

Stratus

Weather Prediction

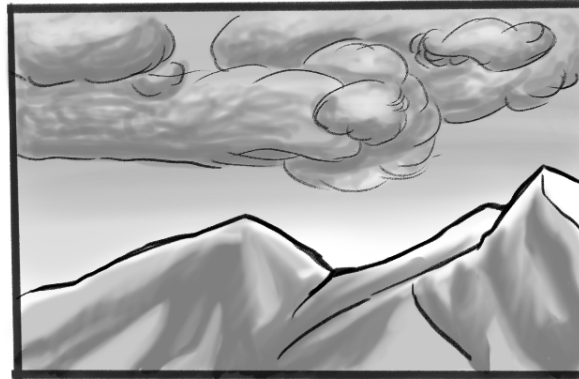
Stratus is a handheld weather device designed to help adventurers anticipate storms and wind shifts without relying on cell service.

Built using environmental sensors and onboard data processing, it showcases my skills in deep research, embedded systems, and rugged product design.

3 Weeks | 2 Designers | Spring 2025



In remote environments, **weather can shift rapidly**, creating dangerous situations. Existing tools and human perception offer limited insight.



Garmin In-Reach Mini

Requires subscription to function
Relies on satellite signal
Only provides weather forecasts from local stations
Likely to be outdated or inaccurate

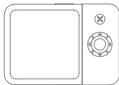


Kestrel 5400

Doesn't provide any forecasts
Only displays current conditions
Large and unwieldy



Human



Device

	Can feel ~5°F change	Measures 0.01°F
	3–5 hPa drop over multiple hours	Exact hPa in real time
	15–20% RH	Measures exact RH%
	Shifts of ~10 mph	Detects 0.5 mph
	N/A	Measures UV-A and UV-B + UV Index
	N/A	Detects strikes up to 25 mi away

The body can feel weather—but it can't measure it.
That's where Stratus in.

Project Intent

A handheld device that tracks **real-time local weather data and generates forecasting estimations** to support safe decision-making in remote environments.

Weather Prediction starts with **observations of the atmosphere**



Temperature

This helps identify **unstable condition** and Influences dew point and precipitation type.



Atmospheric Pressure

Sharp pressure gradients help detect approaching **cold/warm fronts**.



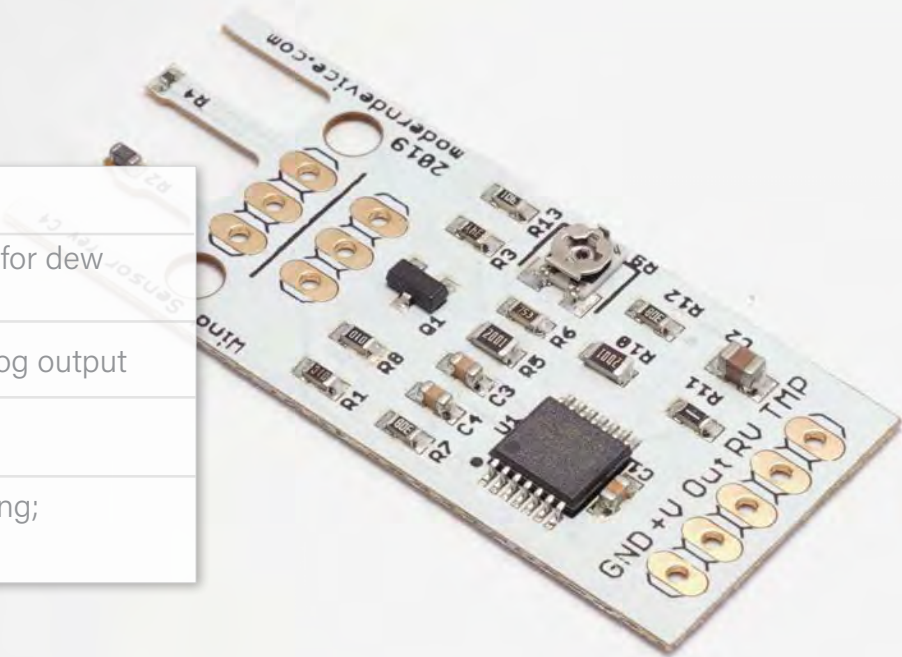
Humidity

Humidity is used to calculate dew point, the temperature at which **moisture condenses**.



