INGEN
Smart Solutions for Secure Tomorrow

WRMS
Farm Smart. Secure Tomorrow.

Telemetric Weather Station

— by INGEN Technologies

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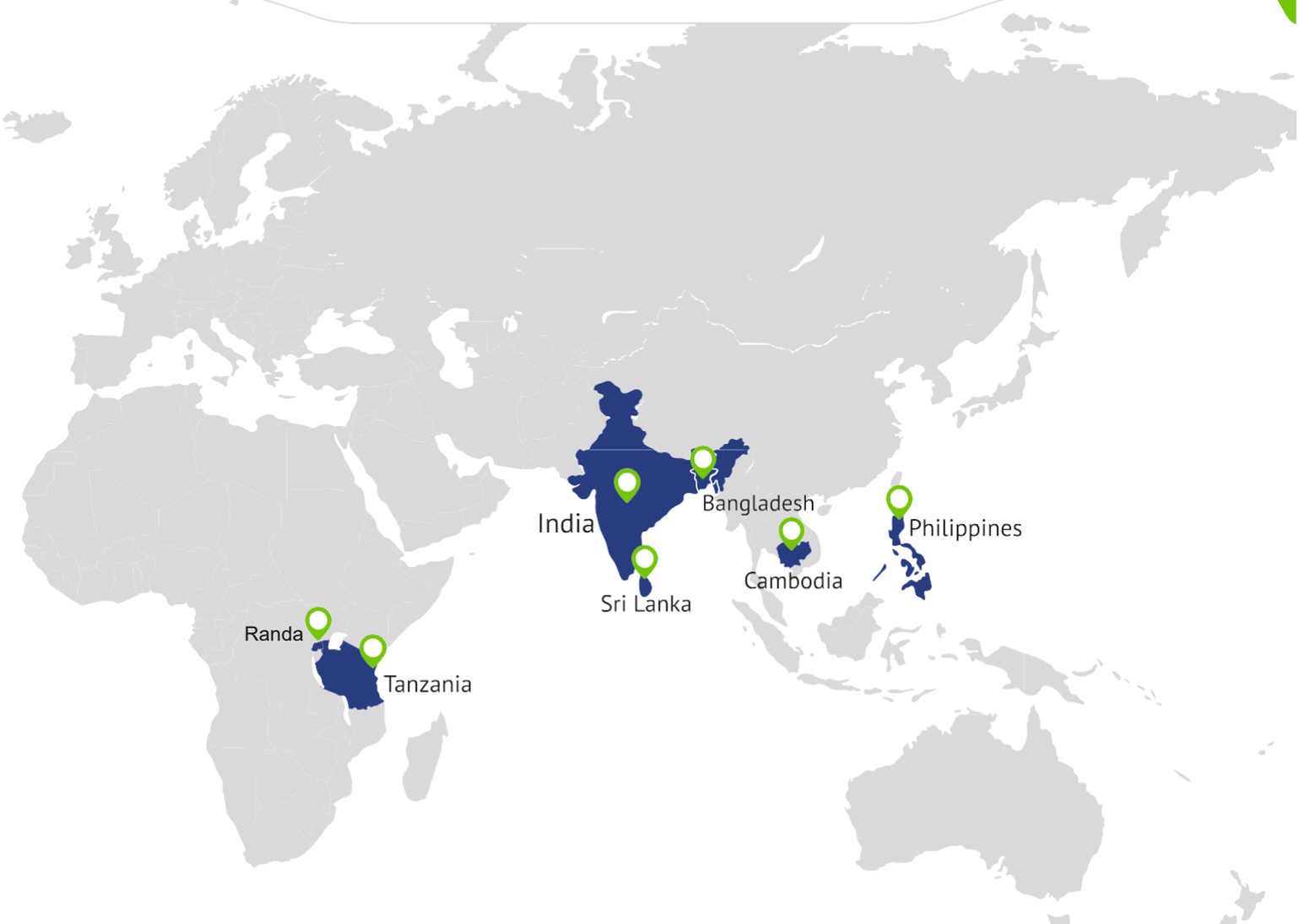
About Us

Wholly-owned subsidiary of WRMS

Ingen Technologies Private Limited, founded in the year 2008 as a subsidiary of Weather Risk Management Services Private Limited, is a leading Weather Service provider in India, with a supply of more than 15,000 Telemetric Weather Stations (TRGs) & Telemetric Rain Gauges (ARGs) across the globe and more than 10,000installations PAN India.

