

# BRIDGE STATUS MONITORING SYSTEM

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**Abstract:** Now a days, numerous varieties of catastrophe is going on normally in all around the world. This is due to alternate in herbal situations. These varieties of failures will break the various shape like bridges and this could harm the life. Hence to constantly confirm and reveal the situations on bridge we make the device known as bridge tracking device. Bridge tracking device will assist to understand the cutting-edge situations on bridge and tell us. As in keeping with the report, as many as 1,217 human beings died and extra than five,000 human beings had been injured in incidents of bridge collapses in the course of the u . s . a . in beyond 15 years. Where in Mumbai round 6 bridges had been collapsed in beyond 7 years and brought about 28 dying in which those are artificial tragedy, in which as a minimum one comparable incident had been said in Mumbai due to the fact that 2010. From the evaluation of various journals papers, The key advantage of the use of is that it has a better diploma of output quality, and the creation of latest era might make the device smarter and extra receptive. We can lessen the danger of human mistakes and damage to the bridge as a result of human and herbal failures may be minimized .

**Keywords:** Wi-Fi, Cloud, Private Channel

## 1.INTRODUCTION

Bridges are constantly subjected to adverse outcomes of material aging. extensive, corrosion of metal reinforcing bars in concrete systems, corrosion of metal system and additives, growing visitors quantity and overloading, or simply or virtually standard deterioration and growing old. These elements, blended with defects of layout and production and unintended harm, spark off the deterioration of bridges and bring about the lack of load sporting potential of bridges. The situation of closely used city bridges is even worse: one in 3 are categorised as growing old or not able to house current car weights and visitors quantity. Therefore, a big variety of those systems want strengthening, rehabilitation, or alternative, however public price range aren't commonly to be had for the desired alternative of present systems or production of latest ones. Bridges can go through structural deterioration because of growing old, misuse or loss of right preservation. Among the various elements that have caused the unsatisfactory situation of bridge systems, one issue that has been overlooked is the unsatisfactory inspection and tracking of present systems. The maximum not unusual place goals for tracking a bridge are to gain quantitative facts approximately the structural conduct in an effort to affirm layout assumptions and to offer actual-time feed-returned throughout production

## 2.LITERATURE REVIEW

Some screw ups are surprising and catastrophic, and a few screw ups simply take their time. Structural Health Monitoring (SHM) may be very useful in serving as an alarm device for stopping each varieties of screw ups. Bridge Engineers want clinical equipment that can supply brief records approximately the fitness of a bridge. Such tool shall complement the periodical guide inspections. But while screw ups occur with any sort of shape there's lack of human lives, cash and lots of extra, maximum of the times. For example, throughout the bridge production growth of the 1950s and 1960s, little emphasis become located on protection inspection and preservation of bridges. This modified while the 2,235 foot Silver Bridge at Point Pleasant, WV, collapsed into the Ohio River, on Dec. 15, 1967. forty six human beings had been killed. Hence to make certain the protection of bridges, the Bridge Health Monitoring System become delivered. Some of the present technology/strategies for Bridge Health Monitoring System are as defined.

