



Iridium Mobile Terminated Data Service Partner Training



RELIABLE • CRITICAL • LIFELINES

Iridium Mobile Terminated Data

- Mobile Terminated Data (ISU → ISU and PSTN → ISU)
 - Data calls between two Iridium ISUs or a data call from a PSTN to an ISU
 - Connect two computers, using a terminal emulation program like HyperTerminal, at 2.4Kbps

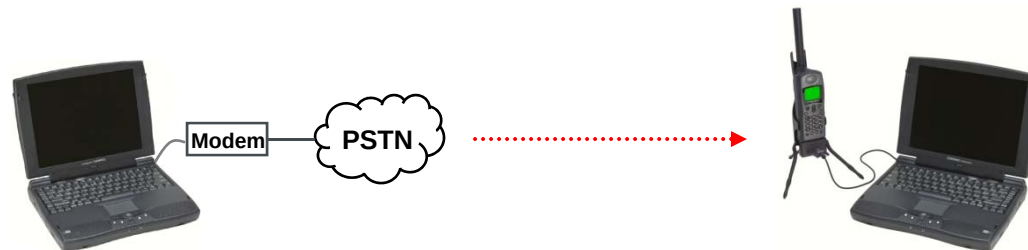
Mobile Terminated Data Scenarios

- Two types of Mobile Terminated Data Calls:

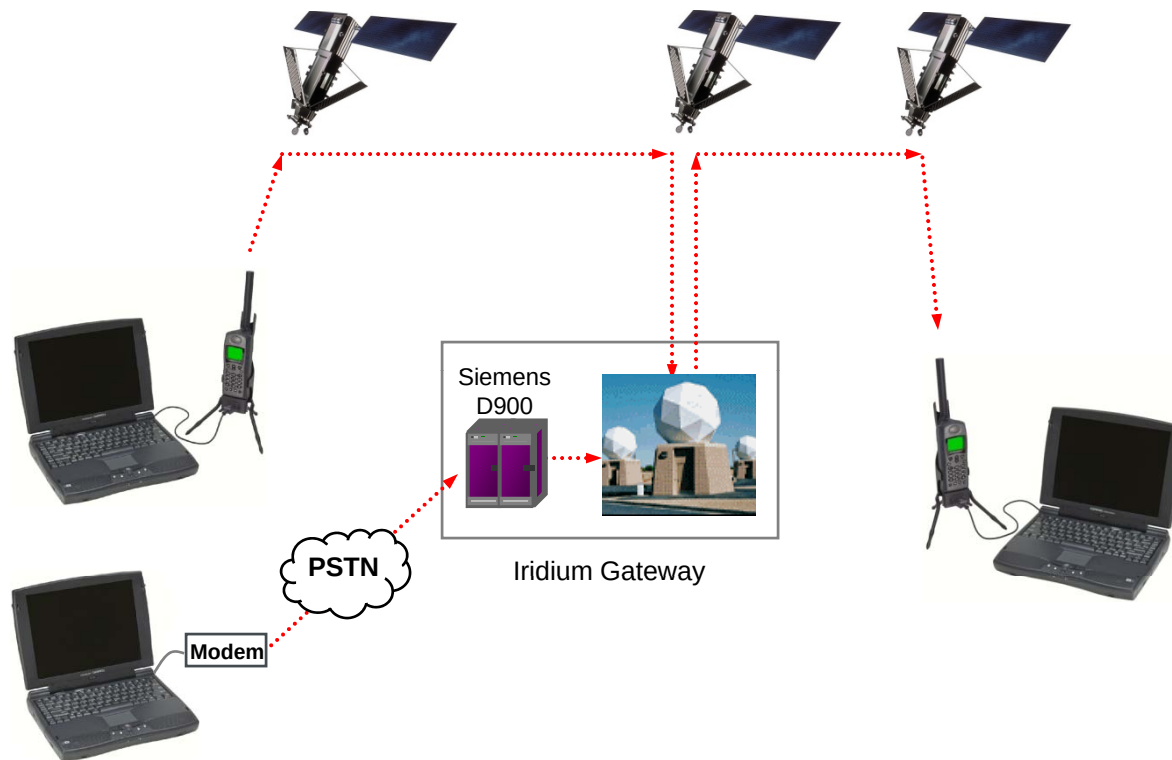
- ISU → ISU



- PSTN → ISU



Mobile Terminated Data Call Flow



Note: Iridium phones do not produce modem tones and therefore require call routing through the gateway.

