WEATHER MONITORING SYSTEM FOR SOLAR & WIND PROJECTS

aeron®

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ABOUT AERON

- A pioneer in the Inertial Navigation technology, Aeron Systems was founded by Mr. Ashvani Shukla (B. Tech., IIT Kanpur) Mr. Abhijeet Bokil (B.E., MIT Pune) in the summer of 2008.
- Building deep-tech products in the field of Inertial Sensing and Internet of Things.
- Serving global customers in Aerospace, Automotive, Renewable Energy, Environment and Manufacturing sectors.

PRODUCTS & SOLUTIONS

In over a decade's journey, Aeron with its innovative research, reliable products and diligent support, has become preferred choice of its customers. The products offered by Aeron are categorised in two divisions.

Inertial Systems & Sensors

Navigate, control and stabilize your platform in aerospace, defense and automotive applications.

- MEMS Inertial Navigation Systems and IMUs
- FOG Inertial Navigation System
- Airborne qualified AHRS
- Digital magnetic compass
- Tilt sensor and inclinometers

Internet of Things

High reliability rugged data loggers and full package environment monitoring solutions

- Wireless Data Logger and Gateway
- Weather monitoring system for solar power plants, wind farm and agri
- Air quality monitoring system
- Water quality monitoring system

WHAT IS DATA LOGGER?

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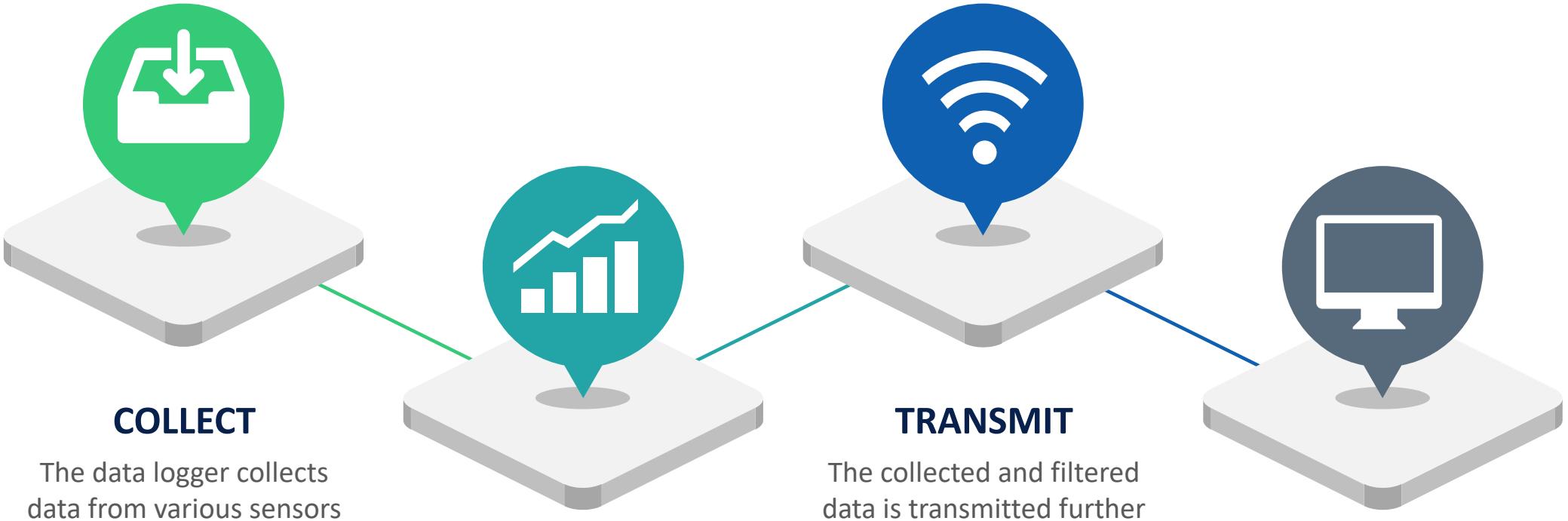

COLLECT

The data logger collects data from various sensors connected to it. Device has analog, digital and serial type inputs for data acquisition from variety of sensors and equipment.

ANALYSE

Collected data is processed, analyzed, filters and algorithms are applied for high accuracy.

TRANSMIT

The collected and filtered data is transmitted further over wired and wireless interfaces.

DISPLAY

The transmitted data is stored on cloud and displayed on user devices using application.

KEY FEATURES OF AERON'S DATA LOGGER

HIGH PRECISION

With industry leading 24 bit ADC data is acquired precisely even for low voltage sensors.

