Alps Virtual Cable Light
Revision B3_10
AT Command Reference List

Document Version 1.0

Important Notes

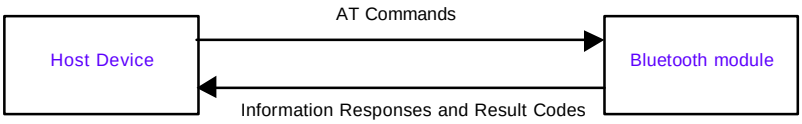
Contents

1 Introduction

This document presents an AT command reference list for the Alps Virtual Cable Light firmware targeted at mobile device applications. The firmware is solely compatible with specific Alps Bluetooth modules.

2 Transfer Properties

Communication between the Bluetooth™ module and the host is based on AT commands. Commands are issued from the host device and responses or result codes are issued from the module.



Note that due to the AT interpreter implementation in the module, the command response time will vary depending on the AT command issued from the host device.

2.1 AT Commands

AT commands are sent by the host to the Bluetooth module to configure parameters, read current parameters or to cause various actions. AT command transfer properties are defined as follows:

- Only one command must be outstanding at any time. Therefore the host must wait for the corresponding result code(s) after issuing a command.
- Commands and their parameters will be specified using printable ASCII characters only.
- Commands can be specified using upper case or lower case letters or a combination of both.
- All commands must be terminated with a single carriage return *<CR>* character. The *<CR>* character is defined as 0x0D in hexadecimal or '¥r'.
- There must be no space characters in a particular command structure unless specified otherwise.
- Commands must be no longer than 63 bytes, including any formatting characters.
- All command parameters must be specified.
- All numerical parameters must be specified in hexadecimal unless specified otherwise.
- Where more than one parameter must be specified, they will be separated by the comma character.

The following table shows the various forms of AT command available together with the syntax.

	Syntax	Hexadecimal
Parameter Type Command	AT+BSCD=522204<CR>	41 54 2B 42 53 43 44 3D 35 32 32 32 30 34 0D
Read Command	AT+BSCD?<CR>	41 54 2B 42 53 43 44 3F 0D
Action Command	AT+BACN=2<CR>	41 54 2B 42 41 43 6E 3D 32 0D

2.2 Information Responses and Result Codes

The Bluetooth module sends information responses and result codes to the host. Responses correspond to read commands issued by the host, for example, the *AT+BSCD?* command. Result codes are generally issued in response to a command but may also be unsolicited, for example, the *READY* result code. The transfer properties are defined as follows:

- Responses, result codes and their parameters will be specified using printable ASCII characters only.
- Responses and result codes will be defined using upper case characters only. Note that parameters may contain lower case letters.
- Responses and result codes are enclosed by a carriage return, line feed *<CR><LF>* pair of characters. The *<CR>* character is defined as 0x0D in hexadecimal or '¥r' and the *<LF>* character is defined as 0x0A or '¥n'.
- All numerical parameters will be specified in hexadecimal unless specified otherwise.
- Where more than one parameter must be specified, they will be separated by the comma character.

The following table shows the various forms of response and result codes available together with the syntax.

	Syntax	Hexadecimal
Result Code	<CR><LF>OK<CR><LF>	0D 0A 4F 4B 0D 0A
Unsolicited Result Code	<CR><LF>+BSCO:0<CR><LF>	0D 0A 2B 42 53 43 4F 3A 30 0D 0A
Information Response	<CR><LF>+BSCD:522204<CR><LF>	0D 0A 2B 42 53 43 44 3A 35 32 32 32 30 34 0D 0A

2.3 Data Types

Non-numeric parameters are specified as character strings. Where appropriate, numeric parameters are specified in either hexadecimal or decimal. The following data types are used for numeric parameters in both AT commands and result codes.

uint8	unsigned 8bit integer
int8	signed 8bit integer
uint16	unsigned 16bit integer
int16	signed 16bit integer
uint24	unsigned 24bit integer
int24	signed 24bit integer
uint32	unsigned 32bit integer
int32	signed 32bit integer
*uint8**	character array or string
nnn	character array parameter

3 AT Commands

3.1 Connection Management Commands

The following commands relate to establishing and releasing connections, issuing inquiries, checking the Bluetooth link condition and so on.

AT+BSLV

Puts the module into slave mode where it is connectable and discoverable.

Command	Possible Response(s)	Comments
AT+BSLV	OK	Success, discoverable and connectable state.
AT+BSLV	OK ERROR:10	Not in the idle state.

AT+BMST=<target>,<nap>,<uap>,<lap>

Put module into master mode. The target service is specified by the *<target>* parameter and the following parameters specify the remote device Bluetooth address that may be obtained by issuing an Inquiry beforehand. Note Dialup Networking cannot be specified as the target service due to the limitation of the GW.

Parameter	Type	Units	Default	Range	Description
target	uint8	-	-	0x00 ~ 0x05	The target service we try to connect 0x00 – Serial Port Profile 0x03 – Headset Profile 0x04 – Hands-Free Profile 0x05 – Object Push Profile
nap	uint16	-	-	0x0000 ~ 0xFFFF	Non-significant address part
uap	uint8	-	-	0x00 ~ 0xFF	Upper address part
lap	uint24	-	-	0x000000 ~ 0xFFFFFF	Lower address part

Command	Possible Response(s)	Comments
AT+BMST=0,2,C7,A10002	OK +BMSC:B,0 +BRFC:2,C7,A10002,0,0,0	Success, connected to the SPP service.
AT+BMST=1,2,C7,A10002	ERROR	target value is invalid.
AT+BMST=5,2,C7,A10002	OK ERROR:10	Not in the idle state.
AT+BMST=5,2,C7,A10002	OK ERROR:1B	The OPP service is not registered.

AT+BDIS

Disconnect the currently active service. Only one service can be active at any time, therefore the host has no need to specify the peer address or service. If there is an active SCO connection when this command is issued, it will also be disconnected.

Command	Possible Response(s)	Comments
AT+BDIS	OK +BRFC:0,0,0,FFFF,3,0	Success.
AT+BDIS	OK ERROR:17	No active connection.

AT+BACN=<packet>

Establish an SCO connection with the device we currently have an RFCOMM connection with. The *<packet>* parameter specifies the packet type to use for the connection attempt. It is not mandatory for Bluetooth devices to support all of the defined audio packet types. If the remote device does not support the specified packet type the connection will fail.

Parameter	Type	Units	Default	Range	Description
packet	uint8	-	-	0x01 ~ 0x03	The packet type on the SCO connection 0x01 – Use HV1 packets 0x02 – Use HV2 packets 0x03 – Use HV3 packets

Command	Possible Response(s)	Comments
AT+BACN=1	OK +BSCO:0	Success, established SCO connection using HV1 packets.
AT+BACN=4	ERROR	Packet value is out of range.
AT+BACN=2	OK ERROR:13	No active connection.

AT+BADS
Release the active SCO connection.

Command	Possible Response(s)	Comments
AT+BADS	OK +BSCO:3	Success, disconnected SCO connection.
AT+BADS	OK ERROR:16	No active SCO connection.

AT+BINQ=<cod>,<mask>,<num>,<length>
Perform an inquiry with the specified Class Of Device (COD) filter. The maximum number of responses is specified by *<num>*, the timeout is specified by *<length>* and the GIAC is used to perform a general inquiry. The Inquiry can be cancelled before it completes by posting the *AT+BCNL* command. The firmware must be in the idle state when this command is issued.

Parameter	Type	Units	Default	Range	Description
cod	uint24	-	-	0x000000 ~ 0xFFFFFF	Remote device's Class Of Device (COD)
mask	uint24	-	-	0x000000 ~ 0xFFFFFF	The mask of COD
num	uint8	-	-	0x01 ~ 0x0A	The number of responses
length	uint8	sec	-	0x02 ~ 0x3C	The total duration of the inquiry mode

Command	Possible Response(s)	Comments
AT+BINQ=20040C,FFFFF3,5,A	OK +BINQ:A,D9,51ED09,200404,HBH-60 +BINC:1	Discover headset or hands-free devices. (number of the responses = 5, the total duration of the inquiry = 10sec) Success, 1 headset device found.
AT+BINQ=100000,100000,8,F	OK +BINC:1	Discover Object Transfer capable devices. (number of the responses = 8, the total duration of the inquiry = 15sec) Success, but no devices found.
AT+BINQ=100000,100000,10,F	ERROR	num value is out of range.
AT+BINQ=100000,100000,8,F	OK ERROR:12	Not in the idle state.

AT+BRSI
Request for the RSSI of the currently active connection. This may be used in conjunction with the link quality value to determine the condition of the active connection from an RF point of view. The result is returned to the host using the *+BRSI* result code. To understand the RSSI value returned by the module, refer to *Ref[1].*

Command	Possible Response(s)	Comments
AT+BRSI	OK +BRSI:-2	Success, RSSI value is -2.
AT+BRSI	OK ERROR:17	No active connection.

AT+BQAL
Request for the link quality of the currently active connection. This may be used in conjunction with the RSSI value to determine the condition of the active connection from a RF point of view. The result is returned to the host using the *+BQAL* result code. To understand the link quality value returned by the module, refer to *Ref[1].*

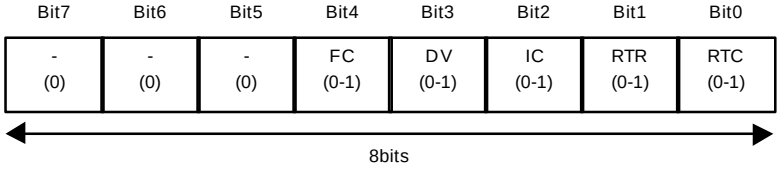
Command	Possible Response(s)	Comments
AT+BQAL	OK +BQAL:255	Success, link quality value is 255.
AT+BQAL	OK ERROR:17	No active connection.

AT+BMSC=<modem>,<break>

If no active RFCOMM connection exists, this command will configure the parameters for the initial Modem Status Command (MSC) sent to the remote device when an RFCOMM connection is established. If an RFCOMM connection exists when this command is posted, the firmware will generate the MSC according to the specified parameters and sent it to the remote device immediately. <*modem*> and <*break*> parameters of the initial MSC are both 0x00 by default.

