netX 90

...It's all you need!

- Smallest multiprotocol SoC with additional Cortex-M4 application processor
- Built-in security features for secure field- and cloud-connectivity
- Supports all Industrial Ethernet, Fieldbus- and IIoT standards
- Energy-efficient SoC with lowest power consumption

Communication

PROFINET
EtherCAT
Industrial Ethernet

Security

On-Chip Flash

Diagnostic

PROFINET
CANopen
Fieldbus

IoT
Internet of Things

Multiprotokoll

OPC UA
MQTT
Industrial IoT

Communication

Application

Application

Motion

Encoder

Sensors

IP67 / IO

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empowering communication

netX 90

Industrial Communication SoC

Innovative Architecture

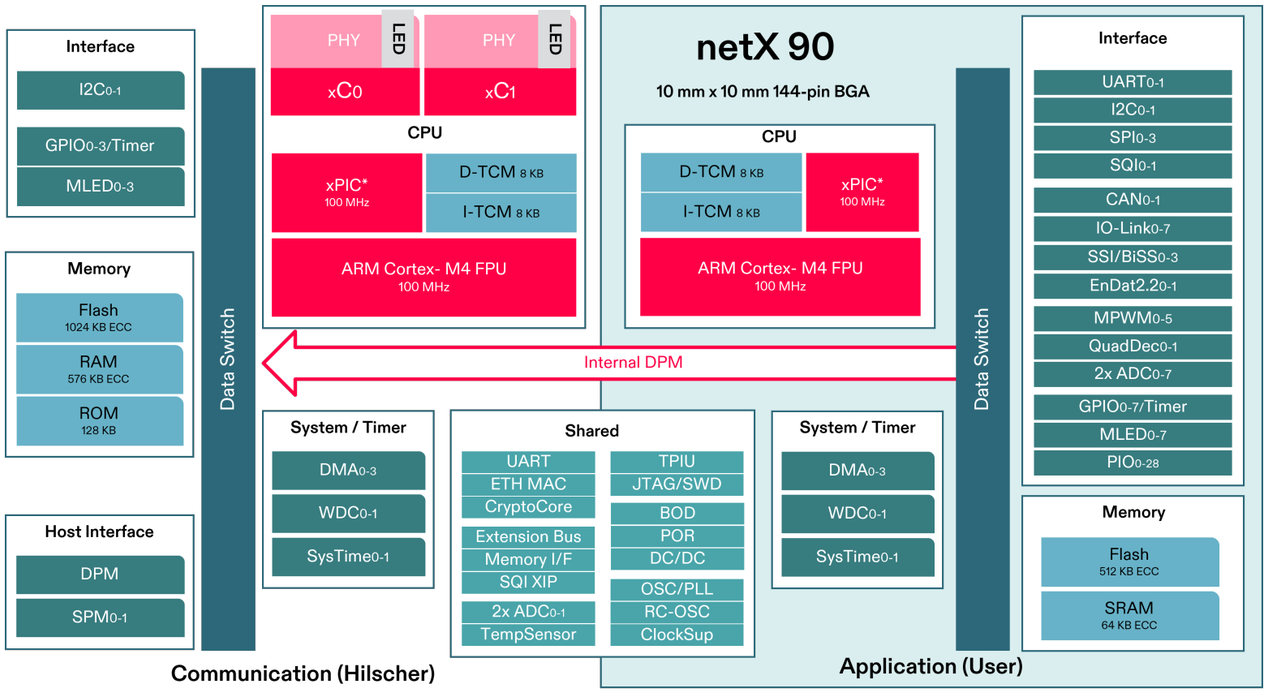
- Two ARM® Cortex®-M4 high-performance processor cores, each with 125 DMIPS, to separate the communication tasks from the application tasks
- Optimized hardware design with integrated DC/DC converter, on-chip BOD and POR circuits
- On-Chip-Flash and –SRAM, integrated Fast Ethernet PHYs and analog/mixed signal IPs

Built-in Security

- Hardware support for cryptographic operations and security functions for protocols such as HTTPS, MQTT and OPC UA
- Secure boot option with multiple security levels
- FIPS 140-2 compliant built-in cryptographic algorithms for highest encryption with different key lengths of up to RSA-4096, ECC-512 and AES-256

Built-in Diagnostics

- Enables the application design of high-reliable systems with built-in diagnostics and enhanced data integrity for IIoT-enabled cloud services
- High product reliability and robustness due to integrated power watch, clock supervisor, and fully ECC equipped on-chip memory
- Applicable for predictive maintenance by dint of onchip functions for voltage monitoring, time stamping, and temperature sensing