VERSATILE INPUTS

Various analog (0-10V, 0-1V, 0-20mV, 4-20mA), digital and serial inputs (RS232, RS485, MODBUS)

GPS

Built-in GPS for precise time synchronization and location information

COMMUNICATION

Wireless communication over 4G/LTE and Wi-Fi. Wired communication over Ethernet, RS485 MODBUS, RS232

RUGGED

Weather protection, IP65, surge protection, 9-36VDC power, powered by solar panel as well as AC supply

KEY SPECS OF AERON'S DATA LOGGER

ANALOG INPUTS
12/8 Analog Single Ended or 4/2 Differential Channels
0-20mA, 4-20mA, 0-1V, 0-5V input range

ADC RESOLUTION
24 bit ADC resolution for analog inputs, highest resolution in this class of products

CONNECTIVITY
Wireless connectivity over Wi-Fi, LTE (4G)/UMTS/GPRS and Wired connectivity over Ethernet, RS485 MODBUS

INPUT INTERFACES
Input digital interfaces: SDI-12, RS232, RS485 MODBUS RTU, MODBUS TCP

TIME SYNCHRONIZATION
Time synchronization through GPS, and internet, RTC with backup battery

STORAGE MEMORY
32 GB flash memory for over 5 years data storage

POWER
9-30 VDC operating voltage

ENVIRONMENT MONITORING PRODUCTS

AIR

Real-time monitoring of air quality parameters for Smart City, Factory and Commercial Buildings.

WATER

Online real-time monitoring of water quality parameters for Industries, Rivers & Commercial Buildings.

SOLAR

Real-time performance monitoring of Solar plants by measuring weather parameters.

WEATHER

Measurement of weather parameters for research, forecast, and smart agriculture

SOIL

Monitoring of soil temperature and moisture for higher farm output and reduced irrigation cost.

WIND

Performance monitoring of Wind power plants to ensure highest energy generation.

RENEWABLE ENERGY – WHY IT IS IMPORTANT?

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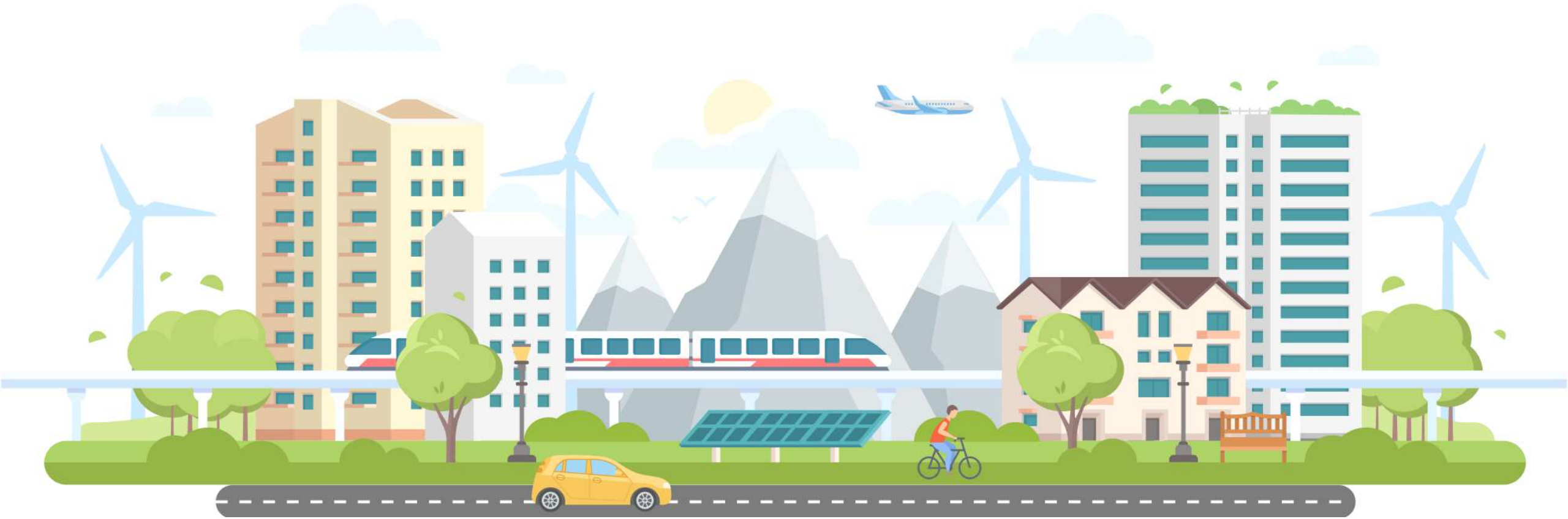

Renewable energy sources are inexhaustible and abundant unlike coal and natural gas have limited reserves.

Renewable sources of energy provide security to countries of all size from global geo-politics.

