivate: # 76 # <Flash>

Erase: # # 76 # <Flash>

Connected Line Identification Restriction (COLR)

Prevents the display of your identification information to the person calling you.

Register: * * 77 # <Flash>

Activate: * 77 # <Flash>

Deactivate: # 77 # <Flash>

Erase: # # 77 # <Flash>

Call Forwarding

Call Forward Unconditional

Send all incoming calls, or just those associated with a specific teleservice, to a different number.

Register: * * 21 * Ph No * Teleservice # <Flash>

Erase: # # 21 * Teleservice # <Flash>

Activate: * 21 * Teleservice # <Flash>

Deactivate: # 21 * Teleservice # <Flash>

Call Forward on Mobile Subscriber Busy

Send all incoming calls, or just those associated with a specific teleservice, to a different number when your account is "busy."

Register: * * 67 * Ph No * Teleservice # <Flash>

Erase: # # 67 * Teleservice # <Flash>

Activate: * 67 * Teleservice # <Flash>

Deactivate: # 67 * Teleservice # <Flash>

Call Forward on No Reply

Forward all calls made to your number, or just those associated with a specific teleservice, on to a different number if your phone is not answered after a certain amount of time.

Register: * * 61 * Ph No * Teleservice * Delay # <Flash>

Erase: # # 61 * Teleservice # <Flash>

Activate: * 61 * Teleservice # <Flash>

Deactivate: # 61 * Teleservice # <Flash>

Call Forward on Mobile Subscriber Not Reachable

Send all incoming calls, or just those associated with a specific teleservice, to a different number when your account is "not reachable."

Register: * * 62 * Ph No * Teleservice # <Flash>

Erase: # # 62 * Teleservice # <Flash>

Activate: * 62 * Teleservice # <Flash>

Deactivate: # 62 * Teleservice # <Flash>

Call Barring

Bar All Outgoing Calls

Does not allow any outgoing calls, or just those associated with a specific teleservice, from the SX5e.

Activate: * * 33 * Password * TeleService # <Flash>

Deactivate: # 33 * Password * TeleService # <Flash>

Bar Outgoing International Calls

Does not allow any outgoing calls, or just those associated with a specific teleservice, to subscribers of networks outside of the country you are in when you make the calls. You will only be able to make calls to subscribers of networks in the same country that you are in when you attempt to make the calls.

Activate: * 331 * Password * TeleService # <Flash>

Deactivate: # 331 * Password * TeleService # <Flash>

Bar Outgoing International Calls Except Those Directed to the Home PLMN Country

Does not allow any outgoing calls, or just those associated with a specific teleservice, to countries other than the one where your home network is located. This does not bar outgoing calls to other subscribers to your network, even if you make the calls from outside the country.

Activate: * 332 * Password * TeleService # <Flash>

Deactivate: # 332 * Password * TeleService # <Flash>

Bar All Incoming Calls

Allows you to bar certain categories of incoming calls according to a barring program which is selected from a set of one or more barring programs chosen when you activate your account. This is valid for all incoming calls, or just those associated with a specific teleservice.

Activate: * 35 * Password * TeleService # <Flash>

Deactivate: # 35 * Password * TeleService # <Flash>

Bar Incoming Calls when Roaming Outside the Home Network Country

Does not allow any incoming calls, or just those associated with a specific teleservice, if you are roaming outside the country where your home network is located.

Activate: * 351 * Password * TeleService # <Flash>

Deactivate: # 351 * Password * TeleService # <Flash>

Bar All Calls

Does not allow any incoming or outgoing calls, or just those of a specific teleservice.

Activate: * 330 * Password * TeleService # <Flash>

Deactivate: # 330 * Password * TeleService # <Flash>

Bar All Outgoing Calls

Does not allow any outgoing calls, or just those associated with a specific teleservice.

Activate: * 333 * Password * TeleService # <Flash>

Deactivate: # 333 * Password * TeleService # <Flash>

Bar All Incoming Calls

Does not allow any incoming calls, or just those associated with a specific teleservice.

Activate: * 353 * Password * TeleService # <Flash>

Deactivate: # 353 * Password * TeleService # <Flash>

Multiparty Call Features *

Multiparty call features are handled within an active call. These features are network-dependent. Contact your service provider for availability.

- To release all held calls or set User Determined User Busy for a waiting call, press: **0 <Flash>**
- To release all Active Calls and accept the held/waiting call, press: **1 <Flash>**
- To release a specific active call x, press: **1 x <Flash>** (x represents the call ID 1-7)
- To place all active calls on hold and accept the held/waiting call, press: **2 <Flash>**
- To place all active calls on hold except call x, press: **2 x <Flash>** (x represents the call ID 1-7)
- To add a held call to the conversation, press: **3 <Flash>**
- To place all active calls on hold and make a call to a specified number, press: **PhoneNo <Flash>**

NOTE: When both a held and a waiting call exist in a conflicting situation, the above procedures apply to the waiting call.

** Not available with the Phonecell® SX5e PBX Terminal.*

DATA FEATURES

The SX5e features a DB-9 digital computer fax/data port for connection to a personal computer (PC) - *not supplied*. When connected to a PC, the SX5e is capable of sending and receiving digital fax and data, sending and receiving e-mail communications, and browsing the Internet. Data speeds may vary depending upon your cellular network.

Connecting to a Computer

A data cable - *not supplied* - is required for data transmission. To determine the necessary cable, count the number of PIN connections in the serial port of your PC (see below). If there are 9 PIN connections in the PC serial port, a DB-9 (female) to DB-9 (male) cable is required. If there are 25 PIN connections in the PC serial port, a DB-25 (female) to DB-9 (male) cable is required - **see Figure 11**.

NOTE: The SX5e does not support direct computer modem (data) operation through the phone or fax ports.