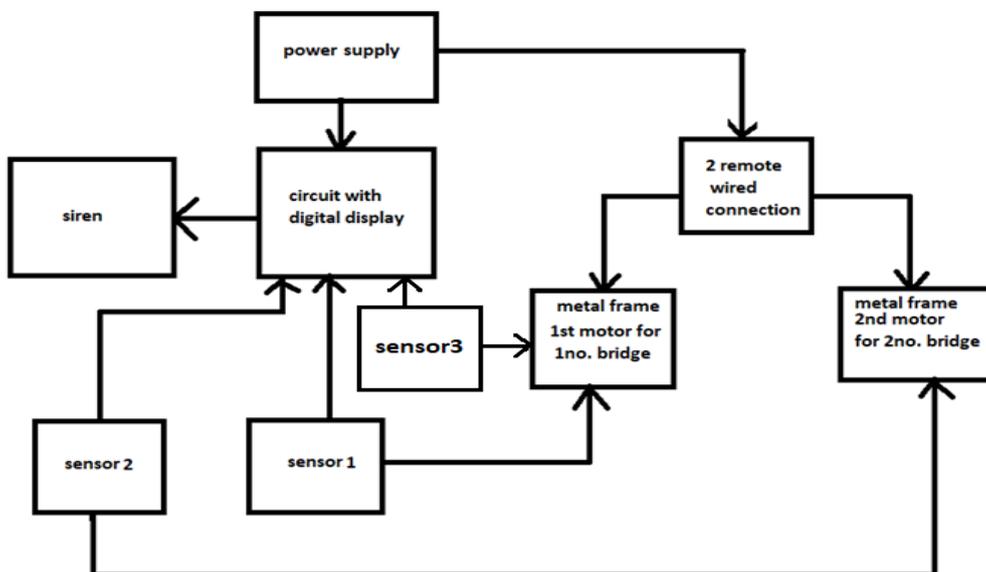
**3. OBJECTIVE OF THE PROJECT:**

The aim of our task is to layout, implement, and check a Bridge reputation tracking device that can be used for tracking fitness of bridge. The Bridge device is save you the accidents, it can be assist to repair the bridge earlier than absolutely broken. It is useful to shield human beings from foremost accidents. It is value saving Through this we can capable of reveal daily reputation of bridge in day by day basist a lot of heavy vehicals are jogging thru bridge ,so it's miles very obious to bridge ought to be broken and we can't test it on day by day basis, so this tool is assist us to reveal this and assist to saving of many lives and it's time saving additionally.

**4. DESIGN AND FABRICATION :**

Bridge reputation tracking device is likewise we will say bridge fitness tracking device additionally as it suggests reputation of the fitness of bridge .Fig. suggests beneathneath a way to paintings this device and additives the use of for this device are those following.

**BLOCK DIAGRAM**



**Components Required:**

1. Remote
2. Switches
3. Transistor
4. Ic
5. Display seven segment
6. sensors as continuity sensors
7. Resistance
8. Diode
9. Capacitor
10. Gear box motors
11. Metal plates
12. Coupler

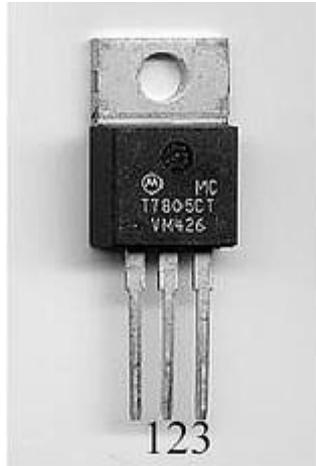
**7. METHODOLOGY :**

**• POWER SUPPLY**

Power deliver is a connection with a supply of electrical energy. A tool or device that elements electric or different varieties of electricity to an output load or organization of hundreds is known as a energy deliver unit or PSU. The time period is maximum usually carried out to electric electricity elements, much less regularly to mechanical ones, and infrequently to others.

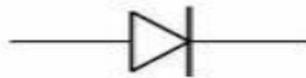
- **REGULATOR IC (78XX)**

It is a 3 pin IC used as a voltage regulator. It converts unregulated DC cutting-edge into regulated DC cutting-edge. Normally we get constant output via way of means of connecting the voltage regulator on the output of the filtered DC (see in above diagram). It also can be utilized in circuits to get a low DC voltage from a excessive DC voltage (as an example we use 7805 to get 5V from 12V).



- **DIODE:**

The diode is a p-n junction tool. Diode is the issue used to govern the glide of the cutting-edge in someone direction. The diode extensively works in ahead bias. Diode while the cutting-edge flows from the P to N direction. Then it's miles in ahead bias. The Zener diode is utilized in opposite bias feature i.e. N to P direction



- **RESISTORS**

The glide of fee thru any cloth encounters an opposing pressure comparable in lots of respects to mechanical friction .this opposing pressure is known as resistance of the cloth .in a few electric powered circuit resistance is intentionally delivered in shape of resistor. Resistor used fall in 3 categories , best of which might be colour coded which might be steel movie and carbon movie resistor



- **Buzzer:**

An audio signaling tool like a beeper or buzzer can be electromechanical or piezoelectric or mechanical type. The essential feature of that is to transform the sign from audio to sound. Generally, it's miles powered thru DC voltage and utilized in timers, alarm devices, printers, alarms, computers, etc. Based at the numerous designs, it may generate unique seems like alarm, music, bell & siren. bell & siren.



- **DPDT Switch :**

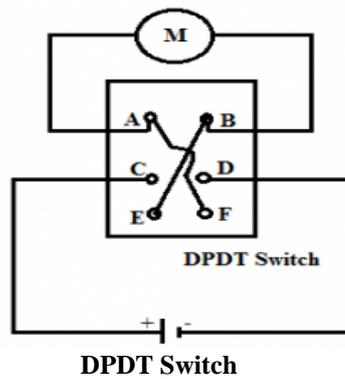
A DPDT or Double Pole Double Throw transfer consists of inputs & 4 outputs in which each enter has equal outputs. This transfer may be very flexible due to the fact every terminal on this transfer may be both in certainly considered one

among positions. The inputs of this transfer can hook up with 4 unique outputs, so it may redirect a circuit into unique modes of operation. This transfer is the mixture of SPDT switches. The schematic image of the dpdt transfer is proven beneathneath. DPDT Switch Symbol.

