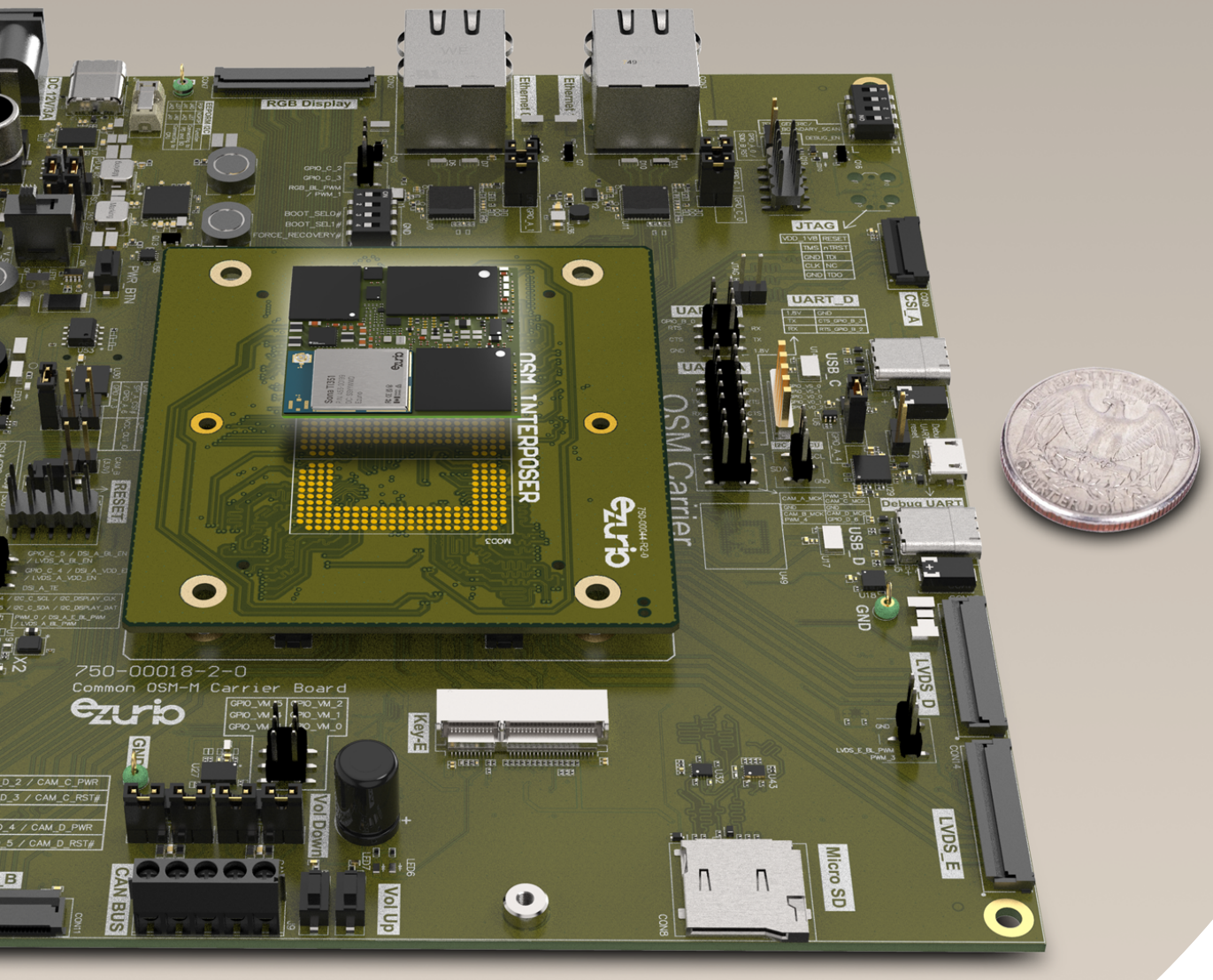
Application Story

Right Sizing Your SOM for Battery-Powered, CRA-Ready Connected Devices

How TI's AM62L and Ezurio's Open-Standard Module SOMs Solve Battery Life, Connectivity, and Compliance Problems



Every embedded design starts with a question about how much processor you actually need. Pick too little, and the first customer request for more features puts you into a tough spot. Pick too much, and you may never use the additional power or board space required. That question gets harder the moment your product runs on a battery and has to talk to something else, whether that is a gateway pushing sensor data or a handheld device a technician carries around a job site. It also gets harder with EU's Cyber Resilience Act as the security architecture behind that choice is now a legal requirement.