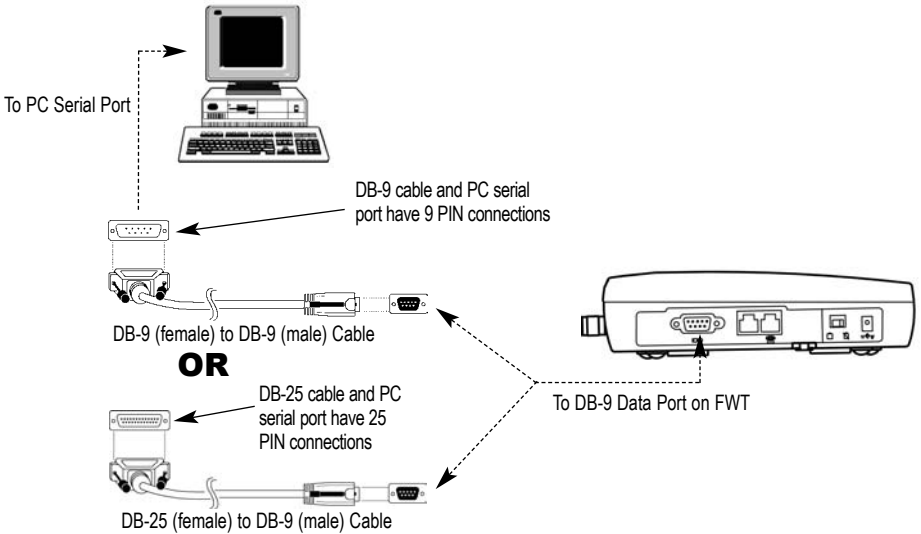


Figure 11 - PC data connection.

Dial-Up Connections

The SX5e allows for traditional dial-up type connections using the serial port of a computer. To use a dial-up connection (circuit switched connection), setup your PC serial port as defined in *Appendix A - How to Setup PC Serial Ports for Your Phonecell®*. Then setup a dial-up networking connection (see your PC's operating systems manual for more information).

Internet, E-mail, and Other Data Applications

Once you connect to your Internet service provider using dial-up networking through the serial port connection with the SX5e, you can run your favorite application to check email, browse the web, or send and receive data with other applications that require a data connection.

Digital Fax

The SX5e allows digital faxes to be sent or received from/to a standard personal computer using PC fax application software.

Sending a Digital Fax

No special mode setting is required when sending a digital fax. The PC fax emulator will change the terminal mode automatically. The SX5e will reset automatically to voice call mode after sending the fax file.

Receiving a Digital Fax

The SX5e can receive digital faxes through the serial port when the PC is configured with the proper application software, such as Winfax or Netfax. To do this, you must configure the computer modem and configure the SX5e.

1. Set up a serial port connection, see *Appendix A - How to Setup PC Serial Ports for Your Phonecell®*.
2. Using a tone dial (DTMF) telephone attached to the telephone port (marked with a phone icon) of the SX5e, press: **# * 67 * 3 #**. This will configure the SX5e to receive faxes through the serial port.

HINT: To change the SX5e to receive faxes through the phone jack, press: **# * 67 * 1 #**.

3. Run the PC fax application as required.

GPRS (Packet Data) Connections

The SX5e features General Packet Radio Service (GPRS) capability that allows for an “always on” packet data connection to the Internet if you subscribe to this service. The advantage of this type of connection is that it is never necessary to “dial-up” to access the Internet. Once activated, the connection remains active whether or not you are working online.

General Packet Radio Service (GPRS) Connections

The SX5e will allow GPRS connectivity if your network service provider has this feature available. GPRS allows packet data connections at higher speeds than conventional circuit switched (dial-up) connections. An SX5 Data Kit is required for the SX5e to use GPRS service. This kit contains a serial cable and a setup CD for installation on a standard personal computer. Contact your service provider or nearest Telular dealer for more information.

SX5e GSM FWT WITH FAX

The SX5e GSM FWT with Fax allows connection to a fax machine and additional telephones. The SX5e can be set up to use one or both of its phone jacks. In Single Jack mode, only the jack designated with a telephone icon is operational. You can connect a fax machine or an additional telephone into that jack, but to receive faxes you must have a fax machine connected. In Dual Jack mode, the unmarked jack is used for fax, and the jack marked with the telephone icon is used for any additional phones.

Set SX5e for Analog Fax

Set In-Bound Fax Port Option

Press: # * 67 * <fax_port> #

- 1 = send incoming fax calls to RJ-11 jack (default).
- 3 = send incoming fax calls to the serial port.

Set Single/Dual Jack Mode

Press: # * 63 * <single jack> #

- 0 = single jack
- 1 = dual jack (default)

Connect SX5e for Dual Jack Mode

1. Connect a fax machine to the unmarked phone jack on the SX5e - *see Figure 12*.
2. Connect a regular phone to the phone jack that is marked with a telephone icon.

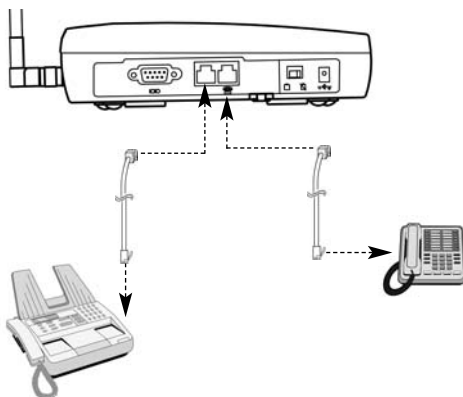


Figure 12 - Dual Jack mode connections.

Connect SX5e for Single Jack Mode

1. Connect a fax machine to the phone jack on the SX5e that is marked with a telephone icon - *see Figure 13*.

NOTE: The fax by-pass must be entered to send a fax in single jack mode because the SX5e default setting is for voice calls.

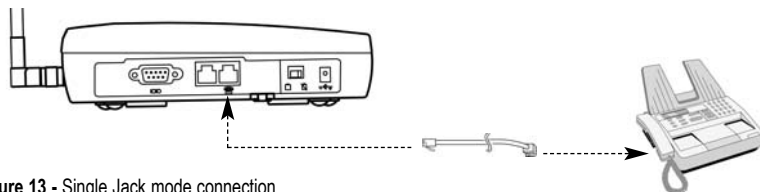


Figure 13 - Single Jack mode connection.

Analog Fax Bypass

This feature allows the phone jack to process the next outgoing call as an analog fax call. After this call, the phone jack automatically returns to the default voice protocol. The user enters this key sequence prior to dialing the telephone number. The terminal interprets the string and properly sets up the call. Refer to the following examples.

NOTE: The analog fax bypass string can only be used in single jack operation.

