Anybus ONE-S100-31-10 – System-on-Module for Industrial Networking

KEY FEATURES:

- 26 × 26 mm compact System-on-Module with integrated PHY and flash memory
- Dual-core ARM® architecture with Cortex® M7 up to 800 MHz for user applications
- Hardware-agnostic software architecture for unmatched resilience
- Multi-protocol supporting PROFINET, EtherNet/IP and EtherCAT, with SPI and Modbus RTU host interface
- Built-in security engine with secure boot, encryption, and signed firmware updates
- Designed for IEC 62443-4-2 and EU Cyber Resilience Act (CRA) compliance (2027)
- Unified footprint for scalability across product variants
- Operating temperature –40°C to +85°C



PRODUCT DESCRIPTION:

The Anybus ONE-S100-31-10 is a compact, all-in-one System-on-Module designed to provide reliable industrial Ethernet connectivity for automation devices. Measuring 26 × 26 mm, it includes all essential hardware and firmware needed to connect to major industrial protocols, simplifying integration and reducing development time.

The Anybus ONE-S100-31-10 features a dual-core ARM® architecture with a power-efficient core dedicated to industrial protocol handling via the Anybus Data & Service Manager, and a high-performance ARM® Cortex® M7 core running up to 800 MHz for user applications. This combination offers robust system partitioning, from running lightweight host control tasks to advanced application logic, within a single SoM. Integrated Ethernet PHY, memory, and switch functionality minimize the need for external components, enabling a clean, space-efficient design.

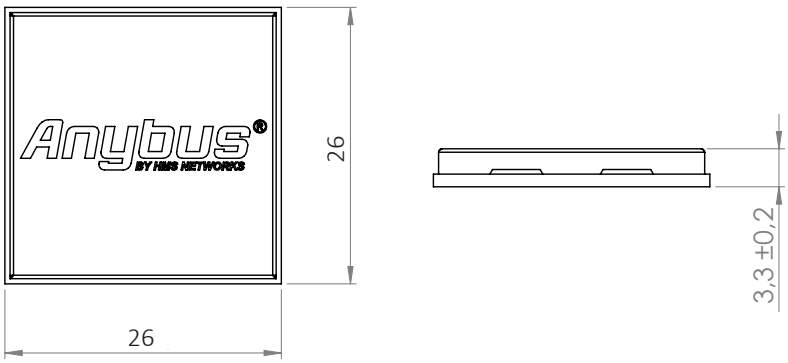
The Anybus ONE-S100-31-10 supports PROFINET device, EtherNet/IP adapter, and EtherCAT SubDevice out of the box, with no license fees. On the host side, the module connects via SPI or a Modbus RTU interface, mapping host data to the active industrial protocol. A unified firmware architecture lets you select the active protocol per application and simplifies future upgrades. Configuration and customization are handled through the Anybus Studio, offering a graphical interface for setup, diagnostics, and firmware management.

Security has been built in from the start. Developed under an IEC 62443-4-1 certified process, the Anybus ONE-S100-31-10 is to be certified to IEC 62443-4-2 SL1 requirements and the EU Cyber Resilience Act. The integrated security engine provides cryptographic secure boot, encrypted communication capabilities, and signed firmware updates, ensuring data integrity and protection throughout the product lifecycle.

With a single footprint across performance levels, the Anybus ONE-S100-31-10 supports a scale-as-you-go approach, from basic industrial connectivity to advanced designs integrating Device intelligence in upcoming SoM variants. The result is a flexible, long-lifetime communication solution.

The Anybus ONE-S100-31-10 is the first product built on the new Anybus Technology Platform, a scalable architecture that decouples hardware and software, ensuring future-proof and simplified lifecycle management through software-defined updates.

DIMENSIONS



SYSTEM & PROCESSING

Attribute	Specification
Product name	Anybus ONE-S100-31-10
Form factor	System on Module (SoM) / Land Grid Array (LGA)
Core architecture	Anybus Core + User Core (ARM® Cortex®-M7)
Core allocation	Anybus Core; M7 = User Core (available in 2027)
Clock frequency	ARM® Cortex®-M7 at 800 MHz
Internal RAM	Up to 512 kB
Additional memory	Up to 64 MB HyperRAM
Flash	Up to 16 MB SPI
Boot source	NOR flash
Real-time clock	Yes
Inter-core coordination	Internal MMIO / IPC
Hardware accelerators	Crypto, EtherCAT
Supply voltage	3.3 V

NETWORKING & PROTOCOLS

Attribute	Specification
Supported protocols	PROFINET, EtherNet/IP, EtherCAT (Compliant with ODVA, PI and ETG)
Protocol selection	Configurable on site, selected by the application
Host interface	Cyclic I/O process data via SPI, acyclic data and commands via UART or SPI, parameters via GPIO
Ethernet ports	2x 10/100BASE-TX MDI + 1x RGMII
Integrated switch	Managed
Topology discovery	LLDP (IEEE 802.1AB)
Time synchronization	PTP / IEEE 1588
QoS	Yes
MAC handling	Preset MAC + customer-configurable MAC

