

abSerial Reference Guide

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Preface

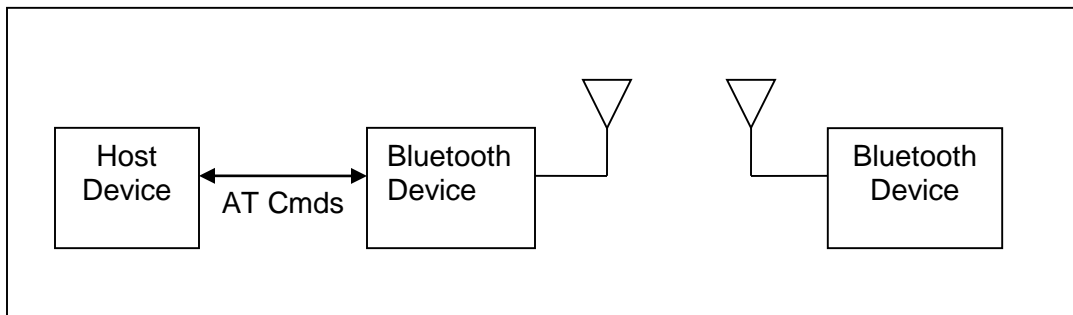
This document provides a detailed description of each command supported by the abSerial interface. Each description explains parameters and the expected behaviors of each command and response.

2 Overview

This chapter gives a basic overview of the abSerial interface. For further information, please refer to the *abSerial User Guide*. Further configuration commands are detailed in the *abSerial Configuration Guide*.

2.1 abSerial Interface Overview

abSerial is an application layer that provides Bluetooth communication between two devices. A serial port is used to communicate with a host device through an AT command interface as shown below.



abSerial provides the following basic features:

- Point-to-point connection. abSerial only supports a connection with one device at a time. (Optional MultiPoint applications are available upon request)
- Serial Port Profile. SPP is supported with abSerial for both Client and Server application.
- Command and Bypass modes: it is possible to switch between Command and Bypass (data transmit/receive) modes during an active connection
- Security: bonding and data encryption provides a secure link between two devices.
- Multiple Device Bonding: security link keys can be exchanged with multiple devices to allow different devices to securely connect with abSerial.
- Power Conservation: use of the Sniff feature to minimize power consumption.
- Variable Baud Rates: the serial port can be configured for the following baud rates: 1200, 2400, 4800, 9600, 19.2K, 38.4K, 57.6K, 115.2K (default), 230.4K, 460.8K, 921.6K

2.2 Factory Defaults

The follow factory defaults are typically shipped with our standard products. Customized defaults may be ordered upon request.

UART: 115200 baud, no parity, 1 stop bit, 8 data bits

Local Name: "Amp'ed UP!"

Class Of Device: 240404 (Rendering device)

Profile: SPP (SerialPort Profile)

Service Name: "AMP-SPP"

Deep Sleep: Disabled

Page and Inquiry Scan: 1.28s Interval, 11ms Duration

Security: Security Mode 4

Bonding PIN: "1234"

Bonding: Always enabled

3 AT Commands

This chapter details the each of the abSerial AT commands including brief descriptions of behavior, syntax of the command, context of the command, and types of responses.

This abSerial Reference Guide covers the following commands:

Table Key:

✓ – command is supported in this release

U – command has been updated for this release, see release notes

Table 3: abSerial Command Summary

Command	abSerial v1.6	abSerial v1.7
AutoReconnectSetup	X	✓
Bond	✓	✓
Build	✓	✓
Bypass	✓	✓
ChangeBaud	✓	✓
DeleteAutoReconnect	X	✓
DeleteSmartCable	✓	X
DisableBond	✓	✓
Discovery	✓	✓
EnableBond	✓	✓
EraseBondTable	✓	✓
ExitSniff	✓	✓
GPIOConfig	✓	✓
GPIORead	✓	✓
GPIOWrite	✓	✓

Command	abSerial v1.6	abSerial v1.7
HostEvent	✓	✓
LinkDisconnect	✓	✓
IAPConnect	✓	✓
IAPDisconnect	✓	✓
LocalName	✓	✓
PassKeyAccept	✓	✓
Reset	✓	✓
ShowDev	✓	✓
SmartCableSetup	✓	X
Sniff	✓	✓
SPPConnect	✓	✓
SPPDisconnect	✓	✓
UpdateInquiryScan	✓	✓
UpdatePageScan	✓	✓
Version	✓	✓

The following subsections describe each of these commands in detail, including a description of behavior, syntax (including possible parameter values), and types of responses.

