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Digi XBee 3 Global LTE-M/NB-IoT Low Power Release Notes

Digi XBee 3 Global LTE-M/NB-IoT Low Power

Version 1171F (July, 2024)

INTRODUCTION

These are the release notes for Digi XBee 3 Global LTE-M/NB-IoT Low Power.

SUPPORTED PRODUCTS

- [Digi XBee 3 Global LTE-M/NB-IoT Low Power](#)

KNOWN ISSUES

1. By-pass mode is now deprecated and is not recommended for new designs. XBee 3 Cellular products support direct USB to access the cellular modem directly. See the user manual for details on how to configure your XBee to use direct USB.
2. Module with SPI mode enabled and pending Status frames to send to the SPI Master will not go to sleep.
3. Closing a TLS session and then immediately opening a new one may result in failure. To workaround, insert a small delay (~5s). [XBCELL-3732]
4. Intermittent failure to go to sleep or wake up when using pin sleep with the SPI_nSSEL line while in SPI mode. [XBCELL-3100]
5. Internal logic can interfere with USB operation in direct USB mode when configured for anything other than bypass (AP=5). [XBCELL-3753]
6. It may not be possible to interrupt MicroPython autostart if the application performs a soft reset very quickly. Workaround: delay the soft reset by a second using `time.sleep(1)`. [XBPY-796]
7. Connections to the BLE API Service within five seconds of waking from sleep can sometimes fail to perform the unlock sequence.
8. Instances where the desired BLE connection type is "Display YesNo" with legacy pairing being used the XBee will request LE Secure Connections instead of using "Just Works". This will cause the XBee to fail to pair as LESC will be disabled on the other device. [XBPY-862]
9. The GNSS and Cellular share certain circuitry, and cannot be run at the same time together. The GNSS On Demand and raw NMEA feature will close the cellular network connection when obtaining GNSS data. Likewise, the GNSS functionality cannot be used while the cellular connection is up.

10. SMS transmissions can be delayed significantly (>30 s) and result in duplicate messages using cellular component version 37.00.xx3. This will be fixed in a future release from the cellular component vendor. [XBCELL-7570]
11. The ATAS (Active Scan) command can return reports for unidentified cells (missing cellid and area code) [XBCELL-7166]
12. For UDP sockets, it is required to either connect or bind the socket before being able to use send or sendto.
13. If bootloader version 2.3.2 is installed, and the XBee is forced into command mode via serial-break reset, and ATAC is executed within 500 milliseconds of boot, command-mode input preceding ATAC may be executed twice. [XBCELL-10059]
14. ATPG (ping) does not use the N3/N4 values to resolve hostnames when ATNS=2. This will be fixed in a future release from the cellular component vendor. [XBCELL-10164]

UPDATE BEST PRACTICES

Digi recommends the following best practices:

1. Test the new release in a controlled environment with your application before you update production devices.
2. Unless otherwise noted, apply updates in the following order:
 1. Device firmware
 2. Modem/Module firmware
 3. Configuration
 4. Application

Digi recommends Digi Remote Manager for automated device updates. For more information, go to <https://www.digi.com/products/iot-platform/digi-remote-manager>.

If you prefer manually updating one device at a time, follow these steps: 1. [Update to latest firmware from XCTU](#)

TECHNICAL SUPPORT

Get the help you need via our Technical Support team and online resources. Digi offers multiple support levels and professional services to meet your needs. All Digi customers have access to product documentation, firmware, drivers, knowledge base and peer-to-peer support forums.

Visit us at <https://www.digi.com/support> to find out more.

CHANGE LOG

1171F (July, 2024)

This is a recommended release.

NEW FEATURES

1. Added support for adding extra nameservers to be used for DNS. ATN3 allows for setting a tertiary nameserver. ATN4 allows for setting a quaternary nameserver. ATNS allows selection of which nameservers should be used. [XBCELL-6525]
2. Added support for specifying the timeout value for the ATGP command. The value is optional. If not specified, the default value of 2 minutes is used.

ATGP no longer allowed in API mode, please use the GNSS request and response API packets instead. [XBCELL-10240]

BUG FIXES

1. Fixed a case where TCP connections with a hostname as a destination could fail (ENOTCONN, transport closed status) unexpectedly. [XBCELL-10165]
2. Fixed an issue with SSL/TLS certificate handling. TLS certificates would be left in the certificate store in the cellular component's NVM indefinitely after the socket connection was closed. Certificates are now automatically deleted when a new TLS socket connection is initiated. [XBCELL-10212, XBCELL-10306]
3. In TCP transparent mode, if ATC0 is non-zero and either ATDL is 0.0.0.0 or ATDE is 0, attempted transmission of transparent-mode data when there is no "connected" client will now set ATCI to 2 (invalid destination), instead of FF (no known status). [XBCELL-10195]
4. When using `os.bundle` or executing from `.mpy` files, very deeply-nested code (classes and functions) or constant tuples now trigger `RuntimeError("maximum recursion depth exceeded")`. [XBCELL-10210]
5. Fix a case in MicroPython where `ble.gap_scan` could hang indefinitely. [XBCELL-10217]
6. Fix issue where a "one shot" GNSS/GPS request would fail, when run in the Eastern Hemisphere. [XBCELL-10224]
7. Ensure that API GNSS "Start Raw NMEA" requests execute indefinitely (until a "Stop Raw NMEA" request), as designed. [XBCELL-10314]