This paper discusses using a specific processor and a specific system-on-module: the Texas Instruments AM62L Sitara processor and Ezurio's Carbon AM62L OSM-SF SOM. This chip and SOM are well suited for a large number of connected, battery-powered devices that stand to benefit from a small, efficient processor, especially from a platform that was already built with CRA compliance in mind.

The Problems That Actually Matter

Design reviews spend a lot of time on the amount of compute and not enough time on the two limits that ultimately decide whether a connected, battery-powered product ships: power draw and connectivity. A device that needs to run a full shift on a battery and push data over Ethernet and Wi-Fi reliably in an industrial setting cares a lot less about GPU benchmarks than about idle current, sleep states, and how many wired and wireless interfaces are onboard.

TI's AM62L is built to address these needs. Compared to the standard AM62, it drops the camera, vision pipeline, and GPU. If your product's interface is a set of menus, a status bar, and a handful of icons, or if it doesn't have a display at all, you're not giving up anything you need. That leaves two categories that AM62L excels. The first is connectivity-centric products where the job is moving data reliably: gateways and connected controllers where Ethernet, Wi-Fi, and fieldbus interfaces are key. The second is battery-powered handheld devices: field tools, portable readers, and test equipment where the display exists to show status and guide a user through a task.

Both categories keep running into the same problems and most connectivity-focused SOMs on the market don't solve them:

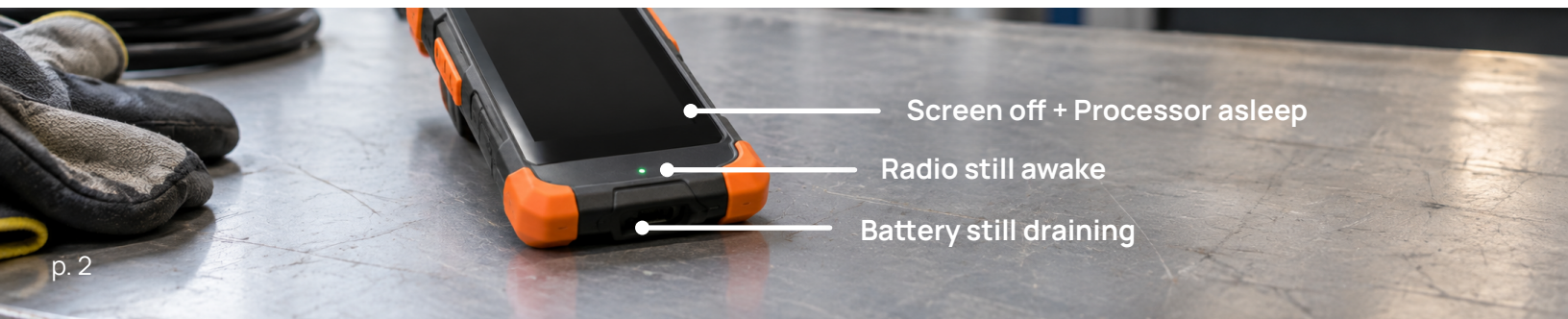
- Radios that don't really sleep: Many small SOMs manage the application processor's power states independently of the wireless radios, so a device that looks asleep still has Wi-Fi or Bluetooth semi-active, quietly draining a battery.

- Carrier boards: Board-mounted radios on small SOMs frequently sit on the underside of the module, which forces a routed cutout into the carrier board layout.

- Lack of certifications: Buy a SOM without an integrated, pre-certified radio, and the antenna design, RF layout, and regulatory certification (and associated costs) become your problem.

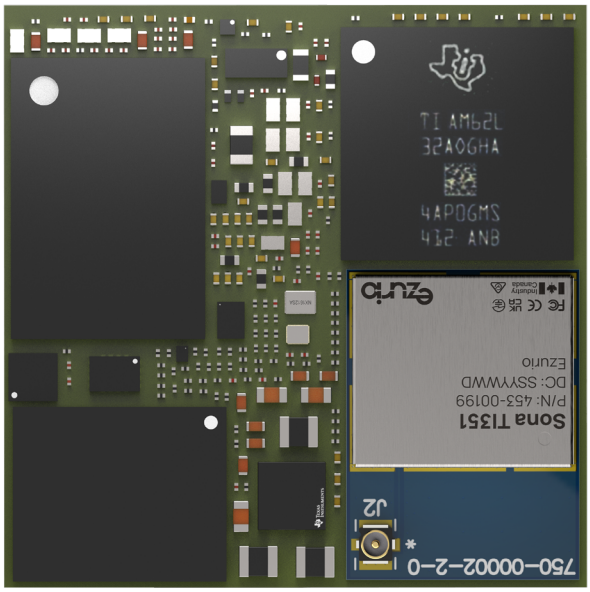
- Display or radio: In a 30mm-class footprint, most vendors have one: a display-capable SOM with no onboard wireless, or a wireless-capable SOM with no display output. Products that need both end up increasing footprint, adding a second board, or dropping a feature.

