



Micro Firmware v1.7.3 Release Notes

These release notes describe features, issues and fixed bugs of the **Micro firmware (FW) version 1.7.3**, relative to version 1.7.1.

- ◆ [New Features](#)
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For full information about the Micro product, please consult the Micro Hardware Guide, which can be found at:

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

New Features

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USBPro Reader Support

The design of the USBPro reader necessitates that the default state of the GPIO lines be outputs, rather than inputs. The Micro firmware recognizes that it is installed in the USBPro reader and makes the adjustment. There is no change for Micro (and Micro-LTE) modules when installed in other readers.

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Gen2V2 Support

The Micro and Micro-LTE now support 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.

Temperature limits extended to -40C

The Micro has been qualified to operate down to -40 C, so the low temperature limit imposed by the firmware have been lowered from -20 C to - 40 C.

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 through 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.

Support for Antenna Detection

Antenna detection is now supported for the Micro and Micro-LTE modules, but uses the new return loss measurement as opposed to testing the port with a small amount of DC current as is done in the M6e module. A port that shows a return loss of less than 10 dB (for example the value “4”: above) is considered to be un-terminated. A port with a return loss greater than or equal to 10 dB is considered to be terminated (for example the value “30” above).

Antenna detection is only activated when /reader/antenna/checkport is enabled. Unlike the M6e module, this only enables detecting antennas with an explicit request, not checking each time the reader transmits. It is recommended that the host application periodically check for antenna status and adjust the antenna list based on which antennas are present.

Support for narrow North American Regions (NA2, NA3)

In order to support narrow-band antennas, two new regions have been introduced, “NA2” and “NA3”. Here are the characteristics of these regions:

Parameter	NA2 region	NA3 region
Enumerated Region Code	0x0D	0x0E
Lowest Permitted Frequency	917400 kHz	917500 kHz
Highest Permitted Frequency	927200 kHz	922500 kHz
Minimum Channel Spacing	200 kHz	100 kHz
Number of Channels in Default Hop Table	50	51

Both these channels are legal for use in regions that adhere to FCC regulatory requirements.

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.
- ◆ The firmware now returns a “0x0408” error if the requested embedded read length is longer than supported. Previously, no error message would be returned.

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- ◆ RSSI is now returned for timed reads under max power save mode. (In older releases, the RSSI was returned as “0”).

Operational Notes

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- ◆ “Target=AB” or “Target=BA” only works for reading tags. Writing is always done for one target. If the reader is set to “Target AB”, the write will be done with Target=A. If the reader is set to “Target BA”, the write will be done with Target=B.
- ◆ Autonomous Operation is only supported for Gen2 protocol, but there currently is no error message returned if non-Gen2 protocols are selected.