

v4.1.1.0 Release Notes

Documentation for Release v4.1.1.0 is available at <https://docs.espressif.com/projects/esp-at/en/release-v4.1.0.0/esp32s2/index.html>. ESP32S2-AT v4.1.1.0 is a major update for ESP32S2-AT [v3.4.0.0](#).

The firmwares:

- [ESP32-S2-MINI-AT-V4.1.1.0.zip](#)

This is the list of changes since release [v3.4.0.0](#):

Known Issues

- [AT+FS](#) may fail after repeated read/write operations

Changelog

Basic

- Added the [AT+SYSRAM](#) setup command to detail memory capacity
- Added the [AT+SYSROLLBACK](#) query command to obtain the address and version of the current and rollback firmware
- Added the [AT+RFCAL](#) command to support RF full calibration
- Added deduplication support for the [AT+SYSMFG](#) command
- Added sleep support in the BLE-only firmware
- Added support to disable sleep when Wi-Fi and BLE coexist
- Fixed an issue where [AT+SYSMSGFILTER](#) did not work when the data contained `\r\n`

Wi-Fi

- Added the [AT+CWBANDWIDTH](#) command to set Wi-Fi bandwidth
- Added the [AT+CWCONFIG](#) command to set the global inactive time and listen interval
- Expand authmode range for [AT+CWLAPOPT](#), [AT+WPS](#), [AT+CWSTARTSMART](#) and [AT+BLUFI](#)
- Fixed a station-connection failure when using [AT+CWJAP](#) after connecting to an Enterprise AP with [AT+CWJEAP](#)
- Fixed a crash when setting hostname length to 32 bytes via [AT+CWHOSTNAME](#)
- Fixed two WPA2-Enterprise connection issues
- Fixed a potential Wi-Fi issue where the device disconnected immediately after powering on and connecting to the AP
- Fixed an issue where [AT+CWLAP](#) did not return valid APs when BLUFI was enabled
- Fixed incorrect Wi-Fi reconnection behavior after sending the [AT+CWQAP](#) and [AT+CWRECONNCFG](#) commands
- Fixed a Wi-Fi disconnection issue when sending the [AT+CWRECONNCFG](#) command twice

TCP/IP

- Added a [netif](#) parameter to the [AT+CIPSERVER](#) command

- Added the **AT+CIPSSLCCIPHER** command to configure the SSL cipher-suite list
- Added a timeout parameter to the **AT+CIPSTART** and **AT+CIPDOMAIN** commands
- Added support for a backup DNS server in **AT+CIPDNS**
- Fixed **AT+CWDHCP** returning an incorrect DHCP state after the DHCP server was disabled
- Fixed an issue where **AT+CIPRECVLEN?** always returned a fixed set of five connections
- Fixed several issues where **AT+CIPSTATUS** returned incorrect statuses
- Fixed an infinite-loop issue when the SSL server encountered a PKI read error
- Fixed some potential reconnection issues in passthrough mode
- Fixed an issue where TLS resources were not freed if TLS negotiation failed
- Fixed an issue where **AT+CIPCLOSE** could not close a connection after reaching the maximum number of open sockets
- Fixed an issue where the UDP mode in **AT+CIPSTART** did not work in passive-read mode
- Fixed an asynchronous issue with **AT+CIPRECVLEN**
- Fixed an issue where **AT+CIPSTO** did not take effect when data transmission failed

mDNS

- Added mDNS query support to **AT+MDNS**
- Added the **instance**, **proto**, and **txt** parameters to the **AT+MDNS** command

HTTP

- Added HTTP status-code output for HTTP commands
- Added the **AT+HTTPCFG** command to configure certificates for HTTP
- Added HTTP-header deduplication to the **AT+HTTPCHEAD** command

MQTT

- Change MQTT message retransmission interval from 1 second to 5 seconds to improve connection stability
- Fixed an issue where an MQTT QoS 2 PUBREL packet might not be retransmitted
- Fixed a potential system hang when executing **AT+MQTTPUB** with QoS 1 or 2, **AT+MQTTSUB** with QoS 1, or **AT+MQTTUNSUB**, if the ESP does not receive the corresponding PUBACK, SUBACK, or UNSUBACK within 30 seconds, while MQTT PING messages are still being exchanged normally.

FatFS

- Added FatFS support on 2 MB flash
- Added a data-length check when writing to FatFS
- Fixed several FatFS mount and unmount issues
- Fixed a mismatch between the generated **fatfs.bin** size and the required size
- Fixed an issue where FatFS did not work if **fatfs.bin** was not pre-burned before flashing
- Fixed an issue where **fwrite()** returned **OK** but data was not written to the file system

OTA

- Enabled app rollback support
- Added compressed OTA v3 support and a sanity checker

WebServer

- Fixed a compilation error when WebSocket and info logging were enabled
- Fixed two `slist` issues where the pointer `fail_item` was used after `free`
- Fixed a potential crash when printing if the SSID length was 32 bytes
- Fixed an issue where AT-Web netconfig failed when used with the WeChat applet

WebSocket

- Added additional parameters to the `AT+WSCFG` command to configure certificates in WebSocket

Interface

- Optimized the UART1 clock source
- Fixed a potential crash when AT was not ready but received data
- Fixed a potential UART voltage fluctuation during light sleep
- Fixed some socket interface issues

System

- `esp-idf` version updated to `~v5.4.2`
- Added an unfilled factory binary
- Added a checker to prevent duplicate keys in `*.defaults`
- Added some return value checks for driver commands
- Added `pre_wakeup_callback` and `process_light_sleep` hook events
- Added a hook function for memory allocation failure
- Supported the new log system and improved log readability
- Added support to configure the default system storage mode
- Added support to print the firmware source
- Added support to override default configurations
- Optimized resources to increase available RAM
- Reduced power consumption when a beacon is lost
- Optimized the root CMake file
- Decoupled Wi-Fi and BLE functions from the base commands
- Renamed `esp_at_get_netconn_count()` to `esp_at_get_netconn_max_count()`
- Exposed `esp_at_get_smartconfig_start_config()` API
- Reconfigured TWDT to disable the panic trigger when AT debug is enabled
- Provided some weak symbols to allow external overriding (`esp_at_nvs_set_xxx/esp_at_nvs_get_xxx/esp_at_log_write`)
- Fixed an issue where the factory binary was not generated in some cases
- Fixed an issue where patches could not be applied on Windows
- Fixed several MCU wake-up issues

Optimization

- **TCP & SSL:** TCP/SSL connections are now proactively closed immediately when their associated netif state changes (netif down, stop, or lost IP). In previous versions, the connections would remain open until a keep-alive timeout, send timeout, or max retry threshold was reached - often taking tens

of seconds to close. This change significantly reduces latency in connection teardown and improves system responsiveness.

- Upgraded supported Python version and some package versions
- Optimized patching process
- Replaced the previous script with `esptool.py merge_bin`
- Fixed an issue where the patch could be applied multiple times

Examples

- Added the `fatfs_to_http_server` example
- Added the `http_get_to_fatfs` example
- Added the WebSocket example document
- Added the AT interface security example

Documentation

- Improved documentation for AT commands, examples, and development
- Added more details for new features and changes
- Added a chatbox to docs.espressif.com/projects/esp-at
- Added a disclaimer for the esp-at project
- Added document format checks