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## ST87M01 embedded software

### Introduction

This document contains the release note for the software running on [STSW-ST87M01](#). The purpose of this document is to illustrate the content of the packages, the changes included in each release, and the status of the features.

## 1 Reference documents

**Table 1. Document references**

Reference	Document
1	<sup>(1)</sup> ST87M01 datasheet
2	<sup>(2)</sup> EVKITST87M01-1 UserManual.pdf
3	<sup>(3)</sup> SLA0105 software license agreement

1. *ST87M01.pdf*

2. *UM3382*

3. *SLA0105*

## 2 Contents

This document includes the software release notes aligned with the latest firmware release.  
 The firmware package contains the following items:

**Table 2. Firmware package content**

FW type	Available
Bundle image type 1 (Nb-IoT Only)	ST87M01_A_2_7_0_M_2_7_0_S_2_7_0_key0405.img
Bundle image type 2 (Nb-IoT + Positioning)	ST87M01_A_2_7_0_M_2_7_0_S_2_7_0_G_2_7_0_key0405.img
Bundle image type 3 (Nb-IoT + WMBUS)	ST87M01_A_2_7_0_M_2_7_0_S_2_7_0_W_1_2_3_key0405.img

### 3 Firmware features

**Table 3. Features status**

Features	Available	Partially tested for main use cases
Transport layer & internet protocols	IPv4, IPv6, UDP, TCP	-
Security layers	-	TLS/DTLS
Application layer protocols	MQTT, HTTP, CoAP	LwM2M
Host processor interface	UART AT Command	-
System drivers	ADC, GPIO, PWM, I <sup>2</sup> C, SPI	-
Positioning	A-GPS, Wi-Fi positioning	.
Cellular features	SMS, eDRX, PSM, Slow mode	-
Update protocol	-	D-FOTA

## 4 Compatibility and certification tables

**Table 4. Compatibility table**

Available for download	FW Application core version	FW Secure core version	FW DSP core modem version	FW DSP core GNSS version	FW DSP core WMBUS version	Compatibility with EC LIB	Compatibility with ST87Mxx GUI
NO	2.0.0	2.0.0	2.0.0	2.0.0			V2.1.0
NO	2.0.1	2.0.1	2.0.1	2.0.1			V2.1.0
NO	2.0.2	2.0.2	2.0.2	2.0.2			V2.1.0
NO	2.0.4	2.0.4	2.0.4	2.0.4		V1.0	V2.1.5
NO	2.0.6	2.0.6	2.0.6	2.0.6	R0.1.11	V1.1	V2.2.1
NO	2.0.11	2.0.11	2.0.11	2.0.11	R0.1.11	V1.1	V2.2.1
NO	2.1.0	2.1.0	2.1.0	2.1.0	NA	V1.1	V2.2.1
NO	2.2.0	2.2.0	2.2.0	2.2.0	R0.2.5	V1.2	V2.2.2
YES	2.3.0	2.3.0	2.3.0	2.3.0		V1.3	V2.2.3
YES	2.4.0	2.4.0	2.4.0	2.4.0	R1.0.0	V1.4	V2.2.4
YES	2.5.0	2.5.0	2.5.0	2.5.0	R1.0.1	V1.5	V2.2.5
YES	2.6.0	2.6.0	2.6.0	2.6.0	R1.2.3	V1.6	V2.2.7
YES	2.7.0	2.7.0	2.7.0	2.7.0	R1.2.3	V1.7	V2.3.0

**Table 5. Regional certified versions**

GCF	PTCRB	RED	RED-DA	ICASA	FCC
2.0.0		2.0.0		2.0.0	
2.0.2		2.0.2			
2.3.0		2.3.0			
2.4.0		2.4.0			
2.7.0	2.7.0	2.7.0	2.7.0		2.7.0

**Table 6. Mobile network operator certified versions**

VODAFONE	TELEFONICA	TIM	Deutsche Telekom
1.0.1	1.0.5	2.0.1	2.1.0

**Table 7. FW bundles definition**

	Bundle type 1	Bundle type 2	Bundle type 3
Application core firmware	X	X	X
Secure core firmware	X	X	X
DSP core modem firmware	X	X	X
DSP core GNSS firmware		X	
DSP core WMBUS firmware			X

## 5 V2.7.0 Version information

### 5.1 V2.7.0 New main features lis

- Improve TCP RX reassembly management
- Fix asserts observed in FT or reported by customers
- Position filtering added for GNSS feature

