Release Notes
RM186 and RM191

RM186_EU Version 100.6.1.0, RM191_US Version 101.6.1.0, RM191_AU Version 102.6.1.0 and RM191_AS Version 103.6.1.0

This document provides release notes for RM186_EU firmware version 100.6.1.0 and RM191_US firmware version 101.6.1.0, and RM191_AU firmware version 102.6.1.0. Release notes are a summary of new and enhanced features, resolved issues, and known issues that are not resolved in this version. Consult the User’s Guide for details on the features of this software release.

- Firmware Version 100.6.1.0 (RM186_EU), 101.6.1.0 (RM191_US), 102.6.1.0 (RM191_AU) and 103.6.1.0 (RM191_AS)
- Firmware Version 100.5.0.7 (RM186_EU), 101.5.0.7 (RM191_US), and 102.5.0.7 (RM191_AU)
- Firmware Version 18.4.1.0 (RM186) AND 17.4.1.0 (RM191)
- Firmware Version 18.4.0.26 (RM186) AND 17.4.0.26 (RM191)

FIRMWARE VERSION 100.6.1.0 (RM186_EU), 101.6.1.0 (RM191_US), 102.6.1.0 (RM191_AU) AND 103.6.1.0 (RM191_AS)

Released September 2017

Third-party software:
- Nordic SoftDevice version: S120 1.0.0
- LoRa Stack version: STACKFORCE Release version 4.4.0

Updates

The following changes/bug fixes have been made for this release:

- Updated stack to the Release version of 4.4.0 (12052)
- Addition of AS region (11638)
- Fixed bug to ensure all SIO pins function with GpioAssignEvent (11213)
- Removed all calls to RunAssert() (11754)
- Return empty service notification instead of invalid handle error when scanning empty GATT table (11718)
- Now pass any errors returned from a call to the LoRaMacJoinReq() API back to the smartBASIC application (11749)
- Fixed bug where the EVLORAMACNEXTTX event isn’t thrown when joining using personalization (11845)
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- Fixed bug where configuring the AppEui, DevEui, and AppKey using the LoramacSetOption only worked when these values were already set using another method, ie at+cfgex 1010 etc (11848)
- Modified the stack so that in EU mode a JoinRequest is only attempted eight times before throwing the Rxtimeout event. Previously there were 48 attempts (11838)
- When using personalisation the module now keeps track of the uplink and downlink counter values over a power cycle (10358)
- EVLORAMACADR event has been modified so that it now returns the packet type and frame pending parameters (11955).
- EVLORAMACTXDRPAYLOADSIZEERROR event added to monitor when a loaded packet becomes too big during the resend process when the datarate reduces (11927 & 12064).
- Maximum size of smartBASIC app is now reduced to 24K.

Known Issues

- There is a potential glitch in the pwm output when pwm is 0 and then a non-zero value is written. The non-zero value should not be less than N where n is dependent on the resolution value that was set in the GpioPwmConfig function.
- When debug is enabled the sf output value is not the spreading factor. It is actually the datarate.

FIRMWARE VERSION 100.5.0.7 (RM186_EU), 101.5.0.7 (RM191_US), AND 102.5.0.7 (RM191_AU)

Released June 2017

Third-party software:
- Nordic SoftDevice version: S120 1.0.0
- LoRa Stack version: STACKFORCE development version 4.4.0

Updates

The following changes have been made for this release:

- Updated Semtech stack to 4.4.0. (11226)
- Fixed the bug that caused the NwkSKey and the AppSKey to be swapped internally.
- Missing error codes are now reported in UwTerminalX.
- Changed product ID – EU changed from 18 to 100, US changed from 17 to 101, and added AU version 102.
- Class C can now be selected. (9946)
- You can now set the channel plan by means of selecting a sub-band. This is only relevant in the RM191_US and RM191_AU modules. (11265)
- The new stack handles retrying the JoinRequests in a different way. Rather than continually trying to Join with the same packet, the stack now sends an RxTimeout event after a certain number of failures. In US and AU mode, this defaults to 2. This is now configurable. (11213)
- Modified the code to confirm which SIO pin caused an interrupt to be thrown. (11213)
- SIO 3 can now be set as an analogue input pin. (11328)
A call to LoRaMacGetOption (LORAMAC_OPT_TX_POWER) now returns the actual Tx power used and not the one set by the user. This covers instances when the power is clipped or the server has changed it via an ADR command. (10435)

