

User Guide – AT Command Specification

Aurawave AW100 Series

Version 1.0

Revision History

Version	Date	Notes	Contributors	Approver
1.0	7 Aug 2025	Initial release.	Dave Drogowski	Josh Toole Jonathan Kaye

Contents

1.	Introduction	4
1.1	Scope of the document	4
1.2	Conventions and abbreviations	4
2.	AT Command syntax	5
2.1	Set Operation <CMD>[=...]	5
2.2	Read Operation <CMD>?	6
2.3	Test Operation <CMD>=?	6
2.4	Execute Operation <CMD>	6
2.5	Responses	6
2.6	Entering successive AT commands	6
2.7	Supported character set	7
3.	General	8
3.1	Test command (AT)	8
3.2	Echo Mode enable (ATE1)	8
3.3	Echo Mode disable (ATE0)	9
3.4	Reboot (AT+REBOOT)	9
3.5	Version (AT+CGMR)	10
4.	Bluetooth interface	11
4.1	Device name (+BTDEVNAME)	11
5.	LE Audio Commands	12
5.1	Public broadcast source create (AT+PBSRCCREATE)	12
5.2	Public broadcast source delete (AT+PBSRCDEL)	12
5.3	Public broadcast source configure (AT+PBSRCCONF)	13
5.4	Public broadcast source start (AT+PBSRCSTART)	14
5.5	Public broadcast source state (AT+PBSRCSTATE)	14
5.6	Public broadcast source stop (AT+PBSRCSTOP)	16
5.7	Public broadcast sink demo (AT+PBSNKCDEMO)	16
6.	Audio system	17
6.1	Audio devices list (AT+AUDDEVLIST)	17
6.2	Audio device set (AT+AUDDEVSET)	17
7.	System configuration	18
7.1	Configuration save (AT+CONFSAVE)	18
7.2	Configuration defaults (AT+CONFDEF)	18
8.	Firmware update	19
8.1	Enter DFU Mode (AT+DFU)	19
9.	Supported Result Codes	20
9.1	Summary of CME ERROR Codes	20
9.2	Summary of Unsolicited Result Codes	20
	Additional Information	21

1. Introduction

This document applies to the following Aurawave software versions:

- 1.0

1.1 Scope of the document

This document presents the AT Command Set for the Cloud2GND Aurawave AW100 series module used to control and configure the device.

1.2 Conventions and abbreviations

In this document, the Aurawave module is referred to as any of the following:

- ME (Mobile Equipment)
- TA (Terminal Adapter)
- DCE (Data Communication Equipment).

A host device controls the Aurawave Module by sending AT Command via its serial interface. The AT command 'host' is referred to as any of the following:

- TE (Terminal Equipment)
- DTE (Data Terminal Equipment)
- Plainly "the application", running on the host embedded system

2. AT Command syntax

The "AT" prefix must be set at the beginning of each Command line. To terminate a Command line, enter <CR>.

Words enclosed in <angle brackets> are references to syntactical elements.

Words enclosed in [square brackets] represent optional items which may be left out from the command line at the specified point.

The brackets are not used when the words appear in the command line.

A string type parameter input should be enclosed between quotation marks ("").

The "AT" prefix is followed by the name of a command which itself is often prefixed by a "+" which indicates an 'extended' command. Though "+" is commonly prescribed for use with vendor specific commands "+" is often used by vendors instead, as is the case here.

The command name is followed by a character or set of characters that indicate which 'sub-operation' of the command should be performed. These operations are outlined in the following subsections.

2.1 Set Operation <CMD>[=...]

Set Operations, set values or perform actions.

Example:

```
AT+CMD=1
```

Where:

- **AT** is the command line prefix
- **+** is the prefix for commands
- **CMD** is the body of a basic command
- **=** specifies the 'Set' operation
- **1** is a parameter (multiple parameters are separated by commas)

2.2 Read Operation <CMD>?

Read Operations check the current values of parameters.

Example:

```
AT+CMD?
```

Where:

- **AT** is the command line prefix
- **+** is the prefix for commands
- **CMD** is the body of a basic command
- **?** specifies the read operation

2.3 Test Operation <CMD>=?

Test Operations test the existence of the command and provide information about the type of its parameters.

