Industrial Communication SoC

With the advent of Industrial IoT, as key technology for cyber-physical systems, Hilscher developed a novel network controller that delivers the breadth of technology for your IIoT application of tomorrow. The netX 90 is the newest addition to Hilscher's SoC family that provides a superior solution with an unmatched protocol flexibility for a variety of industrial slave or device applications in the process and factory automation.

Highly integrated IIoT node

The netX 90 is the first Industrial Ethernet node in 10x10 mm^2 with two Cortex-M4, on-chip Flash, Ethernet PHYs, and DC/DC converter, which reduce the BOM costs for the hardware interface to a few passive components.

One of the highlights of the chip's internal architecture is the logical separation of the communication tasks and the application tasks, both from software quality and security aspects *(see block diagram)*. The partitioning restricts the software access to on-chip peripherals on either side. For the communication, Hilscher provides a scalable software solution in terms of protocol functionality and flexibility.
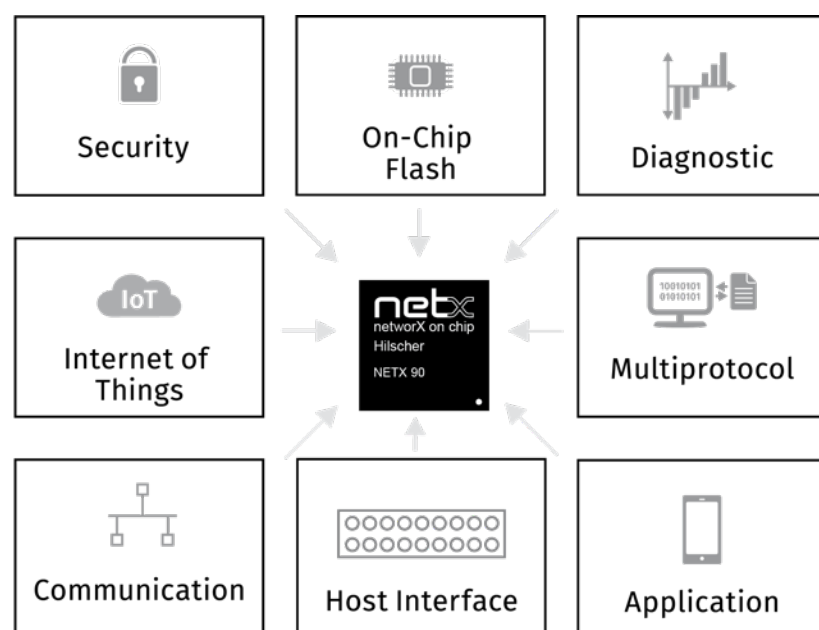
The application makes full use of a separate Cortex-M4 at 100 MHz with DSP and FPU support, enhanced by a feature-rich set of on-chip peripherals with connectivity. The standard processor core allows application developers to benefit from the broad ARM ecosystem by choosing any CMSIS complaint operating system.

One chip. All protocols. Your application.

Enhanced IIoT capability

The SoC features two flexible communication (xC) IPs, which support all popular Industrial Ethernet standards, i.e. hard real-time. Most importantly, the xC architecture flexibly adapts by software to emerging standards and future network requirements such as TSN.

Built-in security features enable developers to apply a secure by design concept by building layers of security as outlined in the IEC 62443, coupled with built-in diagnostics to monitor operating conditions for IIoT-enabled cloud services, e.g. predictive maintenance.

Hardware accelerated cryptographic operations with strong encryption ensure fast, secure, and reliable connections using standards such as TLS for HTTPS or IIoT protocols, i.e. MQTT or OPC UA. The process of software signing assures the integrity of both firmware and device data, including software updates.

Ready to use approach

Hilscher delivers the range of software protocol stacks for communication tasks as prebuilt firmware, i.e. tested and pre-certified. The data exchange with the protocol stack interface using the dual-ported memory (DPM) enables application developers to quickly set up a network prototype.