- CTS/RTS is only set if UART handshaking is enabled. (11339)
- Fixed bug where UART hardware flow control doesn’t work properly at high data rates. (10810)
- In deepsleep mode, the current could be higher than expected because SIO 5 defaulted to the wrong configuration. (11247)
- Added in access to the stack’s LoRaMacQueryTxPossible function. Users are now be able to use this functionality to determine the maximum possible size of any packet transmitted to the gateway. (11480)
- Fixed bug where the code could fall into an infinite loop when using a GPIO pin to wake up from deep sleep. (11443)
- Added EVLORAMACNEXTTX event to AU and US code. (11480)
- Updated EVLORAMACRXERROR to also report an error in the RX1 window. (11498)
- Ati11 now returns the major and minor version numbers. (11499)
- EVLORAMACNEXTX now returned whenever it is likely that a user wants to send a packet. It’s now sent after Joining. (11505)
- EVLORAMACJOINFAIL now returned in case of a mic error in the JoinAccept packet. (11510)
- PacketType and FramePending information added to the LORAMACRxData smartBASIC API. (11500 and 11503)
- Added new event, EVLORAMACSEQUENCECOMPLETE, which is returned when the Uplink/Downlink sequence is complete. As part of this event, the final event that caused it to be raised is returned as an integer value. See the user guide for details. Also returned is the time to the EVLORAMACNEXTX which is the event that indicates you can send the next packet and it is transmitted immediately. For US and AU regions this will always be 0. (11511, 11545 and 11550)
- AppEui, DevEui and AppKey can now be set through a smartBASIC app. (11612)
- Fixed bug where the AppKey value was output via the LoraMacGetOption command. (11562)
- Fixed bug where the two different DevEuis were output from the wrong LoraMacGet commands. (11615)
- The new version numbers (100, 101, 102, 110, 111 and 112) are now output via the smartBASIC sysinfo(1010) command. (11587)
- Added new smartBASIC API, LoramacStartCW(), to trigger the carrier wave needed for the new CW test. This test can only be accessed via command from port 224. (11643)
- New event EVLORAMACFRAMESLOSS to report when the downlink sequence number gets out of sync. (11723)

Known Issues

- In certain circumstances the code fails to send a sequence complete event when a mic error has occurred. This bug can take many hours to appear. A possible solution is to send a new packet to the stack and the code seems to start working normally (although there may be duty cycle issues in the EU modules and so it may take a few minutes before the packet is actually transmitted).
FIRMWARE VERSION 18.4.1.0 (RM186) AND 17.4.1.0 (RM191)

Released October 2016

Third-party software:
- Nordic SoftDevice version: S120 1.0.0
- LoRa Stack version: STACKFORCE 4.3.0

Updates

The following changes have been made for this release:

- Updated LoRa Stack to 4.3.0
- As part of stack update, if JoinRequest fails, the module automatically resends the JoinRequest.
- Changed the IDs for DevEui, AppEui, AppKey, NwkSKey, AppSKey, and DevAddr. AppKey, NwkSKey, and AppSKey are now write only. This closes a potential security problem. All existing modules must be reconfigured with the new IDs.
- Added in new LoramacSetOption() parameter to allow the user to modify the data rate for the 2\textsuperscript{nd} Rx window. This avoids a problem with the iot.semetech.com website where they still use the old value of DR\_3 for this window.
- Bug fix - BLE bonding now works.
- Bug fix – LoramacGetOption() now outputs the correct values for AppEui and DevEui.
- ChannelsMask value can now be obtained in the RM191.
- Added new events for the TxDone signal, ADR command from the gateway, and when a receive window times out.
- New debug \texttt{smartBasic} command which outputs text that reports the frequency on which a packet is transmitted. It also provides waveform output to two SIOs marking when the module is in transmit or receive mode.
- Can now alter the number of times the module attempts to resend a confirmed packet. The default value is eight attempts but it can be set lower. The stack allows a maximum value of eight so if a higher value is entered, it’s clipped.
- Removed the RM191 hybrid option and now let user set the ChannelsMask. Option is not limited to Multitech’s sub-band option. There is now an \texttt{at+cfgex} option which is read at initialization and overwrites the default setting of the bottom eight frequencies (sub-band 1). If the config option is not set, then the default option remains. There is also a runtime LorMacSetOption which modifies the ChannelsMask. This method is not persisted. After a reboot or power cycle, the module defaults to the default or \texttt{at+cfgex} value.

Known Issues

- Initial reading from analog, GPIO input is incorrect. (9121)
- When using Personalisation, the first downlink packet doesn’t appear to contain any payload data if the server is set up to reflect any received data. This is due to the incorrect handling of the sequence counter.
FIRMWARE VERSION 18.4.0.26 (RM186) AND 17.4.0.26 (RM191)

Released April 2016

Third-party software:
- Nordic SoftDevice version: S120 1.0.0
- LoRa Stack version: STACKFORCE 4.1.0

Initial Release

This is the initial firmware release for the RM1xx radios. The following features are part of this release:
- LoRaWAN support for Class A devices – Version 1.0.1
- Bluetooth v4.0

Known Issues
- Initial reading from analog GPIO input is incorrect. (9121)