Example:

```
AT+CMD=?
```

Where:

- **AT** is the command line prefix
- **+** is the prefix for commands
- **CMD** is the body of a basic command
- **=?** **Specifies** the test operation, often used for determining parameter values

2.4 Execute Operation <CMD>

Execute Operations require no operator character and in the current Aurawave AT command specification do not support parameters.

Example:

```
AT+CMD
```

Where:

- **AT** is the command line prefix
- **+** is the prefix for commands
- **CMD** is the body of a basic command

2.5 Responses

AT responds to all commands with a final response.

The response is one of the following:

```
OK<CR><LF>
ERROR<CR><LF>
+CME ERROR: <cause value><CR><LF>
```

Some commands may also produce a varying number of information response lines before the final response. An information response can be received only when a command-specific response syntax is specified. An information response line usually starts with a prefix, which is the command entered:

```
+CMD: [...]<CR><LF>
```

2.6 Entering successive AT commands

When you need to enter a series of AT commands on separate lines, please note that you need to wait for the final response (for example OK, CME error) of the last AT Command you entered before you enter the next AT Command.

2.7 Supported character set

Only ASCII printable characters can be used for AT Command.

3. General

3.1 Test command (AT)

Test the interface.

AT Test the interface	
Test Operation	AT=?
	Response: OK
Execute Operation	AT
	Parameters:
	Response: OK

3.2 Echo Mode enable (ATE1)

Enable the interface echo mode.

ATE0 Enable the interface echo mode	
Test Operation	ATE1=?
	Response: OK
Execute Operation	ATE1
	Parameters:
	Response: OK

3.3 Echo Mode disable (ATE0)

Disable the interface echo mode.

ATE0 Disable the interface echo mode	
Test Operation	ATE0=?
	Parameters:
	Response: OK
Execute Operation	ATE0
	Parameters:
	Response: OK

3.4 Reboot (AT+REBOOT)

Soft reset of MCU, all current operations are dropped.

AT+REBOOT Soft reset of MCU, all current operations are dropped	
Test Operation	AT+REBOOT=?
	Parameters:
	Response: OK
Execute Operation	AT+REBOOT
	Parameters:
	Response:

3.5 Version (AT+CGMR)

Retrieves firmware version information.

AT+CGMR Retrieves firmware version information	
Test Operation	AT+CGMR=?
	Parameters:
	Response:
	OK
Execute Operation	AT+CGMR
	Parameters:
	Response:
	+CGMR: Application: "<nearest commit tag>-<number of commits ahead tag>-g<commit id>" [Controller: SoftDevice: Version <version as string> (<version as hex>), Revision <revision>]
	...
	OK

4. Bluetooth interface

4.1 Device name (+BTDEVNAME)

Set the Bluetooth device name characteristic.

AT+BTDEVNAME Set device name	
Test Operation	AT+BTDEVNAME =?
	Parameters:
	Response: +BTDEVNAME: <name> OK
Read Operation	AT+BTDEVNAME?
	Response: +BTDEVNAME: <name> OK
Set Operation	AT+BTDEVNAME=<name>
	Parameters: <name> Name string value (1-31 bytes)
	Response: OK If there is an error: +CME ERROR: <err>

5. LE Audio Commands

5.1 Public broadcast source create (AT+PBSRCCREATE)

Create an instance of public broadcast source profile role

AT+PBSRCCREATE Create instance	
Test Operation	AT+PBSRCCREATE=?
	Parameters:
	Response: OK
Execute Operation	AT+PBSRCCREATE
	Parameters:
	Response: +PBSRCCREATE: <PBSourceID> OK
	If there is an error: +CME ERROR: <err>

5.2 Public broadcast source delete (AT+PBSRCDEL)

Delete an instance of public broadcast source profile role

AT+PBSRCDEL Delete an instance	
Test Operation	AT+PBSRCDEL=?
	Parameters:
	Response: +PBSRCDEL: <(0)> OK
Set Operation	AT+PBSRCDEL=<PBSourceID>
	Parameters: <PBSourceID> Public broadcast source context ID.
	Response: OK
	If there is an error: +CME ERROR: <err>

5.3 Public broadcast source configure (AT+PBSRCCONF)

Configure a previously created instance of public broadcast source profile parameters.

NOTE: Broadcasts that have been started can no longer be re-configured, even after stopping them. They must be deleted and a new instance created.