Some responses will not be “immediate”. Where applicable, these will be noted and will include an approximate delay before response.

For commands with optional parameters, all possible forms will be listed under the syntax subsection.

Error responses are described in Section 4, Error Responses.

All commands and replies, except the escape sequence, are terminated with a CR/LF.

3.1 AutoReconnectSetup

The **AutoReconnectSetup** command is used enable and configure a device reconnection feature. The remote device's BD Address is automatically remembered from the previous connection. It is NOT a parameter in this command. The **DeleteAutoReconnect** command is used to remove this setup. Both SPP and IAP profiles are supported with this feature.

3.1.1 Syntax

```
AT+AB AutoReconnectSetup [Attempts] [Interval]
```

Where:

[Attempts] 0 – 2000 is the number of pages the will be attempted to the specified device until a connection is successful. A value of 2000 will perform unlimited pages until connected.

[Interval] 1-255 is the number of seconds between page attempts. This interval is in addition to the amount of time required by the page attempt itself.

3.1.2 Responses

If the operation is successful, the response is:

```
AT-AB AutoReconnectSetupDone
```

3.2 Bond

The **Bond** command is used to initiate bonding with a specified device. A personal identification number (PIN) is also required with this command.

3.2.1 Syntax

```
AT+AB Bond [BD Addr] [PIN]
```

Where [BD addr] is the BD Address of the remote device with which to bond and [PIN] is the PIN code to use (up to 16 characters).

3.2.2 Responses

If the request is successfully submitted, the response is:

```
AT-AB BondPending [Remote BD Addr]
```

If the operation is successful, the response is:

```
AT-AB BondOk
```

If the operation fails, the response is:

```
AT-AB BondFail
```

3.3 Build

The **version** command is used to return the current build ID of the application firmware.

3.3.1 Syntax

```
AT+AB Build
```

3.3.2 Responses

If the operation is successful, the response is:

```
AT-AB abSerial Build [date]
```

where [date] is the date code of the application firmware.

3.4 Bypass

The **Bypass** command is used to return the abSerial interface to the bypass mode, if a connection is still available. The possible use for this is to change a setting after a connection has been made (such as the UART baud rate). If the abSerial interface does not have a connection, it will respond as if the connection is down.

3.4.1 Syntax

```
AT+AB Bypass
```

3.4.2 Responses

If a connection is still available, the response is:

```
AT-AB -BypassMode-
```

If there is currently no connection, the response is:

```
AT-AB ConnectionDown
```

3.5 ChangeBaud

The host sends the **ChangeBaud** command in order to change the local UART speed to a new speed identified by the host. This setting will only remain in effect during the current session - until reset.

3.5.1 Syntax

```
AT+AB ChangeBaud [rate]
```

where [rate] is the new baud rate:

- 1200
- 2400
- 4800
- 9600
- 19,200
- 38,400

- 57,600
- 115,200
- 230,400
- 460,800
- 921,600

3.5.2 Responses

If the change is accepted, the response is:

```
AT-AB Baudrate Changed
```

The actual change will not occur until the response has been completely transmitted.

3.6 DeleteAutoReconnect

The **DeleteAutoReconnect** command removes the current reconnect configuration settings that were entered using the **AutoReconnectSetup** command.

3.6.1 Syntax

```
AT+AB DeleteAutoReconnect
```

3.6.2 Responses

If the operation is successful, the response is:

```
AT-AB DeleteAutoReconnectDone
```

3.7 DeleteSmartCable

(Not supported in abSerial v1.7)

The **DeleteSmartCable** command removes the current Smart Cable settings that were entered using the **SmartCableSetup** command, but not the setting from the dynamic configuration. The Smart Cable will then be deactivated for the remainder of this session. Upon reset, if a dynamic configuration for a Smart Cable exists, it will be activated. If there is no dynamic configuration Smart Cable setup, then this feature will remain deactivated.