### 5.2 V2.6.0 Change log

**Table 8. V2.7.0 change log**

CR	Description	Modem binary change	HOST API change
1419694	[DNS] Added timeout and number of tentative to the DNS request command		X
1464564	1464564 [TCP] Improve of Rx reassembly management		
1464724	[SLEEP] Management of sleep time with MODEMSTOP		
1466231	[MQTT] Removed <username>-<passwd> dependency in #MQTTCONNECT, fixing the number of parameters		X
1470326	[LwM2M] Custom objects: add possibility to send error response in case of Unsupported Operations is requested		X
1470337	[MQTT] #MQTTCONNECT: add support for domain name resolution		X
1472933	[GNSS] Position averaging via Kalman filter set by default		
1479854	[GNSS] Add assisted mode indication in SV status		
1470323	[LwM2M] Fix Object /3/0/11 read issue reported by Server		
1472724	[FT] Problems in Czech Republic network with DRX - PSM sleep entry	X	
1474919	[INT] No PSM entry when PSM duration is greater than 320 hours	X	
1479417	[FT] CME ERROR: 20 after AC barring via SIB14-NB	X	
1482647	[INT] No re-entry in PSM after some TAUs	X	
1483424	[IOP] SMS error not managed after loss of coverage		

## 6 V2.5.0 Version information

### 6.1 V2.5.0 New main features list

- Improve GNSS tracking sensitivity
- Add file download via HTTP for FOTA
- Improvements for TLS

### 6.2 V2.5.0 Change log

**Table 9. V2.5.0 Change log**

CR	Description	Modem binary change	HOST API change
1422576	[CAP] Added tick counter information in EXTI callback		
1426166	[DNS] Add command to get DNS Server from IP stack		X
1431848	[IP] Improve error handling in the AT#IPPARAMS command		
1429778	[DNS] DNS server addresses set via the IPPARAMS command are applied instantly without saving and resetting		
1425121	[HTTP] Add "user agent" configuration into HTTP header		X
1425122	[HTTP] New AT command for building HTTP body iteratively		X
1426226	[GNSS] Update GNSS metrics resolution		
1395090	[GPIO] Add Antenna tuner support thanks GPIO		X
1424640	[GPS] Improve tracking sensitivity		
1418791	[WIFI] Improve AGC level range		
1422697	[IP] TCP closure issue with sleep		
1424220	[MQTT] Wrong keep alive management		
1420896	[PS] Allow definition of 2 PDP contexts (only 1 context is stored)	X	

## 7 V2.4.0 Version information

### 7.1 V2.4.0 New main features list

- Enable WMBUS only for ST87M01-1400
- First WMBUS Official Release V1.0.0
- Improve DNS management for IPV6
- Add dual boot mode for GNSS/Wi-Fi
- GNSS GPS+GALILEO combined mode officially introduced

### 7.2 V2.4.0 Change log

**Table 10. V2.4.0 Change log**

CR	Description	Modem binary change	HOST API change
1384114	[GNSS] Improve tracking sensitivity		
1385079	[DNS] Added option to specify IPv4 or IPv6 address for DNS		X
1397216	[DNS] Added IPv6 DNS server request management to the AT#DNS command		
1398924	[AT] support of 14 channels for WIFI scan in AT#WSCAN		X
1408811	[WMBUS] Enable WMBUS only for ST87M01-1400		
1409689	[WIFI] Support of at#wscan command		X
1410145	[WIFI] Add URC to check scan status (#WSCHANNEL, #WSRESTART)		
1411014	[WIFI] Add antenna path selection for WIFI scan in AT#WSCAN command		X
1416177	[RF] Add RF path selection (NB-IOT or GNSS) inside AT#RFRSSI		X
1418408	[GNSS] Add Constellation type (GPS or GAL) inside GNSSSV URC		
1419538	[AT] Change default values for number of pings and timeout in AT#IPPING		X
1397217	[DNS] The AT#DNS command does not return an error message if no DNS servers are set using the AT#IPPARAMS command		
1398783	[FT] Incomplete band scan requested by NAS after attach reject	X	
1414940	[CAP] Wrong address for NVM Ram section used by CAP		
1415808	[MQTT] AT#MQTTCFG set unspecified "optional" number to zero		
1416156	[GCF] improve stability for 3GPP 36.523-1 PCT 22.5.8, 22.4.16	X	
1417479	[AT] After receiving one +CME ERROR: 1121 answer, all AT commands return +CME ERROR: 1120		
1418196	[IOP] some MT SMS not received in EDRX	X	