Use the Fax Bypass

1. Lift up the handset (take off-hook).
2. Press: # * 19 * 1 #, then dial the fax number to be called.
3. Press START on the fax machine.

HINT: If the fax machine does not have a handset, enter # * 19 * 1 #, followed by the remote fax number to be called. Press START.

HINT: If the fax machine has the capability to store telephone numbers for speed dialing, the # * 19 * 1 # command string may be programmed into the machine as a prefix to the telephone number. With some machines, it may also be possible to store the command string as a speed dial number and dial the remote fax machine telephone number manually.

SX5e GSM PBX FWT

The SX5e GSM PBX FWT allows for enterprise On-Premise Equipment or PBX operation when the SX5e is connected to the trunk or extension side of a PBX.



WARNING!

The trunk side of the PBX must only be connected to the trunk side of the SX5e (marked with a telephone icon) - see Figure 14. An extension of the PBX must only be connected to the extension side of the SX5e (unmarked) - see Figure 15. Improper connections could damage the SX5e.

Trunk Side PBX Connection (Trunk Mode)

When the SX5e is connected to the trunk side of a PBX, it allows users within the enterprise to take advantage of potentially lower cellular/PCS rates by routing outgoing calls to the GSM network. Incoming calls to the SX5e from outside the enterprise can be routed to the PBX. Depending on the PBX setup, these incoming calls could also be routed to a specific extension.

Trunk Side Setup (Trunk Mode)

To use the SX5e Trunk Mode, connect an analog trunk from the PBX into the trunk connector of the SX5e (marked with telephone icon) - see Figure 14.

HINT: If the SX5e has been changed to Extension Mode, be sure to change it back to Trunk Mode. To do this, connect a tone-dial (DTMF) telephone to the trunk side jack on the SX5e and press: **# * 108 * 2 #**.

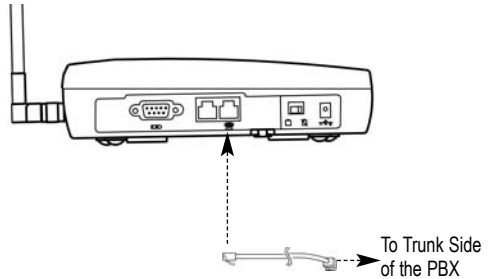


Figure 14 - Connect to trunk side of PBX.

Extension Side PBX Connection (Extension Mode)

When the SX5e is connected to the extension side of a PBX, it allows users to call into the enterprise via the SX5e, dial an extension, be routed to an extension automatically, or connect back out to the PBX trunk.

Extension Side Setup

To use the SX5e in Extension Mode, connect an analog extension from the PBX to the extension connector of the SX5 (RJ-11 with no markings) - see Figure 15. Then connect a DTMF phone to the trunk side (RJ-11 marked with a telephone icon) and set the SX5e to Extension Mode by pressing: **# * 108 * 1 #** on the DTMF phone. The SX5e is now in Extension Mode.

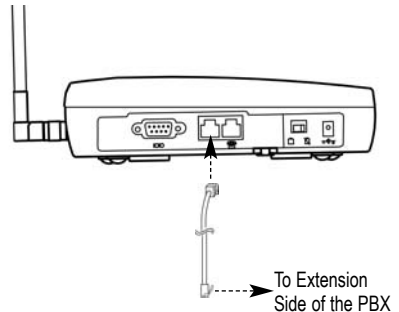


Figure 15 - Connect to extension side of PBX.

Disconnect Detect Setup

The SX5e is able to detect both a PBX disconnect tone and an analog disconnect pulse. When a PBX detects a hang-up, the SX5e must be told to also release the line. This is typically done by either a disconnect pulse or disconnect tone, but it is PBX specific. To find out what your PBX does, contact your PBX manufacturer or refer to your PBX technical manual.

Disconnect Tone

The SX5e can be configured to detect a single PBX disconnect tone. Fifteen standard DTMF tones can be detected. These include DTMF 1 through 9, *, #, A, B, C, and D. The SX5e PBX FWT defaults to not detect a DTMF tone. To configure the SX5e to detect one of the DTMF tones enter, from a connected POTS phone, press # * 111 * <dtmf> # where <dtmf> must be 1 through 16. To disable DTMF detection on disconnect, use 0 for <dtmf>. See the *PBX Command Summary* section of this manual.

HINT: When configuring the SX5e for DTMF Detection, try using DTMF D (15) first, then test the configuration with your PBX. If that does not work, try DTMF C (14), then DTMF B (13), etc., until you find the correct tone that your PBX sends on a disconnect.

NOTE: Your PBX must support a DTMF disconnect tone for this to work.

Disconnect Pulse

The SX5e will automatically detect this type of disconnection from the PBX. There is nothing you need to do on the SX5e to enable this. A disconnect pulse from the PBX of at least 200ms is required for proper disconnect detection.

Two-Stage Dialing Setup (GSM to Extension)

When in Extension Mode, the SX5e allows two-stage dialing so incoming GSM callers can connect to an extension on the PBX. In this mode, if you call the SX5e via GSM, the SX5e will automatically answer the call and present a dial tone. Since the SX5e would be connected to an extension on a PBX, you can access any other extension on the PBX as though you were in your office. Dial the extension number and the SX5e will connect you to that extension through the PBX. Once in extension mode, press # * 109 * 1 # from a DTMF phone connected to the trunk connector of the SX5e - see **Figure 15**. The SX5e is now configured for Two-Stage Dialing.

Example: Assume that your SX5e is connected to a PBX on extension 123. Now assume that you want to be able to connect to any extension (i.e. 858) when you call the SX5e on the GSM network.

1. Make sure you are in Extension Mode by entering # * 108 * 1 # from a DTMF phone connected to the trunk side connector.
2. Enable Two-Stage Dialing by pressing # * 109 * 1 # from the same DTMF phone connected to the trunk side connector.
3. When the SX5e receives a call, it will automatically answer the call, then present a dial tone.
4. When you hear a dial tone, enter the extension you wish to call (858).
5. The far end caller (the person who called the SX5e) will hear whatever the PBX presents after you dialed the extension number.

Auto-Routing Setup (GSM to Extension)

The SX5e can be configured to automatically route an incoming call from the GSM network to an extension in the PBX when in Extension Mode. Two steps are required to set this up after you connect a DTMF telephone to the trunk side of the SX5e (marked with a telephone icon).

