



iWeather EDGE III-V

User Guide

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1 INTRODUCTION

We would like to sincerely thank you for choosing the iWeather Edge V Station. All our products are made with great care and pride, and we hope that your new purchase will give you many years of satisfaction and real-time weather data.

Please take a little time to read the following instructions. They will help you to get the best from your new iWeather station, and prolong its life span.

Every iWeather product is the fruit of great experience in electronics design as well as a profound knowledge in software development. It is also the result and passion for making unique and affordable weather measuring equipment in which traditional craftsmanship and advanced electronics join together in harmony.

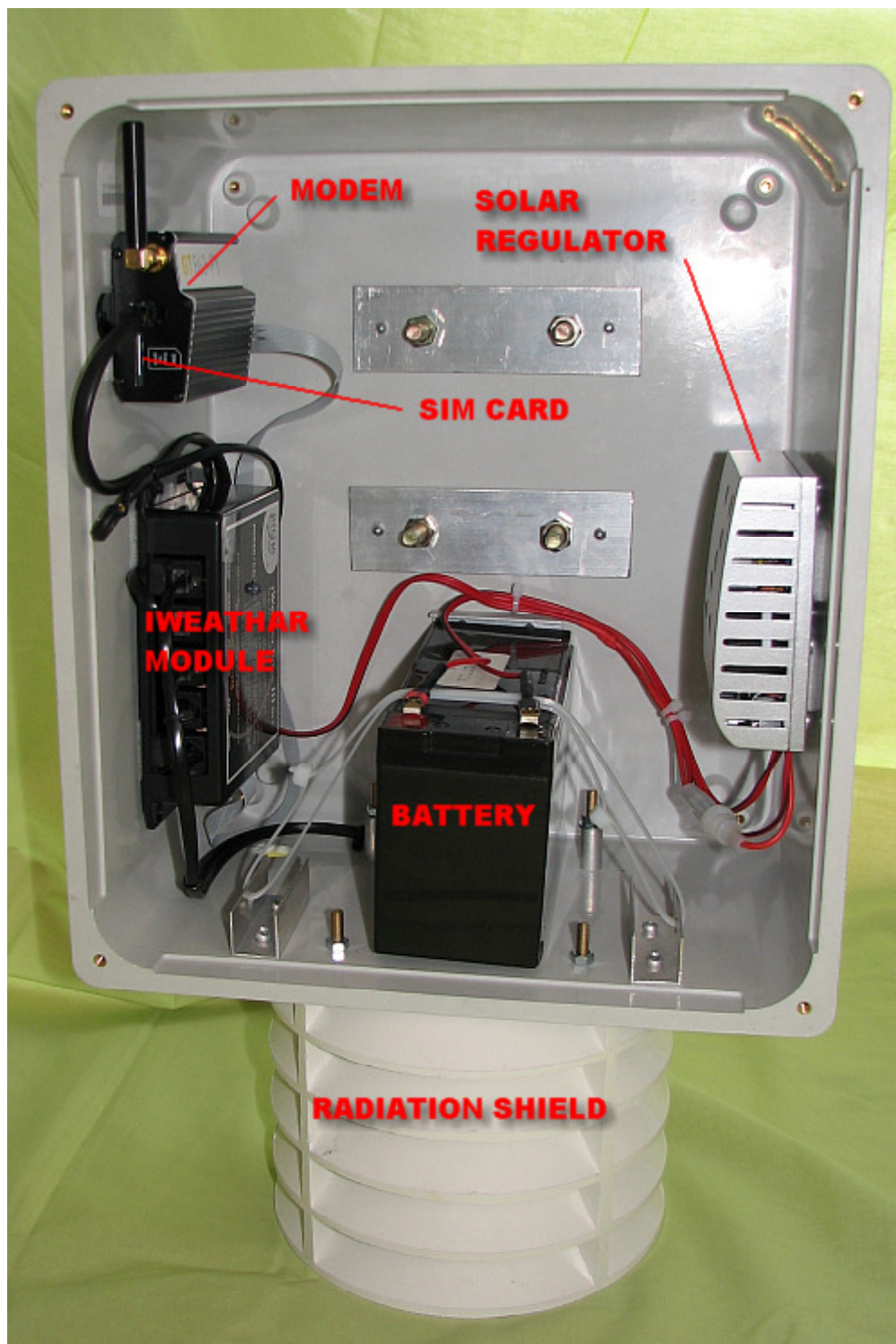
All our products are made using fine quality materials and each one is inspected at various stages of the production process to ensure that it meets our own very high standards.

