

PRELIMINARY REQUEST FOR QUOTATION

BM-TAG-01 Rev B

Engineering, prototype and volume quotation for an active cattle ear tag

Prepared for	Francisco / China sourcing partner
Date	10 August 2026
Quote requested	Engineering + 5 EVT + 20 DVT + 100 pilot + 1,000/5,000 series
Status	BUDGETARY RFQ - NOT RELEASED FOR MANUFACTURE

Important: This package contains a preliminary native KiCad schematic and an unrouted PCB generated from the textual netlist. They have structural validation only, not KiCad ERC/DRC or independent electrical/RF approval. Gerbers, drill files and pick-and-place files are not included. Quote design completion separately and state every manufacturing assumption.

1. RFQ purpose

The customer requests a transparent quotation to complete the electronics design, manufacture five engineering units, and establish realistic recurring prices for commercial quantities. The five prototypes will validate the design; the 1,000- and 5,000-unit prices are planning targets, not purchase commitments.

2. Requested quotation structure

Work package	Quantity / phase	Quote separately
Electronics design completion	One-time	Schematic capture, ERC, library/footprints, PCB layout, DRC/DFM, production outputs
RF engineering	One-time + EVT support	915 MHz simulation, antenna matching, GNSS antenna review, VNA/tuning with enclosure
Bare PCB	5 / 20 / 100 / 1,000 / 5,000	Unit price, panel, tooling, stack-up, controlled impedance, yield and lead time
SMT PCBA	5 / 20 / 100 / 1,000 / 5,000	Components, assembly, AOI/X-ray assumptions, setup/NRE, attrition and lead time
Programming and functional test	Same quantities	Fixture NRE and per-unit test cost must be separate

Work package	Quantity / phase	Quote separately
Battery / HLC post-process	Prototype and series	Manual attachment after reflow, inspection, safety and logistics
Mechanical enclosure - optional	5 prototypes + series tooling	Prototype process, DFM, mold tooling, unit price, material, sealing
Packaging and freight	Each tier	Packaging, labeling, incoterm, destination assumptions and quote validity

3. Product and architecture overview

Item	Preliminary requirement
Product	Sealed active cattle ear tag for GNSS tracking, motion sensing, temperature indicators and LoRa communication
MCU + radio	STM32WLE5CCU6; 915 MHz low-power path; final regional channel plan and certification remain open
GNSS	u-blox MAX-M10S-00B on switched 3.3 V rail
Sensors	LIS2DW12 accelerometer and two TMP117 temperature sensors
Power	EVE ER14335 Li-SOCl ₂ cell with pulse-support HLC; TPS62840 3.3 V main buck; TPS22919 GNSS load switch
PCB target	30 x 42 mm, 4 layers, 1.0 mm, ENIG, rounded R2 corners, two 2.2 mm mounting holes
Mass target	32 g complete device; target only, to be verified in CAD and on five EVT samples
Battery-life target	At least 24 months; not yet demonstrated and not a supplier warranty requirement at RFQ stage
Environment	Outdoor cattle application; UV, rain, mud, shock and vibration; IP67 minimum final enclosure target

Power sequence: ER14335 -> removable current-measurement jumper -> 22 ohm charge/current limiting element + HLC -> VBAT_RAW -> TPS62840 3.3 V VMAIN. TPS22919 switches VMAIN to the GNSS VGNSS rail.

Critical rule: GNSS acquisition and LoRa transmission must not occur simultaneously.

4. Preliminary PCB fabrication requirements

Parameter	Requested basis for quote	Supplier response required
Board	30 x 42 mm, 4 layers, 1.0 mm	Recommended production panel and final tolerances

Parameter	Requested basis for quote	Supplier response required
Copper	L1/L4 1 oz; L2/L3 0.5 oz preliminary	Supplier standard stack-up and any cost-saving alternative
Finish	ENIG	Thickness/specification and storage life
RF traces	50 ohm controlled CPWG on L1 over solid L2	Trace geometry from actual stack-up, coupon and impedance tolerance
Solder mask	Supplier standard; pad-defined mask where fine-pitch package requires	Color options and impact on lead time/cost
Panel concept	20 boards/panel suggested; supplier optimization allowed	Final array, rails, tooling holes, fiducials and depanel method
Via-in-pad	Avoid unless explicitly required	Identify any required filled/capped vias and extra cost
Antenna zones	Copper keepout on all four layers; exact geometry pending RF engineering	DFM/RF review before release
Serial marking	Unique ID/Data Matrix preferred	Method, minimum size and unit cost

5. Assembly and sourcing requirements

The attached BOM has 80 engineering lines. Only seven lines currently carry an LCSC identifier; 59 lines still require exact MPN selection and seven lines use custom footprints. The supplier must not silently substitute RF, timing, power, sensor or protection parts.

