ISSN No:-2456-2165

Soldier Tracking and Health Monitoring System

R. Trinadh[1]
Sir C R Reddy College of Engineering Asst Professor[1]

Y. Kesava Harshitha[2]
U. Sireesha[3]
R. Siva Rama Krishna[4]
P. Dasaradha Ramaiah[5]
Sir C R Reddy College of Engineering UG Scholars[2,3,4,5]

Abstract:- The security of a country is crucial in today's globe. The military is crucial in this sense. There are numerous issues with soldier safety, including their whereabouts, health, etc. The major goal of this project is to create a system that follows a soldier's whereabouts and keeps tabs on their health. For the soldiers taking part in the mission, this system is incredibly helpful. The health of the soldier is monitored during combat by employing numerous sensors, such as heartbeat sensors, temperature sensors, gas sensors, etc. In this technology, the soldier's location is determined using GPS tracking. The soldiers' message is sent to the base control unit using a GSM modem. Also, a panic button is available to the soldier when he is in danger so that the base station can be informed. By utilizing this technology, we can preserve the soldiers' precious lives.

***Keywords*:-** *Sensors, Panic Switch, GSM Module, and GPS Tracking.*

I. INTRODUCTION

The second-largest and one of the most powerful militaries in the world is the Indian army. The Indian Army has played a variety of responsibilities in securing the nation's frontiers against external threats. They suffered numerous wounds throughout the conflict, but they also perished as a result of the inability to relay information to the base unit or control center. They occasionally got lost and ended up in a dangerous area. The safety of the soldiers is a complicated matter.

Today's technology is advanced, and we may create a project to save the lives of warriors by utilizing technology. During combat, the soldier's location is tracked via GSM and GPS. We can easily follow the place where the essential medical treatments will be administered and keep an eye on the soldier's health by employing a variety of sensors. GSM is utilized for wireless communication, and GPS is used to track the location. With this concept, the control room can receive information about the soldiers' precise location and health status. By delivering prompt medical care, this technology helps to decrease the amount of time that soldiers must spend searching and in the control room.

II. LITERATURE SURVEY

- *With IOT, Securely Monitor Soldiers' Health Through a Tracking System:*

Mrs. Tripti Kulkarni or Mrs. Pallavi Kulkarni A study that was released in the June 2019 issue of the worldwide journal of Trends in scientific research and Development. The article describes a method for tracking and monitoring troops' health that is based on the Internet of Things. The proposed system can be installed on a soldier's body to use GPS to track their whereabouts and health state.

- *An IOT-Based System for Monitoring the well-being and Location of Soldiers:*

Krutika Patil, Omkar Kumbhar, Sakshi Basangar , and Priyanka Bagul published the International Journal of Electrical, Electronics and Computer Systems (IJEECS), ISSN (online): 2347-2820, volume 5, issue 1, 2017. This system transmits all parameters in real-time to the base station using a GPS module and a wireless body area sensor network. The system's various sensors, including the humidity sensor, temperature sensor, and pulse sensor, are utilized to determine the state of health of each individual army officer.

- *System for Monitoring And Monitoring Soldier Health with IOT:*

Prof. Sushma B.Akhade, Tushar Samal, Saurav Bhondve, Syraj Masal, Sagar Gite,and others published an article in the International Journal of Advanced Scientific Research and Engineering Trends in April 2020, Volume5, Issue 4. The proposed system can be installed on the soldier's body to use GPS to track their whereabouts and health status. IOT will be used to convey this data to the control panel.

- *Soldier Tracking and Health Indication System Using GPS and IOT:*

International Research Journal of Engineering and Technology, Volume 4, Issue 6, June 2017, by Jasvinder Singh Chhabra, Akshay Chhajed, Shamlee Pandita, and Suchitha Wagh.The goal of this paper is to follow the soldier and navigate from soldier to soldier while also keeping track of their speed, distance, and height during combat.

ISSN No:-2456-2165

➢ *Internet of Things-based Health Monitoring and Tracking System for Troops:*

Brijesh Iyer and Niket patil, both IEEE members who are students, presented at the International Conference on Computation, Communication, and Automation(ICCCA 2017)**.** The article describes a method for tracking and monitoring soldiers' health that is based on the Internet of Things. The proposed technology can be installed on a soldier's body to use GPS to track their condition and position.