SECURITY

Attribute	Specification
Secure boot	Secure boot of application firmware
Key storage	Secure storage via encryption + ELE secure enclave
Secure provisioning	Yes
Device identity	Yes (unique)
Certificate handling	X.509
TLS stack	Mbed TLS
Firmware update	WebDAV
SBOM	Yes
Vulnerability handling	Yes (PSIRT process)

PERFORMANCE

Attribute	Specification
Min cycle time	1 ms (EtherNet/IP, PROFINET); 250 µs–1 ms (EtherCAT)

DEVICE MANAGEMENT

Attribute	Specification
Factory reset	Yes

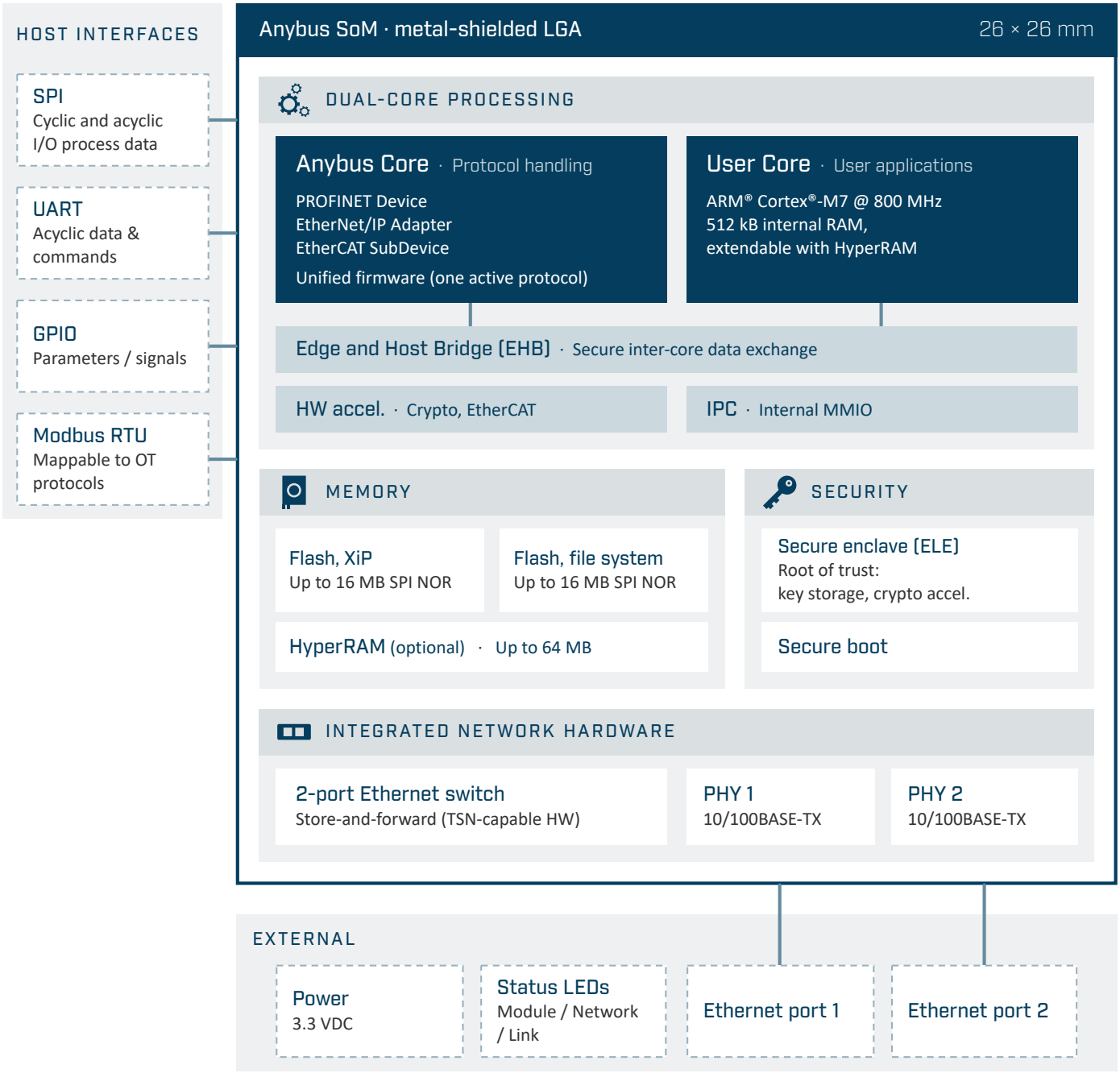
ENVIRONMENTAL & COMPLIANCE

Attribute	Specification
Operating temperature	–40 °C to +85 °C
Storage temperature	–40 °C to +85 °C
RoHS	Compliant
EMC	Emission — EN 61000-6-4 EN 55016-2-3 — Radiated emission EN 55032 — Conducted emission Immunity — EN 61000-6-2 EN 61000-4-2 — Electrostatic discharge EN 61000-4-3 — Radiated immunity EN 61000-4-4 — Fast transients / burst EN 61000-4-5 — Surge immunity EN 61000-4-6 — Conducted immunity
Prepared for IEC 62443-4-2 SL2	2027
EU Cyber Resilience Act (CRA)	2027

