M10 Antenna Detection Application Circuit

With a few external components M10 can detect whether the antenna is fixed or not. The antenna should be carefully chosen when this application is needed. Here we consider two types antenna.

**Type 1:** we consider an antenna whose DC impedance between the ANT_IN and ANT_GND is infinite is adopted.

In this situation a 10KΩ resistance should be embed into the antenna between ANT_IN and ANT_GND. The reference circuit is shown as Figure 1.

![Antenna Detection Circuit for DC Open Antenna](image)

**Figure 1:** Antenna detection circuit for DC open antenna

L1 is used for RF signal blocking and C1 is used for DC blocking. The output of M10’s VDD_EXT (M10 pin7) is 2.8V. Customer can use AT command (AT+QADC?) to check the antenna status. The response of this command is:

+QADC: <status>, <value>

**OK**

The parameter <status>=0 means ADC read is fail and <status>=1 means ADC read is successful. The <value> indicate the voltage with the unit of mV.

When the antenna is ok, the voltage at ADC0 will be equal to VDD_EXT. The response will be as following:

+QADC: 1,1823

**OK**

*Note: Its ok if the value is 1800±100.*
When the antenna is removed, the response will be as following:

\[ +QADC:1,2768 \]

**OK**

*Note: Its ok if the value is 2800±100.*

**Type 2: we consider an antenna whose DC impedance between the ANT_IN and ANT_GND is zero is adopted.**

In this situation it’s no need to embedded a 10KΩ resistance inside the antenna. The reference circuit is shown as Figure 2

![Antenna detection circuit for DC short antenna](image)

**Figure 2: Antenna detection circuit for DC short antenna**

When the antenna is ok, the voltage at ADC0 will be around half VDD_EXT, about 1.4V. The response will be as following:

\[ +QADC:1,1423 \]

**OK**

*Note: Its ok if the value is 1400±100.*

When the antenna is removed, the voltage at ADC0 will be equal to VDD_EXT. The response will be as following:

\[ +QADC:1,2768 \]

**OK**

*Note: Its ok if the value is 2800±100.*