The air and water pollution caused by coal and natural gas plants leads to cancer, heart attack and other life threating diseases.

WHY MONITOR RENEWABLE ENERGY PLANTS?

1. Setting up Solar and Wind power is a major capital investment and its critical that these are operated efficiently for fastest return on investment.

2. The energy generation from Solar and Wind power plants is dependent on the atmospheric conditions.

3. Aeron’s Weather Monitoring System is perfect product for real-time monitoring of atmospheric conditions and thereby for keeping track of plant efficiency on every minute basis.

AERON'S WEATHER MONITORING SYSTEM FOR SOLAR & WIND

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High accuracy measurement of Radiation, Albedo, Air temperature, Humidity, Module temperature, Wind speed, Wind direction, rain fall, barometric pressure and other parameters.

High reliability data logger for precision and reliable data collection from variety of sensors, wireless (4G, Wi-Fi) and Ethernet, RS485 MODBUS wired interfaces.

Installed in over 12 GW solar power plants, approved with NTPC, BHEL, and preferred choice of major developers and EPC companies.

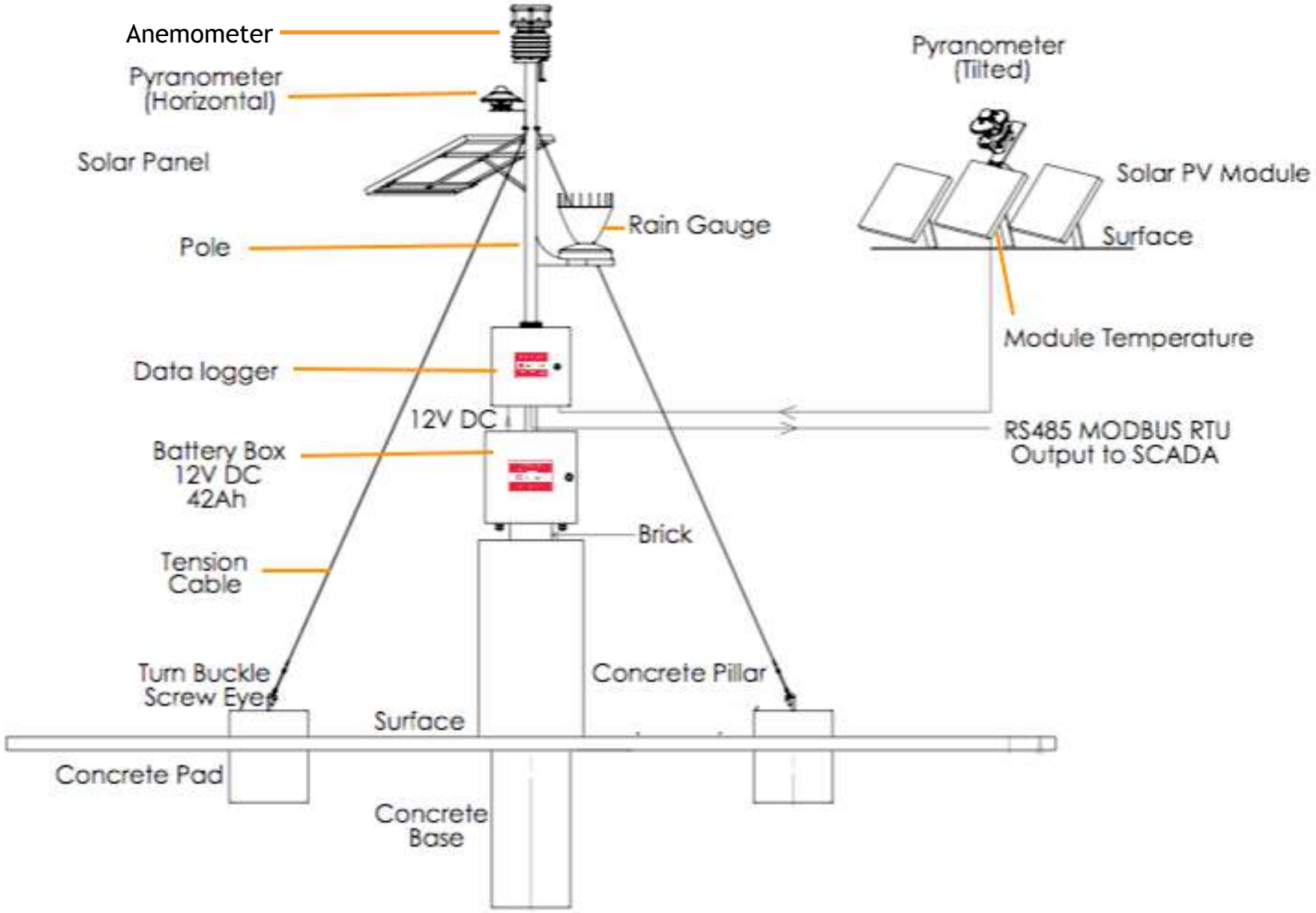
adani™ TATA POWER SOLAR

Greenko HERO FUTURE ENERGIES ABB BHEL

ReNew POWER एनटीपीसी NTPC LARSEN & TOUBRO

It's all about Imagineering

GENERAL DRAWING OF WEATHER MONITORING SYSTEM



The diagram shows typical installation of various sensors and logger. This may change based on site conditions.