Uniform Application Software Interface

- Overlaid structured software layout with DPM channel access functions to the industrial communication protocol stack as consistent and uniform API
- High-speed access from either the external host interface or the internal host application, precisely clock synchronized with the network cycle time
- Ease of use, fast and hassle-free protocol stack implementation that enables application developers to set up a prototype in a few hours

** Hilscher provides a software driver with xPIC Binary for the ETH MAC, IO-Link Controller, and BiSS Master xPIC. The xPIC is not released for standalone use cases, including the toolchain for code developments by users.*

Unmatched Flexibility

- Ready for all popular Industrial Ethernet and Fieldbus protocols due to programmable dual-channel xC subsystem, with switch and IEEE 1588 functionality
- Flexibly adapts to emerging standards and future network requirements such as TSN, PROFINET „High-Performance Profile“ and CC-Link IE Field Basic

Rich Peripheral Set

- Rich set of peripherals for connectivity to interface sensor-specific ICs or submodules with fast I/O processing for electronic controls
- Enhanced functional feature set with industry related on-chip peripherals such as 2x EnDat, 2x BiSS, 2x SSI, 8x IO-Link, 2x CAN, and 3x MAC

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Product Information

Technical Data

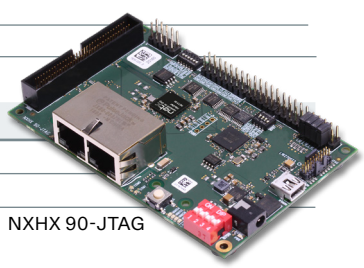
SoC Features	Communication	Application
ARM® Processor	Cortex®-M4 at 100 MHz with MPU	Cortex®-M4 at 100 MHz with MPU and FPU
Hilscher 32-bit RISC	xPIC at 100 MHz with 2x 8 KB TCM	xPIC at 100 MHz with 2x 8 KB TCM
SRAM	576 KB	64 KB
Flash	1024 KB	512 KB
Mask ROM	128 KB	-
DMA Controller	4 channels	
WDC (ARM / xPIC)	1 / 1	1 / 1
Timer (ARM / xPIC)	3x 32-bit / 3x 32-bit	3x 32-bit / 3x 32-bit
xC Subsystem	2 channels	-
IEEE 1588 SysTime	2	1
Fast Ethernet PHY	Dual-port, FX support	-
100 Mbps LVDSPHY	Dual-port	-
Ethernet MAC	10 / 100 Mbps, MII	
UART / SPI / SQI / I2C / CAN	1 (Shared) / - / - / 2 / -	3 / 4 / 2 (Master only, with SPI mode) / 2 / 2
IO-Link V1.1 Controller	-	8 channels
MLED (PWM tuned)	4	8
HIF PIO / PIO / GPIO / MMIO	- / - / 4 / -	Up to 41 / 29 / 8 / 18
Timer (PWM, IC/OC)	4x 32-bit	8x 32-bit
Motion PMW Unit	-	1
ADC SAR (12-bit, 2 Msps)	2x 2 channels and 2x 8 channels	
Quadratur Decoder	-	2
EnDat 2.2 (Master E6)	-	2 (with RTM)
BiSS / SSI (Master BiSS C)	-	2 / 2
Parallel (DPM)	8/16-bit (Read access min. 55 ns)	Internal 32-bit
Serial (SPM)	2x SPI/SQI (Up to 125 MHz/33 MHz)	-
MAC (PHY Modus)	MII (10 / 100 Mbps)	
SRAM / NOR / NAND / SDRAM	x / x / - / x (8/16- bit)	
SD/MMC / SDIO	SPI Modus / -	
SQI (XIP)	x	
Crypto Core	SSL/TLS accelerator, up to RSA-4096, ECC-512, AES-256 and SHA-512	
Secure Boot	Mask ROM Code, EMSA-PSS	
Built-in support	Security levels, AHB Firewall	
Debug / Trace	JTAG/SWD, 4-bit TPIU	
Boundary Scan	JTAG	
DC/DC / POR / BOD	x / x / x	
Thermal diode	x	
Clock Supervisor	Xtal (RC-Osc)	
Power Supply	Single 3.3V	
Temperature range	T_a -40°C ... +85°C / +105°C* (T_j_max ≤ +125°C)	
Power consumption	≤ 1W	
Package dimension	144-pin BGA, 10 × 10 mm, 0.8 mm Ball Pitch	

**Depends on the thermal characteristics of the embedded design and the targeted mission profile (see netX 90 Design-In Guide)*

Product Overview

NETX 90	2270.000	netX 90 Network Controller
NXHX 90-JTAG	7833.000	Software-Development board for netX 90

Note: Technical data may be changed without further notice.



NXHX 90-JTAG

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11/2024 EN