Computer Requirements

- Computing device with a serial port capable of transmitting AT commands. Exception: 9555 can use a USB connection
- A Terminal Emulation program (e.g. HyperTerminal, ProComm)
 - HyperTerminal is a part of all Windows operating systems
 - This training focuses on the use of HyperTerminal

Iridium Requirements

- A SIM card provisioned for data
- Any of the same phones that support Iridium Dial-Up Data and Direct Internet Data:
 - Motorola 9500 or 9505
 - Motorola 9500 or 9505 in a portable dock
 - Motorola 9520
 - 9522A/9522B
 - 9555
 - EuroCom Fixed Mount Unit
- Data Kit (9500/9505) or appropriate Serial/USB Cable

MSISDN-C Definition

- All data contracts are assigned a MSISDN and a MSISDN-C
 - MSISDN = Voice Phone Number
 - MSISDN-C = Data Phone Number
- The MSISDN-C **MUST** be used for a PSTN to ISU data call. (For ISU to ISU, either the MSISDN or MSISDN-C may be used).

SPNet - New Contract

New Telephony Contract (GSM - IRI GSM)

Sub-Market: (8816310) UNITED ST ^

Rate Plan: USD - IS Training SP Telephony

Service Package: STD-TF-xxD1-8816 FMP DATA

Marketing Code: Other

Language: (EN)English

Services:

- Barring All Incoming Calls
- Barring All Outgoing Calls
- Call Forwarding Not Reachable
- Call Forwarding Unconditional
- Call Forwarding on Busy
- Telephony
- Call Forwarding No Reply
- Circuit Data BS26

MSISDN:

MSISDN-C:

SIM Serial (ICCID):

IMEI:

RUDICS group: None

Two-Stage Dialing:

Voice: Select: Optional PIN: None

Data: Select: Optional PIN: None

Leave blank for auto assign or enter MSISDN or MSISDN-C

SAVE » CLEAR » CANCEL »

ONE SYSTEM, GLOBALLY.

SPNet Confirmation Screen

Greetings!
Iridium Satellite LLC


IRIDIUM

Process Request

New Activation

Request ID: 319081

- MSISDN: 881631035806
- MSISDNC: 881692990505

Request information been successfully submitted.

[Return to Contract Summary page.](#)

AT Commands

- Iridium Data services utilize Hayes AT commands
- AT Command Reference Document available on the Partner's extranet.
 - Available commands
 - Command result codes

Commonly Used AT commands

When using Mobile Terminated Data, the ISUs are controlled by AT commands:

- AT Attention
- ATDT Dial
- ATH Hang Up
- AT+CBST=6,0,1 Set Bearer Service
- ATSO=1 Set phone to auto answer after one ring
- ATA Answer immediately
- +++ Transfer from data mode to command mode without hanging up
- ATO Transfer from command mode back to data mode

Originating ISU - Configure

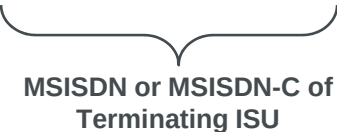
1. Launch terminal emulation program (e.g. HyperTerminal)
2. Select the COM/Serial port and configure for 19,200 bits per second, 8 characters, no parity, 1 stop bit.
3. Type AT
 - Phone will respond with “OK” if configured and connected correctly
4. Type AT+CBST=6,0,1
 - This sets the correct bearer service to match the programming of the SIM card