The pole is fixed to the ground with suitable pillar for high stability in storm and windy conditions.

The data from the logger is sent to the SCADA at site.

ARCHITECTURE OF WEATHER MONITORING SYSTEM

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1

SENSORS

- Pyranometer
- Module temperature
- Anemometer
- Ambient temperature
- Relative humidity

2

SMART DATA LOGGER

3

4

USER DEVICES (WEBSITE / APP)

5

PLC / SCADA

COMMONLY USED SENSORS IN WEATHER MONITORING SYSTEM

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Pyranometer

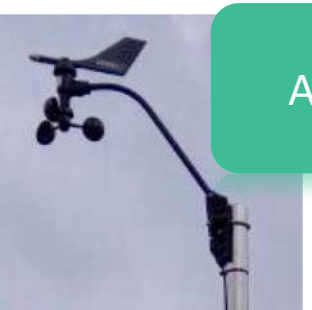
The thermopile pyranometer measures solar radiation which is the primary source of information for available solar energy for generation. Generally two pyranometers are used, one at horizontal level for Global Horizontal Irradiance and second at solar panel angle for Global Tilt Irradiance.

Irradiance

The silicon based irradiance sensor to measure the solar radiation but unlike Pyranometer the reference cell needs to be matched with solar panel material for accurate results. Also it is cost-effective in comparison to Pyranometer.

Module Surface Temperature

The energy output from a solar panel depends on its temperature. Therefore, the measurement of module temperature is important for estimation of the plant performance ratio.



Anemometer

The wind at the site affects the temperature of the solar modules, the data is also useful for safe operation of plant. For Wind Farms, the wind data is very critical because the generation depends on the wind speed and the direction.

COMMONLY USED SENSORS IN WEATHER MONITORING SYSTEM

Ambient Temperature

For the same level of irradiance the energy output from solar panels depends on the ambient temperature. Therefore, it is an important parameter for measurement of plant performance ratio.

Humidity

The humidity affects the generation of power at solar plants. Also the humidity affects the life of various components. It is measured along with the ambient temperature.

Rain Gauge

The rain gauge measures the amount of rain taking place at the site location. The data is used for potential flooding and equipment damage due to rain.

Barometric Pressure

The barometric pressure sensor is used to measure the pressure at the site location. It helps in the performance monitoring of the solar and wind farm.

COMMONLY USED SENSORS IN WEATHER MONITORING SYSTEM

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Soiling Station	The dust and soiling of panels greatly affect the total energy output from the plant, especially at locations which have loose soil causing dust or sand to accumulate over panels. The soiling station measures the energy loss due to soiling and allows operators to decide when to clean the panels.
Cloud Cover	It could be bright sunny day but with cloud cover over site location the energy output may be reduced. To consider the effect of clouds in the plant performance estimation, the cloud cover sensor is used.
Albedometer	This measures global and reflected solar radiation using two pyranometers mounted back to back with each other. It also gives measurement of albedo or net radiation which helps in understanding the effect of ground.
Pyrheliometer	This sensor measures the direct beam solar irradiance. Generally it is used with a sun tracker so that the pyrheliometer can remain aligned towards sun for the measurement.