Parameter	Type	Units	Default	Range	Description
modem	uint8	-	0x00	0x00 ~ 0x1F	Bitfield representing the V.24 control signals as follows: Bit 0 – RTC (Ready To Communicate) Bit 1 – RTR (Ready To Receive) Bit 2 – IC (Incoming Call) Bit 3 – DV (Data Valid) Bit 4 – FC (Flow Control) Bit 5-7 – Must be 0.
break	uint8	-	0x00	0x00 ~ 0xFF	Break signal as specified in GSM document TS 07.10.

To understand <*modem*> parameter in more detail, refer to the following figure.



Command	Possible Response(s)	Comments
AT+BMSC=B,0	OK	Success.
AT+BMSC=F0,0	ERROR	Modem value is out of range.

AT+BESM

Place the active connection into sniff mode. The sniff mode parameters must be set by the *AT+BSNP* command beforehand. To exit sniff mode, use the *AT+BXSM* command.

Command	Possible Response(s)	Comments
AT+BESM	OK +BCHM:2,100	Success, entered the sniff mode.
AT+BESM	OK ERROR:17	Not in the connected state.

AT+BXSM

Exit sniff mode. This command is only available when the module is in sniff mode. To enter sniff mode, use the *AT+BESM* command.

Command	Possible Response(s)	Comments
AT+BXSM	OK +BCHM:0, 0	Success, exited the sniff mode.
AT+BXSM	OK ERROR:17	Not in the connected state.

AT+BEHM

Place the active connection into hold mode. The hold mode parameters must be set by the *AT+BSHP* command beforehand. The firmware will automatically exit hold mode when the time interval expires.

Command	Possible Response(s)	Comments
AT+BEHM	OK +BCHM:1,100 +BCHM:0,0	Success, entered and exited the hold mode.
AT+BEHM	OK ERROR:17	Not in the connection state.

3.2 Security Commands

The following commands are related to security handling. This includes PIN code entry and link key management.

AT+BSEC=<mode>

Change the module's security mode setting. If authentication is enabled, all incoming and outgoing connections will require authentication at the link level using a PIN code or link key. Encryption can be enabled or disabled also. If authentication is disabled, the module will be in a non-secure security state but will support peer devices that have authentication enabled. When the module is powered up or reset, authentication and encryption will be disabled by default. Note that authentication and encryption are always enabled regardless of this setting when the dialup networking profile is used.

Parameter	Type	Units	Default	Range	Description
mode	uint8	-	0x00	0x00 ~ 0x02	Local device security mode 0x00 – disable authentication and encryption 0x01 – enable authentication, disable encryption 0x02 – enable authentication and encryption

The module's security settings can be read using the *AT+BSEC* command with a trailing question mark (?). The value will be returned to the host using the *+BSEC* result code.

Command	Possible Response(s)	Comments
AT+BSEC=1	OK	Success.
AT+BSEC=3	ERROR	mode value is out of range.
AT+BSEC?	OK +BSEC:0	Read current setting.

AT+BPIN=nnn

Specifies PIN code to use when pairing with a remote device. The PIN code *nnn* is an alphanumeric character sequence between 1byte and 16bytes in length. This command should be sent in response to a *+BPIN* result code that will be sent to the host when the PIN code is required. The host may reject the PIN code request by supplying a zero length PIN code as follows *AT+BPIN=*.

Parameter	Type	Units	Default	Range	Description
nnn	uint8*	ASCII	-	0 ~ 16 characters long	PIN code

Command	Possible Response(s)	Comments
AT+BPIN=1234	OK	Success, accepted PIN code request
AT+BPIN=	OK	Success, rejected PIN code request
AT+BPIN=12345678901234567890	ERROR	PIN code length is too long.
AT+BPIN=0000	OK ERROR:15	PIN code response is not required.

AT+BLNK=<key>

This command should be sent in response to a *+BLNK* result code, which indicates that a link key is required for authentication with a specific remote device. The required link key may have been supplied to the host using the *+BPRC* result code after a previous pairing session. The host should store this key in non-volatile memory to be used when it is needed. The link key *<key>* in the *AT+BLNK* command must be exactly the same as that specified in the *+BPRC* result code. Note that the link key is always 32 characters in length. The host may reject a link key request by supplying a zero length link key as follows *AT+BLNK=*. In this case it is likely that the firmware will immediately request a PIN code to be used for pairing and thus creation of a new link key.

Parameter	Type	Units	Default	Range	Description
key	uint8*	-	-	0 or 32 characters long	Link key

Command	Possible Response(s)	Comments
AT+BLNK=12345678901234567890123456789012	OK	Success, accepted link key request.
AT+BLNK=	OK	Success, rejected link key request.
AT+BLNK=1234	ERROR	Link key length is not suitable.
AT+BLNK=123456789ABCDEF0123456789ABCDEF0	OK ERROR:15	Link key response is not required.

AT+BSDA=<nap>,<uap>,<lap>,<key>

This command is used to register a peer device with the module's security database. When a device has been registered, the firmware will handle all requests for link keys for that device automatically i.e. the *+BLNK* result codewill not be sent to the host for that specific device. It is necessary for the host to register its trusted devices every time the module is powered up or is reset since the module itself does not store the peer devices and link keys in non-volatile memory. The link key <*key*> in the *AT+BLNK* command must be exactly the same as that specified in the *+BPRC* result code. Note that the link key is always 32 characters in length.

Parameter	Type	Units	Default	Range	Description
nap	uint16	-	-	0x0000 ~ 0xFFFF	Non-significant address part
uap	uint8	-	-	0x00 ~ 0xFF	Upper address part
lap	uint24	-	-	0x000000 ~ 0xFFFFFF	Lower address part
key	uint8[16]	-	-	32 characters long	Link key

Command	Possible Response(s)	Comments
AT+BSDA=2,C7,A10002,12345678901234567890123456789012	OK	Success.
AT+BSDA=2,C7,A10002,1234	ERROR	Link key is too short.
AT+BSDA=2,C7,A10002,12345678901234567890123456789012	OK ERROR:19	Security database error.

AT+BSDD=<nap>,<uap>,<lap>

This command is used to remove a registered peer device from the module's security database. All further link key requests concerning this peer device will be sent to the host.

Parameter	Type	Units	Default	Range	Description
nap	uint16	-	-	0x0000 ~ 0xFFFF	Non-significant address part
uap	uint8	-	-	0x00 ~ 0xFF	Upper address part
lap	uint24	-	-	0x000000 ~ 0xFFFFFF	Lower address part

Command	Possible Response(s)	Comments
AT+BSDD=2,C7,A10002	OK	Success.
AT+BSDD=2,C7,1FFFFFF	ERROR	Lap is out of range.
AT+BSDD=2,C7,A10002	OK ERROR:19	Security database error.

3.3 Headset & Hands-Free Common Commands

The following commands are applicable to both Headset and Hands-Free operation.

AT+BRNG=nnn

Send a single RING code to the peer headset or hands-free device. The *nnn* parameter specifies the phone number of the incoming call to be used when Caller Identification is supported and enabled. Note that Caller Identification is only applicable to the Hands-Free Profile. When the Headset service is connected, the number may be specified but it will never be sent to the peer device.

Parameter	Type	Units	Default	Range	Description
nnn	uint8*	ASCII	-	-	Phone number

Command	Possible Response(s)	Comments
AT+BRNG=	OK	Success, phone number is not specified
AT+BRNG=0244365111	OK	Success, phone number is 0244-36-5111.
AT+BRNG=	OK ERROR:15	No connection on the HSP or HFP service.

AT+BCUS=nnn

Send a custom AT Command to the peer device during a Headset or Hands-Free connection. The AT Command is specified by *nnn* and may contain any ASCII character except the Carriage Return (0x0D) and Line Feed (0x0A) characters.

Parameter	Type	Units	Default	Range	Description
nnn	uint8*	ASCII	-	-	Custom AT command

Command	Possible Response(s)	Comments
AT+BCUS=AT+BADD	OK	Success, custom command is *AT+BADD*.
AT+BCUS=AT+BDEL	OK ERROR:15	No connection on the HSP or HFP service.

AT+BVGS=<gain>

Send a remote speaker gain request to the peer headset or hands-free device. The *<gain>* parameter specifies the absolute gain and must be a value between 0x0 and 0xF. The request will be issued even if the requested gain is the same as the current gain.

Parameter	Type	Units	Default	Range	Description
gain	uint8	-	-	0x00 ~ 0x0F	Absolute speaker gain

Command	Possible Response(s)	Comments
AT+BVGS=8	OK	Success.
AT+BVGS=FF	ERROR	gain value is out of range.
AT+BVGS=2	OK ERROR:15	No connection on the HSP or HFP service.

AT+BVGM=<gain>

Send a remote microphone gain request to the peer headset or hands-free device. The *<gain>* parameter specifies the absolute gain and must be a value between 0x0 and 0xF. The request will be issued even if the requested gain is the same as the current gain.

Parameter	Type	Units	Default	Range	Description
gain	uint8	-	-	0x00 ~ 0x0F	Absolute microphone gain

Command	Possible Response(s)	Comments
AT+BVGM=8	OK	Success.
AT+BVGM=FF	ERROR	gain value is out of range.
AT+BVGM=2	OK ERROR:15	No connection on the HSP or HFP service.

3.4 Hands-Free Only Commands

The following commands are applicable to Hands-Free operation only.

AT+BSIR=<status>

Send an indication to the remote hands-free device to state that the in-band ring setting of the AG has been changed locally.

Parameter	Type	Units	Default	Range	Description
status	uint8	-	-	0x00 ~ 0x01	In-band ring setting 0x00 – In-band ring has been disabled 0x01 – In-band ring has been enabled

Command	Possible Response(s)	Comments
AT+BSIR=0	OK	Success.
AT+BSIR=2	ERROR	Status value is out of range.
AT+BSIR=1	OK ERROR:15	No connection on the HFP service.

AT+BVRA=<status>

Send an indication to the remote hands-free device to state that the voice recognition setting of the AG has been changed locally.