3.7.1 Syntax

```
AT+AB DeleteSmartCable
```

3.7.2 Responses

If the operation is successful, the response is:

```
AT-AB DeleteSmartCableDone
```

3.8 DisableBond

The **DisableBond** command is used to disallow new bonding with a device.

This command cannot be used while a connection is active.

3.8.1 Syntax

```
AT+AB DisableBond
```

3.8.2 Responses

If the operation is successful, the response is:

```
AT-AB BondDisabled
```

3.9 Discovery

The **Discovery** command is used to initiate a device discovery. The command will return the number of responses of nearby devices and then the individual responses with BD address and name of device. The number of devices returned is limited to 10.

Inquiry is performed with an interval of 10.24 seconds.

The devices are reported in the same order as the original inquiry results.

3.9.1 Syntax

```
AT+AB Discovery
```

3.9.2 Responses

When the discovery command has been accepted, the response is:

```
AT-AB InqPending
```

Once the initial inquiry is complete and discovery has been started, the response is:

```
AT-AB DiscoveryPending [num]
```

where [num] is the number of devices found, in decimal (up to 10 will be reported).

For each name request that is successful, the response uses the returned names in the following format.

```
AT-AB Device [BD addr] [name]
```

where [BD addr] is in hexadecimal with the most significant byte first. [name] is a string in double quotes “ ”.

For each unsuccessful name request, the corresponding name is replaced by “Unknown”. The name request may not be successful if unable to make a connection for the request.

```
AT-ABDevice[BD addr]” Unknown”
```

3.10 EnableBond

The **EnableBond** command is used to enable bonding with another device. The BD Address, PIN and timeout parameters are optional.

When no BD Address is specified, requests from all BD Addresses are allowed.

If a BD Address is specified, bonding requests from devices with BD Addresses other than the one specified will fail and the existing link key will be deleted for that device.

Optionally, a PIN code may be entered with this command. If no PIN code is specified, the default PIN code will be used.

Also, a timeout value, in seconds, may be entered after the PIN code. Bonding will be disabled automatically after the requested timeout. If no timeout is specified, bonding is enabled until reset or until the **DisableBond** command is used.

If this command is issued multiple times, only the last PIN and BD address are saved. Also, if this command is issued before the first timeout occurs, the subsequent command will extend the timeout. The timeout is always set to the specified time beyond the last received **EnableBond**.

3.10.1 Syntax

```
AT+AB EnableBond
AT+AB EnableBond [BD addr]
AT+AB EnableBond [BD addr] [PIN]
AT+AB EnableBond [BD addr] [PIN] [timeout]
```

Where [BD addr] is the BD Address of the remote device with which to bond, [PIN] is the PIN code to use (up to 16 characters), and [timeout] is the duration of the timeout in seconds (1 to 1000).

3.10.2 Responses

If the operation is successful, the response is:

```
AT-AB BondEnabled
```

If bonding has been initiated by a remote device, the notification is:

```
AT-AB BondPending [BD addr]
```

where [BD addr] is the BD address of the remote device that initiated the bonding.

If bonding has occurred, the notification is:

```
AT-AB BondOk [BD addr]
```

where [BD addr] is the BD address of the remote device with successful bonding.

If bonding was initiated by a remote device but failed, the notification is

```
AT-AB BondFail
```

When the time limit for bonding has expired, the notification is

```
AT-AB BondDisabled
```

3.11 EraseBondTable

The **EraseBondTable** command is used to erase all of the bonded device entries. Single devices cannot be erased with this command

3.11.1 Syntax

```
AT+AB EraseBondTable
```

3.11.2 Responses

If the operation is successful, the response is:

```
AT-AB BondTableErased
```

3.12 ExitSniff

The **ExitSniff** command is used to switch a device from sniff mode to active mode.

3.12.1 Syntax

```
AT+AB ExitSniff [BD address]
```

Where [BD address] is the BD address of the device to be switched to active mode.

3.12.2 Responses

If the operation is successful, the response is:

```
AT-AB ActiveMode
```

3.13 GPIOConfig

The **GPIOConfig** command is used to configure a GPIO pin to input or output.