Originating ISU - Dial a Call

1. Type ATDT <phone number><carriage return>

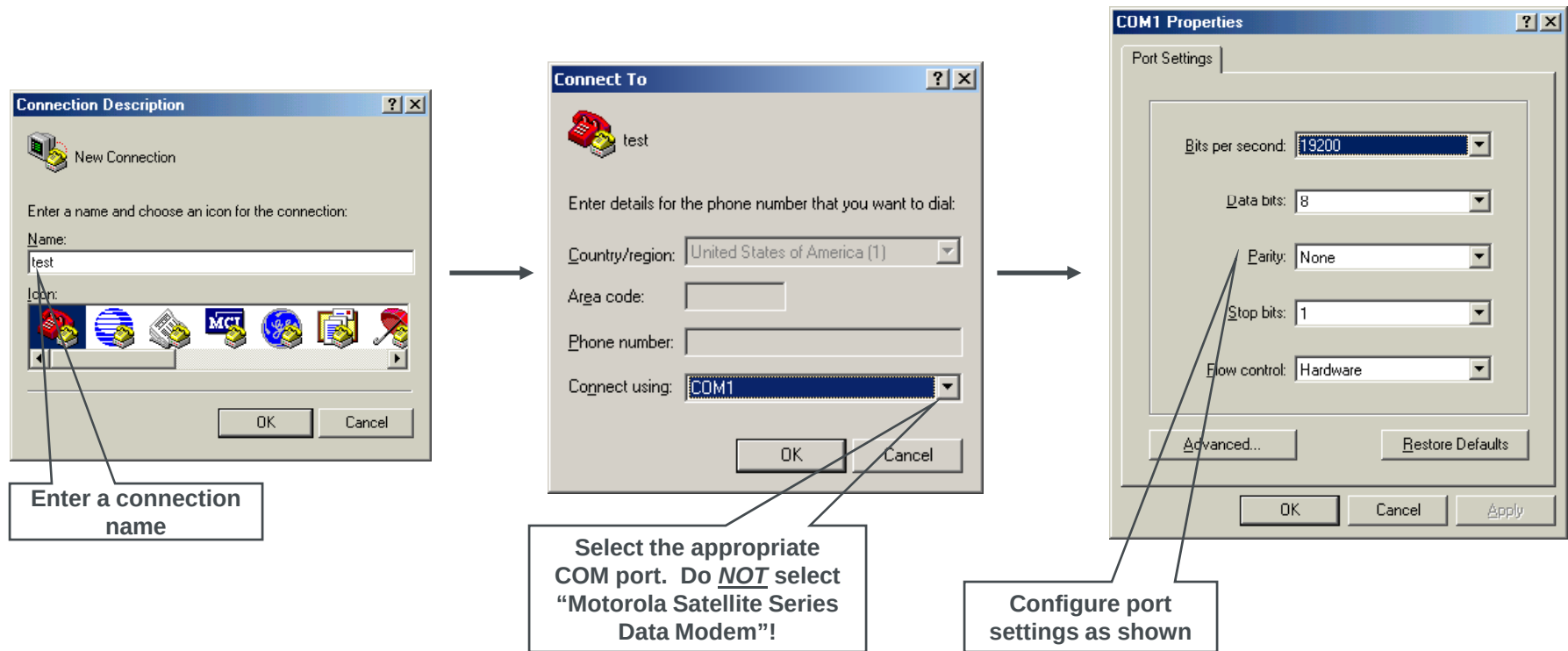
- <phone number> is the MSISDN or MSISDN-C of the terminating ISU
- Since the call is being dialed within the Iridium system, the phone number must be preceded by 00. For example:

ATDT 00 8816929xxxxx

MSISDN or MSISDN-C of
Terminating ISU

- ### 2. A response code will be returned (e.g. CONNECT, BUSY, NO ANSWER, NO CARRIER)
- ### 3. After the call is connected, data exchange can occur

