

- **First Industrial Ethernet node in 10x10 mm<sup>2</sup> with two ARM<sup>®</sup> Cortex<sup>®</sup>-M4 processor cores, on-chip Flash, analog/mixed signal, and integrated PHYs**
- **Fulfills the highest demand on flexibility, determinism, and performance in terms of multiprotocol capability and low latency for short cycle times**
- **Enables developers to implement a profound secure by design concept compliant to the IEC 62443 series for industrial automation security**
- **Improves the application design of high-reliable systems with built-in diagnostics and enhanced data integrity for IIoT-enabled services**



With the advent of Industrial IoT, as key technology for cyber-physical systems, Hilscher developed the next generation of network controllers, which builds on the success of the netX 51/52, where security is a core product value. The first member of this new family is the netX 90, which enables higher degrees of integration with enhanced performances and improved power efficiency ratings, suitable for industrial application designs with smaller form factors.

The increasing complexity of System-on-Chips (SoC), coupled with high software development and maintenance costs, associated with multiprotocol capabilities for real-time industrial communications, turned into market requests that promote solution-oriented concepts. Thus, the netX 90 accelerates this transition by providing a unique value proposition with emphasis on the interplay between hardware and software to improve time to markets.

Accordingly, the advanced SoC design brings together two separate system paradigms in one tiny package, i.e. one for real-time industrial communications and one for industrial applications. The inter-CPU data exchange between both systems, based on a consistent and uniform API, enables application developers to use the software protocol stack for communication tasks as loadable firmware (LFW), fully tested and pre-certified by Hilscher.

The conceptual LFW based software solution is independently usable whether the netX 90 is designed in as stand-alone chip application or as companion chip with host interface that fully carries out the real-time communication tasks for Industrial Ethernet or Fieldbus. The external host interface ensures a high degree of interoperability for maximum I/O data throughput with precise synchronization derived from the network cycle time.

In conclusion, the netX 90 provides a superior solution with an unmatched flexibility for a variety of industrial slave/device applications for the process and factory automation.



# Technical Data / Product Overview

	SoC Features	Communication	netX 90 Application
Core	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
Memory	SRAM (ECC)	576 KB	64 KB
	Flash (ECC)	1024 KB	512 KB
	Mask ROM	96 KB	-
System	DMA Controller	3 channels	3 channels
	WDC (ARM / xPIC)	1 / 1	1 / 1
	Timer (ARM / xPIC)	2x 32-bit / 3x 32-bit	2x 32-bit / 3x 32-bit
	Built-in Bootloader	Host Interface (DPM/SPM), Ethernet (xC <sub>0</sub> DHCP/TFTP), Serial (FTDI USB to JTAG/UART)	
Network	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	
Peripheral	UART (Up to 10 Mbaud)	1	2
	SPI (Up to 50 MHz)	-	4
	I <sup>2</sup> C (Up to 3.4 MHz)	2	2
	CAN (2.0B, SJA1000)	-	2
	IO-Link V1.1 Controller	-	8 channels
	MLED (PWM tuned)	4	8
Mixed Signal	PIO / GPIO / MMIO	- / 4 / -	Up to 49 / 8 / 16
	Timer (PWM, IC/OC)	4x 32-bit (Min. 10 ns)	8x 32-bit (Min. 10 ns)
	ADC SAR (12-bit, 2 Msps)	2x 2 channels	
	EnDat 2.2 (Master E6)	-	2 (With RTM)
Host Interface	BiSS / SSI (Master MB)	-	2 / 2
	Parallel (DPM)	8/16-bit (Read access min. 55 ns)	Internal 32-bit
	Serial (SPM)	2x SPI/QSPI (Up to 125 MHz/33 MHz)	-
External Memory	MAC (PHY Mode)	MII (10/100 Mbps)	-
	SRAM / NOR / NAND / SDRAM	✓ / ✓ / - / ✓ (8/16-bit)	
	SD/MMC / SDIO	SPI Mode / -	
Security	SQI (XIP)	✓	XiP/Read only
	Crypto Core	SSL/TLS accelerator, up to RSA-4096, ECC-512, AES-256, and SHA-512	
Debug	Secure Boot	Mask ROM Code, EMSA-PSS	
	Built-in support	Security levels, AHB Firewall	
	CoreSight™ ETM	JTAG/SWD, 4-bit TPIU	
Analog	Boundary Scan	JTAG	
	DC/DC / POR / BOD	✓ / ✓ / ✓	
	Thermal diode	✓	
Electrical	Clock Supervisor	Xtal (RC-Osc)	
	Power Supply	Single 3.3V	
	Temperature range	T <sub>a</sub> -40°C ... +85°C	
	Power consumption	TBD	
	Package dimension	144-pin BGA, 10x10 mm <sup>2</sup> , 0.8 mm Ball Pitch	

Note: Technical data may be changed without further notice.

Overview	Article Description	Article Number	Article
	NETX 90	2270.000	netX 90 Network Controller * Engineering Sample 2017 (Evaluation Board) / Mass Production 2018 * Please contact your local sales representative for further information

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