Parameter	Type	Units	Default	Range	Description
status	uint8	-	-	0x00 ~ 0x01	Voice recognition setting 0x00 – Voice recognition has been disabled 0x01 – Voice recognition has been enabled

Command	Possible Response(s)	Comments
AT+BVRA=0	OK	Success.
AT+BVRA=2	ERROR	Status value is out of range.
AT+BVRA=1	OK ERROR:15	No connection on the HFP service.

AT+BINP=nnn

Send a response to a data request from the remote hands-free device. Currently the only supported feature is a request for the phone number corresponding to the last voice tag recorded in the hands-free. The phone number is specified by the *nnn* parameter of this command.
A command with no number specified is assumed to be a rejection of the initial data request from the hands-free device. In this case the command will be *AT+BINP=* and the module will send an *ERROR* result code instead of the *+BINP* result code to the remote device.

Parameter	Type	Units	Default	Range	Description
nnn	uint8*	ASCII	-	-	Phone number

Command	Possible Response(s)	Comments
AT+BINP=0244365111	OK	Success, accept a data request.
AT+BINP=	OK	Success, reject a data request
AT+BINP=	OK ERROR:15	No connection on the HFP service.

AT+BCWN=nnn

Send a call waiting notification to the remote hands-free device. The phone number of the waiting call is specified by the *nnn* parameter of the command. The module assumes that the class of waiting call is voice (telephony).

Parameter	Type	Units	Default	Range	Description
nnn	uint8*	ASCII	-	-	Phone number

Command	Possible Response(s)	Comments
AT+BCWN=0244365111	OK	Success, phone number is specified.
AT+BCWN=0244365111	OK ERROR:15	No connection on the HFP service.

AT+BIES=<status>
Send an indication to the remote hands-free device to state that there has been a change in the registration status of the AG. The registration status is initially assumed to be 'service available' so it is the responsibility of the host to supply the correct value.

Parameter	Type	Units	Default	Range	Description
status	uint8	-	-	0x00 ~ 0x01	Registration status 0x00 – Service not available 0x01 – Service available

Command	Possible Response(s)	Comments
AT+BIES=0	OK	Success.
AT+BIES=2	ERROR	Status value is out of range.
AT+BIES=1	OK ERROR:15	No connection on the HFP service.

AT+BIEC=<status>
Send an indication to the remote hands-free device to state that there has been a change in the call status of the AG.

Parameter	Type	Units	Default	Range	Description
status	uint8	-	-	0x00 ~ 0x01	Call status 0x00 – No call present 0x01 – Call is active

The firmware will handle most of the cases where the call status **MUST** be sent to the remote hands-free device.

Command	Possible Response(s)	Comments
AT+BIEC=0	OK	Success.
AT+BIEC=2	ERROR	Status value is out of range.
AT+BIEC=1	OK ERROR:15	No connection on the HFP service.

AT+BIEP=<status>
Send an indication to the remote hands-free device to state that there has been a change in the call set up status of the AG.

Parameter	Type	Units	Default	Range	Description
status	uint8	-	-	0x00 ~ 0x03	Call set up status 0x00 – Not currently in call set up 0x01 – Incoming call process ongoing 0x02 – Outgoing call set up ongoing 0x03 – Remote party being alerted in an outgoing call

The module will handle most of the cases where the call status **MUST** be sent to the remote hands-free device.

Command	Possible Response(s)	Comments
AT+BIEP=1	OK	Success.
AT+BIEP=4	ERROR	Status value is out of range.
AT+BIEP=3	OK ERROR:15	No connection on the HFP service.

3.5 Bluetooth Miscellaneous Commands

The following commands are Bluetooth related but do not fall under any particular category.

AT+BCNL

Cancel the current operation. Possible operations include inquiry (*AT+BINQ* command), connection attempt (*AT+BMST* or *AT+BSLV* command). Note that it is not possible to cancel after the current operation has completed, for example, the connection attempt completed (*+BRFC*) or the inquiry completed (*+BINC*).

Command	Possible Response(s)	Comments
AT+BCNL	OK +BRFC:0,0,0,FFFF,2,0	Success, connection attempt is cancelled.
AT+BCNL	OK ERROR:18	Operation could not be cancelled.

AT+BNAM=<name>

Change the local name setting. Up to 31 characters may be used including non-alphanumeric characters. The name should not contain the ASCII carriage return character or the null character (0x00). As soon is this command is successfully parsed the new Local Name is stored in flash ROM to be used when the need arises.

Parameter	Type	Units	Default	Range	Description
name	uint8*	ASCII	"Alps AG"	0 ~ 31 characters long	Local name

Command	Possible Response(s)	Comments
AT+BNAM=AG01	OK	Success.
AT+BNAM=12345678901234567890123456789012	ERROR	Local name length too long.
AT+BNAM=AG02	OK ERROR:1C	The PS utilization in flash ROM has reached 95% and the change cannot take place.

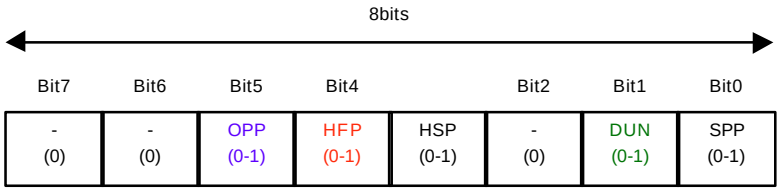
AT+BRSR=<service>,<attribute>

Used to register service records and their related service attributes with the module's Service Discovery Database. Services that have been registered will be visible to all peer devices supporting a Service Discovery Client. The services are specified by the *<service>* parameter and the attributes are specified by the *<attribute>* parameter. Attributes relating to a service that has not been selected for registration will be ignored. Note that this command needs to be sent only once after reset, either due to a power cycle or a soft reset using the *AT+BRST* command. Similarly, all settings will be lost after reset.

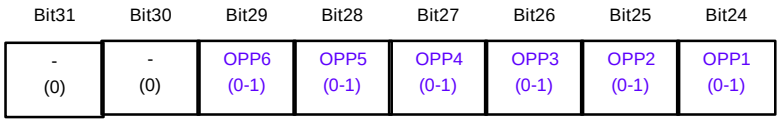
Parameter	Type	Units	Default	Range	Description
service	uint8	-	-	0x01 ~ 0x3B	Bitfield representing the services as follows: Bit 0 – Serial Port Profile Bit 1 – Dialup Networking Profile Bit 3 – Headset Profile Bit 4 – Hands-Free Profile Bit 5 – Object Push Profile Bit 2,6-7 – Must be 0. Note: At least one of the bit 0,1, 3-5 must be 1.
attribute	uint32	-	-	0x00000000 ~ 0x3F3F0001	Bitfield representing the attributes as follows: Bit 0 – Audio Feedback Support (DUN) Bit 1-15 – Must be 0. Bit 16 – Supported Features: Three-way calling (HFP) Bit 17 – Supported Features: EC and/or NR function (HFP) Bit 18 – Supported Features: Voice recognition function (HFP) Bit 19 – Supported Features: In-band ring tone capability (HFP) Bit 20 – Supported Features: Attach a phone number to voice tag (HFP) Bit 21 – Network: Ability to reject a call (HFP) Bit 22-23 – Must be 0. Bit 24 – Supported Formats Lists: vCard 2.1 (OPP) Bit 25 – Supported Formats Lists: vCard 3.0 (OPP) Bit 26 – Supported Formats Lists: vCal 1.0 (OPP) Bit 27 – Supported Formats Lists: iCal 2.0 (OPP) Bit 28 – Supported Formats Lists: vNote (OPP) Bit 29 – Supported Formats Lists: vMessage (OPP) Bit 30-31 – Must be 0. Note1: Bit 0 must be 0 if DUN is not registered. Note2: Bit 16-21 must be 0 if HFP is not registered. Note3: Bit 24-29 must be 0 if OPP is not registered. Note4: At least one of the bit 24-25 must be 1 if OPP is registered.

To understand the <*service*> and <*attribute*> parameters in more detail, refer to the following figures.

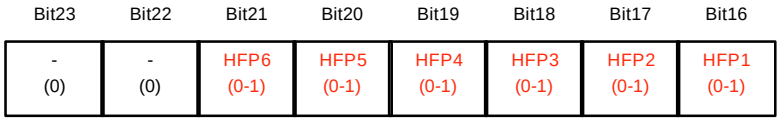
<service>



<attribute>



[OPP1] Supported Formats List: vCard 2.1
[OPP2] Supported Formats List: vCard 3.0
[OPP3] Supported Formats List: vCal 1.0
[OPP4] Supported Formats List: iCal 2.0
[OPP5] Supported Formats List: vNote
[OPP6] Supported Formats List: vMessage



[HFP1] Supported Features: Three-way calling
[HFP2] Supported Features: EC and/or NR function
[HFP3] Supported Features: Voice recognition function
[HFP4] Supported Features: In-band ring tone capability
[HFP5] Supported Features: Attach a phone number to voice tag
[HFP6] Network: Ability to reject a call

[DUN1] Audio Feedback Support

Command	Possible Response(s)	Comments
AT+BRSR=3B,3F3F0001	OK +BRSR	Success, full services and attributes support.
AT+BRSR=20,11000000	OK +BRSR	Success, the OPP service support. (Supported Formats List are vCard 2.1 and vNote)
AT+BRSR=1,20	ERROR	attributes value is invalid.
AT+BRSR=1,0	OK ERROR:1A	The services have been registered already.

AT+BSSP=<is_int>,<is_win>,<ps_int>,<ps_win>

Configure the module's scanning parameters. This single command is used to configure both the page scan and inquiry scan parameters. All parameters are specified in Bluetooth baseband slots, where one slot is 0.625ms. The interval must be greater than or equal to the window value in each case. Setting both the interval AND window to zero will disable scanning. The values written are lost when the module is reset or the power is cycled.

Parameter	Type	Units	Default	Range	Description
is_int	uint16	slots	0x0800	0x0012 ~ 0x1000	Inquiry scan interval
is_win	uint16	slots	0x0012	0x0012 ~ 0x1000	Inquiry scan window
ps_int	uint16	slots	0x0400	0x0012 ~ 0x1000	Page scan interval
ps_win	uint16	slots	0x0050	0x0012 ~ 0x1000	Page scan window

The module's current scanning parameters can be read using the *AT+BSSP* command with a trailing question mark (?). The current scan parameters will be returned to the host using the *+BSSP* result code.