Originating ISU - HyperTerminal Example



Originating ISU - HyperTerminal Example

The screenshot shows a HyperTerminal window titled "test - HyperTerminal" with a menu bar (File, Edit, View, Call, Transfer, Help) and a toolbar. The terminal text is as follows:

```
at
OK
at+cbst=6,0,1
OK
atdt 00881692910105
CONNECT 19200
here is some test data
OK
ath
OK
-
```

Callouts from the terminal text to explanatory boxes:

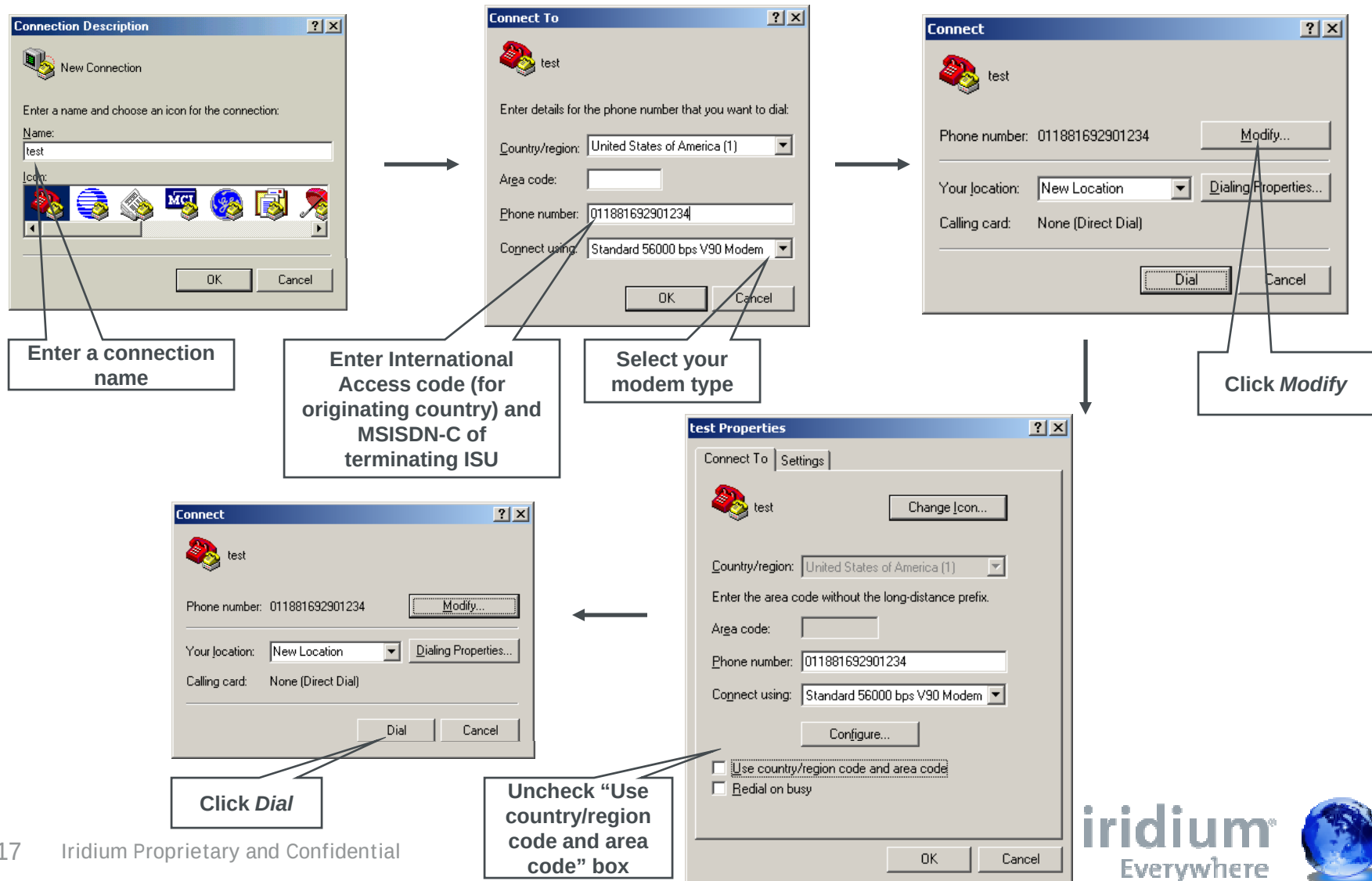
- "Type AT and look for 'OK' response" points to the first "at" and "OK".
- "AT command to set bearer service" points to "at+cbst=6,0,1".
- "AT command to dial the terminating ISU" points to "atdt 00881692910105".
- "AT Results Code indicating that a connection has been established" points to "CONNECT 19200".
- "Response to user entering '+++' to exit data mode" points to the first "OK" after "here is some test data".
- "AT command to terminate call" points to "ath".

