

# netX 100/500

Industrial Ethernet SoC for Master and Slave applications



**Four communication channels as Real-Time Ethernet or fieldbus interface individually configurable**



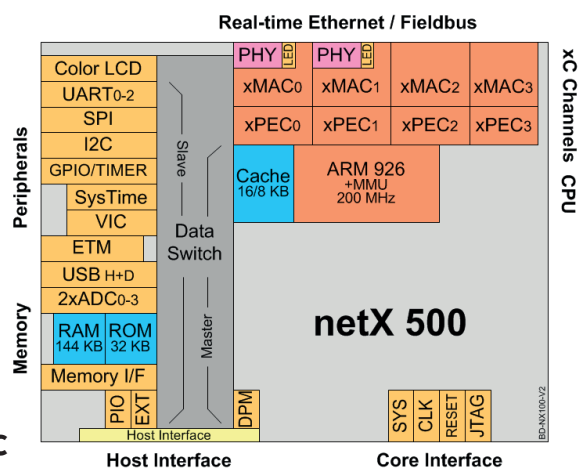
**New system architecture optimized for communication and high data throughput**



**32-Bit/200MHz CPU ARM 926 with 200 MIPS computing power for Windows CE and Linux**



**Dual-port-memory, AD converter and graphic controller on chip**



## Flexible “high end” network controller or highly integrated single chip solution for applications and communication

The netX is a highly integrated network controller with a new system architecture optimized for communication and maximum data throughput.

Based on the 32-Bit CPU ARM 926EJ-S cycled at 200 MHz, it possesses a memory management unit, caches, DSP and Java extensions. The internal memory of 144 KByte RAM and 32 KByte ROM that contains the Bootloader is sufficient for smaller applications whereas for Windows CE and Linux it is supplemented with the 32 Bit Memory Controller memory externally with SDRAM, SRAM or FLASH. The connection to a primary Host is carried out via the Dual-port-memory interface, which is configurable for stand-alone applications also as a 16 Bit extension bus. Comprehensive peripheral functions, serial interfaces such as UART, USB, SPI, I<sup>2</sup>C as well as the integrated graphic controller permit a wide spectrum of applications. Yet, it is the central data switch and the four freely configurable communication channels with their own intelligence that is the main characteristic of the netX as a „high end” network controller.

The 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 picture.

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.



# PRODUCT INFORMATION

## TECHNICAL DATA

Technical Data	
<b>Processor</b>	ARM 926EJ-S, 200 MIPS, ARMv5TE-command set with DSP- and Java-extension
<b>Cache</b>	16 KByte commands / 8 KByte Data
<b>Tightly coupled memory</b>	8 KByte Daten
<b>Memory Managment Unit</b>	Windows CE- and Linux-Support
<b>RAM</b>	144 KByte, of this 16 KByte with external voltage supply
<b>ROM</b>	32 KByte with Bootloader
<b>Ports</b>	2x 10BASE-T/100BASE-TX, Half-/Full-Duplex, IEEE 1588 time stamp
<b>PHY</b>	Integrated, Auto-Negotiation, Auto-Crossover
<b>Real-Time Ethernet</b>	EtherCAT with three FMMUs and four Sync-Manager, EtherNet/IP, POWERLINK with integrated Hub, PROFINET RT and IRT with integrated Switch, SERCOS-III, VARAN
<b>Fieldbus</b>	The systems can be combined as desired. (Quantity netX 100: 1   Quantity netX 500: 2) AS-Interface (Master), CANopen/DeviceNet (Master & Slave), CC-Link (Slave), PROFIBUS (Master & Slave)
<b>Color-LCD-Controller</b>	TFT-panels, Color-STN- & Mono-STN, Resolution 320 x 200 to 640 x 480, color depth 1/2/4/8/16-Bit (netX 500)
<b>Real-Time clock</b>	With external voltage supply (netX 500)
<b>IEEE 1588 System Time</b>	32-Bit second counter, 32-Bit Nano second counter
<b>USB</b>	Revision 1.1, 12 MBaud Full-Speed, Host- or Device-Mode
<b>UART</b>	116550 compatible, max. 3 MBaud, RTS/CTS support, Quantity 3 / 3
<b>I<sup>2</sup>C</b>	netX 100 and netX 500
<b>SPI</b>	Master- and Slave-Mode, max. 10 MHz, 3 Chip-Select-Signals
<b>AD-Converter</b>	2 x 4 Channels with 1MS/s Sample&Hold and 10 Bit-resolution, Single ended, Common Analog Ground, external reference voltage
<b>PWM</b>	0–20 kHz/12-Bit-resolution 0–80 kHz/10-Bit-resolution
<b>Encoder</b>	2 Channels, Impuls quadruplication, digital input filter
<b>General I/Os</b>	3.3 V/6 mA, Quantity: 16 / 16
<b>Status LEDs</b>	2 LEDs two-colors, 3.3 V/9 mA
<b>Memory bus</b>	32-Bit-Databus / 24-Bit-Address bus
<b>Address region</b>	256 MByte SDRAM / 64 MByte Flash
<b>Memory modules</b>	SDRAM, SRAM, Flash
<b>Dual-Port-Memory-Mode</b>	8/16-Bit-Databus, 64 KByte configurable in 8 Blocks; emulated by internal RAM
<b>Extension-Mode</b>	8/16-Bit-Databus, 24-Bit-Address bus, Bustiming adjustable
<b>PIO-Mode</b>	Freely programmable Inputs and Outputs, Quantity 53 / 53
<b>JTAG</b>	ARM-Processor and Boundary-Scan
<b>ETM</b>	Embedded Trace Macrocell, ETM9 V2 Medium Size
<b>System cycles</b>	200 MHz ARM / 100 MHz Periphery
<b>Signal level</b>	+3.3 V
<b>Power supply</b>	for core: +1.5 V   for Input/Output: +3.3V
<b>Operating temperature</b>	without heat sink: -40 ... +70 °C   with heat sink 10°/W: -40 ... +85 °C
<b>Storage temperature</b>	-65 ... +150 °C
<b>Power consumption</b>	PHYs switched off: +1.0W   PHYs switched on: +1.5 W
<b>Housing</b>	PBGA, 1 mm raster: 345 Pins
<b>Dimensions (L x W)</b>	22 x 22 mm

Note: All technical data may be changed without further notice.

Article Overview	
<b>NETX 100</b> 2220.000   netX 100 Network Controller*	<b>NETX 500</b> 2210.000   netX 500 Network Controller*

\* For application Hilscher master protocol a master license must be ordered separately. These will delivered as Security EPROMs and is provided in the design. Further information: [www.hilscher.com/netx](http://www.hilscher.com/netx)

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