**DPDT Switchbol**

- **DC Motor Control using DPDT Switch**

Control the use of DPDT Switch The DPDT transfer circuit diagram is proven beneathneath that is used to govern a DC motor. To manage a DC motor, first, we want to attach the motor to a transfer. Generally, DPDT has six terminals while DC motor has terminals. Here, the transfer terminals are while DC motor has terminals. Here, the transfer terminals are represented with A, B, C, D, E, F & G. The connection of this circuit is as follows. DPDT Switch to Motor Connection



**Electrolytic capacitor :**

Most not unusualplace forms of aluminum and tantalum electrolytic capacitors. All electrolytic capacitors (e-caps) are polarized capacitors whose anode (+) is fabricated from a selected steel on which an insulating oxide layer bureaucracy via way of means of anodization, appearing as the dielectric of the electrolytic capacitor

**Electrolytic capacitor**



- **Gear Box:**

Gear box "in any other case referred to as a equipment reducer or pace reducer" is a hard and fast of gears that may be delivered to a motor to extensively lower pace and/or boom torque.

**BCD to 7-segment latch de-coder drivers CD4511:**

The CD4511 is a BCD to seven phase latch, decoder and driver. The circuit pro-vides the features of a four-bit garage latch, an 8421 BCD-to-seven phase decoder, and an System output pressure functionality. It has a complete of four inputs

particularly A, B, C and D. Since we're the use of best three loops, the fourth enter D is grounded. The different 3 inputs are linked the 3 loops, one for every room.

### **9.RESULT & CONCLUSION:**

Based at the ability mixtures of various to be had sensors and systems, the variety of packages is simply endless. Application of structural fitness tracking technology to bridges has visible super boom withinside the beyond decade. Initial consequences from those packages have proven the functionality of to be had SHM technology in tracking, studying and expertise the fitness of the monitored bridges. Since maximum of case research and packages are simply in beyond latest years, it's miles vital to have a look at their overall performance and consequences over a long term via way of means of non-stop tracking to decide the sturdiness and reliability of those systems. In India loads of bridges are constructed each 12 months wherein the significance given to preservation may be very much less. There aren't any Health Monitoring Systems used on any bridges of India. Around 70% of bridges in India are antique and want maintenance and 57% are over eighty years antique. In such bridges the want for tracking may be very excessive, however they're overlooked. According to a survey in 2003, round 23% of bridges in India want maintenance and that they ought to be monitored. The value of bridge fitness tracking device is negligible compared to the full value of the bridge, So there's want for putting in Bridge Health Monitoring Systems on all Bridges. Bridges that is mainly very reasonably-priced compared to optical fiber systems. This will sincerely save you the catastrophes taking place because of poor bridges and additionally because of herbal failures.

### **10.REFERENCES:**

1. Y. R. Risodkar; A.S. Pawar, A survey: Structural fitness monitoring of bridge the use of WSN 2016 International Conference on Global Trends in Signal Processing, Information Computing and Communication, 2017
2. A.B. Noel, A. Abdaoui, T. Elfouly, M. H. Ahmed, A. Badawy and M. S. Shehata, Structural Health Monitoring Using Wire-mesh Sensor Networks: A Comprehensive Survey, in IEEE Communications Surveys Tutorials, vol. 19, no. three, pp. 1403-1423, 1/3 region 2017
3. Journal Papers: [1]. Yongtao Dong and Ruiqiang Song, Synthesis of Knowledge and Technology Bridges Structural Health Monitoring and Deterioration Detection, Department of Civil & Environmental Engineering, University of Alaska Fairbanks. [2]. D.Niranjan Reddy and P.G.R.Nair, Bridge Monitoring thru Vibration Signatures at Konkan Railway Corporation limited. [3]. Real-time bridge fitness-tracking for management US-Japan Center to Center Cooperative Research in Urban Earthquake Disaster Mitigation among Disaster Prevention Institute, Kyoto University and Southern California EQ Research Center below NSF.; Circuits and Systems electricalnotes.wordpress/electriccsu.org/..elc\_standard\_book.pdf dom.com/..blue-book.pdf electricalengineering-book.com. www.instructables.com
4. www.circuitstoday.com www.eleccircuit.com Electronics: Learning Through Discovery 2nd Edition. Electronics All-in-One For Dummies. Understanding Basic Electronics- 2nd Edition. The Basic Soldering Guide Handbook. Teach Yourself Electricity and Electronics, 6th Edition.