

# Heart failure alert system using rfid technology

[Experience](#), [Failure](#)



The paper will be demonstrating for the first time ever the usage of wireless electrification systems and miniature sensor devices like RIFF passive Tags, that are smaller than a grain of rice and equipped with a tiny antenna which will capture and wirelessly transmit a person's vital body-function data, such as pulse or body temperature , to an integrated ground station. In addition, the antenna will also receive Information regarding the location of the individual from the GAPS (Global Positioning Satellite) System.

Both sets of data medical Information and location will then be wirelessly transmitted to the ground station and made available to save lives y remotely monitoring the medical conditions of at-risk patients and providing emergency rescue units with the person's exact location. This paper gives a predicted general model for HeartFailureAlert System. It also discusses the Algorithm for converting the Analog pulse to Binary data in the tag and the Algorithm for Alerting the Location & Tracking Station. It discusses in detail the various stages involved in tracking the exact location of the Victim using thistechnology. . Illumination It is tough to declare convincingly what is the most Important organ of our DOD Infant every organ has Its own Importance contributing and coordinating superbly to keep the wonderful machine the human body functioning smoothly. And one of the primary organs which the body cannot do without is the heart, 72 beats a minute or over a trillion in a lifetime. The pump house of our body pumping the blood to every corner of our body every moment, thus sending oxygen and nutrients to each and every cell.

Over a period of time, the heart muscles go weak, the arteries get blocked and sometimes because of a shock a part of the heart stops functioning

<https://assignbuster.com/heart-failure-alert-system-using-rfid-technology/>

resulting in what is called a HEART ATTACK. Heart attack is a major cause of death and in today's tension full world It has become very common.

Presently there is no mechanism by which a device monitors a person's heart 24 hours a day, 7 days a week and gives him instant protection in case of problem. Our primary focus is on people with a history of heart problem as they are more prone to death due to heart 'OFF' failure.

In the 1970s, a group of AT clients at the Lawrence Livermore Laboratory realized that a handheld receiver stimulated by RF power could send back a coded radio signal. Such a system could be connected to a simple computer and used to grant access to a secure facility. This system ultimately became one of the first building entry systems based on the first commercial use of RFID. RFID or Radio Frequency identification is a technology that enables the tracking or identification of objects using IC based tags with an RF circuit and antenna, and RF readers that "read" and in some cases modify the information stored in the IC memory.

RFID is an automated data-capture technology that can be used to electronically identify, track, and store information about groups of products, individual items, or product components. The technology consists of three key pieces: ; RFID tags. ; RFID readers. ; A data collection and management system. RFID tags: RFID tags are small or miniaturized computer chips programmed with information about a product or with a number that corresponds to information that is stored in a database. The tags can be located inside or on the surface of the product, item, or packing material.

The RFC tags could be divided in two major groups: Passive Group: where the power to energize the tags circuitry is draw from the reader generated field. Active Group: In this case the tag has an internal power resource, in general a battery that could be replaceable or not, in some case this feature limited the tag lifetime, but for some applications this is not important, or the tag is designed to live more than the typical time needed. RIFF readers: RIFF readers are querying systems that interrogate or send signals to the tags and receive the responses.

These responses can be stored within the reader for later transfer to a data collection system or instantaneously transferred to the data collection system. Like the tags themselves, RIFF readers come in many sizes. RIFF traders are usually on, continually transmitting radio energy and awaiting any tags that enter their field of operation. However, for some applications, this is unnecessary and could be undesirable in battery-powered devices that need to conserve energy. Thus, it is possible to configure an RIFF reader so that it sends the radio pulse only in response to an external event.

For example, most electronic toll collection systems have the reader constantly powered upon that every passing car will be recorded. On the other hand, RIFF scanners used in veterinarian's offices are frequently equipped tit triggers and power up the only when the trigger is pulled. The largest readers malign consist AT a desktop personal computer Walt a special car Ana multiple antennas connected to the card through shielded cable. Such a reader would typically have a network connection as well so that it could report tags that it reads to other computers.