KNOWN ISSUES

1. ATPG (ping) does not use the N3/N4 values to resolve hostnames when ATNS=2. This will be fixed in a future release from the cellular component vendor. [XBCELL-10164]

1171E (February, 2024)

This is a recommended release.

BUG FIXES

1. Fixed an issue with BLE bonding. Bonding information was not stored correctly. [XBCELL-9971]
2. Fixed a critical issue found with some of our customer devices where the firmware cannot be updated and files on the file system cannot be created or modified. This issue can only happen to devices that have flash ID beginning with 0xEF40. The flash ID can be determined with the AT!F command.

The same fix has been applied to the XBee 3 Bootloader, which is included with the XBee firmware .gbl file. Customers are strongly encouraged to install 1171E or newer so that the new bootloader version 2.3.2 (ATVH = 232) is installed. Bootloader version 2.3.2 is backward-compatible with older XBee firmware versions. [XBCELL-10001]

KNOWN ISSUES

1. Bluetooth bonding using LE Secure Connections is unreliable if neither the XBee nor the target device expose I/O capabilities. [XBCELL-10053]
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1171C (December, 2023)

This is a recommended release.

NEW FEATURES

1. Updated MicroPython to version 1.20.0. This does change the bytecode format requiring recompilation of program code.
2. In MicroPython, `os.bundle()` now reserves 64 KiB of the XBee's internal flash. This is increased from 32 KiB on previous firmwares. [XBCELL-5885]
3. Adjusted Internet activation recovery timers to better adhere to common cellular carrier requirements. [XBCELL-9801]
4. In MicroPython, the `phyconfig` method was added to GAP connection objects, allowing configuration of the Bluetooth PHY selection – the default 1M PHY, or 2M PHY (higher data rate but reduced range). [XBCELL-9793]
5. GNSS Only Airplane mode available with ATAM=2. Disables Cellular connections while keeping Location services (GNSS) available. [XBCELL-9737, XBCELL-9845]
6. In MicroPython, the `digi.ble.format_address` and `digi.ble.parse_address` functions have been added, to aid in converting BLE MAC addresses between a human-readable format (e.g. "00:12:34:56:78:9A") and the 48-bit format presented by `gap_scan` and used in `gap_connect` (e.g. b"\x00\x12\x34\x56\x78\x9A"). [XBPY-1044, XBPY-1045]
7. To improve the reliability of the Digi Remote Manager SM/UDP Request Connect feature, the XBee no longer performs a UDP check-in with Digi Remote Manager if a TCP connection is already open, or if a datapoint/health metric upload will soon cause a TCP connection to be created. [XBCELL-9785]
8. The math module was added to MicroPython. [XBPY-1058]
 - Functions: `acos`, `asin`, `atan`, `atan2`, `ceil`, `copysign`, `cos`, `degrees`, `exp`, `fabs`, `floor`, `fmod`, `frexp`, `isfinite`, `isinf`, `isnan`, `ldexp`, `log`, `log10`, `modf`, `pow`, `radians`, `sin`, `sqrt`, `tan`, `trunc`
 - Constants: `e`, `pi`

BUG FIXES

1. In MicroPython, `os.bundle(None)` now performs a soft reboot of the REPL, to clear out stale data. [XBPY-1021]
2. Fixed an issue where the TCP connection to Remote Manager for publishing data points or health metrics could be delayed by several minutes unexpectedly. [XBCELL-9670]
3. Improved reliability of UDP sends performed very quickly after a TCP socket is opened. This improves the reliability of the "SM/UDP Request Connect" feature from Digi Remote Manager. [XBCELL-9674]
4. Fixed an issue where the XBee would be unresponsive on boot if a non-default value is saved for AT\$0, AT\$1 or AT\$2. [XBCELL-9788]
5. Repeated BLE connect and disconnect cycles no longer stop the device from advertising. [XBCELL-9844]

6. Fixed an issue where interacting with the XBee BLE API service would disrupt the output of data received in transparent mode. [XBCELL-9913]
 7. Fixed an issue where MicroPython would cause the XBee to crash when using callbacks or certain other features. [XBCELL-9916]
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1171B (June, 2023)

This is a recommended release.