3.13.1 Syntax

```
AT+AB GPIOConfig [GPIO Pin] [Configuration]
```

Where [GPIO Pin] is the Pin number, 0 – 15, of the desired GPIO to configure. [Configuration] is “i” or “I” for input and “o” or “O” for output.

3.13.2 Responses

If the operation is successful, the response is:

```
AT-AB GPIOConfigDone
```

3.14 GPIORead

The **GPIORead** command is used to read a GPIO pin. A GPIO may be read while configured as either an input or output.

3.14.1 Syntax

```
AT+AB GPIORead [GPIO Pin]
```

Where [GPIO Pin] is the Pin number, 0 – 15, of the desired GPIO to read.

3.14.2 Responses

If the operation is successful, the response is:

```
AT-AB GPIOReadDone [result]
```

Where [result] is either a 1 to indicate high, or 0 to indicate low.

3.15 GPIOWrite

The **GPIOwrite** command is used to set a GPIO pin to high or low. A GPIO may only be set when configured as an output.

3.15.1 Syntax

```
AT+AB GPIOWrite [GPIO Pin] [Setting]
```

Where [GPIO Pin] is the Pin number, 0 – 15, of the desired GPIO to read. [Setting] is a 1 to set a pin to high and a 0 to set a pin to low.

3.15.2 Responses

If the operation is successful, the response is:

```
AT-AB GPIOWriteDone
```

3.16 HostEvent

The **HostEvent** command is used to enable/disable the host notification strings. This will override the default setting in the dynamic configuration only for the current session; until reset.

3.16.1 Syntax

```
AT+AB HostEvent [Enable/Disable]
```

Where [Enable/Disable] is an “e” or “E” character to enable this parameter and a “d” or “D” character to disable it.

3.16.2 Responses

If the feature is successfully enabled, the response is:

```
AT-AB HostEvent Enabled
```

If the feature is successfully disabled there is no response because the events have been disabled.

3.17 IAPConnect

The **IAPConnect** command is used to initiate a connection with the specified Apple iOS device. The remote BD address must be specified.

3.17.1 Syntax

```
AT+AB IAPConnect [BD Addr]
```

Where [BD Addr] is the iOS remote devices BD Address to page . Responses

If the connection is successful, the response is:

```
AT-AB ConnectionUp [Remote BD Addr]
AT-AB -iAP-BypassMode-
```

If the connection cannot be completed, the response is:

```
AT-AB iAPConnectionClosed
```

3.18 IAPDisconnect

The **IAPDisconnect** command is used to terminate a connection with the remote Apple iOS device.

3.18.1 Syntax

```
AT+AB IAPDisconnect
```

3.18.2 Responses

If the connection is successful, the response is

```
AT-AB iAPConnectionClosed
```

3.19 LinkDisconnect

The **LinkDisconnect** command is used to terminate a connection with the remote device's link handle.

3.19.1 Syntax

```
AT+AB LinkDisconnect
```

3.19.2 Responses

If the connection is successful, the response is

```
AT-AB ConnectionDown
```

3.20 LocalName

The **LocalName** command is used to set the name of the device to the name that is reported during device discoveries. By default, the abSerial interface uses "AmpedUP!". Changing the name using this command does not permanently change the local name.

3.20.1 Syntax

```
AT+AB LocalName [name]
```

Where [name] is a string for the new local name (up to 20 characters). The space character is allowed; the name is assumed to be all text up to the end of the command.

3.20.2 Responses

If the operation is successful, the response is:

```
AT-AB LocalNameOk
```

3.21 PassKeyAccept

The **PassKeyAccept** command is used to confirm or block a passkey request during bonding. This is called MITM protection.

3.21.1 Syntax

```
AT+AB PassKeyAccept [y/n]
```

3.21.2 Responses

When a remote device attempts to bond:

```
AT-AB PassKeyConfirmReq [passkey]
```

If the operation is successful, the response is:

```
AT-AB BondOk [remote bd addr]
```

3.22 Reset

The **Reset** command is used to reset the abSerial interface. This is provided in the event that a host application wants to perform a software reset for error recovery. There is a response prior to reset to verify the command was received by the abSerial interface. A reset requires 1.6 seconds.

