ThingMagic
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M6e Firmware v1.19.0 Release Notes

These release notes describe features, fixed bugs and operational caveats of the **M6e firmware (FW) version 1.19.0**, relative to version 1.15.1. For reference, the changes from version 1.13.2 to version 1.15.1 are also provided. The features listed here are fully supported in API 1.27.3 and above, including Universal Reader Assistant version 2.8.16.16.

For full information about the M6e product, please consult the M6e Hardware Guide , which can be found at:

http://www.thingmagic.com/manuals-firmware

New Features

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Load/Save Support

Settings can now be saved in the module, creating new default values that are restored when the module reboots. Although primarily intended to be used for autonomous operation, it can also be used to reduce the number of commands that must be sent to the module to restore operation after a reboot

Autonomous Operation Support

A read plan can be saved which allows the module to automatically begin continuously reading, and optionally return data memory values, whenever the module is powered or whenever one of its GPI lines is asserted. An Autonomous Configuration Tool is available to configure the settings and read plan necessary to implement this feature.

Gen2V2 Support

The M6e now supports the Gen2V2 features of the NXP DNA tags. These features include:

- “Untraceable”. Ability to limit reading of all or part of EPC, TID and User memory fields by unauthorized readers.
- Ability to download and activate security keys.
- Ability to authenticate tag using random challenge strings and AES encryption.
- Ability to obtain memory data in encrypted form, which can be successfully decoded if the host knows the key that has been activated on the tag.
- Ability to obtain authentication and encrypted memory data from a tag buffer rather than the tag backscattering that information to the reader immediately.

These capabilities are supported in the 1.27 version of the API and may be demonstrated using code samples and the version of Universal Reader Assistant which is distributed with the API.

Support for Return Loss Measurement

The firmware will now estimate the return loss of individual antenna ports, based on multiple readings at multiple channels within the active region. (For the North American region, with 50 channels, this measurement can take as long as 600 msec). The return

loss value can be obtained though the API by getting the “/reader/antenna/returnloss” parameter value as well as by using the “CmdGetAntennaReturnLoss” method. The sample code “ReaderStats” has been enhanced to illustrate the recommended method for obtaining this information. The values returned will look like this:

```
Antenna Return Loss
 Antenna 1 | 30
 Antenna 2 | 4
```

Which indicates a return loss of 30 dB for antenna 1, and 4 dB for antenna 2.

Note that this measurement loses accuracy as the numbers increase due to the impact of internal signal reflections that increasingly obscure the measurement of the small signal reflected only at the antenna.

The return loss is measured at an RF level of +15 dB in order to limit impact to other services that are running in the same region while the return loss measurement is being made.

Note

Unlike the Micro and Nano, which use this function for antenna detection, the M6e still uses a small amount of DC current to detect antennas, as it always has. Use of this original method to determine if an antenna is present and of the return loss to determine if the antenna is tuned to the correct frequency, is the best way of ensuring maximum performance for the channel of operation.

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Japan Region Support

A Japanese region, consisting of 6 channels between 916.8 and 920.8 MHz, has been added. Note that it is likely that the M6e-PRC version of the M6e module will be required to pass the strict out-of-band emissions requirements for Japan.

Fixed Bugs

This release of firmware has fixed the following reported bugs.

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- A bug was fixed where the firmware could not read or write User Memory locations higher than 127 kB (Words). In previous versions of firmware, no error would result, but memory addresses of 128 kB and above would be interpreted as starting back at address “0”, repeating every 128 kB. (Ref# 4702)

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- GPO2 can now be combined with GPO1 to drive a 4:1 multiplexer, as in previous releases. (Ref# 4332)

Operational Notes

A condition where the reader would not switch to a second antenna if the regulatory dwell time was exceeded on the first antenna has been resolved. Now, if this condition appears to occur, it is nearly always due to insufficient AsyncOnTime because, by design, the reader returns to antenna 1, or the first one in the configured list, each AsyncOnTime period. (Ref# 3172)