The status bar at the bottom shows: "Connected 0:02:17", "Auto detect", "19200 8-N-1", "SCROLL", "CAPS", "NUM", "Capture", and "Print echo".

Originating PSTN Phone - Configure and Dial a Call

1. Launch terminal emulation program (e.g. HyperTerminal)
2. Configure terminal emulation program (enter phone number of terminating ISU and modem type)
3. Click “Dial” to initiate the data call

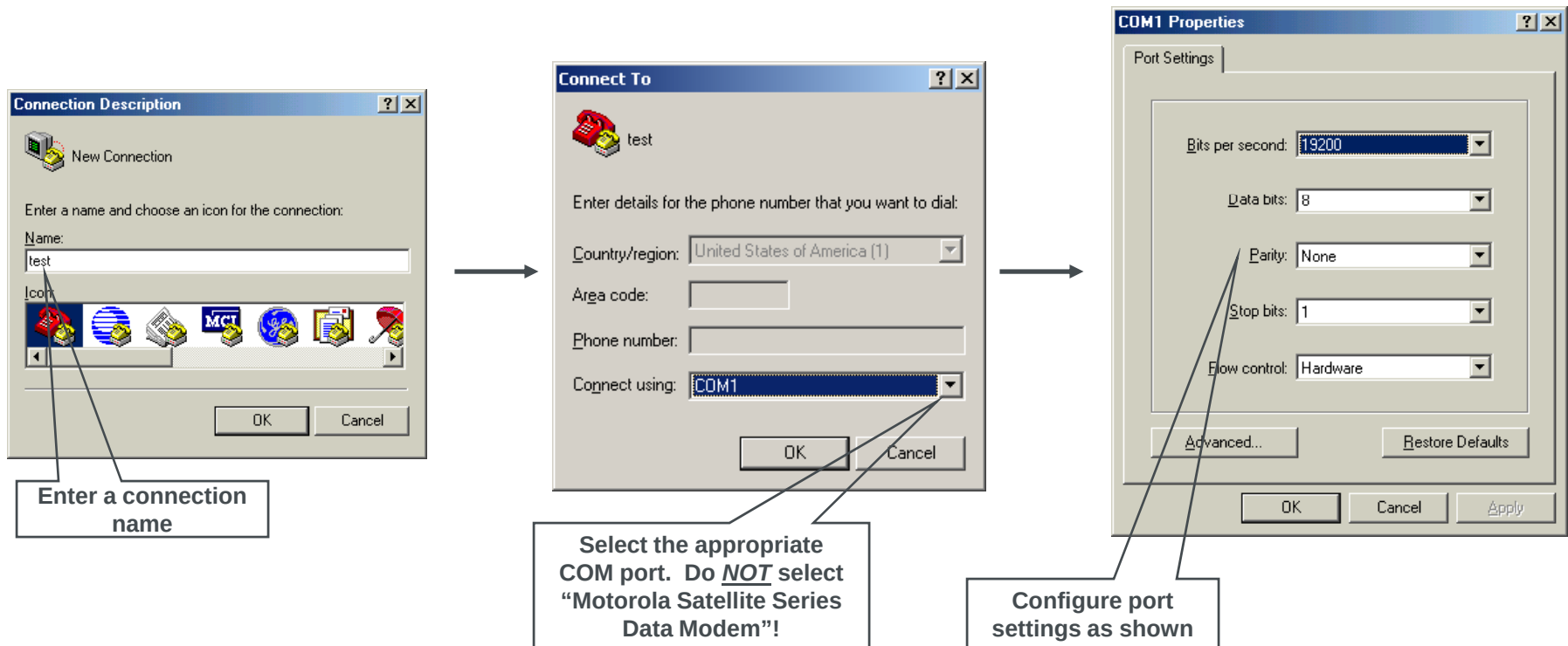
Originating PSTN Phone - HyperTerminal Example



