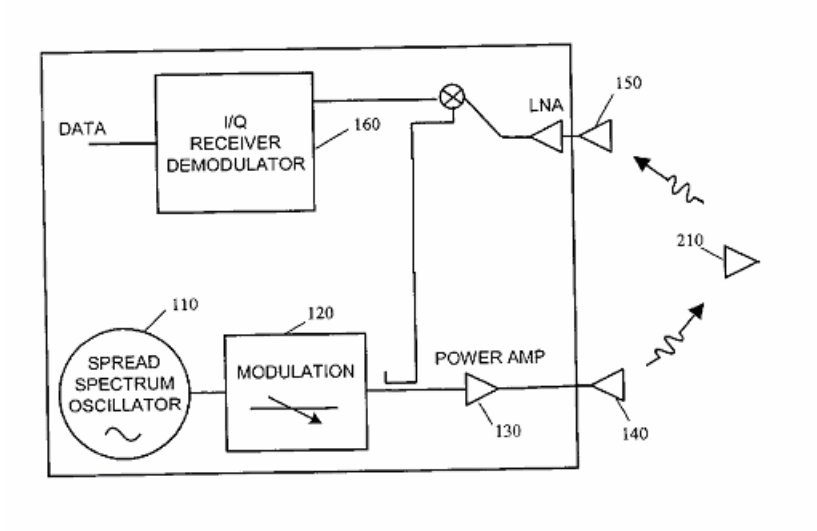
The handheld Reader operates by sending out energy in the 2.44 Ghz band then having that energy reflected off of another sensor antenna labeled as 210.
This signal is transmitted and received through 2 half wave patch antennas printed on a circuit board that is soldered to the main digital signal processor and cannot be removed by the end customer. The antennas themselves have 2.809 dBi of gain.



Reader 800-0000 block diagram
Figure 1.

Every time a sensor is read the current carrier frequency is picked from the table below and then the carrier is turned on for 360ms. This process is repeated at 3 other channels then the unit is turned off for 330 ms before the process can be repeated on the next 4 channels. This leads to a total hop time of 76*.36 + 19*.33 or 33.63 seconds to pass all the way through the frequency hop table

The frequencies used are as follows shown to the nearest MHz. (note table starts at 0 and goes to 75 for a total of 76 hops)

value 0	2471 MHz
value 1	2421 MHz
value 2	2445 MHz
value 3	2465 MHz
value 4	2432 MHz
value 5	2416 MHz
value 6	2452 MHz
value 7	2406 MHz
value 8	2454 MHz
value 9	2427 MHz
value 10	2451 MHz
value 11	2409 MHz
value 12	2462 MHz
value 13	2414 MHz
value 14	2446 MHz
value 15	2477 MHz

value 16	2448 MHz
value 17	2413 MHz
value 18	2433 MHz
value 19	2403 MHz
value 20	2444 MHz
value 21	2425 MHz
value 22	2480 MHz
value 23	2422 MHz
value 24	2466 MHz
value 25	2447 MHz
value 26	2401 MHz
value 27	2430 MHz
value 28	2463 MHz
value 29	2410 MHz
value 30	2453 MHz
value 31	2405 MHz
value 32	2434 MHz
value 33	2478 MHz
value 34	2419 MHz
value 35	2450 MHz
value 36	2428 MHz
value 37	2475 MHz
value 38	2459 MHz
value 39	2476 MHz
value 40	2439 MHz
value 41	2420 MHz
value 42	2449 MHz
value 43	2402 MHz
value 44	2442 MHz
value 45	2460 MHz
value 46	2404 MHz
value 47	2437 MHz
value 48	2461 MHz
value 49	2426 MHz
value 50	2455 MHz
value 51	2415 MHz
value 52	2431 MHz
value 53	2467 MHz
value 54	2441 MHz
value 55	2411 MHz
value 56	2429 MHz
value 57	2469 MHz
value 58	2418 MHz
value 59	2470 MHz
value 60	2481 MHz
value 61	2412 MHz
value 62	2443 MHz
value 63	2464 MHz
value 64	2423 MHz
value 65	2458 MHz
value 66	2407 MHz
value 67	2438 MHz
value 68	2474 MHz
value 69	2436 MHz
value 70	2468 MHz
value 71	2435 MHz
value 72	2473 MHz

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value 73          2457 MHz
value 74          2417 MHz
value 75          2479 MHz
```

This hopping sequence is hard coded into the firmware and is always used in this order. When the end of the table is reached the sequence starts back from the top of the table again.

Because the transmitted signal is used as the local oscillator in the downconverting mixer The receive signal is always in synch with the transmitter.

To actually wake up or write to the sensors that are being look at, the system switches the carrier on and off so that data can modulated onto it using amplitude modulation. When the data has been written to the sensor the sensor then changes the impedance of its receive antenna causing an amplitude modulation of the reflected signal back to the reader. This amplitude modulation is stripped off at the mixer and processed by the signal processor to decode the data.