The iWeather unit can be configured in two ways: As a self contained remote weather station using a solar panel and other accessories or connected directly to a computer with a Internet connection (i.e. using ADSL broadband).

All data from the weather stations are uploaded to the Internet every 6 minutes to the iWeather server which is then used for data analysis. Our system is available on line at <http://www.iweather.co.za>

If you so wish, why not take part in the iWeather community project which allows multiple weather stations to be viewed by the general public.

2 STATION COMPONENTS



NOTE: Your station may differ in configuration depending on version and sensor suite

3 STATION INSTALLATION PROCEDURE

The following parts are essential for the REMOTE weather station:

1. Cup anemometer and wind vane as well as any other sensors.
2. iWeather Edge V module.
3. GPRS Modem and aerial.
4. 12V 7A Sealed battery or similar.
5. 10-20W Solar panel.
6. Serial cable.
7. Water Proof enclosure.
8. Solar Panel Bracket (Optional)
9. Enclosure attachment screws or bolts.
10. SIM card
11. Radiation Shield (Optional)

The following parts are essential for the PC weather station:

1. Cup anemometer and wind vane as well as any other sensors.
2. iWeather Edge V module.
3. 12 Volt Power Supply Unit (PSU).
4. Serial Data Cable.
5. iWeather remote proxy software.
6. Computer running Windows operating system.
7. Permanent Internet connection.
8. Free serial port on the computer.

Please read the enclosed wind sensor instructions on how and where to setup the anemometer.

A incorrectly placed anemometer and wind vain causes incorrect readings. So special attention should be made to ensure the sensor is free of up-wind obstacles such as trees, roofs and walls. Try keep the sensor as high as possible above any roof to which it may be attached, such as on a 2 to 3 meter pole.

Depending on the shape of the obstacle, wind can be deflected up or around walls resulting in bad readings.

Once you have installed the wind sensor, always remember to calibrate the wind vain in the correct direction using the calibration function and instructions found on the Edge unit.

OTHER REQUIRED INSTALLATION TOOLS

1. Compass with rotational degree settings for True North.
2. Silicone glue.
3. Size 13 metric spanner.
4. Cable ties.
5. Screwdriver, flat small (+- 3mm).

WEATHER STATION SETUP

INSTALLING THE HOUSING.

The weather station housing, sensors and solar panel can be installed on a retaining firm 50 mm strong pole. The pole should not be loose or sway in any way in the wind as this will negatively effect wind speed and direction readings and can cause premature aging.

Avoid installing the housing directly into sunlight as this can cause incorrect readings for temperature and ensure that the unit is accessible for future maintenance.

Fix the housing to a vertical pole using the two U clamps. Slide the ends through the units housing holes and attach the supplied nuts inside the housing. Be careful not to damage or injure any of the wires inside the unit while using a spanner to tighten the nuts.

Do not over tighten the nuts as this can cause the housing to crack or the nuts to strip.

Ensure that the back or front of the housing faces a cell phone mast or populated area for optimum signal strength.

SOLAR PANEL INSTALLATION

The solar panel should be installed facing North in the Southern Hemisphere or South facing in the Northern Hemisphere.

Prevent obstacles such as poles, trees or the anemometer from creating shade over the solar panel as even a small shaded area on the panel can cause a major loss of power.

Solar Panel Tilt angles:

Site Latitude (North or South) Tilt Angle

0 ° - 10 ° 10 °

11 ° - 20 ° Latitude + 5 °

21 ° - 45 ° Latitude + 10 °

46 ° - 65 ° Latitude + 15 °

> 65 ° 80 °

Solar panels should be kept clean to maintain optimum power output.

The life-span of solar panels depending on their type can last between 2-3 years to as much as 25 years.

Feed the solar panel wires through the bottom of the housing open hole and connect the positive and negative wires up to the solar panel regulator. Take special attention to the polarity of the wires (red for positive and black for negative)

The Solar Regulator GREEN lamp will light up indicating the solar panel is generating power to the unit and the polarity of the solar panel wires are correct.

Once the solar panel has been applied, connect the battery to the supplied connectors leading to the Solar Regulator. Once again take special note of the polarity. If one of the red wires has a black line on it, this indicates that it is negative.

CONNECTING POWER TO THE UNIT.

Take special precautions when connecting up the battery power as failing to do so can cause the unit to blow a fuse or solar regulator to get damage if the polarity is applied incorrectly.

Up to two 12V 7A batteries can be connected in parallel to the unit to extend the up-time should there be no sunlight for several days.