## 8 V2.3.0 Version information

### 8.1 V2.3.0 New main features list

- HTTP improvements
- Reduced attach time thanks to improvements in initial cell search
- Improved ALP management of TCP ACK reception in sleep mode
- Fixed some attach problems with specific NPRACH configurations
- Updated DNS service

### 8.2 V2.3.0 Change log

**Table 11. V2.3.0 Change log**

CR	Description	Modem binary change	HOST API change
1283365	[OPTIM] Synchronization: avoid ICS on supposed adjacent channels	X	
1358227	[HTTP] Response management		
1366846	[TCP] Improved ALP management of TCP ACK reception vs sleep mode		
1380859	[HTTP] Added request header and body sending synchronization		
1380860	[DNS] TTL Information in DNS answer request		X
1392860	[COAP] Added \r\n to the #COAPRECV URC message before printing the payload		X
1310162	[POW] Long DRX wake-up time when UE received a paging not dedicated to it	X	
1327004	[HTTP] TCP socket gets closed internally after a successful PUT request		
1360060	[AT] AT+CEREG not correctly returned after network reject	X	
1378707	[INT] Watchdog after AT#PWROFF due to bad synchronization between secure and modem	X	
1380560	[DNS] Bad management of DNS address received from network		X
1381165	[INT] TCP issue on real network in case of large frames (972 bytes)	X	
1382124	[IDLE] NCS synchronization not performed for long EDRX	X	
1383999	[AT] Update for awake time parameter in SLEEPMODE command		X
1385891	[CUST] Sometimes TCP transfer failed with error code 2154, or sometimes no ok or no error code after sending TCP packet		
1385931	[AGC] Improve RSSI scan accuracy in EC	X	
1386402	[FT] Attach failure due to wrong NPUSCH scheduling in specific NPRACH configuration		
1391223	[AT] Fixed parsing of AT#MQTTSUB command		X
1391743	[AT] Bad date return on CCLK get		
1392566	[HTTP] Assert when AT#HTTPREAD is called after AT#SOCKETCLOSE		
1395050	[MQTT] Issue during subscribe		

## 9 V2.2.0 Versions information

### 9.1 V2.2.0 New main features list

- Support of DNS servers from NMOs
- Dynamic packet size for MQTT
- ECC management via AT command
- Add spectrum analysis for automatic band configuration
- Improve handling of sleep periods greater than 36 hours
- Improve iPerf
- RAI optimization

### 9.2 V2.2.0 Change log

**Table 12. V2.2.0 Change log**

CR	Description	Modem binary change	HOST API change
1326610	[DNS] Use DNS server address sent by the network		X
1354844	[IP] Avoid URC message in #IPREAD response		
1355817	[IP] The AT#SOCKETCLOSE command does not clear previously received socket data from the receive buffer		
1357485	[MQTT] Increase topic and value max size		
1360374	[MQTT] Improvement of publish and subscribe		
1360548	[IP] LocalPort configurable at creation of TCP socket		X
1365581	[NVM] Update NVM save sequencing		
1338215	[MODEM] No RAI 1 sustained after TAU and reselection of a new cell	X	
1339718	[PS] CCON is delayed on SFR network	X	
1346823	[AT] Report DNS address in AT+CGCONTRDP answer		
1352991	[IP] iPERF improvement inECL1 by fixing RSRP computation	X	
1354848	[IP] The AT#IPDEL command does not clear previously received data from the receive buffer of the deleted IP context		
1356648	[MQTT] AT#MQTTDISC assert correction		
1359850	[IP] Wrong socket port saving in case of automatic local port binding		
1360230	[IP] error with AT#SOCKETCLOSE command for TCP sockets		
1360345	[IOP] High UL ping latency when in drx and edrx	X	
1360373	[TCP/UDP] Avoid usage of port number greater than 0xC100		
1362337	[TM] Issue when using AT command AT#RFTXCW		

## 10 V2.0.11 Version information

### 10.1 V2.0.11 New main features list

- MQTT improvements
- DTLS functional
- Energy in tenth of uwh (no change in STENG traces, only inside URC #ENERGY)
- Improve C-DRX consumption
- Improve iPerf throughput
- GNSS: PPS functionality