There's a cost component too. Every square millimeter of silicon dedicated to a GPU or camera pipeline you don't use still shows up on the bill of materials. Choosing a processor that matches the job is one of the more straightforward ways to control unit cost on a high-volume connected product.



What is on the Chip

The Texas Instruments AM62L applications processor is designed for maximum flexibility and low power in a small, low-cost footprint. Featuring an efficient dual core A53 cluster up to 1.25GHz, and backed up by advanced low power modes, the SoC is designed for maximum connectivity and system integration with 2 Gigabit Ethernet ports, 2x USB 2.0, 8x UARTs, 3x CAN, a 12-bit ADC as well as a 1080p60 capable display subsystem and advanced secure boot capabilities in an 11.9x11.9mm package.



Ezurio's Competitive Advantage: Carbon AM62L OSM-SF SOM

The AM62L chip is only half the design decision. The other half is what is left to sort out once it is on a board, and for a battery-powered, connected product, that is where projects lose time. Carbon AM62L OSM-SF is Ezurio's answer to that: a small, 30mm x 30mm solderable system-on-module that brings the processor, power management, and, if you need it, wireless connectivity together on one part, from a single supplier.

The Carbon AM62L OSM-SF has no underside components, which directly answer the carrier-board problem earlier, no routed cutout.

On the power side, a dedicated TI TPS65214 PMIC manages the module's low power states, including a sleep mode that shuts almost everything down except watching for a wake signal. For a handheld device that spends most of its life waiting for someone to pick it up, that is the difference between a device that is always ready and one that is not.

Wireless is where the two use cases really differ. Carbon AM62L OSM-SF's optional Sona™ TI351 module runs on TI's CC3351 chipset, a rugged, small, globally certified Wi-Fi 6 and Bluetooth radio, and it is backed by Ezurio's EZ Connectivity Stack rather than a bare driver. Most module suppliers hand you a driver and leave you to build and maintain everything around it: firmware, regulatory files, wpa_supplicant configuration, NetworkManager integration, and tracking security fixes against your specific kernel version for the life of the product. EZ Connectivity Stack ships all of that already tested together, across 75+ kernel versions, so a gateway or handheld device built for one region does not need a different radio configuration for another. That is less ongoing engineering time spent maintaining a radio stack.

Meeting the CRA

The EU's Cyber Resilience Act incident-reporting deadline took effect September 11, 2026. RED-DA 2022/30's cybersecurity requirements have already applied to in-scope radio equipment since August 1, 2025, and the CRA's remaining cybersecurity requirements become enforceable December 11, 2027. For a design team picking a SOM right now, the security architecture isn't something you can push off to later in the program. Carbon AM62L OSM-SF covers the hardware half of that. The AM62L's hardware root of trust, secure boot chain, TrustZone-based trusted execution environment, and secure storage map directly onto the access control, secure storage, and cryptography requirements in both

RED and the CRA. It's the same silicon-level foundation, so the security groundwork and the processor choice are the same decision.
The other half is software and lifecycle, and that's where EZ BSP comes in. Chain-of-trust security handles signed, verified firmware updates, the part of the CRA that requires updates to be authentic before they're installed. Vulnerability monitoring generates an SBOM and checks it against known CVEs on demand, covering the CRA's disclosure obligations. Ezurio also runs an active Product Security Incident Response Team that monitors MITRE, CISA, and ENIAS in addition to customer reports with a disclosure clock that mirrors the CRA's own timeline: an early warning within 12 hours, a detailed description within 72 hours, and a mitigation report within 14 days.

Choosing this platform, with Ezurio and Texas Instruments as parters, removes the hardest and most expensive part: the root of trust, the secure boot chain, the update signing infrastructure, and the vulnerability monitoring pipeline. All of these are already built and running with support as needed.

Real Life Use Cases

Connectivity Gateway

Picture a gateway sitting between field equipment and a network uplink: dual Gigabit Ethernet ports for connections, CAN-FD for talking to industrial or automotive equipment, and Wi-Fi/Bluetooth for a configuration path. This is the kind of product that shows up in building automation, HVAC control, and commercial test & measurement equipment: always-on, mains-powered most of the time, but still judged on how little power it wastes and how reliably it keeps talking to the network.