Ingen leverages indigenously manufactured advanced technology, and its strong in-house team of meteorologists, remote sensing experts, and IoT specialists, to provide weather data & forecasting services to various corporations and government organizations in insurance, energy, and agriculture sectors.

Global Footprint



TRG Network

+10,000 TRG across India

In collaboration with various State Government

बिहार सरकार

सत्यमेव जयते
Government of Rajasthan

GOVERMENT OF KARNATAKA

IMD Certification

ISO 90012015 INGEN


Certificate of Registration

This is to Certify That The Quality Management System of

INGEN TECHNOLOGIES PRIVATE LIMITED

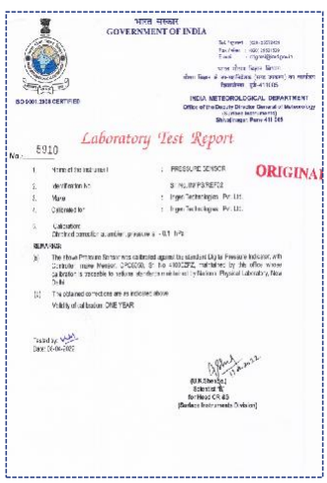
has been assessed and found to conform to the requirements of

ISO 9001:2015

for the following scope :

QUALITY MANAGEMENT SYSTEM

PRESSURE SENSOR


GOVERNMENT OF INDIA

INDIA METEOROLOGICAL DEPARTMENT

Laboratory Test Report

No.: 5910

ORIGINAL

SILICON PYRANOMETER


Certificate of Test & Calibration

NAME OF THE INSTRUMENT : Silicon Pyranometer

IDENTIFICATION NO. : IN/SLR/REF/SR/02

MAKE : Ingen

(Belongs to INGEN Technologies Pvt. Ltd.)

CALIBRATION FACTOR : 54.874 μV/W/m²

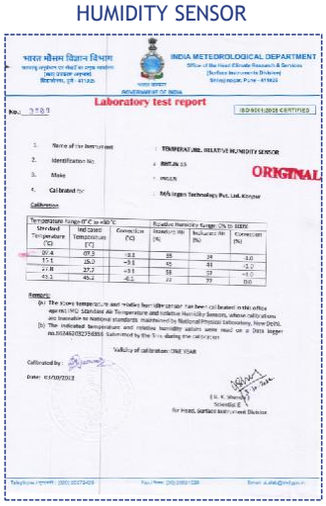
RESISTANCE : 640.2 Ohms

VALIDITY OF CERTIFICATE : One year from date of issue.

PUNE
DATE: 29-03-2022.

(Anjit Anjan)
Scientist E

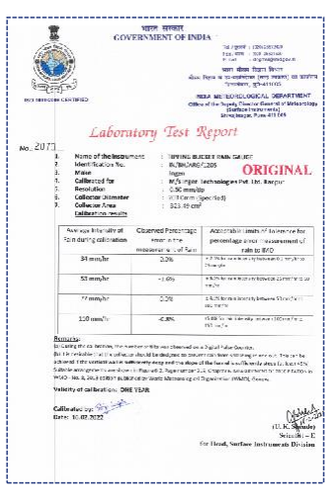
TEMPERATURE RELATIVE HUMIDITY SENSOR


INDIA METEOROLOGICAL DEPARTMENT

Laboratory test report

ORIGINAL

TIPPING BUCKET RAIN GAUGE


GOVERNMENT OF INDIA

INDIA METEOROLOGICAL DEPARTMENT

Laboratory Test Report

No.: 2071

ORIGINAL

ULTRASONIC WIND SPEED & DIRECTION SENSOR


GOVERNMENT OF INDIA

INDIA METEOROLOGICAL DEPARTMENT

Laboratory Test Report ORIGINAL

No.: 3672

Why Us?

1. Indigenous Manufacturer of Telemetric Weather Stations

We, at Ingen Technologies, take great pride in offering indigenously-manufactured Telemetric Weather Stations customized for your specific requirements.

End-to-end Management of TRG

- Manufacturing | Supply | Installation | Operation
- Capacity of manufacturing 500 TRG per month
- Customized design with state-of-the-art technology
- Continuous hardware updation

2. Global Standard Technology

Our sensors conform to the WMO (World Meteorological Organization) standards and are IMD (India Meteorological Department) certified.

