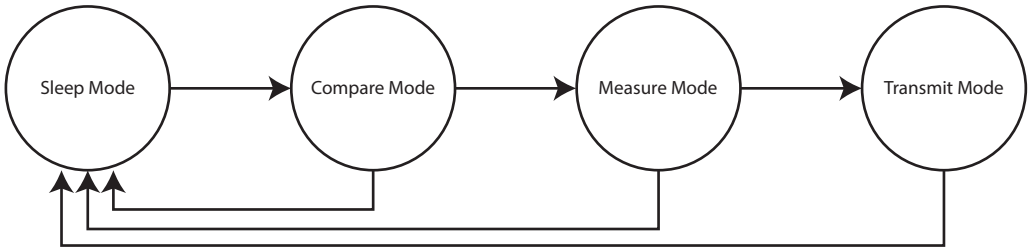
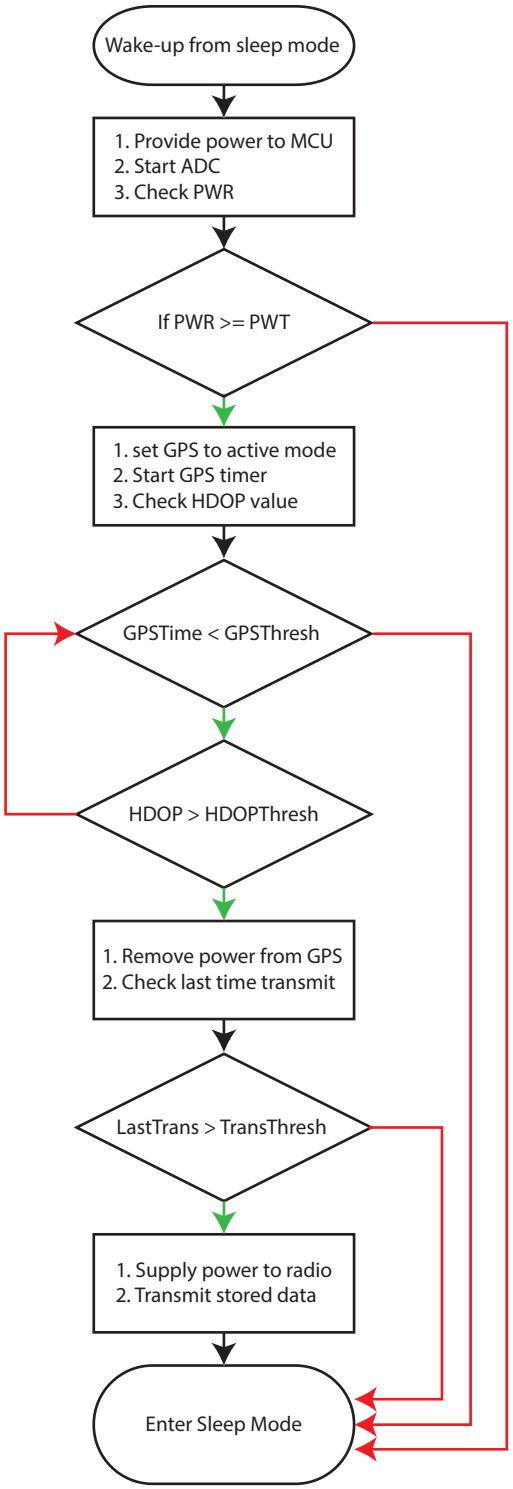
Basic State Diagram



Basic Function Diagram



Key Variables

PWR	voltage of backup battery
PWT	voltage threshold
HDOP	horizontal dilution of precision
HDOPThresh	theshold for HDOP accuracy of fix
GPSTime	time since wakeup
GPSThresh	theshold for GPS fix
LORALast	time since previous LoRa transmission
LORAThresh	threshold for LoRa Tx frequency

1. Sleep Mode
    a. MCU is off (or RESET held high)
    b. GPS backup is on
    c. DC-DC is on (context dependent)

2. Compare Mode
    a. Provide power to MCU
    b. Initalize setup and set registers
    c. Turn on ADC
        i. allow for ADC stabilization
    d. Check current backup battery level (PWR)

If PWR >= PWT GOTO 3,
Else GOTO 1.

3. Measure Mode
    a. set ZOE-M8Q to active refresh mode
    b. initialize the GPSTimer
    c. check incoming fixes for HDOP value

If GPSTimer < GPSThresh GOTO NEXT,
Else GOTO 1.

If HDOP > HDOPThresh GOTO PREVIOUS,
Else GOTO NEXT.

    d. Perform bitwise math on GPS data
    e. Store GPS data in non-volatile memory
    f. Check last time since LoRa transmit

If LORALast > LORAThresh GOTO 4.,
Else GOTO 1.

4. Transmit Mode
    a. Supply power to the radio
    b. Transmit stored data
    c. Set value for LORALast

GOTO 1.