Terminating ISU - Configure and Answer a Call

1. Launch terminal emulation program (e.g. HyperTerminal)
2. Select the COM/Serial port and configure for 19,200 bits per second, 8 characters, no parity, 1 stop bit.
3. Type AT
 - Phone will respond with “OK” if configured and connected correctly
4. Type ATSO=1
 - This sets the phone to auto-answer after one ring

Terminating ISU - HyperTerminal Example



Terminating ISU - HyperTerminal Example

The screenshot shows a HyperTerminal window titled "test - HyperTerminal" with a menu bar (File, Edit, View, Call, Transfer, Help) and a toolbar. The terminal text is as follows:

```
at
OK
ats0=1
OK
RING
CONNECT 19200
this is some test data
OK
ath
OK
-
```

Callouts explain the following parts of the terminal output:

- Type AT and look for "OK" response**: Points to the first "at" and "OK" lines.
- AT command to configure the computer to answer an incoming data call**: Points to the "ats0=1" line.
- AT Results Code indicating an incoming call**: Points to the "RING" line.
- AT Results Code indicating that a connection has been established**: Points to the "CONNECT 19200" line.
- Response to user entering +++ to exit data mode**: Points to the "OK" line following "this is some test data".
- AT command to terminate call**: Points to the "ath" line.

The status bar at the bottom shows: "Connected 0:05:46", "Auto detect", "19200 8-N-1", "SCROLL", "CAPS", "NUM", "Capture", and "Print echo".

Troubleshooting - General

- SIM must be provisioned for data
- Phone must have a data-capable firmware
- Antenna must be in clear line of sight to the sky
- Ensure that the phone and PC are connected correctly (correct COM/Serial or USB port on computer)

Troubleshooting - PSTN to ISU

- Is terminating computer configured for 19,200 bps, 8 characters, no parity, 1 stop bit?
- On the terminating computer, was the correct COM port selected?
- Was the terminating ISU configured to Auto-Answer (using the command ATSO=1)?
- Was the number dialed in international format? (International access code + 8816....)
- Was the MSISDN-C dialed? PSTN to ISU data calls will not work if the MSISDN is dialed.

Troubleshooting - PSTN to ISU

- Could the PSTN be the problem? Try calling from a different location. Even better, try an ISU to ISU call. If this works, the problem is definitely in the PSTN.
 - In many countries, the PSTN can corrupt data calls. The Middle East, Southeast Asia, China, India, Russia and Taiwan are particularly subject to problems.
- Is customer calling from behind a PBX? Try calling from outside the PBX.
 - Some PBX's have been known to corrupt data calls.

Troubleshooting - ISU to ISU

- Are both computers configured for 19,200 bps, 8 characters, no parity, 1 stop bit?
- Was the correct Serial/COM port selected in both computers?
- Was the originating ISU configured for the correct bearer service (using the command AT+CBST=6,0,1)?
- Was the terminating ISU configured to Auto-Answer (using the command ATSO=1)?
- Was the number dialed in international format? (00 + MSISDN or MSISDN-C of terminating ISU)

Resources

- Mobile Terminated Data User's Guide
- Iridium web site (www.iridium.com)
- Iridium extranet site