The smallest readers are the size of a postage stamp and are designed to be embedded in mobile telephones. 2. General Model for Heart Failure Alert System The Heart Failure Alert System consists of : ; RIFF Tag (Implanted into Human body). ; RIFF Reader (Placed in a Cellular Phone). Global Positioning Satellite System. ; Locating & Tracking Station. ; Mobile Rescue Units. The grain-sized RIFF tag is implanted into the human body, which keeps track of the heart pulse in the form of voltage levels. A RIFF reader is placed into the cellular phone.

The RIFF reader sends a command to the RIFF tag which in turn sends these voltage pulses in the form of bits using the embedded software in the tag as response which is a continuous process. These bit sequence is then sent to software program in the cellular phone as input and checks for the condition of heart allure. If any sign of failure is sensed then immediately an ALERT Signal will be generated and in turn results in the AUTODIAL to the Locating & tracking station. This station with the use of GAPS system comes to know the whereabouts of the victim. The locating and tracking station also simultaneously alerts the rescue units. . Working of Implanted RIFF Tags Passive RIFF systems typically couple the transmitter to the receiver with either load modulation or backscatter, depending on whether the tags are operating in the near or far field of the reader respectively. In the near field, a tag couples with a reader via electromagnetic inductance. The antennas of both the reader and the tag are formed as coils, using many turns of small gauge wire. The reader communicates with the tag by modulating a carrier wave, which it does by varying the amplitude, phase, or frequency of the carrier, depending on the design of the RIFF system in question.

The tag communicates with the reader by varying how much it loads its antenna. This in turn affects the voltage across the reader's antenna. By switching the load on and off rapidly, the tag can establish its own carrier frequency (really a sub carrier) that the tag can in turn modulate to communicate its reply. Hug: Oral sleaze RIFF lag RIFF tags are smaller than a grain of rice and equipped with a tiny antenna will capture and wirelessly transmit a person's vital body-function data, such as pulse and do not require line of sight.

These tags are capable of identifying the heart pulses in the form of voltage levels and converts into a bit sequence. The first step in A-D Conversion is Pulse Amplitude Modulation (PAM). This takes an analog signal, samples it and generates a sequence of pulses based on the results of the Sampling (measuring the amplitude at equal intervals) PC (Pulse Code Modulation) quantizes PAM pulses that is the method of assigning integral values in a specific range to sampled instances. The binary encoding of these integral values is done based on the algorithm BIN\_ONCE depending on the average heart pulse voltage of the victim (Bag\_pulse).

Alga BIN\_ONCE: Steps: Read the analog signals from the heart. Steps: Sample the analog signal and generate series of pulses based on the results of sampling based on the tag frequency. Steps: Assign integral values to each sampled instances generated. Steps: Consider every individual sampled unit and ampere with the average voltage level of the heart. Steps: If the sampled instance value is in between the average pulse values then assign

BIT= 0 Otherwise assign BIT=1 . Steps: Generate the bit sequence by considering all the generated individual sample instances.

Fig: Analog-Binary Digits Conversion in Tags Working of RIFF reader inside cellular phone: The RIFF reader sends a pulse of radio energy to the tag and listens for the tags response. The tag detects this energy and sends back a response that contains the tags serial number and possibly other information as well. In simple RIFF systems, the reader's pulse of energy functioned as an on-off switch, in more sophisticated systems, the reader's RFC signal can contain commands to the tag, instructions to read or write memory that the tag contains.

Historically, RIFF readers were designed to read only a particular kind of tag, RIFF readers are usually on, continually transmitting radio energy and awaiting any tags that enter their field of operation. Fig: RIFF Reader in cellular phone. The reader continuously sends ten command to ten tags. In turn receives ten voltage levels in the form of bit sequence as response from the tags with the help of the BIN\_ONCE algorithm. The reader sends the received bit sequence to a software embedded in the cellular phone. In case of detection of a weak heart pulse this software automatically alerts the tracking & location station .