System Breakdown

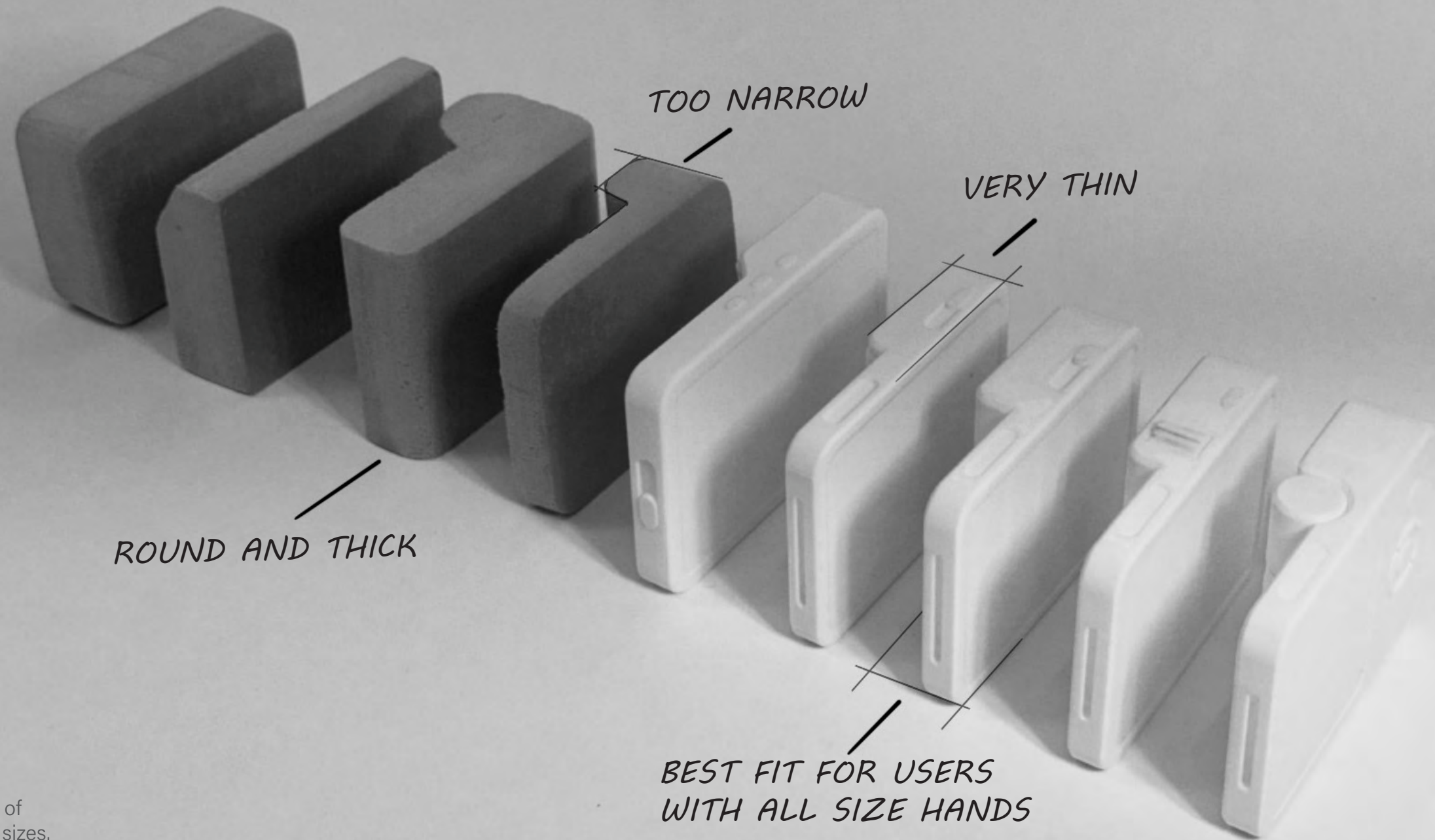
Function	Sensor Module	Notes
Temperature / Humidity / Pressure	BME280	Compact 3-in-1 sensor; provides data for dew point, storm prediction, and altitude
Wind Speed / Direction	Modern Device Wind Sensor Rev. P	Thermal sensor, no moving parts, analog output
Lighting Detection	AS3935	Detects strikes up to 40km away
UV Exposure	VEML6075	Accurate, digital UV-A and UV-B sensing; enables UV index calculation



HANDHELD
GEAR INFORMED
GRIP,
BALANCE, AND
DURABILITY.