SUPPORTED SENSOR BRANDS IN WEATHER MONITORING SYSTEM

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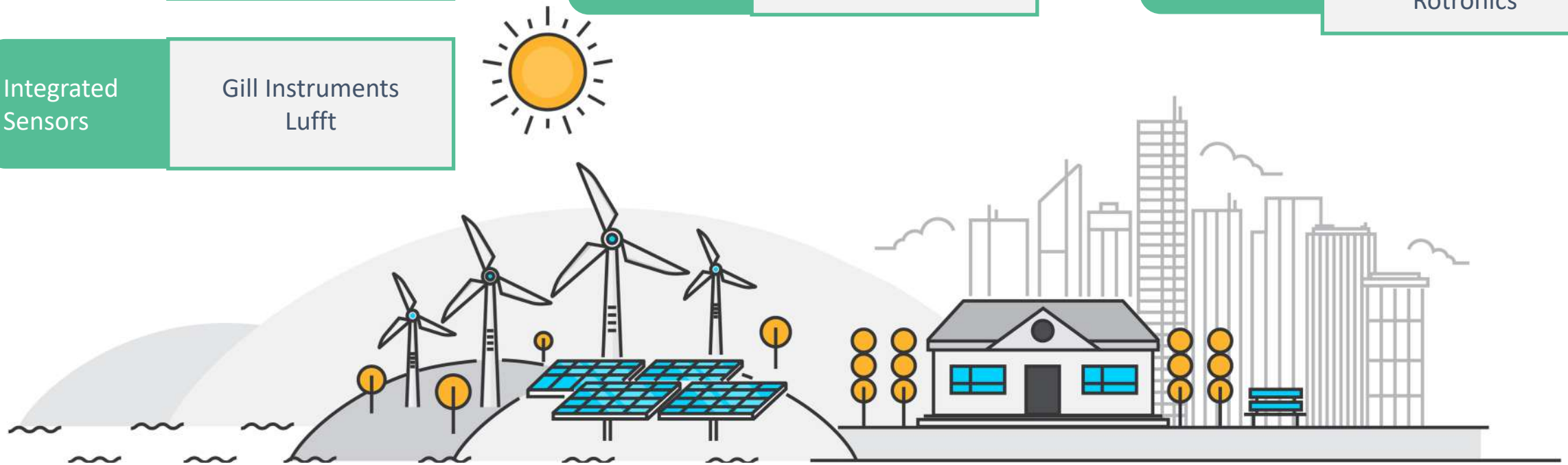
Pyranometer	Kipp & Zonen Hukseflux Eko Instruments Apogee
Irradiance	Meteocontrol IMT Solar
Integrated Sensors	Gill Instruments Lufft
Anemometer	R M Young Metone Davis Instruments Lufft Gill Instruments
Rain Gauge	R M Young Davis Instruments
Module temperature	Meteocontrol IMT Solar Aeron Systems
Temperature & Humidity	R M Young Metone Davis Instruments Rotronics



PROJECTS USING AERON'S WEATHER MONITORING SYSTEM

*Aeron's Weather Monitoring Systems are being used in over **12 GW** of solar & wind power projects globally. Following are the details of few major projects and our customers.*

500 MW project in Kurnool, Andhra Pradesh. This is part of 1000 MW solar park.

Greenko

300 MW project in Vietnam. This is a major solar project in the Vietnam.

ABB

230 MW project at Karnataka, India. It is part of 2,050 MW Pavagada Solar Park.

TATA POWER SOLAR

648 MW project at Tamilnadu, India. It is one of the largest project in India.

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PROJECTS USING AERON'S WEATHER MONITORING SYSTEM

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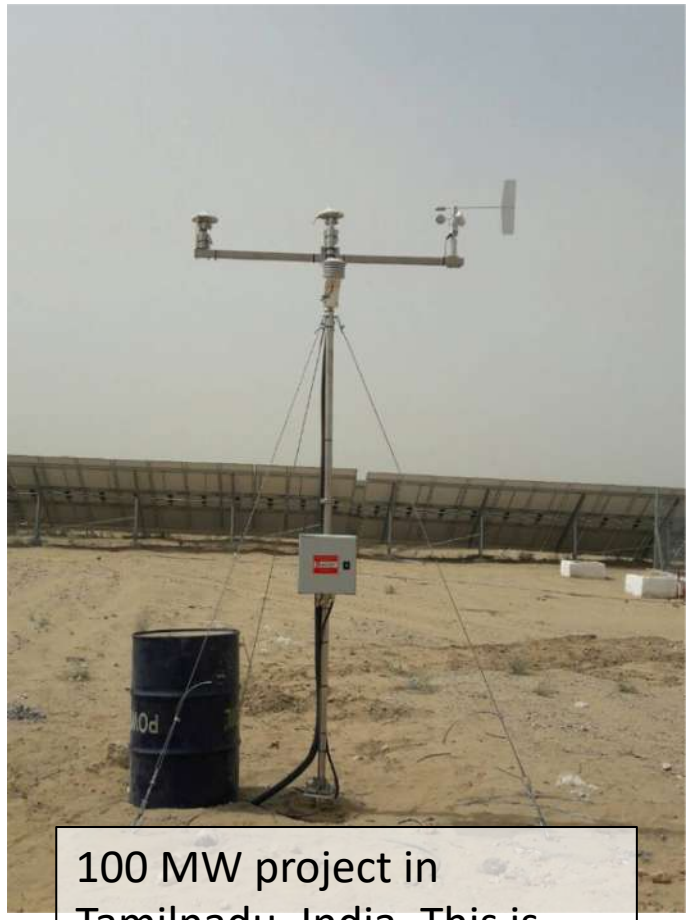
250 MW project in Madhya Pradesh, India. It is part of 750 MW Rewa Ultra Mega Solar Park.

