

Production-ready embedded Linux for *TI Sitara*

A custom Yocto-based platform for AM335x, AM62x, and AM64x — the industrial workhorse line. Deterministic I/O with PRU-ICSS, industrial networking, and long-lifecycle support.

Validated on **AM335x · AM62x · AM64x (BeagleBone & TI EVK)**
PRU-ICSS + Cortex-R5F/M4F — deterministic I/O

THE PLATFORM

The industrial workhorse, productized.

The TI Processor SDK gets you running — but industrial products need reproducible builds, deterministic I/O, and support across a long lifecycle.

A reproducible Yocto build with PRU-ICSS deterministic I/O and industrial networking — owned by you, supported for the long lifecycle industrial demands.

Our Sitara platform is a Yocto-built platform aligned to the TI Processor SDK. It brings reproducible, customer-owned builds to AM335x/AM62x/AM64x, with PRU-ICSS for sub-microsecond deterministic I/O and first-class industrial networking — built for the long lifecycles industrial products demand.

VALIDATED HARDWARE

AM335x · AM62x · AM64x — on BeagleBone and TI EVKs, aligned to the TI Processor SDK with PRU-ICSS deterministic I/O.

8 yrs

building production
embedded Linux platforms

6

SoC platform families — ~90%
of the embedded Linux market

1

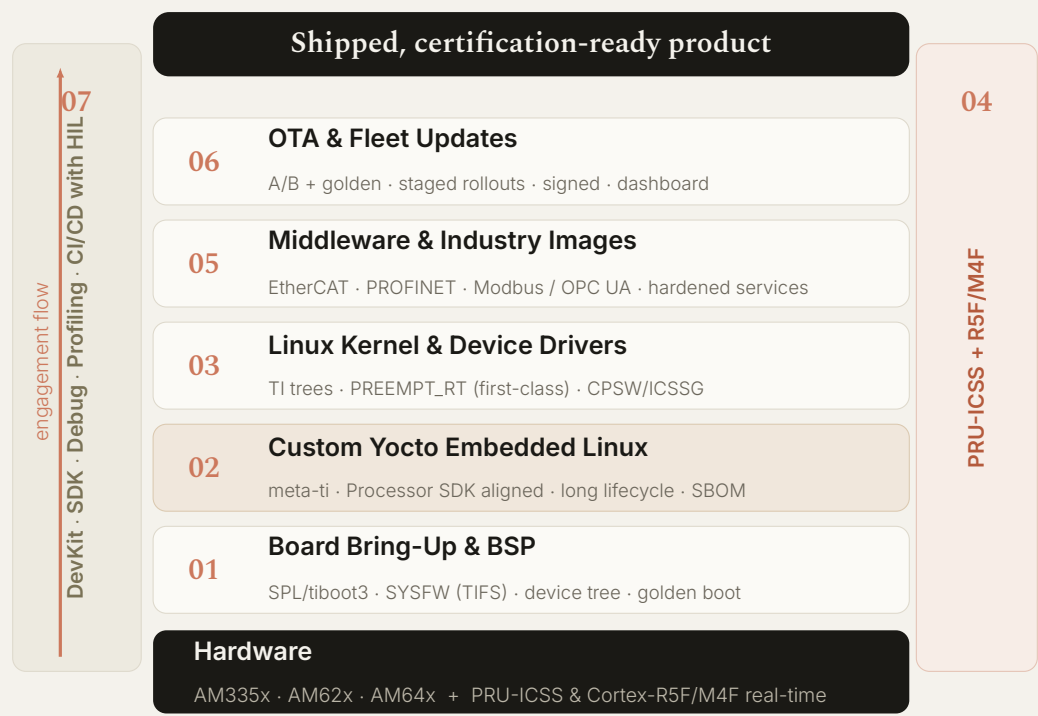
engineering methodology,
applied across every platform

[Add your proof point here] e.g. "Delivered a Sitara platform with EtherCAT-over-PRU for an automation customer — deterministic I/O, long-lifecycle support." One concrete, anonymized outcome here will do more for credibility than any claim on the following pages. Replace this box before sending.