AT+PBSRCCONF Configure parameters of a previously created public broadcast source role instance											
Test Operation	AT+PBSRCCONF=? Parameters: See Set Operation										
	Response: + PBSRCCONF: <(0-N) >,<ParamTag>,<ParamValue> OK										
Set Operation Set a PB source parameter	AT+PBSRCCONF=<PBSourceID>,<ParamTag>,<ParamValue> Parameters: <PBSourceID> Public broadcast source context ID. <ParamTag> Parameter tag.										
	<table><tr><th>Value</th><th>Description</th></tr><tr><td>"NAME"</td><td>Broadcast name</td></tr><tr><td>"PRESET"</td><td>LC3 codec preset</td></tr><tr><td>"CODE"</td><td>Broadcast Code Set to enable encrypted broadcast KNOWN ISSUE:Setting CODE to less than 4 characters factory defaults the system</td></tr></table>	Value	Description	"NAME"	Broadcast name	"PRESET"	LC3 codec preset	"CODE"	Broadcast Code Set to enable encrypted broadcast KNOWN ISSUE:Setting CODE to less than 4 characters factory defaults the system		
	Value	Description									
	"NAME"	Broadcast name									
	"PRESET"	LC3 codec preset									
	"CODE"	Broadcast Code Set to enable encrypted broadcast KNOWN ISSUE:Setting CODE to less than 4 characters factory defaults the system									
	<ParamValue> Parameter value.										
	"NAME" ASCII String (4-32 bytes)										
	"PRESET" tag possible values										
	<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>16 kHz Low latency</td></tr><tr><td>1</td><td>16 kHz High-reliability</td></tr><tr><td>2</td><td>48 kHz Low latency</td></tr><tr><td>3</td><td>48 kHz High-reliability</td></tr></table>	Value	Description	0	16 kHz Low latency	1	16 kHz High-reliability	2	48 kHz Low latency	3	48 kHz High-reliability
	Value	Description									
	0	16 kHz Low latency									
	1	16 kHz High-reliability									
	2	48 kHz Low latency									
	3	48 kHz High-reliability									
"CODE" ASCII String (4-16 bytes)											
Response: + PBSRCCONF: <PBSourceid >,<ParamTag>,<ParamValue> OK If there is an error:											

	+CME ERROR: <err>
Query via Set Operation Query a PB Source parameter	AT+PBSRCCONF=<PBSourceID>,<ParamTag>
	Parameters: See Set Operation
	Response: + PBSRCCONF: <id>,<ParamTag>,<ParamValue> OK If there is an error: +CME ERROR: <err>

5.4 Public broadcast source start (AT+PBSRCSTART)

Start LE audio broadcast for a public broadcast source instance

AT+PBSRCSTART Start broadcasting	
Test Operation	AT+PBSRCSTART=?
	Parameters:
	Response: +PBSRCSTART: <publicBroadcastSourceID> OK
Set Operation	AT+PBSRCSTART=<PBSourceID>
	Parameters:
	Response: OK If there is an error: +CME ERROR: <err>

5.5 Public broadcast source state (AT+PBSRCSTATE)

Retrieve state of specified instance of public broadcast source.

AT+PBSRCSTATE Retrieve state of instance	
Test Operation	AT+PBSRCSTATE=?
	Parameters:
	Response: +PBSRCSTATE: <publicBroadcastSourceID> OK
Set Operation	AT+PBSRCSTATE=<pbSourceID>
	Parameters:
	Response: +PBSRCSTATE: <pbSourceID>,<state in decimal>,<state in string>

	OK If there is an error: +CME ERROR: <err>
--	---

5.6 Public broadcast source stop (AT+PBSRCSTOP)

Stop LE audio broadcast for a public broadcast source instance.

AT+PBSRCSTOP Stop broadcasting	
Test Operation	AT+PBSRCSTOP=?
	Parameters:
	Response: +PBSRCSTOP: <publicBroadcastSourceID> OK
Set Operation	AT+PBSRCSTOP=<pbSourceID>
	Parameters:
	Response: OK If there is an error: +CME ERROR: <err>

5.7 Public broadcast sink demo (AT+PBSNKDEMO)

Create, configure, and enable public broadcast sink demo.

The AW100 module will look for Auracasts with Broadcast Names set to “Aurawave” and attempt to sync.

Supports only **48khz Codec presets** and **Analog audio out**

Note: a system reboot must be executed to return to normal operation after executing this command.

