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# WELCOME TO THE FUTURE OF INDUSTRIAL COMMUNICATION

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INTRODUCING THE NETX FAMILY OF CONTROLLERS BY HILSCHER



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## NETX: THE BEST OF BOTH WORLDS ON A SINGLE CHIP

With Hilscher, you'll only need one driver for all your networks. Our family of netX network controller modules offer intelligent solutions that support established Fieldbus and Real-Time Ethernet systems with a single chip. This innovative "networX on chip" design reduces the number of part and eliminates network maintenance costs without sacrificing performance.

HILSCHER'S TOOLS ALLOW

YOU TO MAKE THE MOST OF

BOTH CURRENT FIELDBUS AND

ETHERNET TECHNOLOGIES,

LINKING THEM IN A WAY THAT

REDUCES YOUR ENGINEERING

EFFORT AND LOWERS COSTS,

WHILE ADDING VALUE ACROSS

YOUR ENTIRE AUTOMATION

PRODUCT LINE.

### CONTROLLING A WIDE SPECTRUM OF DEVICES AND APPLICATIONS

netX is an open technology with built-in support for virtually all of today's Fieldbus and Ethernet communication technologies, allowing it to be specified for a wide variety of industrial applications, including:

- Bar code and identification systems
- Programmable Logic Controllers
- Intelligent I/O
- Operator Interface terminals
- Drives
- And many, many more!

netX not only brings a new level of performance to individual devices but also increases your control over the entire application. As a result, you'll experience greater overall performance and efficiency without losing your ability to integrate future control innovations.

### SINGLE SOLUTION. MANY BENEFITS

Integrating netX technology into your automation product brings a wealth of new benefits today without locking you out of the promise of tomorrow's technologies:

- Maximize performance of current Fieldbus and Ethernet communication
- Utilize unmatched flexibility and scope of application across your entire product line
- Provide greater control of automation devices and processes
- Experience greater efficiency; reduced manufacturing costs
- Ensure compatibility with future innovations
- Refocus engineering resources on your core competences
- Realize exceptional return on your investment

#### Supported Fieldbus Systems

Masters and Slaves

AS interface

CANopen

CC-Link (slave only)

DeviceNet™

PROFIBUS

#### Supported Real-Time Ethernet Systems

Masters and Slaves

EtherCAT

EtherNet/IP™

Ethernet POWERLINK (slave only)

PROFINET: RT and IRT with integrated switch

SERCOS III (slave only)

Modbus TCP (slave only)

## THE HILSCHER FAMILY OF INDUSTRIAL COMMUNICATION SOLUTIONS

**NETX NETWORK ON CHIP** With four configurable network communication channels, netX can support multiple communication protocols simultaneously. It can be used as a network co-processor with a standard Dual-Port-Memory interface or as a highly integrated Single Chip Solution for your custom control solution.

### NETX FEATURES

- Four individually configurable communication channels  
*(Real-Time Ethernet or Fieldbus)*
- 32-Bit/200 MHz ARM 926 with 200 MIPs computing power
- IEEE 1588 Clock, Integrated Ethernet Hub and Switch functions
- Dual-Port-Memory
- AD converter
- Built-in I/O
- Encoder interface
- PWM interface
- LCD controller
- We guarantee 10-year availability

### NETX PRODUCT AND SUPPORT OFFERINGS

Hilscher's netX family of controllers offers comprehensive peripheral functions with a computing capacity of 200 MIPS *(based on industry-standard ARM architecture)*.

Our innovative product design allows communications and applications to be executed on a single chip to save costs without sacrificing performance. Plus, with integrated supplements like an rcX multitasking kernel, Board Support Package, and the Hitex Tool Chain, customers can easily integrate netX technology into their automation products.



netX	5	50	100	500
CPU		ARM 966	ARM 926	ARM 926
SRAM/ROM	64K	112/64K	152/32K	152/32K
Dual-Port Memory	x	x	x	x
Communication Channels	2	2	3	4
Real Time Ethernet	x	x	x	x
FieldBus	x	x	x	x
IEEE 1588	x	x	x	x
USB Port		x	x	x
UARTs		3+2	3+3	3+4
I2C		x	x	x
SPI Bus	x	x	x	x
Display Controller				x
I/O-Link Controller		x		
Real Time Clock				x
PWM			x	x
Encoder			x	x
I/O	16	40+54	47+53	47+53
AD Converter			x	x

*\*Some features share signal pins and can't be used together.*

### NETX DEVELOPMENT TOOLS

To assist you with the integration of netX technologies into your solutions, Hilscher offers a variety of helpful development tools.