1. Enable auto-routing by pressing: # * 109 * 0 #
2. Configure the extension to route to by pressing: # * 110 * <extension number> #

NOTE: The extension number can be up to 8 digits, between 0 through 9.

Example: Assume that the SX5e is connected to extension 123 of your PBX. To enable the SX5e to automatically route all its GSM calls to another extension that goes to a specific person or operator at extension 999, follow these instructions.

1. Make sure you are in Extension Mode by entering # * 108 * 1 # from a DTMF phone connected to the trunk side connector.
2. Enable Auto-Routing by pressing # * 109 * 0 # from the same DTMF phone connected to the trunk side connector.
3. Configure the auto-route extension (in this example, 999) by pressing # * 110 * 999 #.
4. When the SX5e receives a call, it will automatically answer the call, then dial 999 on the extension line. This means extension 123 is calling 999.
5. The far end caller (the person who called the SX5e) will hear the line answered, then will hear whatever the PBX presents when calling an extension.

Two-Stage Extension Side Dialing (Extension to GSM)

When connected to a PBX extension, any other extension on the PBX can access the SX5e. The SX5e will always present two-stage dialing where another extension can access the GSM network (extension side least cost routing). Only Extension Mode setup is required. No other settings need changing.

Example: The SX5e is connected to extension 123 on the PBX. To allow extension side dialing, setup the unit for Extension Mode and call the unit.

1. Make sure you are in Extension Mode by entering **# * 108 * 1 #** from a DTMF phone connected to the trunk side connector.
2. Call extension 123 from another PBX extension (or from the trunk side of the PBX).
3. When called, the SX5e will automatically answer, then present a dial tone.
4. Once a dial tone is heard, you may dial a number. The connection will be over the GSM network.

PBX Command Summary

Mode/Option	Command	Result
Change to Trunk Mode	# * 108 * 2 #	Enables the SX5e Trunk Mode. Note: This is the default mode for the SX5e PBX option.
Change to Extension Mode	# * 108 * 1 #	Enables the SX5e Extension Mode.
Enable Auto-Route	# * 109 * 0 #	Enables the SX5e to Auto-Route to an extension when in Extension Mode. Incoming calls to the SX5e will be routed to the Auto-Route Extension Number automatically. This setting disables two-stage dialing.
Auto-Route Extension Number	# * 110 * <extension> #	Sets the extension number that will be called when Auto-Route is enabled.
Enable Two-Stage Dialing	# * 109 * 1 #	Disables Auto-Route and enables two-stage dialing. Callers will be able to dial any extension within the PBX. This is the default mode.
Enable Disconnect Tone Detection	# * 111 * <dtmf> # DTMF 0 through 9 = 1 through 10 DTMF * = 11 DTMF # = 12 DTMF A = 13 DTMF B = 14 DTMF C = 15 DTMF D = 16	Enables the detection of <dtmf> for disconnection by the PBX.
Disable Disconnect Tone Detection	# * 111 * 0 #	Disables the detection of a DTMF tone for disconnection by the PBX. This is the default mode

SX5e TECHNICIAN SETUP

The following commands are to be used by trained field technicians to set up the SX5e for operation on the network. Since these commands can directly affect the proper operation of the unit, there is an additional level of security to prevent casual access.

Enter Technician-Programming Mode

Technician setup commands are only accessible in Technician Programming Mode. Once in this mode, multiple commands can be accessed without having to exit and re-enter this mode.

Press: **# * 0 * 1 2 3 4 4 3 2 1 #**

The dial tone will change to a steady "Programming" tone and the Power/Battery LED indicator will flash alternately RED and GREEN.

Dial Tone After Disconnect

When enabled, this allows dial tone to be heard immediately after a disconnect. Sometimes the network takes too long to fully disconnect the call, so this parameter allows immediate dial tone, even if the network has not completed the call termination, and allows the user to attempt to make another call.

Press: **# * 8 * <dial tone option> #**

0 = no tone after a remote on-hook (default)

1 = enable dial tone after remote on hook

Receiver Off-Hook (ROH) Setup

When the connected phone is off-hook for an extended length of time and not in a call, an ROH tone can be generated to the phone that will notify the user that the phone has been off-hook and should be placed on-hook. Continuous means that the ROH tone will be on continuously, independent of the ROH Stop Time parameter. Non-continuous means that the tone will stop at the specified Stop Time parameter. This command is effected by the ROH Start and End parameters.

Press: **# * 9 * <post ROH option> #**

0 = continuous ROH tone

1 = non-continuous ROH tone (default)

ROH Start and End Setup

These parameters allow setup of the when the ROH tone starts and when it ends after it starts. **NOTE:** The stop time only affects Non-Continuous in ROH Setup. The start and end time parameters are in seconds.

• To change start time, press: **# * 102 * <start time> #**

• To change end time, press: **# * 103 * <end time> #**

Start time and end time values can be between 10 and 90 seconds. Start time default is **50** seconds. End time default is **60** seconds.

Example: If you want ROH to start 30 seconds after the phone has been off hook and stop 50 seconds after that (meaning that the ROH tone will be heard for 50 seconds), then do the following.

1. Enable non-continuous ROH by pressing **# * 9 * 1 #** on the connected DTMF phone.

2. Set the ROH Start Time to 30 seconds by pressing **# * 102 * 30 #**.

3. Set the ROH Stop Time to 50 seconds by pressing **# * 103 * 50 #**.

Call-Answered Supervision Pulse

This allows the SX5e to generate a pulse on the RJ-11 jack when a call is connected.

Press: **# * 18 * <cas_pls_enable> * <cas_pls_freq> * <cas_pls_duration> * <cas_pls_level> #**

Use the values specified below to program this option. Any values outside of those specified will be invalid.

cas_pls_enable **0** = disable the pulse (default)

1 = enable the pulse

cas_pls_frequency **0** = 12 kHz (default)

1 = 16 kHz

cas_pls_duration Values from 0 ms to 65535 ms. The default is **100** ms.

cas_pls_level **0** = 0 dBm
 1 = -3 dBm
 2 = -6 dBm
 3 = -9 dBm (default)
 4 = -12 dBm
 5 = -15 dBm
 6 = -18 dBm

Line-Reversal Outgoing

This sets up the SX5e to polarity reverse the tip and ring lines on the RJ-11jack when an outgoing call is made and the far end answers (connects).