Command	Possible Response(s)	Comments
AT+BSSP=0,0,1000,12	OK	Success, inquiry scan disabled, page scan set.
AT+BSSP=0,0,12,1000	ERROR	ps_win is greater than ps_int.
AT+BSSP?	OK +BSSP:800,12,400,50	Read current settings.

AT+BSNP=<max_int>,<min_int>, <att>,<to>

Configure the module's sniff mode parameters. The interval parameters are specified in Bluetooth baseband slots and the attempt and timeout parameters are specified in Bluetooth baseband receive slots. One baseband slot is defined as 0.625ms. The maximum interval must be greater than or equal to the minimum interval. The values written are lost when the module is reset or the power is cycled.

Parameter	Type	Units	Default	Range	Description
max_int	uint16	slots	0x0100	0x0001 ~ 0xFFFF	Maximum sniff interval
min_int	uint16	slots	0x0100	0x0001 ~ 0xFFFF	Minimum sniff interval
att	uint16	slots	0x0008	0x0001 ~ 0x7FFF	Sniff attempt
to	uint16	slots	0x0008	0x0000 ~ 0x7FFF	Sniff timeout

The module's sniff mode parameters can be read using the *AT+BSNP* command with a trailing question mark (?). The sniff parameters will be returned to the host using the *+BSNP* result code.

Command	Possible Response(s)	Comments
AT+BSNP=160,160,8,8	OK	Success.
AT+BSNP=160,160,0,0	ERROR	att value is out of range.
AT+BSNP?	OK +BSNP:100,100,8,8	Read current settings.

AT+BSHP=<max_int>,<min_int>

Configure the module's hold mode parameters. The interval parameters are specified in Bluetooth baseband slots. One baseband slot is defined as 0.625ms. The maximum interval must be greater than or equal to the minimum interval. The values written are lost when the module is reset or the power is cycled.

Parameter	Type	Units	Default	Range	Description
max_int	uint16	slots	0x0100	0x0001 ~ 0xFFFF	Maximum hold interval
min_int	uint16	slots	0x0100	0x0001 ~ 0xFFFF	Minimum hold interval

The module's hold mode parameters can be read using the *AT+BSHP* command with a trailing question mark (?). The hold parameters will be returned to the host using the *+BSHP* result code.

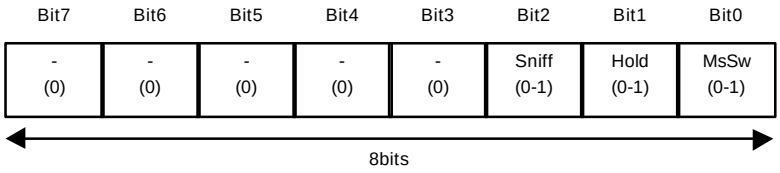
Command	Possible Response(s)	Comments
AT+BSHP=160,160	OK	Success.
AT+BSHP=160,320	ERROR	min_int is greater than max_int.
AT+BSHP?	OK +BSHP:100,100	Read current settings.

AT+BWLP=<policy>

Configure the module's default link policy settings. This command should be used before connecting to the peer device. The link policies are all disabled by default when the module is reset or the power is cycled.

Parameter	Type	Units	Default	Range	Description
policy	uint8	-	0x00	0x00 ~ 0x07	Bitfield representing the link policy as follows: Bit 0 – Enable Master/Slave switch Bit 1 – Enable Hold Mode Bit 2 – Enable Sniff Mode Bit 3-7 – Must be 0.

To understand the *<policy>* parameter in more detail, refer to the following figure.



The current setting can be read using the *AT+BWLP* command with a trailing question mark (?). The value will be returned to the host using the *+BWLP* result code.

Command	Possible Response(s)	Comments
AT+BWLP=6	OK	Success, enabled the hold and sniff mode.
AT+BWLP=8	ERROR	policy value is out of range.
AT+BWLP=2	OK ERROR:11	Active connection exists.
AT+BWLP?	OK +BWLP:0	Read current settings.

AT+BSCD=<cod>

Configure the module's local Class of Device. The appropriate Class of Device for the intended application may be determined from the Bluetooth Assigned Numbers document that is available at www.bluetooth.com. The value written is lost when the module is reset or the power is cycled.

Parameter	Type	Units	Default	Range	Description
cod	uint24	-	0x522204	0x000000 ~ 0xFFFFFF	Bluetooth class of device

The module's local Class of Device can be read using the *AT+BSCD* command with a trailing question mark (?). The value will be returned to the host using the *+BSCD* result code.

Command	Possible Response(s)	Comments
AT+BSCD=522204	OK	Success.
AT+BSCD=1FFFFFF	ERROR	cod value is out of range.
AT+BSCD?	OK +BSCD:522204	Read current setting.

AT+BMFS=<size>

Change the Maximum Frame Size (MFS) used by the module when RFCOMM connections are established. The MFS is one of the factors that influence the throughput of the Bluetooth connection. It is possible for the peer device to negotiate a smaller MFS when establishing the RFCOMM connection, however, the MFS will never be larger than the value specified here.

Parameter	Type	Units	Default	Range	Description
size	uint16	bytes	0x0140	0x002C ~ 0x02BC	RFCOMM Max Frame Size

The current setting can be read using the *AT+BMFS* command with a trailing question mark (?). The value will be returned to the host using the *+BMFS* result code.

Command	Possible Response(s)	Comments
AT+BMFS=64	OK	Success.
AT+BMFS=20	ERROR	size value is out of range.
AT+BMFS?	OK +BMFS:140	Read the current setting.

AT+BDUT

The firmware supports the Bluetooth test mode through the *AT+BDUT* command. When this command is issued the firmware will set the inquiry/page scan parameters to their Bluetooth defaults and then enable Device Under Test (DUT) mode. It is the responsibility of the external processor to issue the *AT+BSLV* command to make the module connectable and discoverable. It is intended that this command be used when connecting the module to a Bluetooth Tester (e.g. Rhode & Schwartz CMU200). Refer to *Ref[1]* for further details of the Bluetooth test mode.

Command	Possible Response(s)	Comments
AT+BDUT	OK	Success.

3.6 Miscellaneous Commands

The following commands do not fall under any other category.

AT+BRST

Reset the module. Note that the reboot time varies according to the state of the flash ROM contents and may take up to several seconds to complete. This is extended further if flash ROM defragmentation is has been determined necessary. All volatile configuration settings will be lost when the module is reset. There are no parameters for this command.

Command	Possible Response(s)	Comments
AT+BRST	OK +BINF:830,2,C7,A10001,Alps AG READY	Success.

AT+BECO=<mode>

Enables or disables echo of data received over the UART. Data will only be echoed if it is determined to be an AT Command. When the module is powered up or reset, echo will be disabled by default.

Parameter	Type	Units	Default	Range	Description
mode	uint8	-	0x00	0x00 ~ 0x01	UART echo mode. 0x00 – disable UART echo 0x01 – enable UART echo

The module's UART echo mode can be read using the *AT+BECO* command with a trailing question mark (?). The value will be returned to the host using the *+BECO* result code.

Command	Possible Response(s)	Comments
AT+BECO=1	OK	Success.
AT+BECO=2	ERROR	mode value is out of range.
AT+BECO?	OK +BECO:0	Read current setting.

AT+BEVT=<mode>

Masks result codes that are transmitted from the module over the UART to the host. When the module is powered up or reset, the result code mask is cleared, meaning that all result codes will be transmitted.

Parameter	Type	Units	Default	Range	Description
mode	uint8	-	0x01	0x00 ~ 0x02	Event mask settings. 0x00 – mask all result codes and UART echo data 0x01 – mask cleared, all result codes and UART echo data enabled 0x02 – mask *WARNING:<code>* result codes only

The module's event mask settings can be read using the *AT+BEVT* command with a trailing question mark (?). The value will be returned to the host using the *+BEVT* result code.

Command	Possible Response(s)	Comments
AT+BEVT=2	OK	Success.
AT+BEVT=3	ERROR	Mode value is out of range.
AT+BEVT?	OK +BEVT:1	Read current setting.

AT+BURT=<rate>,<stop>,<parity>

Configure the module UART driver. New settings can be chosen for each parameter as shown below or the original default settings can be maintained. The original settings cannot be read or written by the host, they are defined in *Ref[1]*. The settings will take effect after the module has parsed the command and issued the *OK* result code. The new settings are also stored in flash ROM and applied every time the module reboots. The *AT+BWSP* command has no effect on these UART settings.

The module contains a mechanism whereby the original default UART settings are restored given certain conditions. This feature allows the module to be recovered after incorrect UART settings have been issued for some reason. When the UART settings have been restored it will be indicated to the host using the *+BURT* result code at the recovered UART settings. Refer to *Ref[1]* for further details.

Parameter	Type	Units	Default	Range	Description
rate	uint16	-	0x0000	0x0000 ~ 0x0EBF	UART Baud rate 0x0000 – Default 0x00EC – 57600bps 0x01D8 – 115200bps 0x03B0 – 230400bps 0x075F – 460800bps 0x0EBF – 921600bps *rate = (BaudRate * 0.004096) + 0.499* *% Error = ((rate * 1000) / 4.096) - BaudRate) / BaudRate) * 100*
stop	uint8	-	0x02	0x00 ~ 0x02	Stop bits 0x00 – 1 stop bit 0x01 – 2 stop bits 0x02 – default
parity	uint8	-	0x03	0x00 ~ 0x03	Parity type 0x00 – none 0x01 – odd 0x02 – even 0x03 - default

There is no command to read the current UART settings because if communication is possible it must mean that the host has prior knowledge of the correct settings.

Command	Possible Response(s)	Comments
AT+BURT=0,2,3	OK	Restore all original settings.
AT+BURT=75F,2,3	OK	New rate is 460.8kbps with original stop bits and parity.
AT+BURT=1d8,0,0	OK	New rate 115.2kbps, 1 stop bit and no parity.
AT+BURT=0,2,4	ERROR	parity value is out of range.

AT+BURI=<time>

Change the UART recovery timer value. When the module is powered up or is reset it starts a timer that is used to restore the original UART settings. When this timer expires, the default UART settings are restored immediately and hence the UART is in a known state where communication is guaranteed. If the module receives any data over the UART before the timer expires, the UART recovery feature is cancelled and operation continues as normal. The feature can be disabled by setting the timer value to zero, however, this must only be used when it is certain that the custom UART settings are correct.