3.22.1 Syntax

```
AT+AB Reset
```

3.22.2 Responses

If the operation is successful, the response is:

```
AT-AB ResetPending
```

3.23 ShowDev – For testing usages only.

The **ShowDev** command is display the list of paired devices.

Syntax

```
AT+AB ShowDev
```

3.23.1 Responses

The response is either:

AT-AB BondTableEmpty

Or:

[list of 6 byte BD Addresses; for all paired device.

3.24 SmartCableSetup

(Not supported in abSerial v1.7)

The **SmartCableSetup** command is used enable and configure a Smart Cable device. A device's BD Address is specified with which to automatically establish a connection; replacing the need for AT connection commands. This command will override the dynamic configuration of a Smart Cable device until the **DeleteSmartCable** command is issued; it is saved in non-volatile memory.

3.24.1 Syntax

```
AT+AB SmartCableSetup [BD address] [Attempts] [Interval]
```

Where:

[BD address] is the BD address of the remote device to page and attempt to connect.

[Attempts] 0 – 999 is the number of pages the will be attempted to the specified device until a connection is successful. A value of 1000 will perform unlimited pages until connected.

[Interval] 1-1000 is the number of 100ms intervals (0.1sec to 100 sec) between page attempts. This interval is in addition to the amount of time required by the page attempt itself.

3.24.2 Responses

If the operation is successful, the response is:

```
AT-AB SmartCableConfigDone
```

3.25 Sniff

The **Sniff** command is used to switch a device from active mode to sniff mode.

3.25.1 Syntax

```
AT+AB Sniff [BD address] [Sniff Interval]
```

Where [BD address] is the BD address of the device to be switched to active mode. [Sniff Interval] is given in slots from 66-10,000.

3.25.2 Responses

If the operation is successful, the response is:

```
AT-AB SniffMode
```

3.26 SPPConnect

The **SPPConnect** command is used to initiate a connection with the specified device. The remote BD address must be specified. The remote Service is optional. If not specified, the first registered SPP service will be used by default.

3.26.1 Syntax

```
AT+AB SPPConnect [BD Addr] [Service]
```

Where [BD Addr] is the remote devices BD Address to page. [Service] is the specific service on the remote device; optional.

3.26.2 Responses

If the connection is successful, the response is:

```
AT-AB ConnectionUp [Remote BD Addr]
AT-AB -BypassMode-
```

If the connection cannot be completed, the response is:

```
AT-AB SPPConnectionClosed
```

3.27 SPPDisconnect

The **SPPDisconnect** command is used to terminate a connection with the remote device.

3.27.1 Syntax

```
AT+AB SPPDisconnect
```

3.27.2 Responses

If the connection is successful, the response is

```
AT-AB SPPConnectionClosed
```

3.28 UpdateInquiryScan

The **UpdateInquiryScan** command is used to modify the Inquiry scan parameters: mode, duration, and interval.

3.28.1 Syntax

```
AT+AB UpdateInquiryScan [mode] [duration] [interval]
```

where [mode] is the discoverable mode:

- 0: non-discoverable
- 1: limited discoverability – NOT SUPPORTED
- 2: discoverable

[duration] is the scan length in slots; 18 to 4096. The default duration is 18 slots.

[interval] is the period between scans in slots; 18 to 4096. The default interval is 2048 slots

3.28.2 Responses

If the command is successful, the response is:

```
AT-AB InquiryScanUpdateDone
```

3.29 UpdatePageScan

The `UpdateInquiryScan` command is used to modify the Page scan parameters: mode, duration, and interval.

3.29.1 Syntax

```
AT+AB UpdatePageScan [mode] [duration] [interval]
```

Where [mode] is the connectable mode:

- 0: non-connectable
- 1: connectable

[duration] is the scan length in slots; 18 to 4096. The default duration is 18 slots.

[interval] is the period between scans in slots; 18 to 4096. The default interval is 2048 slots

3.29.2 Responses

If the command is successful, the response is:

```
AT-AB PageScanUpdateDone
```

3.30 Version

The `version` command is used to return the current version of the abSerial interface.