### 10.2 V2.0.11 Change log

Table 13. V2.0.11 Change log

CR	Description	Modem binary change	HOST API change
1350052	[AT] URC energy display in tenth of $\mu$ Wh, <b>no change for STENG</b>		X
1332979	[ALP] AT parser improvement		
1342662	[CAP] AT#POWEROFF management in CAP mode when no SIM		
1338079	[AT] Added AT cmd to enable First PLMN URC display after Wake up from PSM or Switch On	X	
1335885	[GNSS ] Fixed issue with periodicity greater than 0		
1338136	[SLEEP] delay before entering sleep after OOS	X	
1345736	[NVM] Configured max IP packet size		
1352099	[MQTT] Update of user credential management and "will info"		
1284056	[C-DRX] Reduced power consumption in C-DRX mode	X	
1343307	[GPIO] Added AT command to enable GNSS PPS output		
1335916	[IP] Data transfer improvement in case of TAU	X	
1335509	[SLEEP] Sporadic lock when sending UDP in PSM on Amarisoft		
1335648	[AT] GNSS fix display on UART0 in case of CAP		
1323245	[IP] RAI flag variants not working in Denmark	X	
1338057	[IP] Lock after UDP transfer start on T3324 expiry	X	
1335912	[IP] iPERF improvement: apply default periodic BSR timer when not explicitly set	X	
1336087	[FOTA] Rollback command without bitmap parameter		
1345733	[MQTT] Bad management of unsubscribe		
1326960	[MQTT] Spaces ignored inside MQTT topic name and messages		
1337791	[TCP] Better management of AT#SOCKETCLOSE trigger #SOCKETCLOSED URC		
1353877	[NVM] Bad test of NVM version when setting default value		

## 11 V2.0.6 Version information

### 11.1 V2.0.6 New main features list

- Data transfer improvement during TAU
- Sleep management improvement
- Improved GNSS time precision
- Increased max packet size for data transfer
- Improved iPerf throughput
- Added HTTP support of Json content
- Added WMBUS support

### 11.2 V2.0.6 Change log

**Table 14. V2.0.6**

CR	Description	Modem binary change	HOST API change
1315016	[HTTP] Changed API to send HTTP request		X
1248971	[WMBUS] Added WMBUS support		X
1334146	[CAP] Added support for WMBUS also in CAP mode		X
1312977	[HTTP] Manage CR/LF in HTTP request		X
1308931	[IP] Increase data transfer maximum payload size to 1400 bytes		X
1320597	[DNS] Support of subdomain in URL		X
1333165	[HTTP] Added support of JSON content in HTTPSEND command		X
1306739	[GNSS] Improve time management precision		
1325844	[GNSS] Add Pulse Per Second (PPS) feature		
1284029	[LOG] Raster offset sometimes not correctly reported in STENG log	X	
1323313	[All Incorrect printing of Get SOCKETCREATE command information after wake-up		
1333710	[GNSS] Datetime in NMEA sentences is not in UTC format		X
1323454	[PS] Deadlock after attach reject cause 9	X	
1333373	[LOG] RSRP sometimes not correctly reported in STENG logs	X	
1316812	[SLEEP] Sleep counter wrongly decremented		
1311016	[IP] Improve iPERF data rate (seen in IOP)	X	
1323093	[AllURC] messages related to sleep mode not always sent		
1323555	[FOTA] "ATI" command response old NB-IOT firmware version, when NB-IOT in in PSM		
1337791	[TCP] Better management of AT#SOCKETCLOSE trigger #SOCKETCLOSE D URC		X
1335916	[PS] Data transfer improvement in case of TAU	X	
1345771	[SLEEP] Sleep counter wrongly decremented on application core		

## 12 V2.0.4 Version information

### 12.1 V2.0.4 New main features list

- Support for RPM (Radio Policy Manager)
- New API for TCP/IP

### 12.2 V2.0.4 Change log

**Table 15. V2.0.4 Change log**

CR	Description	Modem binary change	HOST API change
1205383	[SLEEP] in PSM, go to sleep between TAU and first PO	X	
1274065	[PS] added RPM support (Radio Policy Manager)	X	X
1280665	[GNSS] Increased sensitivity in assisted mode		
1300836	[AT] Changed the AT command for ADC GPIO config		X
1300838	[AT] AT command IPR change API and autodetect		X
1302214	[GNSS] Indicate GNSS gap before NBIOT session		X
1306126	[IP] New API to centralize receive and send functions		
1310891	[TLS] AT command hex format support (input/output)		X
1312032	[PS] Added specific error code for IPSENDUDP when buffer full	X	X
1312127	[GNSS] GNSSFIX URC generated even if fix not achieved		X
1312426	[HTTP] New HTTPRECV URC and HTTPREAD command		X
1302350	[INT] Assert when AT command during sleep: xTimerGenericCommand on line 386	X	
1311248	[SYS] Improve power off management		
1313942	[IP] Bad management of Network End point in case of IPv6		