- IMD Certifications: Humidity Sensor, Temperature Sensor, Tipping Bucket Rain Gauge, Silicon Pyranometer and Ultrasonic Wind Sensor

3. Top-notch Team

We leverage our strong in-house team of meteorologists, remote sensing experts, and IoT specialists to provide accurate & real-time weather data & forecast services.

- In-house R&D, Hardware, & Software teams linked with IIT Kanpur, ST Microelectronics, etc.

4. Support & Services

Our trained technicians are stationed in most of the Indian states to attend to your requirements at shortest possible time.

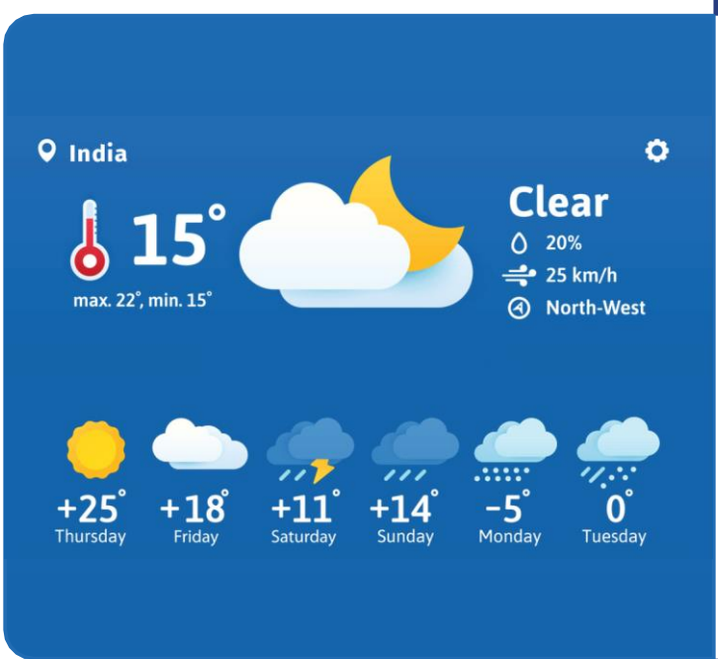
- Preventive Maintenance: Every 3 months
- Sensor Calibration: Twice a year
- Prioritized Location Visits: As and when scheduled
- Component Replacement: After a specified period of life
- Error Resolution: Within 72 hours of reporting

5. Focus on Data Quality

- Data is being monitored round-the-clock
- Advanced algorithms & integrity checks are applied on the data
- Statistical analysis tools capture parameter drifts
- Automated alerts are generated in-case of data failure

6. Data Quality Checks

- Syntactic Checks: To ensure that data is as per the sensor resolution and range
- Climate-range Checks: To ensure that Datum is consistent with month-wise climatology
- Time-series Consistency: Plausible difference between two successive values based on meteorological heuristics
- Spatial Consistency: Plausible difference between two nearby stations based on variations
- Device Consistency: Comparison with nearest IMD and state government weather stations to avoid systematic errors



Ingen's Automated Weather Stations provide continuous automatic observations for weather parameters like air temperature, relative humidity, dew point, precipitation, sunlight intensity, short and longwave solar radiation, wind speed & direction, barometric pressure, soil moisture, soil temperature etc. These parameters remain crucial for accurate weather monitoring.

The TRG mast is available in variable shapes & sizes

- From 2 m to 10 m unipole, tripod or triangular tower made up of galvanized iron or stainless steel to which various sensors can be attached.
- The support fixtures and frames for sensors & accessories can also be made as per client's requirements.