Parameter	Type	Units	Default	Range	Description
time	uint16	s	0x000A	0x0001 ~ 0x012C	UART recovery timeout

The current setting can be read using the *AT+BURI* command with a trailing question mark (?). The value will be returned to the host using the *+BURI* result code.

Command	Possible Response(s)	Comments
AT+BURI=3C	OK	Success, new timer value is 1min
AT+BURI=0	OK	Success, feature is disabled
AT+BURI=200	ERROR	time value is out of range
AT+BURI?	OK +BURI:3C	Read current setting

AT+BTUN=<tune>

Change the UART tuning value. The module UART can be tuned for either throughput or latency depending on the demands of the application. The new value will be lost when the module is reset.

Parameter	Type	Units	Default	Range	Description
tune	uint8	-	0x00	0x00 ~ 0x01	UART tune 0x00 – tune for throughput 0x01 – tune for latency

The current setting can be read using the *AT+BTUN* command with a trailing question mark (?). The value will be returned to the host using the *+BTUN* result code.

Command	Possible Response(s)	Comments
AT+BTUN=1	OK	Success.
AT+BTUN=2	ERROR	tune value is out of range.
AT+BTUN?	OK +BTUN:0	Read the current setting.

AT+BDFG

Force the module to perform flash ROM defragmentation. As changes are made to the flash ROM in the module it gradually fills up and at the same time the module boot time may also increase. When the flash ROM reaches 70% the module sets an internal flag to indicate that the flash ROM should be defragmented when it next boots up. This command can be used to force the module to defragment the flash ROM at any time. In order to complete the defragment process the module will automatically reboot. When the defragmentation process has completed the *+BINF* and *READY* result code will be sent to the host.
The module power must remain constant and should be reset until the defragment process has fully completed.

The current utilization of the flash ROM can be read using the *AT+BDFG* command with a trailing question mark (?). The value will be returned to the host using the *+BDFG* result code.

Command	Possible Response(s)	Comments
AT+BDFG	OK +BINF:830,2,C7,A10001,AG01 READY	Success.
AT+BDFG?	OK +BDFG:45	Read the current utilization.

4 Information Responses and Result Codes

4.1 General Result Codes

The following are general result codes relating to the processing of AT Commands from the host etc.

OK

Previous command has been received and was parsed correctly.

ERROR

Previous command has been received but could not be parsed correctly and the command contents have been discarded.

ERROR:<code>

This result code indicates that an error has occurred within the firmware that normally requires handling by the host. All *ERROR:<code>* result codes may be masked away using the *AT+BEVT* command. Note that *ERROR* result codes indicating invalid AT commands are not be masked away.

The error code parameter *<code>* is specified in hexadecimal and is guaranteed to be 2 bytes in length, represented by 2 characters. Refer to the "Error Codes" section of this document for a list of possible error codes, their meanings and possible handling action.

Parameter	Type	Units	Default	Range	Description
Code	uint8	-	-	0x10 ~ 0x1B	System error code

Example *ERROR:10* Connection request when not in the idle state

WARNING:<code>

This result code indicates that a warning state exists within the module, which the host should be aware of, because it may require handling by the host. All *WARNING* result codes may be masked away using the *AT+BEVT* command.

The warning code parameter *<code>* is specified in hexadecimal and is guaranteed to be 2 bytes in length, represented by 2 characters. Refer to the "Warning Codes" section of this document for a list of possible warning codes, their meanings and possible handling action.

Parameter	Type	Units	Default	Range	Description
code	uint8	-	-	0x80 ~ 0x87	System warning code

Example: *WARNING:80* Cancel request when in the idle state i.e. nothing to cancel

READY

This is an unsolicited result code indicating that the module has initialised and is ready to receive AT commands. This also implies that the module has reboot.

4.2 Connection Result Responses and Result Codes

The following responses and result codes relate to establishing and releasing connections, inquiry results, checking the Bluetooth link condition and so on.

+BRFC: <nap>,<uap>,<lap>,<service>,<status>,<attribute>

The status of the RFCOMM connection has changed. The address specified by <*nap*>, <*uap*> and <*lap*> parameters is that of the peer device or will be zero in the case of disconnection. The current status is given by the <*status*> parameter. The service attributes of the peer device are specified on each service when the current status is "Connect complete" and the service is Headset Profile, Hands-Free Profile, and Object Push Profile.

Parameter	Type	Units	Default	Range	Description
nap	uint16	-	-	0x0000 ~ 0xFFFF	Non-significant address part
uap	uint8	-	-	0x00 ~ 0xFF	Upper address part
lap	uint24	-	-	0x000000 ~ 0xFFFFFF	Lower address part
service	uint16	-	-	0x0000 ~ 0xFFFF	Related service 0x0000 – Serial Port Profile 0x0001 – Dialup Networking Profile 0x0003 – Headset Profile 0x0004 – Hands-Free Profile 0x0005 – Object Push Profile 0xFFFF – Currently active service
status	uint16	-	-	0x0000 ~ 0x0006	Status of the RFCOMM connection 0x00 – Connect complete. 0x01 – Connect timeout. 0x02 – Connect cancelled. 0x03 – Disconnect. 0x04 – Connect failure. 0x05 – Abnormal disconnect. 0x06 – Service not supported.
attribute	uint8	-	-	0x00 ~ 0x3F	Bit field representing the attributes as follows: [Case of Serial Port Profile] Bit 0-7 – Always 0. [Case of Dialup Networking Profile] Bit 0-7 – Always 0. [Case of Headset Profile] Bit 0 – Remote Audio Volume Control Bit 1-7 – Always 0 [Case of Hands-Free Profile] Bit 0 – Supported Features: EC and/or NR function Bit 1 – Supported Features: Call waiting and three way calling Bit 2 – Supported Features: CLI presentation capability Bit 3 – Supported Features: Voice recognition Bit 4 – Supported Features: Remote volume control Bit 5-7 – Always 0 [Case of Object Push Profile] Bit 0 – Supported Formats List: vCard 2.1 Bit 1 – Supported Formats List: vCard 3.0 Bit 2 – Supported Formats List: vCal 1.0 Bit 3 – Supported Formats List: iCal 2.0 Bit 4 – Supported Formats List: vNote Bit 5 – Supported Formats List: vMessage Bit 6-7 – Always 0.

+BSCO:<status>

The status of the SCO connection has changed. The current status is given by the <*status*> parameter.

Parameter	Type	Units	Default	Range	Description
status	uint16	-	-	0x0000 ~ 0x0005	Status of the SCO connection 0x00 – Connect complete. 0x01 – Connect timeout. 0x02 – Connect cancelled. 0x03 – Disconnect 0x04 – Connect failure 0x05 – Abnormal disconnect

+BINQ:<nap>,<uap>,<lap>,<cod>,<name>
Inquiry result containing the peer address, its Class Of Device and its local name if available. If the local name is not available "Name not found" will be sent instead of the actual name parameter. Note that only the first 20 characters of the remote device name are sent.

Parameter	Type	Units	Default	Range	Description
nap	uint16	-	-	0x0000 ~ 0xFFFF	Non-significant address part
uap	uint8	-	-	0x00 ~ 0xFF	Upper address part
lap	uint24	-	-	0x000000 ~ 0xFFFFFF	Lower address part
cod	uint24	-	-	0x000000 ~ 0xFFFFFF	Remote device's Class Of Device (COD)
name	uint8*	ASCII	-	1 ~ 20 characters long	Remote device name

+BINC:<result>
Inquiry has completed. The reason for completion is given by the *<result>* parameter.

Parameter	Type	Units	Default	Range	Description
result	uint8	-	-	0x00 ~ 0x03	Inquiry result 0x00 – Inquiry error. 0x01 – Inquiry completed due to timeout. 0x02 – Inquiry cancelled by user. 0x03 – Inquiry completed because max number of responses reached.

+BRSI:<rssi>
Indicates the RSSI value for the currently active connection. Returned when the host posts a *AT+BRSI* command. Refer to *Ref[1]* for detailed information on the return value's meaning.

Parameter	Type	Units	Default	Range	Description
rssi	int8	-	-	-128 ~ +127	RSSI of the current active connection. Value returned is in **decimal**.

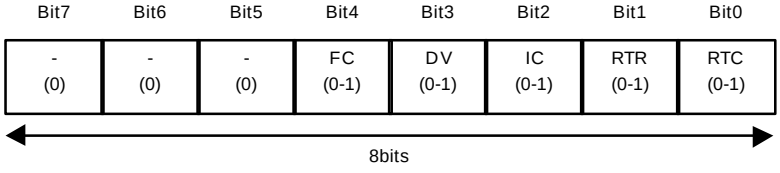
+BQAL:<quality>
Indicates the link quality value for the currently active connection. Returned when the host posts a *AT+BQAL* command. Refer to *Ref[1]* for detailed information on the return value's meaning.

Parameter	Type	Units	Default	Range	Description
quality	uint8	-	-	0 ~ +255	Link quality of the current active connection. Value returned is in **decimal**.

+BMSC:<modem>,<break>
Indicates that a Modem Status Command (MSC) was received over RFCOMM from the peer device. Note that there is no requirement for the host to respond to the MSC indication because it is handled internally.

Parameter	Type	Units	Default	Range	Description
modem	uint8	-	-	0x00 ~ 0x1F	Bitfield representing the V.24 control signals in hexadecimal format as follows: Bit 0 – RTC (Ready To Communicate) Bit 1 – RTR (Ready To Receive) Bit 2 – IC (Incoming Call) Bit 3 – DV (Data Valid) Bit 4 – FC (Flow Control) Bit 5-7 – Always 0.
break	uint8	-	-	0x00 ~ 0xFF	Break signal as specified in GSM document TS 07.10.

To understand the *<modem>* parameter in more detail, refer to the following figure.



+BCHM:<mode>,<interval>
Indicates that the module's low power mode is changed. New low power mode is specified by *<mode>* and *<interval>* specifies the actual interval used for the low power mode.