ACME

250 MW project in Bikaner Rajashthan, India. It is one of the 740 MW projects with this customer.

ReNew POWER



100 MW project in Tamilnadu, India. This is one of the 640 MW projects with this customer.

LARSEN & TOUBRO
It's all about Imagineering

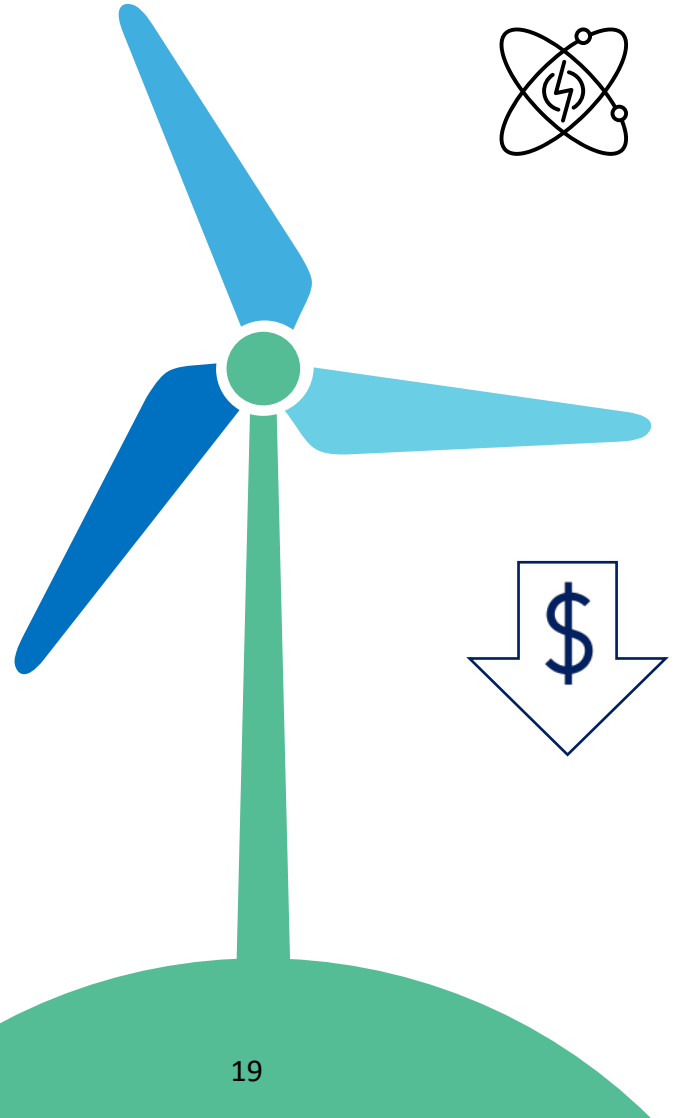
ADVANTAGE AERON

QUALITY YOU CAN TRUST

Inherited from defense electronics, Aeron offers highest quality product. With key systems made in India and certified to international standards, you can trust on Aeron for the quality product.

TECHNOLOGY YOU ASPIRE FOR

The latest IoT and sensor technology is the next big trend in the world, and Aeron is at the forefront of technology development.



SERVICE YOU CAN RELY ON

Serving customers for over a decade with exceptional service standards you can rely on for your critical requirements.

PRICE WITHIN YOUR BUDGET

The value optimization is the key mantra for low prices with high quality. Our product prices remain within your budget.