TRG Data Flow Diagram

Figure 1

TRG Applications

Weather Forecasting & Weather Data Services

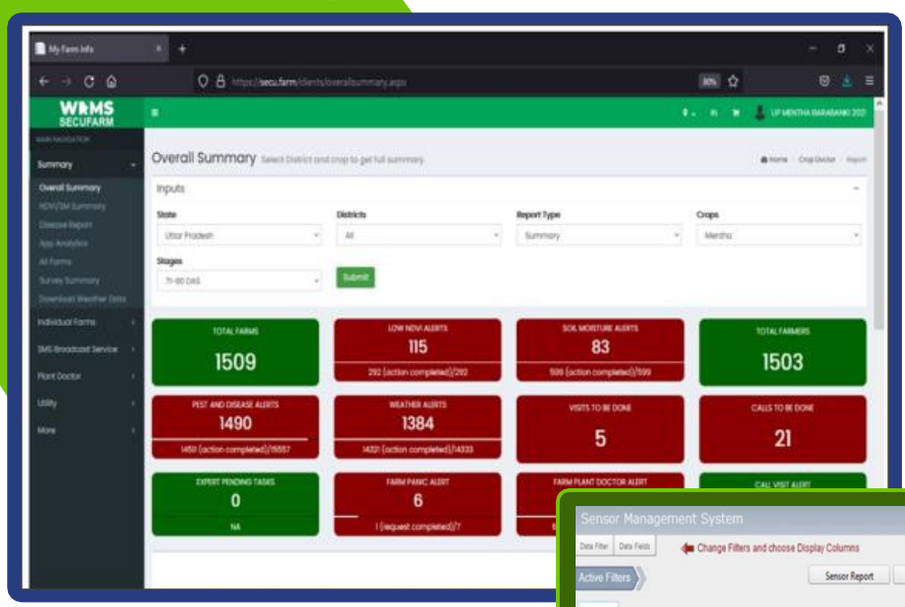


Figure 2

Sensor Management System

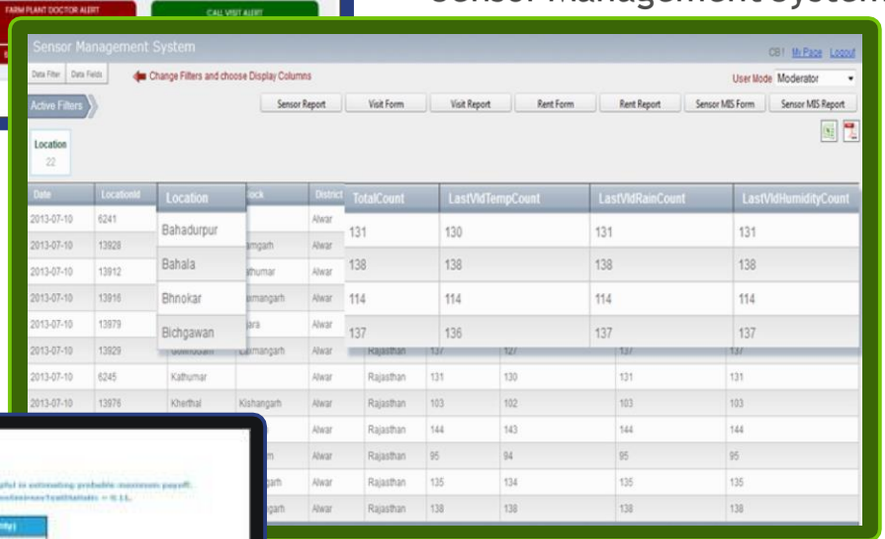


Figure 3

Risk Management

Figure4

Agri Advisory

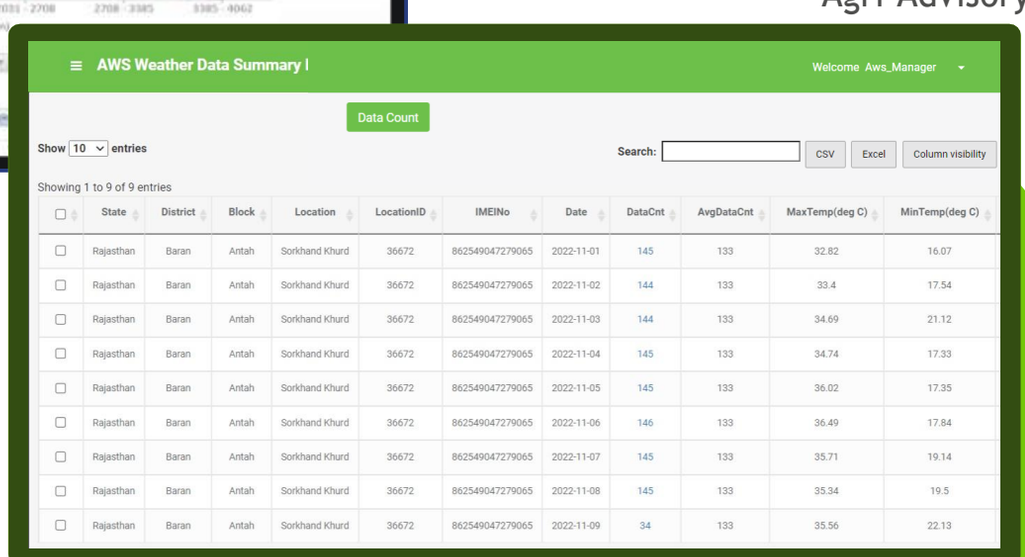


Figure 5

Technical Specifications of TRG Sensors

Precipitation Sensor

Type : TBRG with rugged magnetic reed switch

Item # : iSRG101/iRMS101

Range : Unlimited

Height above funnel: sufficient to accumulate rain during heavy rainfall / high intensity rainfall events

Housing Material: Rust proof Housing Marine Industrial grade Stainless steel of 304 Grade

Resolution: 0.25mm or better

Accuracy :

±2% or better, for rain rate Rain rate up to 25 mm/hr.