None of that requires a GPU or a camera. It needs interfaces that work, TSN support, hardware timestamping when timing matters on the network side, and a small enough footprint to fit into the enclosure the product already has. AM62L's connectivity set and Carbon AM62L OSM-SF's dedicated low power modes cover that without any extra design work. And because the radio and certification are already handled, the team can spend less time on RF and antenna tuning.

Battery-Powered Handheld with a Simple UI

Technicians usually have a portable test tool with a small display showing status, a menu, and a simple animation. It runs on battery power, spends a lot of its life asleep, and wakes up for short bursts of activity. This is what is behind portable test and measurement equipment, HMI/kiosk-style handhelds, and field diagnostic tools. The single MIPI-DSI display output on AM62L covers the UI without the GPU overhead a full graphics pipeline would add, and the PMIC's low power states cover the battery life requirement between uses.

The rest of the interface work is small: onboard ADC inputs for a sensor reading, PWM and GPIO for a status LED or alert, I2S for an audible beep, and eMMC/SD storage for storing results. The 30mm x 30mm footprint of Carbon AM62L OSM-SF matters too: it has to physically fit inside a device meant to be held in one hand, and a -40°C to +85°C operating range means the same design holds up whether it's used on a bench or outdoors.



A Checklist for You

If you're trying to figure out if the AM62L is right for you, here are a few questions:

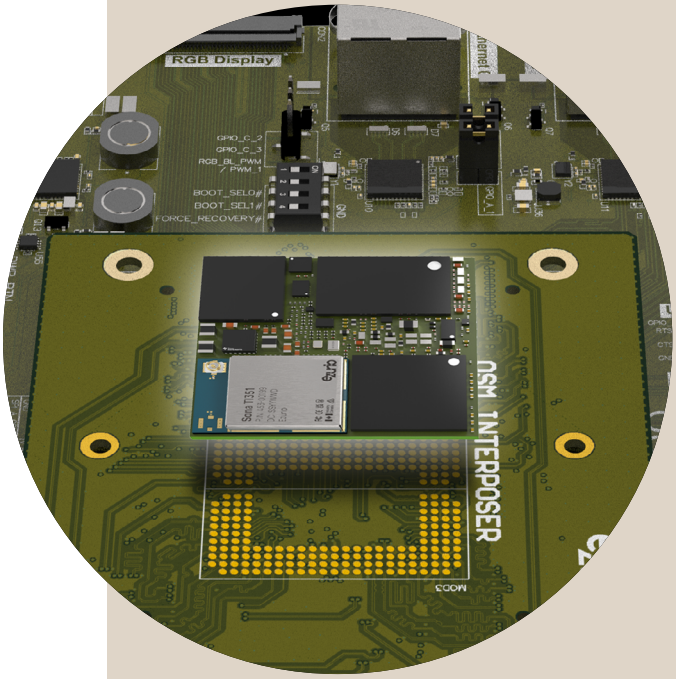
- Does your user interface need more than menus, status indicators, and simple icons?
- Does the design need a camera or a vision pipeline?
- Is the device battery powered, or does it need to spend most of its time in a low power state?
- Do you want pre-certified Wi-Fi and Bluetooth out of the box instead of carrying radio design and certification yourself?
- Do you want to keep your carrier board layout and manufacturing process as simple as possible?

If most of those point toward simple, battery-conscious, and connectivity-first, AM62L and Carbon AM62L OSM-SF are right for the job.

Getting Started

The fastest way to answer the questions above is with real hardware. Order samples of the Carbon AM62L OSM-SF and get your design kickstarted with a ready-to-go prototype kit. This kit includes a built-in foldable display, carrier board, SOM with adapter, and accessories ready to be used out-of-the box.

To learn more about the OSM EVK visit:
www.ezurio.com/part/ezomi-62l-0201-00199-2-k2



About Ezurio

Ezurio turns design possibility into reality with a comprehensive range of RF modules, system-on-modules, single board computers, internal antennas, IoT devices, and custom solutions. With decades of engineering expertise, Ezurio provides solutions that reduce development costs and time to market. Our global reach and unmatched support are backed by a resilient global supply chain that gives our customers the stability to overcome every design challenge with confidence. Turn design possibility into reality with Ezurio, your connectivity expert.

To learn more about Ezurio, visit
www.ezurio.com