LIFECYCLE & LOGISTICS

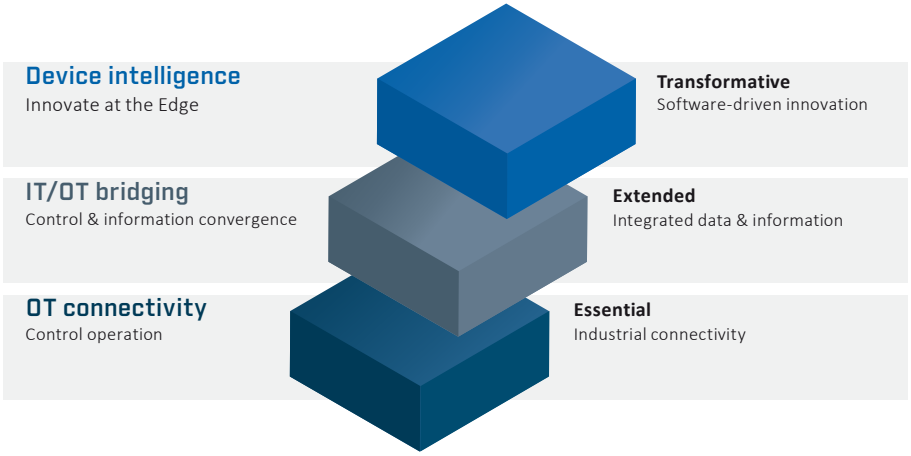
Attribute	Specification
Delivery format	Tape & Reel, prototype samples available on tray

HARDWARE BLOCK DIAGRAM



The Anybus concept: Scalable, efficient and future-proof

The Anybus ONE-S100-31-10 is the first product built on the new Anybus Technology Platform, Anybus ONE, an architecture created to change how connectivity is designed into industrial devices. Instead of selecting a new communication solution for every product and every protocol, device makers can build on one platform that scales with their portfolio and evolves with the standards around it. The result is faster time to market, lower lifetime cost, and products that stay current long after they ship.



One architecture with scalable functionality levels, designed to support a full range of communication needs across a complete device portfolio.

ONE DESIGN, A FULL PORTFOLIO

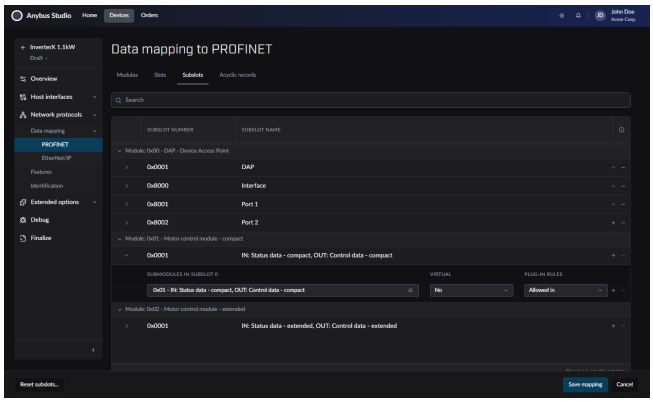
Anybus ONE is offered in functionality levels that share a single footprint and a common core architecture, from essential industrial connectivity, through IT/OT data convergence, to innovation at the edge. A device maker can start with what a product needs today and move up the range without redesigning hardware. One integration effort serves an entire family of devices, from the simplest connectivity node to the most capable, which means engineering investment is made once and reused across the portfolio.

EFFICIENT DEVELOPMENT WITH ANYBUS STUDIO

Every variant is configured and maintained through Anybus Studio, a single graphical tool for network protocols, security functions, and application services. The same environment carries a project from first prototype through to firmware maintenance in the field, so teams learn one tool and reuse it across every product they build on the platform. Development effort goes into the application that differentiates the product, not into the plumbing underneath it.

FUTURE-PROOF BY DESIGN

The platform's software-defined architecture decouples hardware from firmware, so capabilities can be added over the life of a product through software rather than silicon. New industrial standards and tightening security requirements can be met by updating the firmware on hardware already in the field. The platform is built to adopt technologies such as TSN, OPC UA, MQTT, and Edge AI as they mature meaning a device designed today is positioned to stay relevant in the connected, secure, and intelligent factories of tomorrow.



Anybus Studio - A unified configuration tool that streamlines customization, testing, and maintenance.