Parameter	Type	Units	Default	Range	Description
mode	uint8	-	-	0x00 ~ 0x02	Low power mode 0x00 – Active Mode 0x01 – Hold Mode 0x02 – Sniff Mode
interval	uint16	slots	-	0x0000 ~ 0xFFFF	[Case of Active Mode] Always 0. [Case of Hold or Active Mode] The interval of each low power mode.

4.3 Security Result Responses and Result Codes

The following result responses and result codes are security related. This includes pairing results, PIN code requests, link key requests and security database operation results.

+BSEC:<mode>
Response to a module authentication setting read request from the host using the *AT+BSEC?* command.

Parameter	Type	Units	Default	Range	Description
mode	uint8	-	0x00	0x00 ~ 0x02	Local device security mode 0x00 – disable authentication and encryption 0x01 – enable authentication, disable encryption 0x02 – enable authentication and encryption

+BPIN:<nap>,<uap>,<lap>
Request to host for a PIN code to be used for pairing with the peer device specified by the Bluetooth address. The host must respond with the *AT+BPIN* command.

Parameter	Type	Units	Default	Range	Description
nap	uint16	-	-	0x0000 ~ 0xFFFF	Non-significant address part
uap	uint8	-	-	0x00 ~ 0xFF	Upper address part
lap	uint24	-	-	0x000000 ~ 0xFFFFFF	Lower address part

+BPRC:<nap>,<uap>,<lap>,<key>
Pairing attempt has completed.

Parameter	Type	Units	Default	Range	Description
nap	uint16	-	-	0x0000 ~ 0xFFFF	Non-significant address part
uap	uint8	-	-	0x00 ~ 0xFF	Upper address part
lap	uint24	-	-	0x000000 ~ 0xFFFFFF	Lower address part
key	uint8[16]	-	-	32 characters long	Link key

+BLNK: <nap>,<uap>,<lap>
Link key request for authentication with the peer device identified by the specified address parts. The host must respond with the *AT+BLNK* command.

Parameter	Type	Units	Default	Range	Description
nap	uint16	-	-	0x0000 ~ 0xFFFF	Non-significant address part
uap	uint8	-	-	0x00 ~ 0xFF	Upper address part
lap	uint24	-	-	0x000000 ~ 0xFFFFFF	Lower address part

4.4 Headset & Hands-Free Common Result Codes

The following result codes are applicable to both Headset and Hands-Free operation.

+BVGS:<gain>
Indicates that the headset or hands-free speaker volume has changed either due to a local request or the remote device has changed it alone. The *<gain>* parameter specifies the absolute gain and is a value between 0x0 and 0xF.

Parameter	Type	Units	Default	Range	Description
gain	uint8	-	-	0x00 ~ 0x0F	Absolute speaker gain

+BVGM:<gain>
Indicates that the headset or hands-free microphone gain has changed either due to a local request or the remote device has changed it alone. The <*gain*> parameter specifies the absolute gain and is a value between 0x0 and 0xF.

Parameter	Type	Units	Default	Range	Description
gain	uint8	-	-	0x00 ~ 0x0F	Absolute microphone gain

+BCUS:nnn
Indicates that the module has received data over RFCOMM during a Headset or Hands-Free connection that could not be processed by the internal AT parser. The received data is specified by *nnn,* which may or may not be printable ASCII characters.

Parameter	Type	Units	Default	Range	Description
nnn	uint8*	ASCII	-	-	Custom AT command from remote device

4.5 Headset Only Result Codes
The following result codes are applicable to Headset operation only.

+BBUT
Indicates that a button press has been received from the peer Headset device. This may be used to distinguish between audio transfer and call termination.

4.6 Hands-Free Only Result Codes
The following result codes are applicable to Hands-Free operation only.

+BDAL: <type>,nnn
Dial request has been received from the remote hands-free device. *nnn* specifies the phone number or the memory location depending on the dial type. If the dial type is re-dial, no number will be specified.

Parameter	Type	Units	Default	Range	Description
type	uint8	-	-	0x00 ~ 0x02	Dial type 0x00 – Last number re-dial 0x01 – Dial number 0x02 – Dial memory location
nnn	uint8*	ASCII	-	-	Data depending on the dial type [Case of Last number re-dial] No number specified [Case of Dial number] Specified the phone number [Case of Dial memory location] Specified the memory location number

+BCAL:<accept>
Indicates the peer hands-free device's response to an incoming call or a terminated call.

Parameter	Type	Units	Default	Range	Description
accept	uint8	-	-	0x00 ~ 0x01	Response to a call 0x00 – Call rejected or terminated 0x01 – Call accepted

+BVTS:<dtmf>
Indicates that the module has received a DTMF request from the remote hands-free device. The <*dtmf*> parameter is specified as a character.

Parameter	Type	Units	Default	Range	Description
dtmf	uint8	ASCII	-	1 character long	Specifies the requested DTMF code

+BVRA:<vrec>
Indicates that the module has received a request from the remote hands-free device to enable or disable the voice recognition feature of the host.

Parameter	Type	Units	Default	Range	Description
vrec	uint8	-	-	0x00 ~ 0x01	Voice recognition status 0x00 – Disable voice recognition 0x01 – Enable voice recognition

+BNEC:<nrec>
Indicates that the module has received a request from the remote hands-free device to disable Noise Reduction and Echo Canceling functions.

Parameter	Type	Units	Default	Range	Description
nrec	uint8	-	-	0x00	Noise Reduction and Echo Canceling status 0x00 – Disable Noise Reduction and Echo Cancel

+BCID:<clip>
Indicates that the module has received a request from the remote hands-free device to enable or disable Caller Identification. The host may use this result code to decide whether to add a number to the *AT+BRNG* command.

Parameter	Type	Units	Default	Range	Description
clip	uint8	-	-	0x00 ~ 0x01	Caller Identification status 0x00 – Disable Caller Identification 0x01 – Enable Caller Identification

+BHLD:<hold>
Indicates that the module has received a Call Hold request from the remote hands-free device. The <*hold*> parameter is mapped directly to the <*n*> parameter in the *AT+CHLD* command received from the peer device. The Hands-Free Profile only supports values from 0 to 4, however the module will send the received parameter as-is using this result code.

Parameter	Type	Units	Default	Range	Description
hold	uint8	-	-	0x00 ~ 0x04	Call Hold status 0x00 – Releases all held calls or sets User Determined User Busy for a waiting call. 0x01 – Releases all active calls and accepts the held or waiting call. 0x02 – Places all active calls on hold and accepts the held or waiting call. 0x03 – Adds a held call to the conversation. 0x04 – Connects the two calls and disconnects the subscriber from both calls.

+BCWN:<status>
Indicates that the module has received a request from the remote hands-free device to enable or disable Call Waiting Notification.

Parameter	Type	Units	Default	Range	Description
status	uint8	-	-	0x00 ~ 0x01	Call Waiting Notification status 0x00 – Disable Call Waiting Notification 0x01 – Enable Call Waiting Notification

+BINP:<type>
Indicates that the module has received a request from the remote hands-free device for data of a type specified by the <*type*> parameter. Currently, only one type of data is specified which is the phone number corresponding to the last voice tag recorded in the hands-free. The host should respond with a *AT+BINP* command after receiving this result code.

Parameter	Type	Units	Default	Range	Description
type	uint8	-	-	0x01	The data type indication 0x01 – Phone number corresponding to last voice tag

+BIER:<status>
Indicates that the module has received an indicator reporting activation event from the remote hands-free device to disable or enable event reporting.

Parameter	Type	Units	Default	Range	Description
status	uint8	-	-	0x00 ~ 0x01	Indicator event reporting status 0x00 – Disable indicator event reporting 0x01 – Enable indicator event reporting

4.7 Bluetooth Miscellaneous Result Responses

The following result responses are Bluetooth related but do not fall under any particular category.

+BRSR

Indicates that the service record registration using the *AT+BRSR* command has completed successfully.

+BSSP:<is_int>,<is_win>,<ps_int>,<ps_win>

Response to a scan parameters read request from the host using the *AT+BSSP?* command.

Parameter	Type	Units	Default	Range	Description
is_int	uint16	slots	0x0800	0x0012 ~ 0x1000	Inquiry scan interval
is_win	uint16	slots	0x0012	0x0012 ~ 0x1000	Inquiry scan window
ps_int	uint16	slots	0x0400	0x0012 ~ 0x1000	Page scan interval
ps_win	uint16	slots	0x0050	0x0012 ~ 0x1000	Page scan window

+BSNP: <max_int>,<min_int>, <att>,<to>

Response to a sniff mode parameter read request from the host using the *AT+BSNP?* command.

Parameter	Type	Units	Default	Range	Description
max_int	uint16	slots	0x0100	0x0001 ~ 0xFFFF	Maximum sniff interval
min_int	uint16	slots	0x0100	0x0001 ~ 0xFFFF	Minimum sniff interval
att	uint16	slots	0x0008	0x0001 ~ 0x7FFF	Sniff attempt
to	uint16	slots	0x0008	0x0000 ~ 0x7FFF	Sniff timeout

+BSHP: <max_int>,<min_int>

Response to a hold mode parameter read request from the host using the *AT+BSHP?* command.

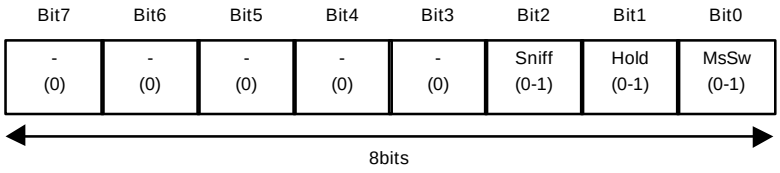
Parameter	Type	Units	Default	Range	Description
max_int	uint16	slots	0x0100	0x0001 ~ 0xFFFF	Maximum hold interval
min_int	uint16	slots	0x0100	0x0001 ~ 0xFFFF	Minimum hold interval

+BWLP:<policy>

Response to a default link policy settings read request from the host using the *AT+BWLP?* command.

Parameter	Type	Units	Default	Range	Description
policy	uint8	-	0x00	0x00 ~ 0x07	Bitfield representing the link policy as follows: Bit 0 – Enable Master/Slave switch Bit 1 – Enable Hold Mode Bit 2 – Enable Sniff Mode Bit 0,3-7 – Always 0.