III. PROPOSED SYSTEM

The proposed method includes tracking a soldier as well as monitoring their health. With the use of sensors, GPS, and GSM, the control room can view the soldier's specifics. When soldiers become disoriented during a mission, GPS is utilized to direct them in the right direction. Using GSM and GPS, the control room can find out where the soldier is. By using a variety of sensors, we can follow the soldier's whereabouts and track his or her health. They activate the panic switch in an emergency. The suggested system is composed of two components: The soldier unit and the control room.

The soldier's health is continuously monitored via the DHT11 temperature sensor, MAX10302 heart rate sensor, and MQ2 gas sensor. The soldier's location is tracked using GPS, and the SMS is sent to the control room using GSM. The microprocessor AT89S52 processes and stores the data from the sensors.

➢ *The Algorithm:*

- The GPS is used to track the soldier's location, and the results are shown on an LCD after being communicated to the control unit.
- Using a variety of sensors, the soldiers' health states are assessed. Information is provided to the control room when a sensor's limit is crossed.
- Information is transferred to the control room and the desired data is shown on an LCD when the threshold value is crossed.
- Toxic gases present in the environment can be found using gas sensors.
- When soldiers are in serious condition, they utilize the panic switch.

➢ *Hardware Description*

- *Heartbeat Sensor (MAX 10302):*

A low-power, plug-and-play biometric sensor with a pulse oximeter and heart rate sensor, the MAX30102 is based on the I2C protocol. The module includes the MAX30102, an updated (and MAX30100's successor) Analog Devices integrated pulse oximeter and heart rate sensor IC. It uses two LEDs, a photodetector, improved optics, low-noise analog signal processing, and two LEDs to detect heart rate (HR) and pulse oximetry (SpO2) readings.

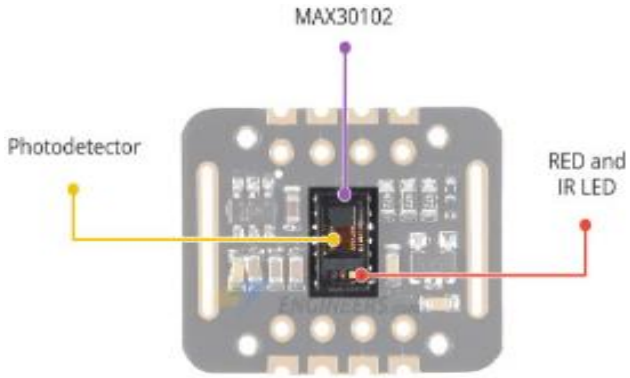

Fig 1 Heartbeat sensor
(MAX 10302)

- *Temperature Sensor (DHT11):*

The amount of water vapor in the air is measured as humidity. Many physical, chemical and biological processes are impacted by the air's humidity content. Humidity can have an impact on personnel safety, health, and corporate costs in industrial applications. Both a sensor and a module are available for the DHT11 humidity and temperature sensor.

Fig 2 Temperature
Sensor (DHT11)

- *Gas Sensor (MQ2):*

One of the MQ sensor series most often-used models is the MQ2. Because sense is based on the change in resistance of the sensing materials when exposed to the gas. Metal oxide sensors are also known as Chemiresistors.

Fig 3 Gas Sensor
(MQ2)

- *GSM:*

In Europe and other parts of the world, many mobile phone customers use the GSM (Global System for Mobile communication) digital mobile network. The most popular of the three digital wireless telephony technologies—TDMA, GSM, and CDMA—GSM employs a version of time.

ISSN No:-2456-2165

Fig 4 GSM

- *GPS Receiver:*

When a soldier is engaged in a military conflict, GPS is utilized to track their location. It follows the information in real-time everywhere on the planet.

Fig 5 GPS Receiver

- *Control Unit:*

Here, the microcontroller is connected to the sensors, GPS, and GSM. The control room gathers information from each soldier and uses it to provide that soldier with immediate support and assistance.

- *The Soldier Unit:*

Soldier Unit consists of various health monitoring sensors to observe the health of the troop and they consist of GPS and GSM. The key component of the suggested system is the microcontroller. This project's work involves following a soldier's whereabouts and keeping tabs on his or her health.. The system has additional components for dangerous gas detection. When a soldier is in a critical condition, they can utilize the panic switch on this system. By activating the panic button, a GSM control room receives the message. GPS is used to track the location of the soldier during the war.