## 13 V2.0.3 Version information

### 13.1 V2.0.3 Main features list

- Fix for IOP (AT+CGDCONT and AT+COPS)

### 13.2 V2.0.3 Change log

**Table 16. V2.0.3 Change log**

CR	Description	Modem binary change	HOST API change
1302198	[AT] Display IP address in response to AT+CGDCONT? for IOP	X	X
1307276	[AT] AT+COPS? still displays PLMN after detach for IOP	X	X

## 14 V2.0.2 Version information

### 14.1 V2.0.2 Main features list

- Added monitoring for power consumption
- Changed the default baud rate speed to 115200
- Improved sleep time after AT command

### 14.2 V2.0.2 Change log

**Table 17. V2.0.2 Change log**

CR	Description	Modem binary change	HOST API change
1261250	[AT] Added the monitoring of the power consumption		X
1274061	[IP] Do not send CRTDUP containing IPv6 RA if no change of address	X	
1283952	[DNS] FFinalize DNS feature		X
1284060	[SLEEP] Allow sleep in DRX/EDRX in case of async AT commands	X	
1284140	[UART] Change the default baudrate speed to 115200		X
1284437	[GPIO] Ring pin default values after RFACTORY request		
1286777	[GNSS] Reduce AFC steps in GNSS		
1296731	[LOG] Add RTSS traces for SNR, Tx info, Tx ack/nack		
1282304	[IP] Abnormal detach on UDP request with async PSM wakeup	X	
1282665	[IP] Socket not correctly restored at WakeUp		
1283317	[GPIO] Wrong information reported of the GPIOCFG request		
1286812	[SIM] Bad SIM AT command syntax (CR/LF)	X	X
1288464	[MQTT] Publish issue with new sleep mechanism		
1290726	[IP] Update of TCP & UDP transmission for new sleep mode		
1291482	[IP] NB-IoT modem gets stuck during UDP Iperf test	X	
1292903	[AT] Corrected an issue in the conversion of the decimal display		
1295526	[PS] No TAU performed after AT#PTW in IOP	X	

## 15 V2.0.1 Version information

### 15.1 V2.0.1 New main features list

- Improved ALP sleep mode handling

### 15.2 V2.0.1 Change log

**Table 18. V2.0.1 Change log**

CR	Description	Modem binary change	HOST API change
1272805	[SLEEP] Update of ALP to support new sleep mode mechanism		
1275307	[SYS] Update WDG reboot policy for modem and CM4		
1275810	[GNSS] Add DSP load indicator		
1278078	[AT] URC display format harmonization		X
1273398	[HTTP] Answer from server not correctly managed		
1273402	[TCP] FreeRTOS TCP window mechanism not working correctly after sleep		
1274063	[L1] AT#PWROFF Assert in file rf_cal.c on line 944	X	
1274072	[PS] Unexpected RRC connection release during iPERF	X	
1274559	[SYS] RFACTORY only partially executed		
1277189	[LOG] Wrong estimation of RSRP/RSRQ in STENG logs	X	
1281757	[PS] No sleep mode entry after a cell reselection in PSM	X	
1281964	[AT] System locks if too many parameters for modem AT command	X	
1282129	[SYS] Assert DMA after detach: interrupt.c on line 981	X	



## 16 Licenses

This software package for ST87M01 can be obtained only if the SLA is accepted.

**Table 19. Open source licenses**

Software	License
FreeRTOS (core + TCP/IP + MQTT + HTTP)	MIT open-source license (SPDX-License-Identifier: MIT).
CoAP/LwM2M Wakaama	Eclipse Public License Version 2.0
mbedTLS (TLS, DTLS)	Apache License Version 2.0

## Revision history

**Table 20. Document revision history**

Date	Version	Changes
21-Jul-2025	1	Initial release.
01-Sep-2025	2	Updated to DV_2.6.0 software version.
17-Oct-2025	3	Updated to DV_2.7.0 software version

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