Press: **# * 22 * <line_reversal_outgoing> #**
 0 = disable line reversal (default)
 1 = enable line reversal.

Line-Reversal Incoming

This sets up the SX5e to polarity reverse the tip and ring lines on the RJ-11jack when an incoming call is received (the phone starts ringing).

Press: **# * 23 * <line_reversal_incoming> #**
 0 = disable line reversal (default)
 1 = enable line reversal

Disconnect Pulse

This pulse is generated by the SX5e on the RJ-11 jacks to indicate that the active call has been remotely disconnected (disconnected at the far end).

Press: **# * 79 * <disconnect_pulse> #**

The disconnect pulse value is programmed in 1 millisecond increments from 0 to 65,535. A value of 0 disables the disconnect pulse. The default is **700**.

Audio Input Impedance

This command changes the SX5e input impedance at the RJ-11 jack. The options are either 600 ohms or 900 ohms.

Press: **# * 68 * <audio_impedance> #**
 0 = 600 ohms (default)
 1 = 900 ohms

Self Test Interval

The SX5e can periodically check that it is functioning properly. This command specifies the interval.

Press: **# * 76 * <self-test_interval> #**

The self-test interval is programmed in 1 minute increments from 1 to 65,535 minutes. To disable this periodic test, set the interval to 0. The default is **180** minutes.

Dial Tone Frequency

This command allows changing the dial tone that is generated from the SX5e to the connected phone. The options are dial-tone per North American standards or single tone European standards.

Press: **# * 80 * <dial_tone_parameter>**
 0 = Dual frequency tone - North American (default for PCS networks)
 1 = 425 Hz - European (default for networks other than PCS)

Personalization Options

The SX5e can set locks (per GSM 02.22) to protect the SIM and the equipment from being used. The options include SIM personalization, network personalization, network subset personalization, service provider personalization, and corporate personalization.

SIM Personalization

Enables a user to personalize a ME so that it may only be used with particular SIM(s).

Network Personalization

Allows the network operator to personalize a ME so that it can only be used with that particular network operator's SIMs

Network Subset Personalization

A refinement of network personalization, which allows network operators to limit the usage of a ME to a subset of SIMs.

Corporate Personalization

Allows a corporate customer to personalize MEs that he provides for his employees or customers use so that they can only be used with the company's own SIMs.

Service Provider Personalization

Allows the service provider to personalize a ME so that it can only be used with that particular service provider's SIMs.

Press: **# * 37 * <type> * <operation> * <password> #**

Type	0 = SIM 1 = Network 2 = Network Subset 3 = Corporate 4 = Service Provider
Operation	0 = Activate (enable the personalization) 1 = De-activate (stop the verification checks, but not remove) 2 = Disable (remove the personalization)
Password	Contact your service provider.

Reset Technician Factory Defaults

Reset all technician parameters to the factory defaults. The user settings are not affected.

Press: **# * 106 * 1 #**

Technical Mode Password Settings

This command allows changing, enabling or disabling the technician password. Enabling the password requires that it be entered before changing accessing any technician mode commands. The default is **enabled**.

- To enable technician password, press: **# * 122 * 1 #**
- To disable technician password, press: **# * 122 * 0 #**
- To change technician password, press: **# * 121 * <new password> #**

SX5e TROUBLESHOOTING

Telephone Service is Not Working

If the telephone service is not working, first check the operation of the telephone equipment and wiring connected to the SX5e. Test the equipment on a different service or piece of equipment to ensure proper operation, or connect a known good telephone device to the phone port on the SX5e. This will verify the condition of the telephone equipment and the internal wiring of the telephone service to ensure that it's working properly. If the telephone system or wiring is not working properly, replace or repair the equipment as required. Otherwise, contact your cellular provider or your authorized Telular distributor.

Unable to Receive Incoming Calls

If more than one telephone or telephone device is connected to the SX5e, make sure that all devices are "on-hook" (hung up). If one extension is "off-hook" (off its cradle), none of the extensions on the phone line will ring when an incoming call occurs.

Unable to Send/Receive Data/FAX Calls

Check all the connections from the SX5e to other equipment (computer, fax machine, etc.). Verify that necessary settings have been properly configured (see the *Data Features* or the *Analog Fax* sections of this manual). If everything is properly connected and configured and you are still unable to send or receive data or fax calls, contact your service provider.


Moisture or Ventilation Problems


Visually inspect the SX5e's unit enclosure. Moisture can damage the equipment. Ventilation is also very important. If there are moisture or ventilation problems, move the SX5e to correct as necessary. See the Temperature Environment section of this manual.

No Power

The power LED lamp on the front of the SX5e indicates the unit's power condition. If the LED is GREEN, the SX5e is receiving power. If the power cord is connected and the LED lamp is not lit, the SX5e is not receiving power. Verify that the AC power source and its corresponding circuit breaker are functioning properly.

CONFORMANCE STATEMENTS

 The SX5e 900/1800 MHz (Dual Band) models are in conformance with the requirements of the applicable EU CE Council Directives.

 The SX5e 1900 Mhz models are in conformance with all applicable FCC requirements.

FCC Part 15 Class B Compliance

This Phonecell® SX5 model has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. Changes or modifications not expressly approved by Telular Corporation will void your authority to operate the equipment per FCC part 15 paragraph 15.21. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment OFF and ON, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the antenna.
- Increase the separation between the equipment and the terminal.
- Connect the equipment into an outlet on a circuit different from that to which the terminal is connected.
- Consult your Authorized Telular Distributor or an experienced radio/TV technician for help.

SAFETY INFORMATION

The Phonecell® SX5 functions as both a radio transmitter and receiver. When it is ON, the SX5 receives and sends out radio frequency (RF) energy. The SX5 GSM 900/1800 Dual-Band unit operates in the frequency ranges of 890 MHz to 960 MHz and 1710 MHz to 1880 MHz. The SX5 1900 unit operates in the frequency range of 1850 MHz to 1990 MHz. Both units employ commonly used phase/frequency modulation techniques. When you use the SX5, the cellular system handling your call controls the power level at which the unit transmits.