NEW FEATURES

1. Include the cellular network type (4g) in the health metrics reported to Digi Remote Manager when HM bit 7 (Serving Cell Data) is set. [XBCELL-9069]
2. The `modem_status.receive()` and `modem_status.callback()` functions have been added to the `xbee` module in MicroPython, allowing MicroPython applications to respond to modem status messages generated by the module. [XBCELL-7803]
3. Optimize TCP receive data buffering for MicroPython sockets, by allowing more data to be collected between `.recv()` calls. [XBCELL-9278]
4. Added the modem event log that can be viewed with the `ATM#` command. This log provides power and connection status of the cellular modem component and can be used to help understand cellular connection issues. [XBCELL-8741]

BUG FIXES

1. Fixed an intermittent issue where deep sleep or shutdown was held off for up to 30 seconds after the cellular component was turned off. [XBCELL-9142]
2. In MicroPython, callbacks are now allowed to be any callable object. Previously they were required to be either literal functions or lambdas. [XBPY-958]
3. Fixed an issue where a client closing an incoming connection to a TCP listening socket created by MicroPython could cause further connection attempts to the same listener to fail. [XBCELL-9280]
4. For the SMS messaging with Remote Manager feature, the default value for ATDP (Remote Manager phone number) was changed to 12029823370 and the default value for ATRI (Remote Manager service ID) was changed to the empty value (single space, ASCII 0x20) meaning no service ID. This change was made because the previous default phone number 32075 was discontinued by Digi's Remote Manager SMS service provider and will no longer function. To ensure the Remote Manager SMS message feature continues to work properly with this change in defaults, it is highly recommended the settings on both the device side and the Remote Manager side be checked and this functionality be tested by sending an SMS ping from Remote Manager.
5. Improved network registration timing when joining a roaming network, particularly on reattach after power cycle. [XBCELL-9561]
6. Fixed an issue where PSM sleep current was around 50 uA higher than expected. [XBCELL-9480]
7. Fixed an issue in the MicroPython `digi.ble` module where a gap scan iterator would block indefinitely after the module enters sleep. [XBCELL-9577]
8. Fixed an issue in MicroPython where bundled code could not be imported if the bundled filename contains a directory separator. [XBPY-1022]

KNOWN ISSUES

1. The XBee will be unresponsive on boot-up if a non-default value for AT\$0, AT\$1 or AT\$2 is saved to flash (ATWR). Workarounds: update to newer XBee firmware, downgrade to the previous firmware, or apply AT\$0/\$1/\$2 at runtime without performing ATWR. [XBCELL-9788]
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1171A (September, 2022)

This is a recommended release.

NEW FEATURES

1. Initial release
2. Key Features:
 - o Digital I/O support.
 - o Analog Input support.
 - o API & Transparent mode
 - o AT command mode
 - o SMS
 - o TCP/UDP
 - o TLS/TCP
 - o Incoming connections
 - o MicroPython
 - On-device programmability to add local intelligence.
 - Many examples in the Digi MicroPython Programmer Guide.
 - o Filesystem support
 - ATFS command to access through AT command mode
 - API frames to access through API mode
 - MicroPython file interfaces for programmatic access
 - Supports filesystem access through Digi Remote Manager
 - Provides MicroPython module import support
 - Allows storage of TLS certificates for MicroPython
 - Secure encrypted file storage to protect MicroPython code and TLS private keys
 - o Digi Remote Manager
 - Location reporting to Remote Manager as a health metric.
 - Serving cell information reporting to Remote Manager as a health metric.
 - o Bluetooth Low Energy (BLE)
 - Send a subset of API frames to the XBee through the encrypted BLE API Service
 - Configure the XBee 3 Cellular using the Digi XBee Mobile app for Android and iOS.
 - Use MicroPython to scan for advertisements, connect to peripherals and interact with connected devices.
 - o Low power modes
 - LTE power save mode (PSM)
 - Deep sleep mode
 - Pin sleep support
 - Cyclic sleep support
 - Airplane mode support
 - o eDRX configuration support (extended discontinuous reception) for additional power savings
 - o FTP(s) OTA update the Telit module by using the **FO** AT command or through Digi Remote Manager. FTPS is supported for encrypted FTP.
 - o Update the Telit module locally using Cellular Component FW Update (0x2B) API frames.
 - o Digi TrustFence secure boot
 - o Direct USB

- SMS UTF-16/UCS-2 encoding support
- Multi-network capability (Verizon, AT&T, ...)
- NB-IoT support
- GNSS On Demand and raw NMEA payload support

KNOWN ISSUES

1. MicroPython code which has been “bundled” can not be imported if the bundled filename contains a directory separator. Workaround: Restructure the code into a single directory before bundling.
[XBPY-1022]

IMPORTANT NOTES

Digi XCTU version 6.5.6 or newer must be used when installing XBee firmware 1171A or newer.

*Release Notes Part Number: 93001370