HOW IT FITS TOGETHER

The platform stack

Hardware comes alive at the bottom and ships as a maintainable product at the top. Developer tooling spans the whole engagement; the real-time domain runs the hard-real-time path alongside Linux.



Each layer is a capability detailed on the following pages.

■ Hardware & product ■ Owned OS foundation ■ Real-time domain ■ Spans the engagement

Board Bring-Up & BSP

Your Sitara board boots reliably — through the SYSFW/SPL chain to a brick-proof field device.

The foundation layer: a clean boot through the AM6x SYSFW/SPL chain, with every industrial peripheral verified.

- **Schematic review** — DDR routing/config, power sequencing (PMIC), boot straps.
- **Custom BSP & device tree** — for your exact carrier.
- **Bring-up & smoke test** — rails, clocks, memory, and peripherals.
- **Custom bootloader** — SPL/U-Boot port, boot media, SYSFW integration on AM6x.
- **Golden boot & failsafe** — watchdog rollback and partitioning.

TECHNICAL DETAIL			
Boot chain	ROM→SPL/tiboot3→U-Boot	SYSFW	TIFS on AM6x
Storage	eMMC / SD / QSPI	Recovery	Golden image

You receive: a custom BSP & device tree, bootloader with SYSFW integration, golden-boot setup, and a bring-up report.

Custom Yocto Embedded Linux

A reproducible, owned Sitara Linux built for long industrial lifecycles.

Replacing ad-hoc SDK images with a reproducible build aligned to the TI Processor SDK — and maintainable for years.

- **Reproducible builds** — meta-ti, TI Processor SDK alignment, Yocto LTS.
- **Long-lifecycle support** — built for industrial product lifespans.
- **Minimal & locked down** — read-only rootfs, hardened services.
- **You own everything** — source, build system, recipes.
- **Auditable & maintainable** — SBOM, CVE patching, strong mainline support.
- **Manufacturable** — reproducible image across the line.

TECHNICAL DETAIL			
Build system	Yocto / BitBake	BSP layer	meta-ti
Alignment	TI Processor SDK	Supply chain	SBOM + signed

You receive: the full source & build system, a reproducible signed image, an SBOM, and docs aligned to the TI SDK.

Linux Kernel & Device Drivers

A deterministic, hardened Sitara kernel with industrial networking driven properly.

Sitara is a first-class real-time target — we tune the kernel for determinism and drive the industrial networking and I/O.

- **Kernel customization** — TI trees with strong mainline support.
- **PREEMPT_RT** — Sitara is a first-class RT target.
- **Boot streamlining** — industrial fast-start.
- **Drivers** — industrial Ethernet (CPSW/ICSSG), CAN, ADC/touch, display (LCDC/DSS), SPI/I2C.
- **PRU-ICSS** — interface drivers and remoteproc integration.

TECHNICAL DETAIL			
Kernel	TI trees	Real-time	PREEMPT_RT (first-class)
Networking	CPSW / ICSSG	Custom	PRU-ICSS

You receive: a tuned RT kernel config, industrial-networking and I/O drivers, and PRU-ICSS interface integration.

Real-Time Domain (PRU-ICSS)

Sub-microsecond deterministic I/O and custom industrial protocols, alongside Linux.

Sitara's defining strength is determinism: PRU-ICSS delivers sub-microsecond I/O and custom industrial protocols, with Cortex-R5F/M4F for real-time control.

- **PRU-ICSS firmware** — deterministic sub-microsecond I/O, custom industrial protocols, encoder/PWM.
- **FreeRTOS / Zephyr** — on Cortex-M4F (AM62x) and R5F (AM64x).
- **RPMmsg / remoteproc** — between Linux and the real-time domains.
- **Mixed-criticality** — industrial architectures and partitioning.

TECHNICAL DETAIL			
RT engines	PRU-ICSS + R5F/M4F	RTOS	FreeRTOS / Zephyr
Comms	RPMmsg / remoteproc	I/O	sub-microsecond

You receive: PRU-ICSS firmware, R5F/M4F real-time firmware, the RPMmsg link, and a documented mixed-criticality architecture.

Middleware & Industry Images

Ship faster with a hardened, industrial-networking-tuned image instead of a blank build.