GLOBAL DISTRIBUTOR PARTNERS

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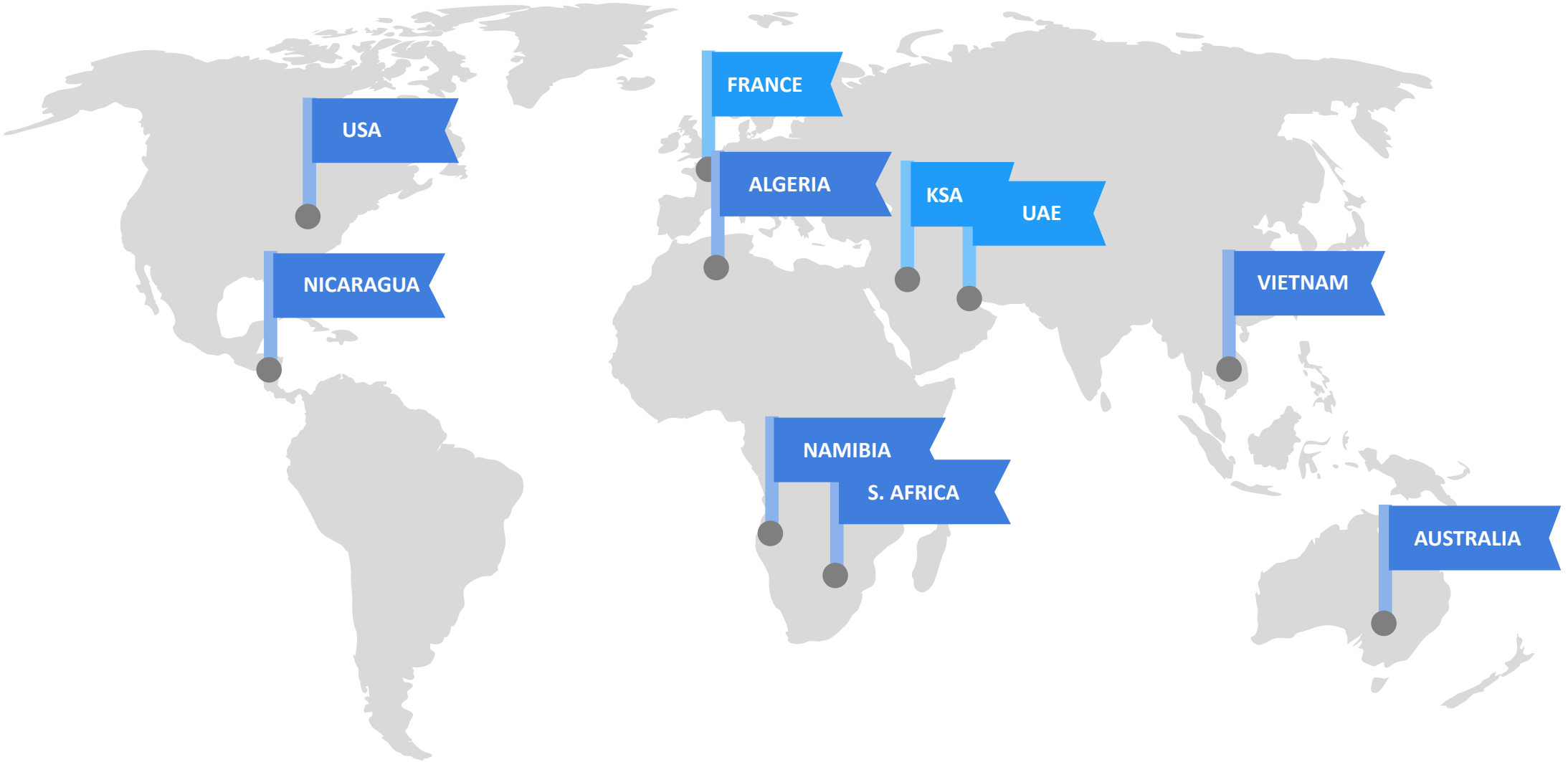
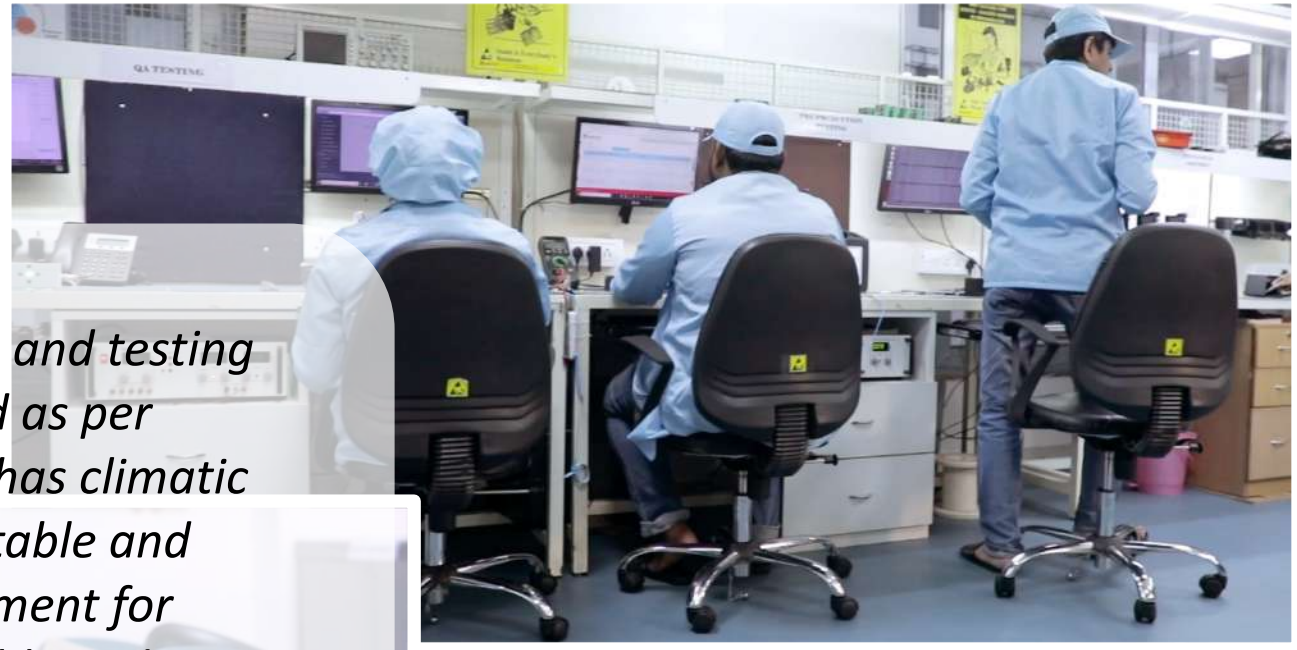


