

Business Case Summary: Scaling Arduino GIGA R1 WiFi Prototype

1. Objective

Scale a working prototype built on Arduino GIGA R1 WiFi into 100-1000 unit runs, maintaining core functionality while optimizing cost, manufacturability, and supply chain reliability.

2. Options for Scaling

A. Use Arduino GIGA R1 WiFi:

- Short term (100 units)
- Volume discounts possible
- No hardware redesign
- ~\$65 per unit in bulk

B. Custom Hardware:

- Recreate GIGA capabilities using STM32H747 + WiFi module
- Fully tailored board, lower cost
- Ideal for 1000+ units
- Estimated cost: \$20-40 per unit

C. Off-the-Shelf STM32 Boards + ESP32:

- Suitable for pilot batches
- Inexpensive but clunky

D. Arduino OEM Licensing:

- Arduino-compatible hardware
- Mid-volume solution with better control

3. Estimated Cost Per Unit

| Item | Prototype | 100 units | 1000 units |
|---------------|-----------|-----------|------------|
| GIGA Board | \$80 | \$65 | \$55 |
| Custom PCB | N/A | \$25-40 | \$15-30 |
| Assembly/Test | N/A | \$5-10 | \$3-7 |

| | | | |
|----------------|-------|----------|----------|
| Enclosure | \$10 | \$8 | \$5 |
| Other Parts | \$10 | \$8 | \$6 |
| Total (approx) | \$100 | \$90-130 | \$60-100 |

4. Next Steps

- Finalize specs: What functions must be retained from GIGA?
- Pilot: Order 100 units using Arduino GIGA or STM32 dev boards
- Engage hardware designer for custom PCB
- Prepare business case with breakeven, ROI
- Contact manufacturers and explore Arduino OEM licensing

5. Summary

Scaling from prototype to production requires balancing cost, flexibility, and delivery. Using GIGA boards is fine short-term, but custom hardware is key to reducing cost and tailoring the product. A phased approach - pilot, design, manufacture - ensures technical stability and financial viability.