



“Rainfall Sensor-CR196”

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Introduction

Orissa has a record of flood affected states in India. The flood in Orissa occurs mainly during monsoon season due to heavy rainfall. The heavy rain fall at different catchments enhance the flood condition in costal areas of Orissa. The flood in Orissa occurs mainly during June to October. The rain fall extends from central part of coastal Orissa to northwest part of Orissa. It is also part of the disturbances like low pressure develop over Bay of Bengal. However, the frequency of very heavy rainfall does not show any significant trend in recent years over Orissa.

Sunjray with a long history in research and development suggested the tipping bucket measurement technique to be used in Orissa to measure the rain fall in different parts of Orissa for further information related to flood. This tipping bucket technology was initially developed by Christopher Wren In 1662 AD, (The first tipping-bucket rain gauge in Britain).



Figure 1

Detail of Sensor

The tipping bucket rain gauge consists of a large steel cylinder. At the top end of the cylinder, a funnel like structure is made to collect the rain water. The funnel channelise the water into one of two small buckets which are balanced equally. After a specific time period when the bucket has a certain amount of water, the lever tips and at the same time an electrical signal is sent to the data recorder.

Rainfall amount is decided by the total amount of rain that has fallen in a set period and by counting the corresponding number of 'clicks' in that time period. This gives an average amount of rain fall in a certain time at a certain place. The advantage of the device is, it does not need manual check up at the site. The device transmit the data regularly upon each event. The data is collected and sent back to the main web server through a GPRS link. The device has also a inbuilt battery to run the data collection and transmission system. The battery is recharged with a solar pan continuously to supply an uninterrupted power supply.

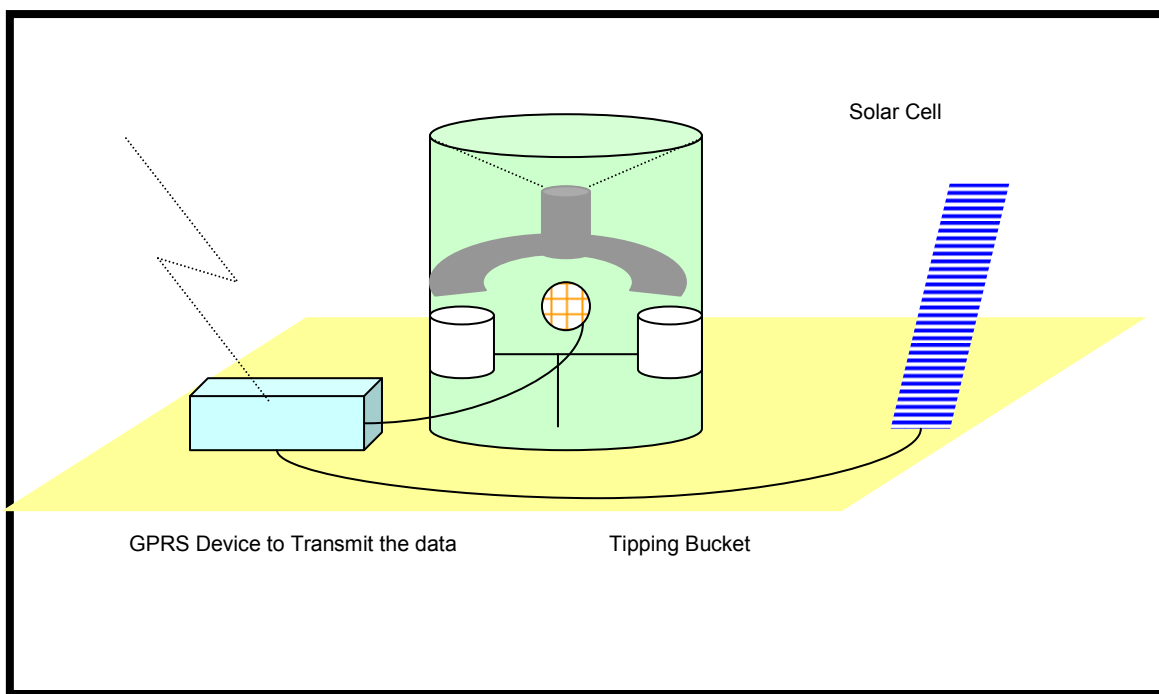


Figure 2

Features

1. The device is made of corrosive steel
2. The device can work in a different temperature and humidity as well.
3. The device has two buckets to accept the rain water in a certain time interval
4. The device has a funnel like structure at the top end of the device
5. The device collects data in every 5 minutes and transmits to the main server till the water level is full in one bucket
6. The device goes in silent mode once the data sent to the server for next 5 minutes.
7. The device has a robust structure to avoid entering of any water, moisture or dust to the measuring and data handling modules.



8. The rainfall data can be saved maximum up to 512 days as it has maximum 2MB inbuilt memory
9. The total power consumption is 10 mA
10. The data transmission modules require less than 0.1 mA,
11. The device has a built in solar panels and it generates power for 30 days of consecutively in cloudy days
12. This device does not need any special electric power point as it has inbuilt battery
13. The device is also attached with a solar cell to supply constant power to the data acquisition and data transmission part.
14. The data acquisition and data transmission are available on board to avoid the daily manual interaction.
15. The device has also enabled with a sleep mode to achieve low power consumption
16. The device has a microprocessor (MPU) with memory
17. The device has option of connecting to RS 485, RS 232 and RS 232
18. The device is attached with a Web Server for regular reporting systems
19. The data can be sent to maximum 4 different web servers
20. The rain fall report can be created on daily, weekly, monthly and annually
21. The device has been attached with GSM facilities
22. The information can be sent over SMS or through GPRS
23. The configuration of data transmission unit is possible remotely
24. The data can also be sent to operator's mobile phone.