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Kontron 5G All-In-One KBox

5G Network in Small Package

Kontron's 5G Core solution, deployed on the industrial-grade KBox A-151-RPL platform, offers a powerful and compact private 5G network architecture tailored for enterprise and industrial use. Built on robust edge computing capabilities, this platform delivers reliability and flexibility for deploying mission-critical applications in diverse environments.

When combined with Kontron's indoor 5G all-in-one RAN solution, the offering delivers end-to-end 5G functionality—from radio to core—in a modular, scalable format. This setup supports advanced use cases with high security, including encryption and authentication, while enabling seamless deployment and management. The compact form factor, industrial robustness, and full integration make it ideal for organizations seeking reliable private 5G connectivity with the flexibility to grow and adapt over time.

The All-in-one setup combines a 5G radio access network (RAN), 5G SA Core, with intuitive Element Management system into a single KBox - industrial PC as simplified solution which reducing deployments and implementation complexity. Leveraging the capabilities of 5G technology, the solution provides low latency and high bandwidth, enabling real-time communication, for mission critical applications, and support of a wide range of data-intensive use cases. The heart of the Kontron Private 5G All-In-one solution is our 5G SA Core which is the center of gravity in this complex system. Kontron 5G standalone (SA) core is a version 3GPP Release 16 compliant solution which includes all fundamental Network Functions from Control Plane and User Plane perspective. The solution is cloud-

native which means it is hardware agnostic and can be deployed on any COTS server in our case on KBox A-151-RPL - Embedded Box PC, dimensioned and optimized for high performance in small footprint. 5G Standalone (5G SA) ensures unprecedented levels of automation across an end-to-end network to fulfil the needs of new services and applications. The 5G Core solution embodies flexibility, programmability, and a distributed architecture, delivering the agility needed to accelerate time-to-market while optimizing performance and efficiency. Operating on a secure Ubuntu OS, our 5G Core virtualizes all network functions through containerization and orchestrates them using Kubernetes, ensuring a robust and agile infrastructure.



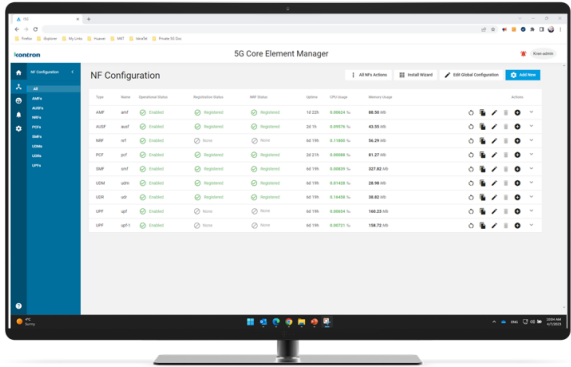
The second key component in Kontron 5G All-in-one solution is the Radio network which in our case is

realized with Integrated 5G Small Cells platform capable of handling 5G wireless network waveforms.

Packed in a sealed carrier grade unit for indoor installation for wall or ceiling mount, or with an optional outdoor version the 5G Small Cells platform is at the forefront in terms of digital technology and signal processing associated to advanced architecture ideal for implementation of cellular and advanced wireless private networks.

Our offering also includes **5G-enabled devices** such as routers, gateways, cameras, and sensors. Finally, **The Kontron 5G Core Element Manager** is web-based management system designed to offer a straightforward and robust portal for managing 5G

network functions and subscriber provisioning across the entire 5G system.



KEY FEATURES AND BENEFITS

- Fast Deployment:** Pre-packed and pre-integrated solution which is designed for rapid installation.
- Mobility:** This setup is designed to be practical and portable, packed into a small but powerful footprint.
- Backup on Cloud:** Extend the 5GC network into the Cloud with full blown backup on cloud.
- Intuitive Management:** Benefit from centralized management and monitoring capabilities, enabling streamlined operations, efficient troubleshooting, and proactive maintenance.
- Accelerated Time-to-Market:** Rapidly deploy and test new services and applications, leveraging cloud-native capabilities, agile development methodologies, and DevOps practices.
- End-to-End Solution:** Enjoy a complete end-to-end solution that encompasses 5G Core and 5G Radio components, reducing complexity, enhancing interoperability, and facilitating rapid deployment.

Technical Data

5G Core - Control Plane Function
3GPP R15/R16 Standards compliant - Service Based Architecture (SBA): AMF, SMF, UDM, UDR, AUSF, NRF and PCF - AMF Access and Mobility Management Function - SMF Session Management Function - UDM Unified Data Management - UDR Unified Data Repository - AUSF Authentication Server Function - NRF Network Repository Function - PCF Policy Control Function
5G Core - User Plane Function
- UPF – general purpose User Plane Function HW agnostic - DPDK-UPF – high performance UPF with acceleration - Edge-UPF – distributed UPF on customer premisses
5G Core Key Functionalities
- Registration Management - Registration, Deregistration (UE, Network) - Connection Management - UE triggered, Network triggered (Paging), AN Release - Mobility Management - Xn based HO - Security - SBA architecture; Release 16 - Using NRF - NF Service discovery and selection - Specific use cases - Subscribed UE data manipulation - RAT restriction - Reregistration required - Subscription withdrawn - Framed Routing Support

5G All-In-One Box Configuration
1 × KBox A-151-RPL - Embedded Box PC - Based on 13th Generation Intel® Core™ U-Series - Memory DDR5 Up to 96 GByte - Storage - up to 2 TByte NVME via M.2 Key M - Maintenance free with Passive cooling 1 × Switch (optional) 20 × 1 G/10 G SFP + 4 × 10 G/25 G SFP28 + 2 × 40 G QSFP+ ports available 5G Indoor Small Cell (Outdoor option on request) - FR1: n77, n78, band (others on request) 2x2 MIMO (others option and Outdoor on request) - Bandwidth 100 MHz - GPS and PTP 1588v2 support - Different options for DL & UL-centric configurations - AC/DC power adapter and PoE support - Num. of users: 1–100
5G Core Element Manager
- Intuitive Web based system which provides Fault and Performance management - Dashboard with main KPIs, statuses and statistics - Network Function provisioning and manipulation - Subscriber provisioning and configuration - Network exporters and Monitoring - Backup and Restore - Alerting - Logging - SSO

Some features are hardware dependent.
Some features might not be included in dedicated software releases.



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