Requirement	Expected supplier action
Approved vendor list	Propose manufacturer MPN, supplier PN, lifecycle status, MOQ, lead time and approved alternate for every unresolved line
Critical parts	Confirm genuine STM32WLE5CCU6, MAX-M10S-00B, TPS62840, TPS22919, TMP117, crystals and low-capacitance RF TVS parts
DNP	C13 is optional/DNP unless engineering release changes it
MSL handling	State dry-pack, bake and floor-life controls for moisture-sensitive devices
Assembly inspection	State AOI coverage, X-ray availability/need, first-article inspection and failure/rework reporting
Substitutions	No substitution without written approval and updated BOM/AVL

6. Battery, HLC and final assembly

Safety and process: The ER14335 lithium-thionyl-chloride cell must never pass through reflow. Quote battery purchase and post-reflow attachment as a separate operation. State dangerous-goods shipping route, cell brand/lot traceability and whether completed devices can be exported to Brazil.

Preferred electrical connection: Tabbed cell soldered to dedicated PCB pads after PCBA test; supplier may propose a connector alternative with vibration and height trade-offs.

HLC: Pulse-support capacitor type, footprint, leakage at high temperature and assembly sequence remain engineering items. Quote sourcing and validation separately.

7. Programming and functional test

Test	Preliminary acceptance objective
Visual/AOI	Correct parts, polarity, solder joints and first-article orientation
Short/open and rails	No abnormal short; VMAIN and switched VGNSS operate correctly
SWD programming	Program firmware, device identity and protected production keys supplied later by customer
I2C sensors	LIS2DW12 and two TMP117 devices respond at expected addresses
GNSS	UART communication, controlled power-up/down and position acquisition under defined sky/simulator conditions
LoRa/Rf	Conducted TX/RX path test and power check against final engineering limits
Sleep current	Measured through dedicated current pads; final numeric limit to be frozen after EVT
Traceability	Record serial number, firmware version, test result, key measurements, date and lot

The supplier should quote a bed-of-nails fixture as one-time NRE and state the per-unit test cycle and data format. Production keys will not be sent with this preliminary RFQ.

8. Mechanical enclosure - optional quotation

The mechanical design is still conceptual. No STEP file or mold-ready drawing is included. If the supplier offers mechanical engineering, quote it as a separate work package.

Item	Preliminary target
Envelope	Approximately 38 x 58 x 16 mm; must be verified around final PCB, battery and HLC
Material	UV-stabilized light-colored TPU or supplier-recommended equivalent
Sealing	IP67 minimum; IP68 desirable after process validation

Item	Preliminary target
Antenna effect	RF matching must be finalized with cured resin and closed enclosure
Prototype	Quote additive/soft-tool prototype for five units before hard tooling
Series	Quote mold NRE, expected tool life, unit price at 1,000 and 5,000, and material certification

9. Required supplier response

Response field	Required information
Commercial	Currency, incoterm, payment terms, quote validity, MOQ, lead time and freight assumption
Engineering	Scope, deliverables, revision rounds, source-file ownership, exclusions and NRE
PCB/PCBA	Unit prices by quantity, setup/tooling, panelization, yield/attrition and quality controls
Components	Completed BOM/AVL with MPNs, pricing tiers, stock/lead time and substitutions
Testing	Fixture price, test coverage, cycle time, data retention and per-unit cost
Battery/logistics	Cell source, post-reflow process, dangerous-goods handling and export feasibility
Quality	Factory certifications, traceability, incoming inspection, failure analysis and warranty terms

10. Release gate

No-build instruction: No fabrication or component purchase is authorized by this RFQ. Before an EVT purchase order, the customer must approve the native schematic, ERC, PCB, DRC, final stack-up, Gerbers, drill files, BOM/AVL, CPL, assembly drawings, firmware image and test limits.

11. Package contents

File/folder	Purpose
01_RFQ_BM-TAG-01_REV-B_EN.pdf/.docx	Vendor-facing scope and requirements
02_GUIA_FRANCISCO_PT.pdf/.docx	Portuguese handoff guide and negotiation cautions
03_BOM_AND_QUOTE_TEMPLATE...xlsx	Editable BOM, price tiers, factory response and open-items matrix
04_SOURCE_CONCEPT/KICAD_PRELIMINARY	Native preliminary KiCad project: schematic, unrouted PCB, project and validation notes
04_SOURCE_CONCEPT/pcb	Rev B technical concept, engineering BOM, textual netlist and references

File/folder	Purpose
04_SOURCE_CONCEPT/BM-TAG-01-REV-B-CORRIGIDO.zip	Original corrected concept package
05_EMAIL_TO_FRANCISCO_PT-EN.txt	Ready-to-send message
06_MANIFEST_SHA256.txt	File integrity list