Exposure to RF (Radio Frequency) Energy

In 1991, the Institute of Electrical and Electronics Engineers (IEEE), and in 1992, the American National Standards Institute (ANSI), updated the 1982 ANSI Standard for safety levels with respect to human exposure to RF energy. After reviewing the available body of research, more than 120 scientists, engineers and physicians from universities, government health agencies and industry developed this updated Standard. In March, 1993, the U.S. Federal Communications Commission (FCC) proposed the adoption of this updated Standard.

The design of the Telular Phonecell® SX5 complies with this updated Standard. Of course, if you want to limit RF exposure even further than the updated ANSI Standard, you may choose to control the duration of your calls and operate your phone in the most power-efficient manner.

Safe Operation Requirement

The Phonecell® SX5 must be either wall mounted or desk mounted and should not be operated when any person is within 203 mm (8 inches) of the antenna.

Temperature Environment

Operating Temperature: From -10°C to +50°C ; Up to 95% relative humidity (non-condensing).

Storage Temperature: From -40°C to +60°C; Up to 95% relative humidity (non-condensing).

Antenna Care and Replacement

Do not use the Phonecell® SX5 with a damaged antenna. If a damaged antenna comes into contact with the skin, a minor burn may result. Have the antenna replaced by a qualified technician immediately. Use only a manufacturer-approved antenna. Unauthorized antennas, modifications, or attachments could damage the Phonecell® SX5.

Driving

Check the laws and regulations on the use of cellular products in the areas where you drive. Some jurisdictions prohibit use of a cellular device while driving a vehicle. Even if your jurisdiction does not have such a law, we strongly suggest that, for safety reasons, the driver use extreme caution when operating the cellular device while the vehicle is in motion. Always obey the law.



WARNING!

The Phonecell® SX5 is intended either to be wall mounted or mounted on a flat surface to allow proper ventilation. Do not block the space beneath the Phonecell® SX5 as this could cause the unit to overheat and fail.

Exposure to electronic Devices

Most modern electronic equipment is shielded from RF energy. However, RF energy from cellular devices may affect inadequately shielded electronic equipment.

RF energy may affect improperly installed or inadequately shielded electronic operating and entertainment systems in motor vehicles. Check with the manufacturer or its representative to determine if these systems are adequately shielded from external RF energy. You should also check with the manufacturer of any equipment that has been added to your vehicle.

Consult the manufacturer of any personal medical devices (such as pacemakers, hearing aids, etc.) to determine if they are adequately shielded from external RF energy.

Turn the Phonecell® SX5 OFF in health care facilities when any regulations posted in the areas instruct you to do so. Hospitals or health care facilities may be using equipment that could be sensitive to external RF energy.

Aircraft

Turn OFF the Phonecell® SX5 before boarding any aircraft.

- Use it on the ground only with crew permission.
- Do not use it in the air.

To prevent possible interference with aircraft systems, U.S. Federal Aviation Administration (FAA) regulations require you to have permission from a crew member to use your cellular phone (or any other cellular product) while the plane is on the ground. To prevent interference with aircraft systems, FCC regulations prohibit using your cellular device while the plane is in the air.

Children

Do not allow children to play with the Phonecell® SX5 to prevent damage to the unit.

Blasting Areas

Construction crews often use remote control RF devices to set off explosives. Therefore, to avoid interfering with blasting operations, turn the Phonecell® SX5 OFF when in a "blasting area" or in areas posted: "Turn off two-way radio."

Potentially Explosive Atmospheres

Turn the Phonecell® SX5 OFF when in any area with a potentially explosive atmosphere. It is rare, but the Phonecell® SX5 or its accessories could generate sparks. Sparks in such areas could cause an explosion or fire resulting in bodily injury or even death.

Areas with a potentially explosive atmosphere are often, but not always, clearly marked. They include fueling areas such as gas stations; below deck on boats; fuel or chemical transfer or storage facilities; areas where the air contains chemicals or particles, such as grain, dust, or metal powders; and any other area where you would normally be advised to turn off your vehicle engine.

Do not transport or store flammable gas, liquid or explosives in the area of the Phonecell® SX5 or accessories.

Vehicles using liquefied petroleum gas (such as propane or butane) must comply with the National Fire Protection Standard (FPA-58). For a copy of this standard, contact the National Fire Protection Association, One Batterymarch Park, Quincy, MA 02269, Attn: Publications Sales Division.

WARRANTY

I. WHAT THIS WARRANTY COVERS AND FOR HOW LONG:

TELULAR CORPORATION ("Telular") warrants to a distributor Buyer, or to a customer only if the customer is a Buyer directly from Telular, that the Products (including accessories) shall comply with the applicable Specifications and shall be free from defects in material and workmanship under normal use and service for a period of fifteen (15) months from date of shipment from Telular. Telular, at its option, shall at no charge either repair, replace or refund the purchase price of the Product during the warranty period, provided it is returned by Buyer in accordance with the terms of this warranty to the Telular designated repair center. Repair or replacement, at Telular's option, may include the replacement of parts, boards or Products with functionally equivalent reconditioned items. Repaired and replacement items are warranted for the balance of the original warranty period. All replaced items shall become the property of Telular. **SUCH ACTION ON THE PART OF TELULAR SHALL BE THE FULL EXTENT OF TELULAR'S LIABILITY HEREUNDER, AND BUYERS EXCLUSIVE REMEDY.** Buyer shall be responsible for all costs and expenses incurred by Buyer including without limitation any handling, labor or transportation charges. **OTHER THAN AFORESAID, THIS EXPRESS WARRANTY IS EXTENDED BY TELULAR TO BUYER ONLY AND NOT TO BUYER'S CUSTOMERS OR USERS OF BUYER'S PRODUCTS.**

II. HOW TO OBTAIN WARRANTY SERVICE

Product covered under this warranty shall only be accepted from and returned to Buyer's designated repair center. Buyer's dealers, distributors, agents, and end users cannot submit items to Telular under this warranty. To receive warranty service an RMA number must first be obtained from Telular Technical Support. The defective or non-compliant Product should be sent by Buyer freight pre-paid to: Telular Corporation, 647 North Lakeview Parkway, Vernon Hills, IL 60061, USA or other designated location. The product must be packaged in the original carton and packing material or an equivalent package and must have the assigned RMA number clearly marked on the carton. Returned Product received without an RMA number will be returned to the sender.