Larger batteries can also be used provided enough charge is created from the solar panel.

DO NOT connect the batteries up in series as this can cause significant damage to the modem and iWeather unit due to over voltage and void warranties.

To connect two charged batteries up, connect the **positive** of one battery to the **positive** of the other, and the **negative** wire from one battery to the **negative** of the other.

NEVER the other way around as both batteries can explode!



SIGNAL STRENGTH AND CELLULAR COVERAGE

Obtaining maximum signal strength is important in getting good data feeds through to the iWeather server and to prolong battery life.

iWeather Edge V comes standard with a omni directional antenna.

This aerial should always face the direction to which the cellular base station is located for optimum performance for non omni directional aerials such as the patch antennae.

The aerial should be placed away from other electronics to prevent interference and should be kept away from the iWeather Unit in particular.

Use a cellular service provider that has a strong signal in the area and especially has good stable data equipment.

If a weak signal is picked up from the station, larger aerials are available, such as the YAGI type antennas from Poynting. Aerial's must be able to operate in the 900Mhz or 1800Mhz bands depending on the cellular providers GPRS operating frequency. Aerials should have the standard SMA male connector to connect to the modem.

SENSORS

Temperature and humidity sensors are usually located in the radiation shield below the enclosure. The pressure sensor is found inside the enclosure or built inside the iWeather module itself.

Radiation shields are available on request and should be kept near moving air for accuracy. Always keep the sensor holes clear of dirt or debris and ensure that insects do not make it there home.

KEEP ANY INSECT REPELANT CLEAR OF THE SENSORS AS THEY WILL CAUSE DAMAGE.

Should you wish to put insect repellent on the housing, keep it clear from going into the two sensor holes located underneath the housing if provided.



FINISHING TOUCHES

Once the unit has been installed and wired correctly, SILICONE glue should be used to close the hole used for the wind vane and solar panel inputs.

This is to prevent rain water from penetrating the housing.

Also use the glue around the U brackets where they meet the housing. Other areas may include pop rivet holes.

DO NOT BLOCK THE TWO SENSOR HOLES LOCATED UNDERNEATH THE HOUSING.

Use cable ties to neaten the cabling from the solar panel and wind vane. Cables that are left loose can weaken as they vibrate in the wind or wear against other surfaces.

4 CALIBRATING THE UNIT

Once you have installed the wind sensor it is required to be calibrated for the correct direction. All wind vains are pre-calibrated before leaving the factory for the sensor arm to face Northward should you not wish to re-calibrate it. By this we mean you could face the wind vains arm towards True North and no further calibration would be required. (Provided the wind vain comes pre-installed).

It is important NOT to position the enclosure above the solar panel as the shade coming off it would greatly reduce the solar panels effectiveness. It is also recommended that the enclosure be placed underneath the solar panel to keep it in the shade. The wind vain should never point directly over the solar panel either as birds have a habit of sitting on them and messing on the solar panel rendering them useless and unable to charge the battery.

Also attaching the wind vain too close to the solar panel causes incorrect readings as the wind is deflected off the solar panel towards the anemometer.

Ideally the wind vain should be at least 1 meter or more above the solar panel and pointing in the opposite direction.

STEPS TO CALIBRATE:

1. Loosen the wind vain so that it can be easily removed using the supplied alan key.
2. Apply power to the unit.
3. Wait for the blue lamp to flash indicating calibration mode (around 30 seconds or less).
4. Turn the wind vain on top until the blue lamp is lit continuously.
- 5 Slide the already loosened wind vain carefully off.
6. Using a compass set to TRUE NORTH, point the front of the wind vain (pointed section) true north and gently place it back onto the arm.
7. By moving the wind vain, the blue lamp should light up indicating true north. If not then run from step 4 again. Use the magnetic declination value to calculate true north.
8. Tighten the small screw using the supplied alan key.

Your unit is now calibrated.

Each time the iWeather unit is reset, the calibration mode is automatically initiated for roughly 1 minute. Should you wish to reset the unit, unplug the positive wire from the battery, then with the positive wire in hand, place it on the negative battery terminal for a second, then return it back to the battery positive wire. Do not short out the battery terminals as this can cause an explosion.

5 SPECIFICATIONS

1. Power consumption: $12V < 100mA$.
2. Wind speed accuracy $< 1 \text{ km/h}$.
3. Wind Direction < 4 degrees depending on calibration.
4. Used Bandwidth $\pm 25\text{Mb}$ per month.

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