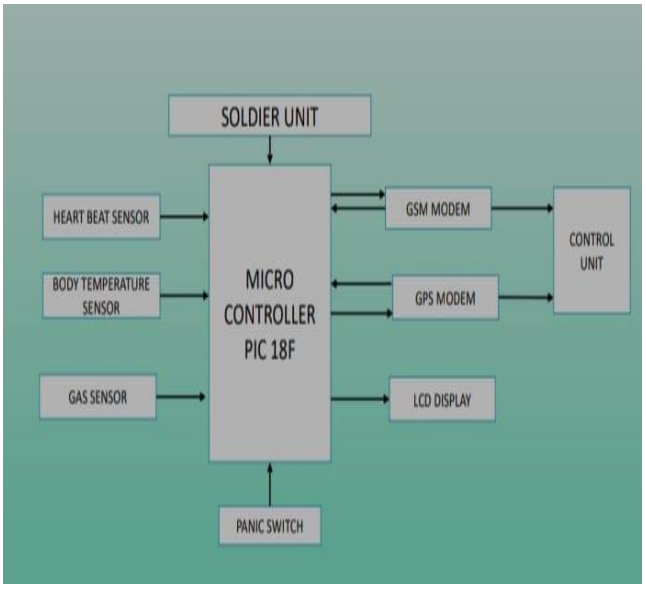

Fig 6 Soldier Tracking and Health Monitoring System

IV. RESULTS

Fig 7 Temperature and Heartbeat verification

The above picture depicts that “T” indicates the body temperature in Fahrenheit and “t” indicates the temperature in Celsius. “H” indicates Heartbeat

Fig 8 Panic Switch Alert

Figure 8 represents the panic switch alert which is pressed by the soldier they are in a dangerous condition. The alert is observed by the control room.

ISSN No:-2456-2165

Fig 9 GPS Location on Google

V. CONCLUSION

The mechanism for tracking soldiers' health is described in the paper. The threshold values are stored by a microcontroller. Each soldier's health status is provided through their body temperature sensor, gas sensor, and heartbeat sensor. We can locate the soldier who went missing using GPS. The panic switch alerts the control room when the soldier is in danger, which increases communication between soldiers and the control center. Consequently, we may draw the conclusion that this approach is very beneficial to soldiers' lives.

REFERENCES

[1]. Health Monitoring and Tracking systems for soldiers using internet of things (IOT) - https://ieeexplore.ieee.org / document/8230007

[2]. Ankita Sharma and Shipra Agarwal "Real-Time Health monitoring system of soldiers using IOT", Conference on Advanced computational paradigms and Hybrid intelligent computing, AISC volume 1373, 7 December 2021.

[3]. Archana Padikar A, Cinmayee C K, Chaithra E, Chethan1 "Health Monitoring and Soldier Tracking System using IOT", Conference on International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181

[4]. G. Harinee1, R.Ramya2, " Soldier Health Care Monitoring & Tracking System Using IOT " Conference on IOSR Journal of Electronics and Communication Engineering (IOSR-JECE) ,e-ISSN: 2278-2834,p- ISSN: 2278-8735. PP 01-05

[5]. https://www.academia.edu/79291669/Soldier_Health_Monitoring_and_Tracking_System_Using_IOT_and_AES

[6]. S.Sathishkumar1, J.Dhivagar2, V.Prem3, B.Saikrishna4 "LOCATION TRACING AND HEALTH MONITORING SYSTEM FOR SOLDIER'S USING INTERNET OF THINGS (IOT)" Conference on International Research Journal of Engineering and Technology (IRJET), Volume: 08 Issue: 04 | Apr 2021

[7]. T Manikandan[1], J Ranjani[2], Ramnya V[2] and S Preethi[2] "AIOT based Real Time Environment Monitoring and Tracking System for Soldiers using SN-MQTT Protocol, Conference series : Journal of Physics, April 2021

[8]. E. Shalini1* , S. Priya2 , S. Sabitha3 , S. R. Shalini4 , C. Shanmugam "Soldiers Health Monitoring and Tracking System" Conference on International Journal of Research in Engineering, Science and Management Volume 4, Issue 7, July 2021

[9]. Jasvinder Singh Chhabra1, Akshay Chhajed1, Shamlee Pandita1, Suchita Wagh2 " GPS And IoT Based Soldier Tracking & Health Indication System " International Research Journal of Engineering and Technology (IRJET) , Volume: 04 Issue: 06 | June-2017

[10]. Health Monitoring and Tracking System for Soldiers using Internet of Things, Niket Patil, student member, IEEE and Brijesh Iyer, Member, IEEE, International Conference on Computing, Communication and Automation (ICCCA2017).