To understand the *<policy>* parameter in more detail, refer to the following figure.



+BSCD:<cod>

Response to a Class of Device read request from the host using the *AT+BSCD?* command.

Parameter	Type	Units	Default	Range	Description
cod	uint24	-	0x522204	0x000000 ~ 0xFFFFFF	Bluetooth class of device.

+BMFS:<packet>

Response to the RFCOMM max frame size value read request from the host using the *AT+BMFS?* command.

Parameter	Type	Units	Default	Range	Description
size	uint16	bytes	0x02BC	0x002C ~ 0x02BC	RFCOMM Max Frame Size

4.8 Miscellaneous Result Responses and Result Codes

The following result responses and result codes do not fall under any other category.

+BINF:<version>,<nap>,<uap>,<lap>,<name>

Indicates the local Bluetooth address and the current local name. This code is sent after the module has powered up or reset. It also implies that the module has reboot for a particular reason.

Parameter	Type	Units	Default	Range	Description
version	uint16	-	-	0x0000 ~ 0xFFFF	Number indicating the application version. Most significant byte identifies the major version. Least significant byte identifies the minor version.
nap	uint16	-	-	0x0000 ~ 0xFFFF	Non-significant address part
uap	uint8	-	-	0x00 ~ 0xFF	Upper address part
lap	uint24	-	-	0x000000 ~ 0xFFFFFF	Lower address part
name	uint8*	ASCII	-	1 ~ 31 characters long	Local device name

+BURT:<rate>,<stop>,<parity>

Indicates that the module's UART configuration has undergone an unsolicited change. This occurs when the module restores its original UART configuration. Refer to *Ref[1]* for details of the recovery feature. Standard values for the *<rate>* parameter are defined below along with the formula for calculating non-standard values.

Parameter	Type	Units	Default	Range	Description
rate	uint16	-	0x0000	0x0000 ~ 0x0EBF	UART Baud rate 0x0000 – Default 0x00EC – 57600bps 0x01D8 – 115200bps 0x03B0 – 230400bps 0x075F – 460800bps 0x0EBF – 921600bps *rate = (BaudRate * 0.004096) + 0.499* *% Error = ((rate * 1000) / 4.096) - BaudRate) / BaudRate) * 100*
stop	uint8	-	0x02	0x00 ~ 0x02	Stop bits 0x00 – 1 stop bit 0x01 – 2 stop bits 0x02 – default
parity	uint8	-	0x03	0x00 ~ 0x03	Parity type 0x00 – none 0x01 – odd 0x02 – even 0x03 - default

+BURI:<time>

Response to a read request from the host for the UART recovery timer value, using the *AT+BURI?* command.

Parameter	Type	Units	Default	Range	Description
time	uint16	s	0x000A	0x0001 ~ 0x012C	UART recovery timeout

+BTUN:<tune>

Response to a read request from the host for the UART tune value, using the *AT+BTUN?* command.

Parameter	Type	Units	Default	Range	Description
tune	uint16	-	0x0000	0x0000 ~ 0x0001	UART tune 0x0000 – tune for throughput 0x0001 – tune for latency

+BDFG:<rate>

Response to a request to read the current Persistent Store (PS) utilization using the *AT+BDFG?* command. The return value may be used to determine the best time to force a PS defrag. Refer to *Ref[1]* for important details of PS and the defrag process.

Parameter	Type	Units	Default	Range	Description
rate	uint8	%	-	0 ~ 100	The current utilization of the flash ROM. Value returned is in **decimal**.

5 Error Codes

The possible parameter values of the *ERROR:<code>* are defined in this section. The parameter value is specified in hexadecimal and is guaranteed to be 2 bytes in length, represented by 2 characters. Error codes may take a value between 0x10 and 0x7F.

Error Code	0x10
Description	Connection attempt requested when the module is not in the idle state. The module could be performing another operation such as inquiring.
Liable Commands	AT+BMST, AT+BSLV
Handling	Cancel the current operation using the *AT+BCNL* command and then re-issue the connection request.

Error Code	0x11
Description	The requested operation cannot be processed because there is an active RFCOMM connection.
Liable Commands	AT+BWLP
Handling	Release the current RFCOMM connection using the *AT+BDIS* command and re-issue the request.

Error Code	0x12
Description	Inquiry request when the module is not in the idle state. The module could be performing another operation such as connecting.
Liable Commands	AT+BINQ
Handling	Cancel the current operation using the *AT+BCNL* command and then re-issue the inquiry request.

Error Code	0x13
Description	SCO connection requested when the module does not currently have an RFCOMM connection.
Liable Commands	AT+BACN
Handling	Establish an RFCOMM connection and then re-issue the SCO connection request.

Error Code	0x14
Description	SCO connection requested when the module already has an active SCO connection. There can only be one SCO connection at any time.
Liable Commands	AT+BACN
Handling	If SCO re-connection is desired, first disconnect the current SCO connection using the *AT+BADS* command and then re-issue the SCO connection request.

Error Code	0x15
Description	The requested operation was unexpected or is out of context. For instance, requesting a speaker volume change for the Headset when an SCO connection does not exist will trigger this error.
Liable Commands	AT+BPIN, AT+BLNK, AT+BRNG, AT+BCUS, AT+BVGS, AT+BVGM, AT+BSIR, AT+BVRA, AT+BINP, AT+BCWN, AT+BIES, AT+BIEC, AT+BIEP
Handling	Could indicate that the host program state and module program state have lost synchronization.

Error Code	0x16
Description	The requested function relies on an SCO connection, which does not currently exist.
Liable Commands	AT+BADS
Handling	If an SCO connection is desired set it up using the *AT+BACN* command.

Error Code	0x17
Description	The requested function relies on an RFCOMM connection, which does not currently exist.
Liable Commands	AT+BDIS, AT+BRSI, AT+BQAL, AT+BESM, AT+BXSM, AT+BEHM
Handling	If an RFCOMM connection is desired set it up using the *AT+BMST* or *AT+BSLV* commands.

Error Code	0x18
Description	The current module operation cannot be cancelled. For instance, issuing a cancel request when the module has an active RFCOMM connection or is in the idle state will trigger this error.
Liable Commands	AT+BCNL
Handling	If RFCOMM disconnection is desired, use the *AT+BDIS* command.

Error Code	0x19
Description	An access operation to the module security database has failed.
Liable Commands	AT+BSDA, AT+BSDD
Handling	Check parameters and re-try if desired.

Error Code	0x1A
Description	Service record registration has been requested when they already have registered.
Liable Commands	AT+BRSR
Handling	Service registration can only occur once per session.

Error Code	0x1B
Description	Connection attempt requested when the service records are not registered.
Liable Commands	AT+BMST
Handling	Use *AT+BMST* command after the service records are registered using *AT+BRSR* command.

Error Code	0x1C
Description	Writing to the PS attempt requested when the PS utilization has reached 95%.
Liable Commands	AT+BNAM
Handling	Reset the module so that defrag occurs and then re-issue the request.

Error Code	0x1D
Description	UART configuration requested when the UART recovery feature is disabled.
Liable Commands	AT+BURT
Handling	Enable the UART recovery timer using the *AT+BURI* command and then re-issue the request.

6 Warning Codes

The possible parameter values of the *WARNING:<code>* are defined in this section. The parameter value is specified in hexadecimal and is guaranteed to be 2 bytes in length, represented by 2 characters. Warning codes may take a value between 0x80 and 0xFF.

Warning Code	0x80
Description	Sniff mode is not enabled locally.
Liable Commands	AT+BESM
Handling	Ensure that sniff mode has been enabled, if desired, before making a connection attempt.

Warning Code	0x81
Description	Hold mode is not enabled locally.
Liable Commands	AT+BEHM
Handling	Ensure that hold mode has been enabled, if desired, before making a connection attempt.

Warning Code	0x82
Description	No low power modes have been enabled locally. This warning overrides both the 0x80 warning and the 0x81 warning in the event of both modes being disabled.
Liable Commands	None
Handling	Ensure that at least one power mode has been enabled, if desired, before making a connection attempt.

Warning Code	0x83
Description	Remote device does not support sniff mode or it is disabled.
Liable Commands	AT+BESM
Handling	Make preparations for alternative low power operation if required.

Warning Code	0x84
Description	Remote device does not support hold mode or it is disabled.
Liable Commands	AT+BEHM
Handling	Make preparations for alternative low power operation if required.

Warning Code	0x85
Description	Remote device's low power modes are disabled or are not supported.
Liable Commands	None
Handling	Make preparations for alternative low power operation if required.

Warning Code	0x86
Description	Low power mode has not changed.
Liable Commands	AT+BESM, AT+BXSM, AT+BEHM
Handling	Make preparations for alternative low power operation if required.

Warning Code	0x87
Description	The remote hands-free device has disabled Indicator Event Reporting, but the host is sending the indicator report.
Liable Commands	AT+BIES, AT+BIEC, AT+BIEP
Handling	Do not issue these liable commands if Indicator Event Reporting has been disabled.

7 Quick Reference List

The following is a complete list of the AT Commands and Result Responses/Codes.