#### netSTICK (NXSTK 50-RE / NXSTK 50-FB)

To develop a netX-based network co-processor solution:

- Low cost netX 50 target system with Real-Time Ethernet or Fieldbus
- Integrated Debug Interface
- HiTOP Software Development and Debug environment
- Evaluation of protocol stacks and application on the netX 50
- Low cost, easy and ready to use

#### netX Software Development Board (NXHX 500-RE)

For the development of a product based on netX: - \_

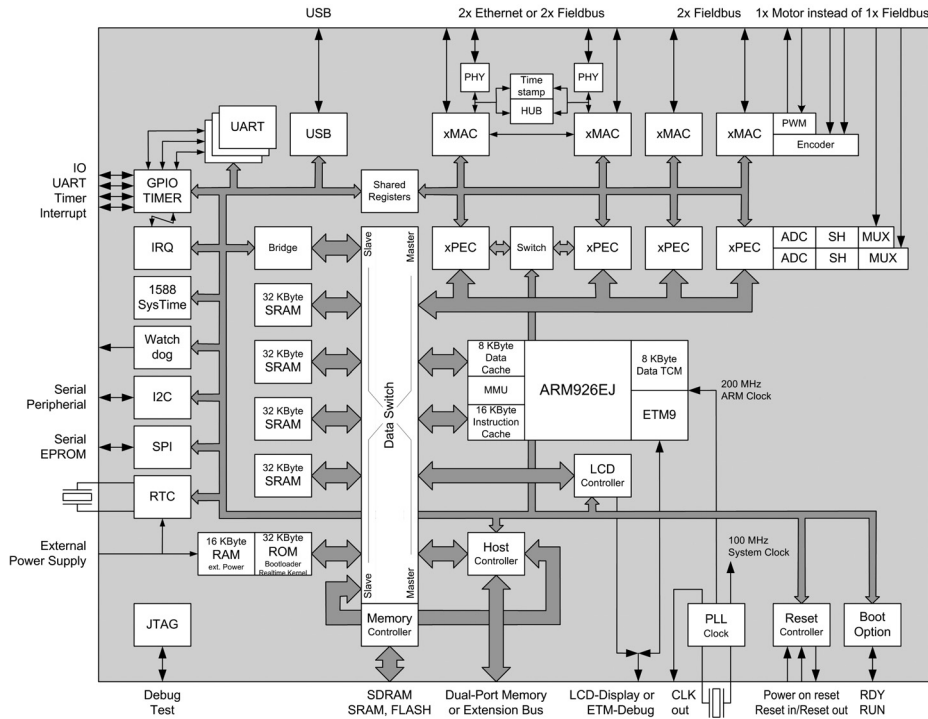
- netX 500 "system on chip"
- 16 MB Flash, 8 MB SDRAM, 4MB SPI Flash
- Master or Slave Development
- 8 Inputs/Outputs
- USB-based JTAG interface
- USB 1.1 port, RS232C port
- Dual Port-Memory Interface
- Up to 2 Ethernet Ports and 1 Fieldbus Port
- Sample Applications and Schematics
- HiTOP IDE and Debugger

#### PC Adapter for Software Dev. Board (NXPCA)

To develop a netX-based network co-processor solution:

- Connects the netX Software Development Board to a PC via Dual-Port-Memory
- PC compatible to program netX Software Development Board as a target system
- Features flat cable to couple from PC adapter to netX Software Development Board's Dual Port Memory

# A NEW SYSTEM ARCHITECTURE OPTIMIZED FOR COMMUNICATION AND MAXIMUM DATA THROUGHPUT



The central data switch connects via five data paths to the ARM CPU and the communication, graphic and Host controllers with the memory or the peripheral units. In this way the controllers transmit their data in parallel, contrary to the traditional sequential architecture with only one common data bus and additional bus allocation cycles.