III. WARRANTY CONDITIONS:

This is the complete warranty for the Products manufactured by Telular and sold to Buyer. Telular assumes no obligation or liability for additions or modifications to this warranty unless made in writing and signed by an officer of Telular. Unless made in separate written agreement between Telular and Buyer, Telular does not warrant the installation, field maintenance or service of the Products or parts.

TELULAR CANNOT BE RESPONSIBLE IN ANY WAY FOR ANY ANCILLARY EQUIPMENT NOT FURNISHED BY TELULAR WHICH IS ATTACHED TO OR USED IN CONNECTION WITH THE PRODUCTS OR FOR OPERATION OF THE PRODUCTS WITH ANY ANCILLARY EQUIPMENT AND ALL SUCH EQUIPMENT IS EXPRESSLY EXCLUDED FROM THIS WARRANTY. FURTHERMORE, TELULAR CANNOT BE RESPONSIBLE FOR ANY DAMAGE TO THE PRODUCTS RESULTING FROM THE USE OF ANCILLARY EQUIPMENT NOT FURNISHED BY TELULAR FOR USE WITH THE PRODUCTS.

WHEN THE PRODUCT IS USED IN CONJUNCTION WITH ANCILLARY OR PERIPHERAL EQUIPMENT NOT MANUFACTURED BY TELULAR, TELULAR DOES NOT WARRANT THE OPERATION OF THE PRODUCT/PERIPHERAL COMBINATION, AND TELULAR SHALL HONOR NO WARRANTY CLAIM WHERE THE PRODUCT IS USED IN SUCH A COMBINATION AND IT IS DETERMINED BY TELULAR THAT THERE IS NO FAULT WITH THE PRODUCT. TELULAR DISCLAIMS LIABILITY FOR RANGE, COVERAGE, AVAILABILITY, OR OPERATION OF THE CELLULAR SYSTEM WHICH IS PROVIDED BY THE CARRIER.

IV. WHAT THIS WARRANTY DOES NOT COVER:

(a) Subsequent upgrades and enhancements to the Product. (b) Defects, non-compliance or damage resulting from use of the Product in other than its normal and customary manner or environment. (c) Defects, noncompliance or damage from misuse, lightening, accident or neglect. (d) Defects, noncompliance or damage from improper testing, operation, maintenance, installation, adjustment, or any alteration or modification of any kind. (e) Product disassembled or repaired in such a manner as to adversely affect performance or prevent adequate inspection and testing to verify any warranty claim. (f) Product which has had the serial number removed or made illegible. (g) Defects, non-compliance or damage due to spills of food or liquid. (h) All plastic surfaces and all other externally exposed parts that are scratched or damaged due to customer normal use. (i) Costs and expenses, including without limitation handling, labor and transportation, incurred in returning Product for warranty service to Telular's Repair Center. (j) Repair, programming or servicing by someone other than Telular.

V. GENERAL PROVISIONS:

THIS WARRANTY IS GIVEN IN LIEU OF ALL OTHER EXPRESS OR STATUTORY WARRANTIES. IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, INFRINGEMENT, DELIVERY, NEGLIGENCE AND PERSONAL INJURY, ARE DISCLAIMED. FURTHER, AS THE CELLULAR CARRIER IS NOT CONTROLLED BY TELULAR, NO WARRANTY IS MADE AS TO COVERAGE, AVAILABILITY OR GRADE OF SERVICE PROVIDED BY THE CELLULAR CARRIER. IN NO EVENT SHALL TELULAR BE LIABLE FOR DAMAGES IN EXCESS OF THE PURCHASE PRICE OF THE PRODUCT, FOR ANY LOSS OF USE, LOSS OF TIME, INCONVENIENCE, COMMERCIAL LOSS, LOST PROFITS OR SAVINGS OR OTHER INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE SUCH PRODUCT TO THE FULL EXTENT SUCH MAY BE DISCLAIMED BY LAW. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS.

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APPENDIX A:

HOW TO SETUP PC SERIAL PORTS FOR YOUR PHONECELL

Requirements

- GSM account with your network service provider including a Data/Fax facility.
- PC/Laptop/ Notebook with Com Port.
- Windows 95/98

NOTE: When all of the above have been satisfied, you may proceed.

Modem Setup

1. Power on your PC/laptop and start Windows 95/98.
2. Access the CONTROL PANEL settings, then select the MODEMS option.

NOTE: A data card modem device may appear in the list of installed modems.

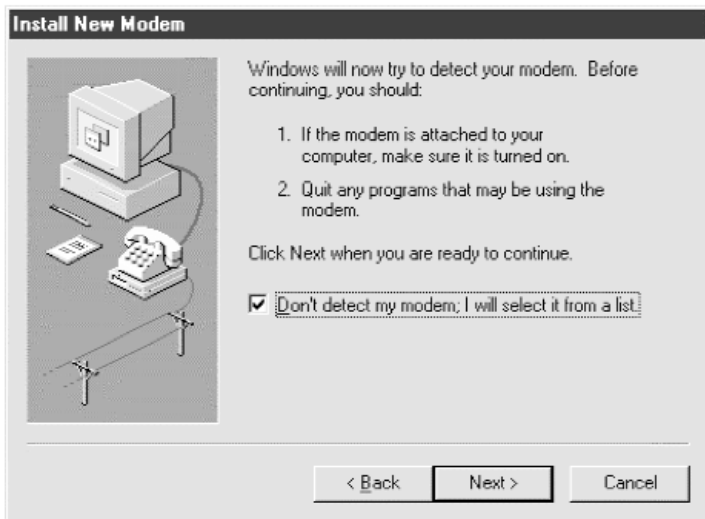
3. Click the ADD button to install a new modem device for the SX5e.