Pre-integrated platform variants tuned per industry — the right industrial stack, hardened and ready, on day one.

Industrial Automation
EtherCAT (PRU-ICSS), PROFINET, EtherNet/IP, Modbus, OPC UA, TSN.

Motion & Control
real-time control stacks, motor control.

IoT & Gateways
MQTT, edge gateways, protocol translation.

Energy & Utilities
Modbus / DNP3, metering, RS-485.

Medical
traceable builds, SBOM, audit-ready workflow.

Building Automation
BACnet, KNX, HVAC control.

Also available: transportation, grid, and process-control variants — or a variant built to your vertical.

PRODUCTION BASELINE — EVERY VARIANT			
Filesystem	Read-only + overlayfs	Resilience	Watchdog recovery
Services	Hardened daemons	Tamper / power loss	Survives both

You receive: an industry image pre-integrated with the relevant industrial stack, hardened to the production baseline.

OTA & Fleet Updates

Update a whole Sitara fleet in the field, safely, without sending a truck.

Safe over-the-air updates with a guaranteed way back — built for unattended industrial deployments.

- **A/B updates** — with golden recovery and auto rollback.
- **Auto rollback** — a failed health check reverts automatically.
- **Fleet management** — cloud or on-prem, staged rollouts, delta updates.
- **Dashboard** — upload, target a fleet, monitor, one-click rollback.
- **Signed & secure** — a signed update chain.

TECHNICAL DETAIL			
Engine	RAUC / Mender	Scheme	A/B + golden
Rollout	Staged + delta	Trust	Signed updates

You receive: a configured OTA pipeline, the update server, the dashboard, and signed-update tooling.

DevKit, SDK, Debug & Profiling

Your team owns and operates the platform — no black box, no dependency.

Spans the whole engagement: tooling for your own team to develop, debug, profile, and rebuild the platform.

- **Evaluation images** — for TI EVKs / BeagleBone and custom boards.
- **Application SDK & Yocto eSDK** — cross-toolchain plus the full build workflow.
- **Debug** — JTAG (CCS / XDS), kgdb, gdbserver.
- **Profiling & CI/CD** — perf, LTTng, boot & latency; HIL.

TECHNICAL DETAIL			
Eval	TI EVK / BeagleBone	SDKs	App + eSDK
Debug	CCS / XDS JTAG	Pipeline	CI/CD + HIL

You receive: eval images, both SDKs, CCS/JTAG debug setup, and a CI/CD pipeline with hardware-in-the-loop tests.

WHY US

Why SoC Centric

One engineering methodology, applied with the rigor of a regulated-industry supplier.

- Replaces ad-hoc vendor images with a reproducible, owned, manufacturable platform built to ship.
- You own everything — full source, build system, and documentation. No lock-in, to us or anyone.
- Reproducible Yocto builds with SBOMs — **certification-ready** for ISO 26262, IEC 62304, IEC 61508, and DO-178C environments.
- Sub-microsecond deterministic I/O via PRU-ICSS and first-class PREEMPT_RT — the industrial determinism story, owned.
- Part of a platform family covering ~90% of the embedded Linux market, with one consistent methodology.
- A natural growth path: platform → independent verification & validation → hardware-in-the-loop testing → field data logging.

GETTING STARTED

How an engagement begins

01

Eval image

We send a working platform image for your board to evaluate — no commitment.

02

Architecture call

A 30-minute call to map your hardware, industry, and target to a plan.

03

Pilot

A scoped bring-up + Yocto build on your actual board, with deliverables.

04

Platform delivery

Full source, build system, OTA, and tooling — handed over, owned by you.

GET STARTED

Let's talk

Ready to turn your Sitara project into a product?

The TI SDK gets you running. We turn Sitara into an industrial product you can ship, certify, and support across its full lifecycle.

→ Request an evaluation image for your board | → Schedule a 30-minute platform architecture call

GET IN TOUCH

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SOC CENTRIC

Production embedded Linux platforms across
NVIDIA Jetson · AMD Xilinx Zynq · NXP i.MX ·
TI Sitara · Intel/AMD x86 · Raspberry Pi.

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