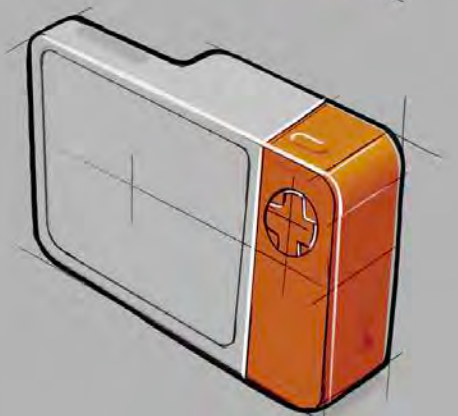
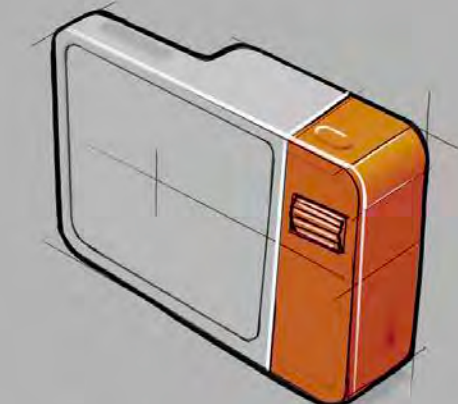
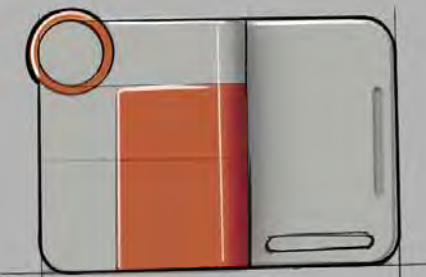
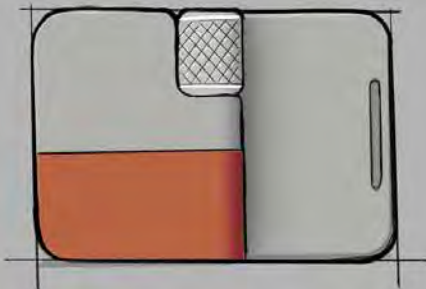
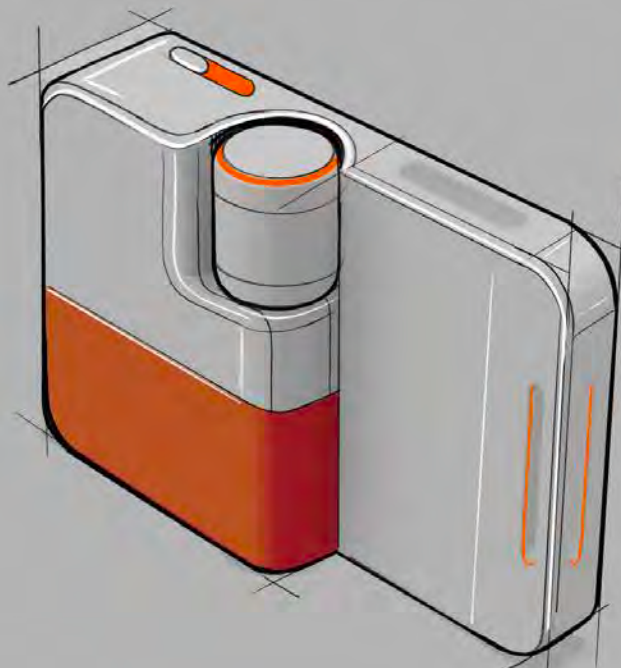
RUGGED
FORMS AND
PURPOSEFUL
DETAILING
GUIDED EARLY
CONCEPTS.

COMPACT,
WEATHER-READY
PRODUCTS
SHAPED
PORTABILITY
AND USABILITY.



Tested with **12 users** of
varying genders and sizes.







Attachment Strap



Three Stage Knob



Quick Exchange Battery



Custom Packaging



Switching between **Off, Passive, and Active** changes the level of information the device provides, conserving battery when monitoring quietly and delivering full predictions only when you need them.



Passive



Temperature



Atmospheric
Pressure



Humidity

Active



UV



Wind



Lightning
Detection





Ambidextrous design



Multiple Orientations