3.30.1 Syntax

```
AT+AB Version
```

3.30.2 Responses

If the operation is successful, the response is:

```
AT-ABabSerialVer [x.y]
```

where [x.y] is the current version of the abSerial Interface.

4 Bluetooth Smart AT Commands

This chapter details AT command that support Bluetooth Smart or LE (Low Energy). These commands only apply to Bluetooth Smart or SmartReady platforms.

4.1 LeAdv

The **LeAdv** command is used to enable and disable LE advertising functionality. For specific interval settings, please see the BT Configuration Guide.

4.1.1 Syntax

```
AT+AB LeAdv [Enable/Disable]
```

Where `Enable` will turn on advertising (default)

`Disable` will turn of advertising

4.1.2 Responses

If the operation is successful, the response is:

```
AT-AB AdvOk
```

4.2 LeConnect

The **LeConnect** command is used to build a LE connection with a remote device.

4.2.1 Syntax

```
AT+AB LeConnect [bd address]
```

Where `[bd address]` is the remote device's BD Address

4.2.2 Responses

If the operation is successful, the response is:

```
AT-AB LeConnectionUp
```

4.3 LeConnectCancel

The **LeConnectCancel** command is used to cancel a pending connect request.

4.3.1 Syntax

```
AT+AB LeConnectCancel
```

4.3.2 Responses

If the operation is successful, the response is:

```
AT-AB LeConnectCancelDone
```

4.4 LeDisconnect

The **LeDisconnect** command is used to disconnect from a remote LE device once connected.

4.4.1 Syntax

AT+AB LeDisconnect

4.4.2 Responses

If the operation is successful, the response is:

```
AT-AB LeConnectionDown
```

4.5 LeDiscovery

The **LeDiscovery** command scans for remote devices.

4.5.1 Syntax

```
AT+AB LeDiscovery
```

4.5.2 Responses

When the discovery command has been accepted, the response is:

```
AT-AB LeDiscoveryPending
```

For each device found, the response is:

```
AT-AB LeDevice [BD addr]
```

Where [BD addr] is in hexadecimal with the most significant byte first.

4.6 LeGetChar

The **LeGetChar** command is used read data from a readable characteristic.

4.6.1 Syntax

```
AT+AB LeGetChar [handle]
```

Where [handle] is the GATT layer character handle, 1 byte in ascii coded hex format: hh

4.6.2 Responses

If the operation is successful, the response is:

```
handle: [Data] vlen:[length] value(hex):[1-20 bytes of data]
```

4.7 LeRole

The **LeRole** command is used to set the LE role.

4.7.1 Syntax

```
AT+AB LeRole [role]
```

where [role] is the desired device role:

c: Central role

p: Peripheral role

Note: this role is saved in NVM

4.7.2 Responses

If the operation is successful, the response is:

```
AT-AB LeRoleDone
```

4.8 LeScan

The **LeScan** command is used to enable and disable LE scanning functionality. For specific interval settings, please see the BT Configuration Guide.

4.8.1 Syntax

```
AT+AB LeScan [Enable/Disable]
```

Where `Enable` will turn on scanning (default)

`Disable` will turn off scanning

4.8.2 Responses

If the operation is successful, the response is:

```
AT-AB ScanOk
```

4.9 LeUpdateChar

The **LeUpdateChar** command is used to update a writeable characteristic.

4.9.1 Syntax

```
AT+AB LeUpdateChar [handle] [length] [data]
```

Where

`[handle]` is the GATT layer character handle, 1 byte in ascii coded hex format:
hh

`[length]` is 1-20 bytes

`[data]` formatted in ascii coded hex bytes, space delineated: ex. 00 01 02

4.9.2 Responses

If the operation is successful, the response is:

```
AT-AB LeUpdateCharDone
```


5 Error Responses

This chapter details the error responses that occur under specific circumstances.

There are seven error responses that can occur beyond error responses specific to a particular command (e.g., **Discovery**). They are:

- ErrConnect
- ErrExecution
- ErrFormat
- ErrInProgress
- ErrInvalidParam
- ErrNumParam
- ErrUnknownCmd

The following subsections detail the different error responses. These error responses replace the original error response

AT-AB ErrorCommand

5.1 ErrConnect

The **ErrConnect** error response will be sent if abSerial has a valid connection established and the command cannot be executed while connected (even in the command mode). Examples of commands that produce this error response are given in the following table.