7.1 AT Commands

Connection Management Commands	**Comment**
AT+BSLV	Connect as slave
AT+BMST	Connect as master (initiator)
AT+BDIS	Disconnect RFCOMM
AT+BACN	Audio connect
AT+BADS	Audio disconnect
AT+BINQ	Inquiry request
AT+BRSI	Read current RSSI
AT+BQAL	Read current link quality
AT+BMSC	Send Modem Status Command (MSC) or set the initial MSC parameters
AT+BESM	Enter the sniff mode
AT+BXSM	Exit the sniff mode
AT+BEHM	Enter the hold mode
Security Commands	
AT+BSEC	Set or read security mode
AT+BPIN	PIN code response
AT+BLNK	Link key response
AT+BSDA	Add device to security database
AT+BSDD	Delete device from security database
Headset & Hands-Free Common Commands	
AT+BRNG	Send RING code
AT+BCUS	Send custom AT Commands
AT+BVGS	Change remote speaker gain
AT+BVGM	Change remote microphone gain
Hands-Free Only Commands	
AT+BSIR	Change in-band ring setting
AT+BVRA	Change voice recognition setting
AT+BINP	Respond to data request for voice tag phone number
AT+BCWN	Send call waiting notification
AT+BIES	Change service status
AT+BIEC	Change call status
AT+BIEP	Change call set up status
Bluetooth Miscellaneous Commands	
AT+BCNL	Cancel current operation
AT+BNAM	Change local name
AT+BRSR	Register service records
AT+BSSP	Change or read scan parameters
AT+BSNP	Change or read sniff mode parameters
AT+BSHP	Change or read hold mode parameters
AT+BWLP	Change or read default link policy settings
AT+BSCD	Change or read Class of Device
AT+BMFS	Change or read the RFCOMM maximum frame size
AT+BDUT	Enable device under test mode
Miscellaneous Commands	
AT+BRST	Reset local device
AT+BECO	Change or read the UART echo mode
AT+BEVT	Change or read result code transmission state
AT+BURT	Configure UART settings
AT+BURI	Change or read the UART recover timer
AT+BTUN	Change or read the UART tuning method
AT+BDFG	Force the module to defragment the flash ROM or read the current utilization

7.2 Result Responses and Result Codes

General Result Codes	Comment
OK	AT Command was successfully parsed
ERROR	AT Command could not be parsed or system error if code is specified
WARNING	Indicate system warning
READY	Local device is ready to accept AT Commands
Connection Result Responses and Result Codes	
+BRFC	RFCOMM connection status
+BSCO	SCO connection status
+BINQ	Inquiry result
+BINC	Inquiry complete
+BRSI	Response to read RSSI request
+BQAL	Response to read link quality request
+BMSC	Modem Status Command indication
+BCHM	Change low power mode status indication
Security Result Responses and Result Codes	
+BSEC	Response to read security setting
+BPIN	PIN code request
+BPRC	Pairing complete
+BLNK	Link key request
Headset & Hands-Free Common Result Codes	
+BVGS	Speaker gain change indication
+BVGM	Microphone gain change indication
+BCUS	Custom AT Command indication
Headset Only Result Codes	
+BBUT	Button press indication
Hands-Free Result Codes	
+BDAL	Dial request
+BCAL	Call accept/reject indication
+BVTS	DTMF request
+BVRA	Enable or disable Voice Recognition
+BNEC	Disable Noise Reduction and Echo Canceling
+BCID	Enable or disable Caller Identification
+BHLD	Call hold handling
+BCWN	Enable or disable Call Waiting Notification
+BINP	Data request (voice tag phone number)
+BIER	Enable or disable Indicator Event Reporting
Bluetooth Miscellaneous Result Responses	
+BRSR	Service record registration status
+BSSP	Response to Inquiry/Page scan parameter read
+BSNP	Response to Sniff parameter read
+BSHP	Response to Hold parameter read
+BWLP	Response to default link policy settings read
+BSCD	Response to Bluetooth Class of Device read
+BMFS	Response to RFCOMM maximum frame size read
Miscellaneous Result Responses and Result Codes	
+BINF	Local device information
+BURT	UART configuration changed
+BURI	Response to UART recovery timer read
+BTUN	Response to UART tuning method read
+BDFG	Response to the current utilization of the flash ROM read

8 References

In the following references *xxx* is the firmware version and *yy* is the document version.

Ref[1] Alps_VCL_FRN_*xxx_yy*.pdf Firmware Release Note
Ref[2] Alps_VCL_USER_*xxx_yy*.pdf AG Users Guide

9 Document Change History

9.1 Alpha Versions

Version	Section	Details
Alpha4 1.2	All	Formatting changes for addition of Contents section.
Alpha5 1.0	Miscellaneous Commands	Added AT+BURT command description
Alpha5 1.0	Miscellaneous Result Codes	Added +BURT result code description
Alpha6 1.0	Headset & Hands-Free sections	Separated "Headset & Hands-Free" sections into "Headset & Hands-Free Common", "Hands-Free Only" and "Headset Only" sections.
Alpha6 1.0	Error Codes	Classification of error codes into "Error" and "Warning".
Alpha6 1.0	Error Codes	Error code values changed and descriptions elaborated.
Alpha7 1.0	Connection Management Commands	Added (Note1) and (Note2) to AT+BSLV command description.
Alpha7 1.0	Bluetooth Miscellaneous Commands	Added AT+BRSR, AT+BSSP, and AT+BSNP command descriptions.
Alpha7 1.0	Connection Result Codes	Added +BRFC result code description.
Alpha7 1.0	Bluetooth Miscellaneous Result Codes	Added +BRSR result code description.
Alpha7 1.0	Connection Management Commands	Added (Note1) and (Note2) to AT+BSLV command description.
Alpha7 1.0	Connection Management Commands	Corrected AT+BMSC syntax.
Alpha7 1.0	Miscellaneous Result Codes	Corrected +BURT syntax.
Alpha7 1.1	Bluetooth Miscellaneous Commands	Corrected AT+BSPP to AT+BSSP.
Alpha7 1.2	Connection Management Commands	Corrected AT+BSPP to AT+BSSP.
Alpha8 1.0	Connection Management Commands	Added (Note3) to AT+BSLV command description.
Alpha8 1.0	Connection Management Commands	Modified AT+BINQ syntax and description.
Alpha8 1.0	Connection Management Commands	Modified AT+BMSC command description.
Alpha8 1.0	Connection Management Commands	Added AT+BESM, AT+BXSM, and AT+BEHM command description.
Alpha8 1.0	Security Commands	Added AT+BSEC command description.
Alpha8 1.0	Security Commands	Removed AT+BPRM and AT+BPRS command description.
Alpha8 1.0	Bluetooth Miscellaneous Commands	Modified AT+BSNP command description.
Alpha8 1.0	Bluetooth Miscellaneous Commands	Added AT+BSHP, AT+BWLP, and AT+BDUT command description.
Alpha8 1.0	Miscellaneous Commands	Modified AT+BECO command default setting.
Alpha8 1.0	Connection Result Codes	Added +BCHM result code description.
Alpha8 1.0	Security Result Codes	Modified +BPRC result code description.
Alpha8 1.0	Error Codes	Modified Error code (0x12) meaning.
Alpha8 1.0	Error Codes	Added Error codes (0x1A and 0x1B) description.
Alpha8 1.0	Warning Codes	Modified Warning codes (0x81 and 0x84) meaning.
Alpha8 1.0	Warning Codes	Added Warning code (0x86) description.
Alpha8 1.1	Connection Management Commands	Corrected the examples of AT+BINQ command description.
Alpha8 1.1	Connection Management Commands	Modified AT+BEHM command description.
Alpha8 1.1	Security Result Codes	Corrected +BPRC syntax.
Alpha8 1.1	Miscellaneous Result Codes	Corrected +BURT result code description.

9.2 Beta Versions

Version	Section	Details
Beta1 1.0	Bluetooth Miscellaneous Commands	Modified AT+BWLP command description.
Beta1 1.1	Bluetooth Miscellaneous Commands	Modified AT+BSSP command description.
Beta1 1.1	Security Result Codes	Corrected +BPRC result code description.
Beta2 1.0	Connection Management Commands	Modified AT+BMST command description.
Beta2 1.0	Hands-Free Only Commands	Modified AT+BIEC command description.
Beta2 1.0	Hands-Free Only Commands	Added AT+BIEP command description.
Beta2 1.0	Bluetooth Miscellaneous Commands	Modified AT+BRSR command description.
Beta2 1.0	Connection Management Result Codes	Modified +BRFC result code description.
Beta2 1.0	Hands-Free Only Result Codes	Added +BIER result code description.
Beta2 1.0	Warning Codes	Added Warning Code (0x87) description.
Beta2 1.0	Warning Codes	Added description of liable commands to all warning codes.
Beta2 1.1	AT Commands	Wording slightly changed in rule list.
Beta2 1.1	Connection Management Commands	Added note in AT+BDIS description about active SCO connections when the command is issued.
Beta2 1.1	Connection Management Commands	Extended AT+BRSI and AT+BQAL descriptions.
Beta2 1.1	Connection Management Result Codes	Added references for +BRSI and +BQAL return value meanings in the associated FRN document.
Beta2 1.1	Connection Miscellaneous Result Codes	Corrected +BRSR description to indicate that the result code itself means successful completion.
Beta2 1.2	Connection Miscellaneous Result Codes	Modified AT+BSEC command description.
Beta3 1.0	All	Changed the format of the command / result code description.
Beta3 1.0	Bluetooth Miscellaneous Commands	Modified AT+BRSR command description to configure the Network service attribute for the Hands-Free Profile.
Beta3 1.0	Bluetooth Miscellaneous Commands	Modified AT+BWLP command description to enable the role switch.
Beta3 1.0	Bluetooth Miscellaneous Commands	Added AT+BSCD command description to change or read the local class of device parameter.
Beta3 1.0	Bluetooth Miscellaneous Commands	Added AT+BMFS command description to change or read the max frame size on a RFCOMM connection.
Beta3 1.0	Miscellaneous Commands	Added AT+BURI command description to change or read the UART recovery timeout value.
Beta3 1.0	Miscellaneous Commands	Added AT+BTUN command description to change or read tuning the UART for either the throughput or the latency.
Beta3 1.0	Miscellaneous Commands	Added AT+BDFG command description to force the module to defrag the flash ROM or read the current utilization of the flash ROM.
Beta3 1.0	Error Codes	Added Error codes (0x1C and 0x1D) description.
Beta3 1.0	Commands / Codes	Added AT+B***? command descriptions to read current parameters. In addition, added +B*** result code descriptions to indicate the current parameters.
Beta3 1.0	Security Commands	Changed link key references from *nnn* to *<key>* and the type from uint8* to uint[16] where appropriate.
Beta3 1.0	Security Commands	Corrected references to *+BLNK* with *+BPRC*.
Beta3 1.0	Error Codes	Corrected various descriptions.
Beta3 1.0	Warning Codes	Corrected various descriptions.
Beta3 1.0	Quick Reference List – AT Commands	Corrected *AT+BSLV* description.
Beta3 1.0	All	Expanded descriptions throughout document.
Beta3 1.0	All	References to “Result Codes” changed to “Information Responses and Result Codes”.

9.3 Official Versions

Version	Section	Details
Revision B3_10	All	First Relese