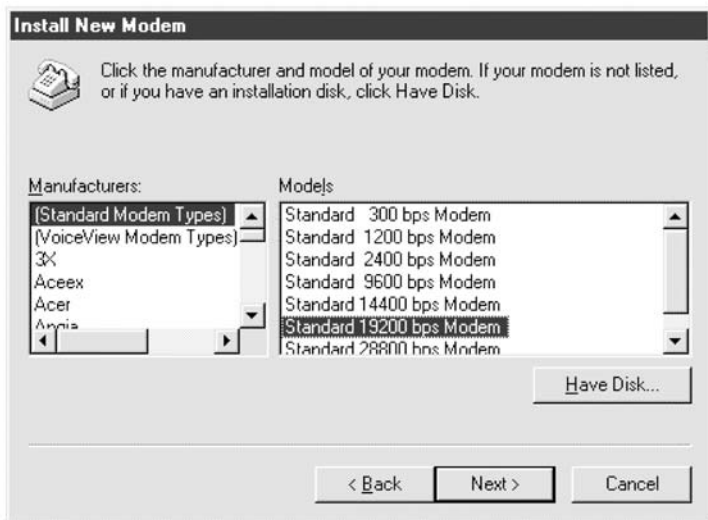
MODEMS



4. The install new modem window may appear asking for the type of modem to install. Select "Other," then click on the NEXT button. If this window does not appear, go to Step 5.
5. The install new modem window will appear. Select the "Don't detect my modem option," then click on the NEXT button.

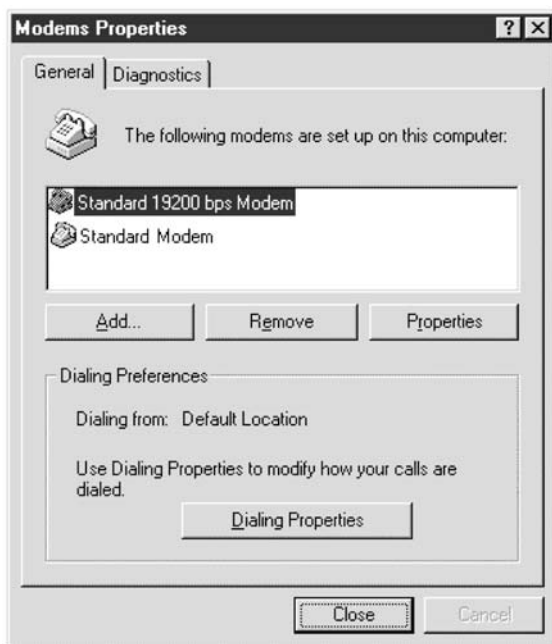


6. The install new modem will update again to select the manufacturer and modem model. Select "Standard Modem Types" from the manufactures list, then select "Standard 19200 bps Modem" from the model list. Click on the NEXT button to continue.



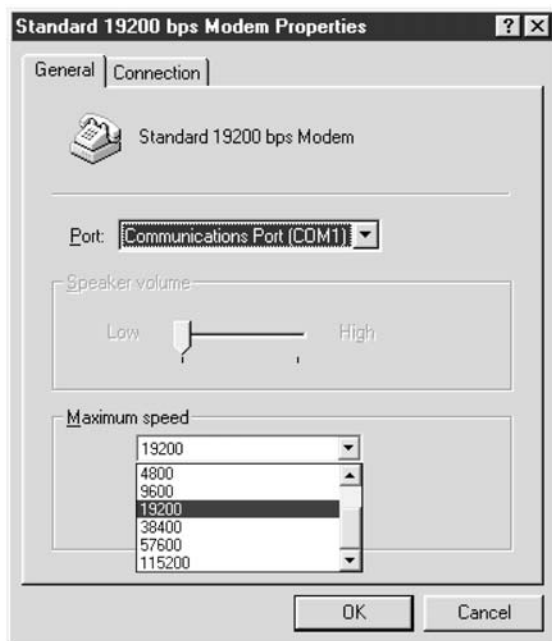
7. The install new modem will update to select the com port. Select the available serial port and then click on the "Next" button. Windows 95 will create a modem configuration file for the SX5e. This may take several minutes.
8. The Install New Modem window will update again. Click on Finish to proceed.

9. The Modems Properties window should appear. Click on the Properties button.

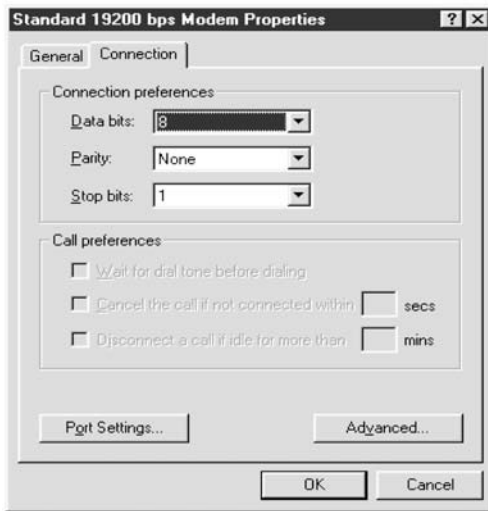


10. Select the Properties button for the selected modem and change your serial port speed as required.

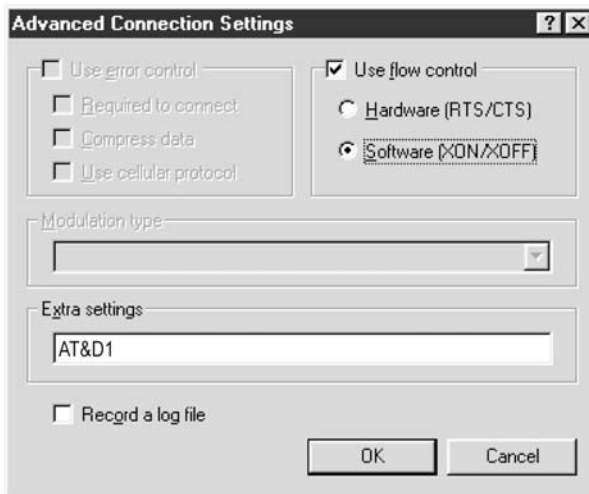
- GPRS Connections: Use 115,200
- Fax and Circuit Switched Data: Use 19,200



11. Then click on the Connection tab. Set as shown below.



12. Click on the Advanced button. Set as shown.



13. Click on OK and Close to back out of each window. Your modem is now set up.



647 North Lakeview Parkway
Vernon Hills, Illinois 60061, USA
Tel: 847-247-9400 • Fax: 847-247-0021
E-mail: support@telular.com
<http://www.telular.com>