Table 1. Example Commands that Generate <ErrConnect>

Example	Reason
AT+AB Discovery	Performing a device discovery while a connection is up.
AT+AB SPPConnect 00043e000000	Establishing a connection to a device while a connection is exists with another.

5.2 ErrExecution

The **ErrExecution** error response will be sent if the command cannot complete for any reason.

Examples of commands that produce this error response are given in the following table.

Table 2. Example Commands that Generate <ErrExecution>

Example	Reason
AT+AB Discovery	Execution of command with correct syntax failed.

5.3 ErrFormat

The *ErrFormat* error response will be sent if abSerial receives a command (text terminated by a carriage return or line feed) that does not match the expected format of starting with “AT+AB”.

Examples of commands that produce this error response are given in the following table.

Table 3. Example Commands that Generate <ErrFormat>

Example	Reason
AT-AB Discovery	A valid command name that does not start with the right prefix.
SPPConnect 00043e000000	A command does not start with “AT+AB”.
abcdef	A command does not start with “AT+AB”.

5.4 ErrInvalidParam

The *ErrInvalidParam* error response will be sent if the parameters for the requested command are not correct. The parameter(s) will be echoed back to the user starting from the parameter that was rejected.

Examples of commands that produce this error response are given in the following table.

Table 4. Example Commands that Generate <ErrInvalidParam>

Example	Response	Reason
AT+AB SPPConnect 8136	AT-AB ErrInvalidParam 8136	Numeric parameter not specified with required number of digits (BD address must always be 12 hex characters).
AT+AB SPPConnect 00043e008136 GOEP	AT-AB ErrInvalidParam goep	Unrecognized (or unsupported) symbolic parameter used.
AT+AB ChangeBaud 1600	AT-AB ErrInvalidParam 1600	Numeric parameter is out of range (specified baud rate is not supported by command).
AT+AB EnableBond 00043e000000 12345678901234567	AT-AB ErrInvalidParam 12345678901234567	String parameter (PIN) has too many characters.

5.5 ErrNumParam

The *ErrNumParam* error response will be sent if there are too few parameters for the requested command. A command sent with too many parameters does not generate an error; instead, the extra parameters are ignored.



Note: some commands will accept a variable number of parameters.

Examples of commands that produce this error response are given in the following table.

Table 5. Example Commands that Generate <ErrNumParam>

Example	Reason
AT+AB Sniff	The minimum number of parameters was not specified.

5.6 ErrUnknownCmd

The *ErrUnknownCmd* error response will be sent if the requested command is not recognized. The unrecognized command will be echoed back to the host. Any parameters given will be ignored.

```
AT-AB ErrUnknownCmd [unrecognized command]
```

An accepted command always starts with the command identifier:

```
AT+AB
```

5.7 ErrInProgress

ErrInProgress is sent in response to *Discovery* command being issued when the previous one is still in progress.

```
AT+AB Discovery [unrecognized command]
```

Examples of commands that produce this error response are given in the following table:

Table 6. Example Commands that Generate <ErrInProgress>

Example	Reason
AT+AB Discovery	Trying to do discovery when the previous one has not completed.

6 Other Responses

The following subsections describe types of responses that occur under specific circumstances, not necessarily as a result of a specific command. They are:

- Reset
- Escape Sequence

6.1 Reset

Upon either hardware reset or software reset (such as the **Reset** command), abSerial will respond as follows after the reset is complete:

```
AT-AB -CommandMode-  
AT-AB BDAddress [BD addr]
```

Because the BD address of the local device is reported during this response, the response is different than a response to the Escape Sequence.

6.2 Escape Sequence

If the Escape sequence, “^#^\$^%”, is received and no connection is active, abSerial will immediately respond with:

(Note: there is no CR or LF after these 6 characters)

```
AT-AB -CommandMode-
```

When the Escape Sequence is received while a connection is still active and there is no data for 2 seconds, abSerial will respond (after those 2 seconds of no data) with the CommandMode reply.

abSerial will now be in command mode.