The prebuilt communication firmware is fit for purpose whether the netX 90 is designed in as standalone chip application or companion chip with host interface that fully carries out the real-time communication tasks for Industrial Ethernet or legacy Fieldbus. For the seamless integration, Hilscher provides the toolset and API for the application.

The netX Studio from Hilscher includes all components required to configure, develop, and debug embedded applications. The compartmentalized project manager features a set of utility tools to set up the prebuilt communication firmware in three rather simple steps.

From sensor to the cloud

Hilscher provides the complete ecosystem by turning IIoT into reality. The prebuilt communication firmware is equipped with IIoT capabilities (MQTT or OPC UA) to seamlessly connect field devices to cloud applications (SAP, IBM, and Microsoft) by the Edge Gateway, which interoperates with the vendor-independent field devices simultaneously to the process control.

If you want to learn more about the netX 90 SoC and Hilscher's leading-edge IIoT solutions, please contact your sales representative.
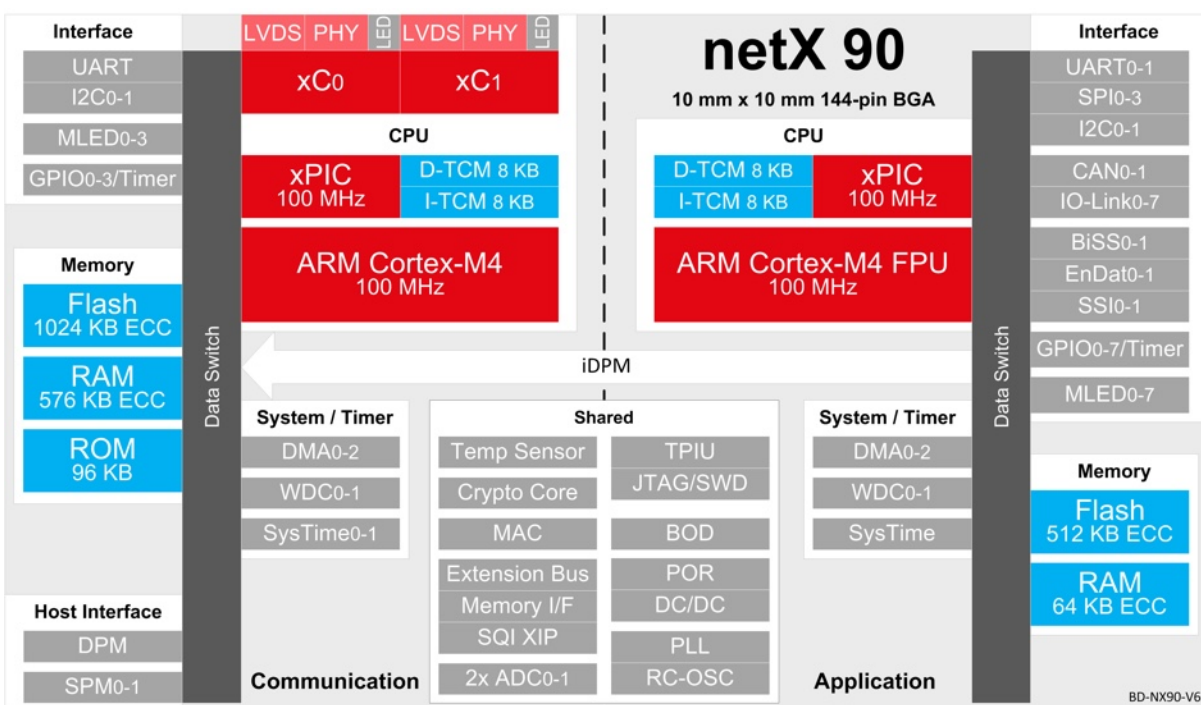
- Ease of use, fast and hassle-free protocol stack implementation with consistent, uniform API
- Scalable SoC solution usable as standalone chip application or as companion chip with host
- Energy-efficient suitable for product application designs with smallest form factors

Note: Engineering Sample 2017 (Evaluation Board) / Mass Production 2018