The controllers of the four communication channels are structured on two levels and are identical to each other. They consist of dedicated ALUs and special logic units that receive their protocol functions via Microcode. Two channels possess an additional integrated PHY for Ethernet.

The Medium-Access-Controller xMAC sends or receives the data according to the respective bus access process and encrypts or converts these into Byte depictions.

The Protocol Execution Controller xPEC compiles these into data packets and controls the telegram traffic. These are exchanged in DMA blocks over the memory of the ARM. In addition, every channel has a Dual-Port-Memory available for status information or as local data image.

With the intelligent communication ALUs, the netX carries out the most varied protocols and protocol combinations and can synchronize them independently of the reaction time of the CPU – an absolutely new feature in industrial communication technology.

## netX 500 System Development Board (NXDB 500-SYS)

- To develop the most sophisticated products utilizing all the features of netX:
- Used for extensive system software development
- Features various types of memory and interfaces using SDRAM, SPI DATA Flash, DIMM, NVRAM and SRAM
- 240 x 320 Pixel Color TFT LCD display
- Touch display input
- Multi Media Card
- Switches and LEDs to simulate digital inputs and outputs
- 2 Ethernet ports
- Fieldbus ports for AS interface, CANopen, CC-Link, DeviceNet, PROFIBUS
- USB, JTAG, ETM
- JTAG, ETM.

## netX 100 Network Evaluation Board (NXEB 100-NET)

- For the development of a product based on netX:
- Works as a network Master or Slave
- Permits data exchange via switches, LEDs and performance measurements
- Serves as reference and certification for switching interfaces (AS-interface, CANopen, CC-Link, DeviceNet, PROFIBUS and various Real-Time Ethernet systems)
- Board Support Packages are available separately for OS extensions and adaptations

## netX 500 HMI Evaluation Board (NXEB 500-HMI)

- To develop a product with integrated network and display:
- Serves as an evaluation platform for netX terminal applications based on Windows<sup>®</sup> CE<sup>®</sup> or Linux OS
- Features LCD display with soft keys and touch screen
- Switches and LEDs to simulate inputs and outputs
- 2 Ethernet ports for Real Time Ethernet Communication
- Compact Flash memory slot available
- Board Support Packages available separately for Windows<sup>®</sup> CE<sup>®</sup>

## Board Support Package (NXBSP 500-RX):

- License-free OS developed for netX:
- Specially developed for netX and rCX
- Superior scope and performance to other dedicated kernels
- Board Support Packages for other Operating Systems like Windows CE, Linux, VxWorks are available

## PCI INTERFACES, MODULES AND GATEWAYS

Hilscher also offers a wide range of PC compatible interface cards and communication modules:

Product	ISA	PCI	PCI Express	PCMCIA	Compact PCI	PMC	Mini PCI	PC/104	PC/104 Plus	PCI-104	Gateways	Embedded Modules
PROFIBUS DP	M/S	M/S		M/S	M/S	M/S		M/S	M/S	M/S	Modbus TCP Virtual Driver	M/S
DeviceNet	M/S	M/S		M/S	M/S	M/S		M/S	M/S	M/S	Modbus TCP Virtual Driver	M/S
InterBus	M/S	M/S						M/S				S
CANopen	M/S	M/S		M/S	M/S	M/S		M/S	M/S	M/S	Modbus TCP Virtual Driver	M/S
AS interface	M	M						M				M
ModBus Plus	M	M						M				
SERCOS		M/S		M/S				M/S				M/S
EtherNet/IP		M/S	M/S		M/S		M/S			M/S		M/S
PROFINET		M/S	M/S		M/S		M/S			M/S		M/S
EtherCAT		M/S	M/S		M/S		M/S			M/S		M/S
Powerlink		S	S		S		S			S		S
SERCOS III		S	S		S		S			S		S
Modbus TCP		S	S		S		S			S		S

M=Master/Scanner/Server/Controller S=Slave/Adaptor/Client/Device

## HILSCHER ENGINEERING SERVICES DELIVER CUSTOM SOLUTIONS

At Hilscher, we've earned our reputation as leaders in the field of industrial communication through the innovation of dynamic products that deliver real world benefits.

Additionally, we offer customers a wide variety of engineering services to assist you in the development, production, operation and support of custom industrial communication products based on netX technology.

For more information on how you can put our company's engineering expertise to work for you,

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