±3% or better, for rain rate between 25mm/hr to 50 mm/hr

±4% or better, for rain rate between 50mm/hr to 100 mm/hr

±5% or better, for rain rate above 100mm/hr

Operating Temp: -20°C to +60°C

Levelling: levelling Screw with circular Spirit bubble leveler

Filter: Debris protection filter

Rain water drain: The rain water to drain out from the base of the collector

Resistance: Frost, heat & salt resistant, withstanding all climatic conditions

Compliance standards: IMD

Integrated Data logger

Features

- Ultra “low” power 32bit ARM controller
- 16GB memory expandable up to 64GB
- 16x2 alphanumeric LCD & keypad
- Watchdog timer available
- System Reset option available
- SMS configurable setting command
- 2G/3G/4G compatible GPRS modem
- Firmware Over the Air (FOTA) update feature
- 12 digital/analog channels, 16-bit A/D converter
- Sample intervals configurable from 1 sec to 24hours
- Sensor Interface: ADC, SDI-12, SPIs, I2Cs, USARTs, RS232, RS485 etc.
- System Clock Stability 1 ppm per year, real time clock synchronized with GPS
- Accessible through USB/RS232/RS485/Bluetooth
- Rain Calibration Mode

Specification

Memory: 16GB, extendable upto 64GB
External Power: 12V to 24V DC (48 V maximum)
Power Consumption: < 50mA
Basic Communication Interface: RS232, RS485
Main Power option: Solar panel or 12v DC adapter
Operating Temperature: -40 ˚C to +60 ˚C
Operating Humidity range: 0% to 100%

Communication Unit

IDCU for TRG iDAS101

- Frequency: 900MHz and 1800MHz
- HF Output max: 2W Class 4 at 900MHz and 1W Class 1 at 1900MHz
- Antenna Impedance: 50Ω
- Interface: RS 232/RS485/Bluetooth
- Data retrieval via USB and memory card
- Built-in GPS
- GPS time auto-synchronization
- Support SMS, FTP, TCP-IP, HTTP, HTTPS, MQTT comm.
- Can push the data to two different servers simultaneously
- OTA Firmware upgradation
- GPRS Signal Strength indication
- Expandability for more parameters with AES 128 bit encryption
- IP65 protection

The Ingen Datalogger equipped with an integrated communication modem for real-time data transmission. The IDCU is able to send the weather station data in a compressed format to the central server using HTTPS/FTP/API or other protocol.

During a signal loss condition, the IDCU will keep trying for the transmission and resume the transmission once the GPRS network is available.

Power Supply

The weather station is a standalone wireless unit powered by Solar Panel (10W to 75 Wt) charged battery of 3.7V/12V. Li-cell battery is preferred to ensure consistent power supply. TRG sensors can work up to 20 days in extremely rainy weather with fully charged batteries.

POWER REQUIREMENTS

- Battery 3.7V/12V
- Power consumption <100mA/3.7V
- Battery can be charged through 230V AC (with suitable adaptor) or a 10W-75 W solar panel

PHYSICAL SPECIFICATIONS

- Materials: Stainless steel, Plastic, Anodized Aluminum, Iron
- Height: 1.5 m to 10 m depending on requirement
- Enclosure: 2* 2 sq m to 5*5 sq m
- Weight: approx 7 kg – 20 Kg

Application Software

Portal Software

Portal Software aggregates, manages, analyzes, organizes and distributes weather information into a single systemtailored to the preferences of different user groups (farmers, agri officers, insurance companies, administrator, etc).

It broadly does the following

- Data acquisition (from IDCU)
- Data management & display (real-time, history andforecast)
- Administrator (manage the web content based onthe authorization model)
- Support section (statistics, SMS, email alerts, data export, etc)
- Resources – high speed networking, high performance computing and large data storage

Clientele

INGEN
Smart Solutions for Secure Tomorrow

INGEN Technologies Private Limited

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Kacchar Dist. Kanpur Nagar - 208017

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