2ADQFMZ03AD Operational Description

The 2ADQFMZ03AD is a remote tank level monitoring device. It is intended to be powered by a non-rechargeable lithium battery pack for a predicted average lifetime of at least 10 years.

The unit uses a BLE (Bluetooth Low Energy) microcontroller which manages all wireless communications. BLE advertising is also used to allow infield testing and diagnostics as well as enabling possible firmware upgrade. A 1.98dBi PCB (Printed Circuit Board) antenna over a ground plane is used as main BLE antenna.

The device reads the tank level sensor every few minutes. When a significant level change is detected, the microcontroller (MCU) activates the BLE transceiver to advertise the tank's level. If there is no level change after 24 hours, the unit performs a daily report using the same procedure on the cellular module.

The unit contains an LTE Cat. M1 certified cellular module (FCC ID: RI7ME310G1WW, IC: 5131A-ME310G1WW) which manages all cellular communications. A quarter-wave monopole antenna over a ground plane is used as main cellular antenna. The 2ADQFMZ03AD uses low data volume: up to 100KB per month, but usually around 10KB per month. Basic GPS functionality is also available to locate a lost unit or locate tanks that can be physically moved.

In the circuit, a load switch is used to power the external sensor. The sensor's signal is then read by the MCU through one of its analog to digital converter. The MCU sends the data using the BLE transceiver.

BLE wireless communication does not operate simultaneously with the cellular communication.