AT+PBSNKDEMO Create, configure, and enable public broadcast sink demo							
Test Operation	AT+PBSNKDEMO=?						
	Response: +PBSNKDEMO: [<channelLocation>,...] OK						
Set Operation	AT+PBSNKDEMO=<channelLocation>						
	Parameters: <channelLocation> possible values						
	<table><tr><th>Value</th><th>Description</th></tr><tr><td>“LEFT”</td><td>Left channel location</td></tr><tr><td>“RIGHT”</td><td>Right channel location</td></tr></table>	Value	Description	“LEFT”	Left channel location	“RIGHT”	Right channel location
	Value	Description					
	“LEFT”	Left channel location					
	“RIGHT”	Right channel location					
	Response: OK						
If there is an error: +CME ERROR: <err>							

6. Audio system

6.1 Audio devices list (AT+AUDDEVLIST)

List audio devices supported by AW100 series module

AT+AUDDEVLIST	
Test Operation	AT+AUDDEVLIST=?
	Parameters:
	Response:
	OK
Execute Operation	AT+AUDDEVLIST
	Parameters:
	Response:
	+AUDDEVLIST: <number of audio devices>
	<device id>,<device string>
	<device id>,<device string>
	...
	OK
	If there is an error:
	+CME ERROR: <err>

6.2 Audio device set (AT+AUDDEVSET)

Set default input audio device used by Public Broadcast Source instances.

For retrieving a list of supported audio devices refer to AUDDEVLIST.

AT+AUDDEVSET	
Test Operation	AT+AUDDEVSET=?
	Parameters:
	Response:
	+AUDDEVSET: <device id>
Set Operation	OK
	AT+AUDDEVSET=<device id>
	Parameters:
	<device id> possible values
	See AUDDEVLIST command
	Response:
	OK
	If there is an error:
	+CME ERROR: <err>

7. System configuration

7.1 Configuration save (AT+CONFSAVE)

Save current system configuration, including:

- Bluetooth Device Name
- Public Broadcast Source Instances or lack thereof and their configuration
 - Broadcast state is also persisted
- Default Audio Input

AT+CONFSAVE Save current system configuration	
Test Operation	AT+CONFSAVE=?
	Parameters:
	Response:
	+CONFSAVE OK
Execute Operation	AT+CONFSAVE
	Parameters:
	Response:
	OK If there is an error: +CME ERROR: <err>

7.2 Configuration defaults (AT+CONFDEF)

Reset system configuration to defaults. Executing AT+CONFSAVE is still required to persist defaults.

AT+CONFDEF Reset system configuration to defaults	
Test Operation	AT+CONFDEF=?
	Parameters:
	Response:
	+CONFDEF OK
Execute Operation	AT+CONFDEF
	Parameters:
	Response:
	OK If there is an error: +CME ERROR: <err>

8. Firmware update

8.1 Enter DFU Mode (AT+DFU)

Enter firmware DFU mode.

Refer to AW100 DFU Guide for firmware upgrade procedure.

AT+DFU Enter firmware DFU mode	
Test Operation	AT+DFU=?
	Parameters:
	Response:
	OK
Execute Operation	AT+DFU
	Parameters:
	Response:

9. Supported Result Codes

9.1 Summary of CME ERROR Codes

The final result code +CME ERROR: <err> indicates an error.

The following table lists the possible error codes returned by Aurawave AT commands.

Value	Error Code	Context	AT Commands
19	ENODEV	No such device/device not ready	AT+AUDDEVLIST
22	EINVAL	Invalid argument/parameter validation failed	AT+PBSRCCONF AT+BTDEVNAME
44	ECHRNA	Parameter out of range/index validation	AT+AUDDEVSET AT+AUDDEVLIST AT+PBSRC*
114	EALREADY	Operation already in progress/state conflict	AT+AUDDEVSET AT+PBSRCSTART AT+PBSRCSTOP

9.2 Summary of Unsolicited Result Codes

As of firmware version 1.0, no unsolicited result codes are indicated

Additional Information - Ezurio

Please contact your local sales representative or our support team for further assistance:

Headquarters	Ezurio 50 S. Main St. Suite 1100 Akron, OH 44308 USA
Website	http://www.ezurio.com
Technical Support	http://www.ezurio.com/resources/support
Sales Contact	http://www.ezurio.com/contact

Note: Information contained in this document is subject to change.

Additional Information – Cloud2GND

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