TEKTELIC COMMUNICATIONS INC.

KONA PICO GATEWAY MODULE TUNING PROCEDURE

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Document Revision

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0.1	Sep 21, 2017	Released	A.Narayanan	Initial Release

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1 Transmitter Tests

1.1 Calibration of Transmitter Output Power

1.1.1 Description

Since the Pico Gateway is an open loop power control system, the maximum TX output power will be calibrated to be less than 27.5 dBm by adjusting the power-gain look up table. The result of calibration will be stored in non-volatile memory.

Pico gateway software uses a gain lookup table as shown in Table 1-1 to select the gain settings required to transmit a packet. Note that that the software selects the lowest LUT entry that is closest to the power requested to transmit a packet.

Table 1-1: Tx power-gain look up table

LUT #	g_dac	g_pa	g_mix	Nominal Output power(dBm)
0	3	0	9	-1
1	3	0	11	2
2	3	0	13	4
3	3	0	15	6
4	3	1	8	8
5	3	1	9	10
6	3	1	10	12
7	3	1	11	13
8	3	1	12	15
9	3	1	13	17
10	3	1	15	19
11	3	2	11	21
12	3	2	12	23
13	3	2	14	25
14	3	2	15	26
15	3	3	10	27

1.1.2 Procedure

1. Connect the RF output of the gateway to a power meter.
2. Send test packets at SF7, 925.4MHz, 500 kHz BW, RF Power 27dBm.

3. Measure the output power using a power meter that can trigger on the power level and measure the level during packet transmission. Calculate the average power from the maximum power measured on 5 packets.
4. If the output power is measured to be greater than 27.5dBm, disable the highest entry in the power-gain LUT. Once the LUT is adjusted, repeat the step 2 and 3 until output power is less than or equal to 27.5dBm. Note that that the software selects the lowest LUT entry that is closest to the power requested to transmit a packet.
5. If the output power is measured to be less than or equal to 27.5dBm, save the highest LUT# entry allowed in the NVM to complete the calibration procedure.

1.1.3 Test Limits

Table 1-2: Tx Calibration test limit

Parameter	Value
Max output power	27.5dBm

1.1.4 Test Outputs

Calibration values from this test will be stored in the EEPROM of the gateway.

Table 1-3: Tx Calibration result

Calibration entry Name	value
Maximum LUT#	Integer <=15