PRODUCTION & TESTING FACILITY



The production and testing facility certified as per ISO9001-2015 has climatic chamber, rate table and advance equipment for product assembly and testing.

DESIGN & DEVELOPMENT FACILITY

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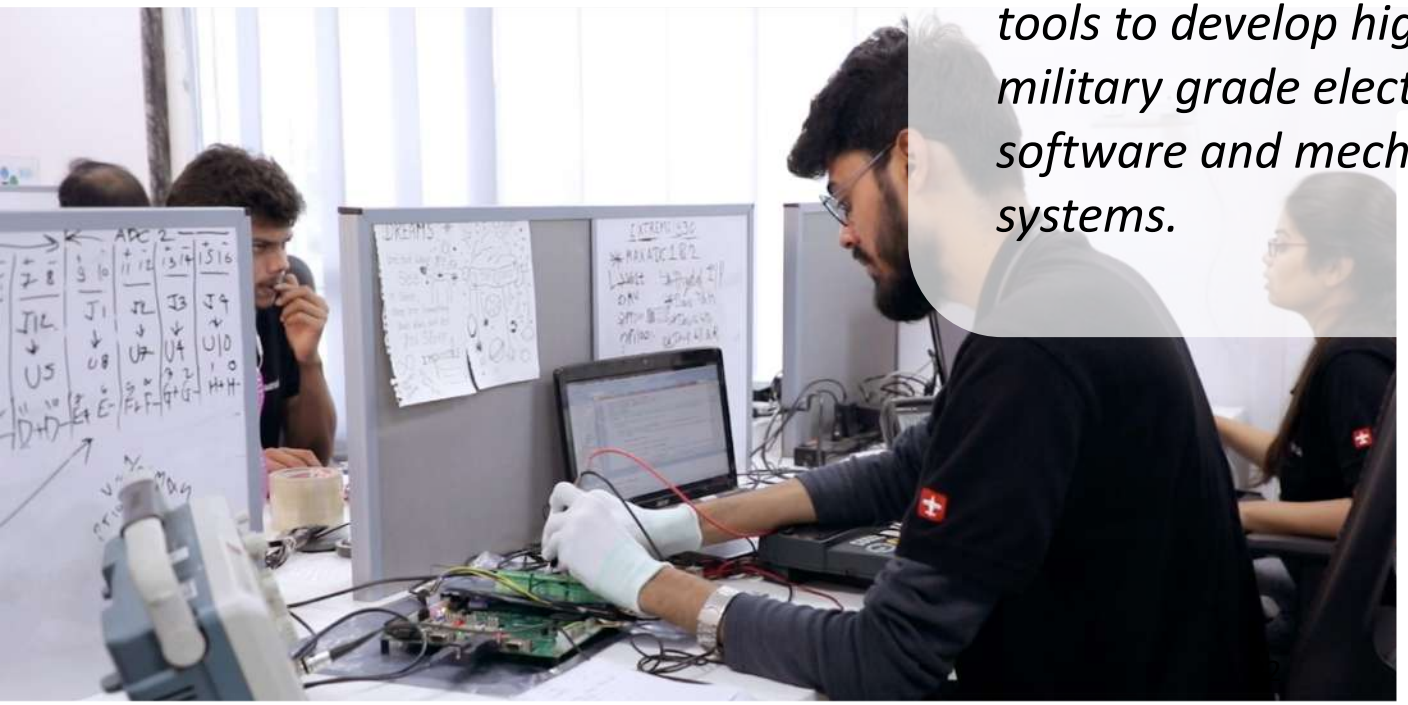
Well equipped design and development facility with tools to develop high speed military grade electronics, software and mechanical systems.



WORK CULTURE AT AERON

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THANK YOU!

Looking forward to hearing from you!

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