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ZT 8995

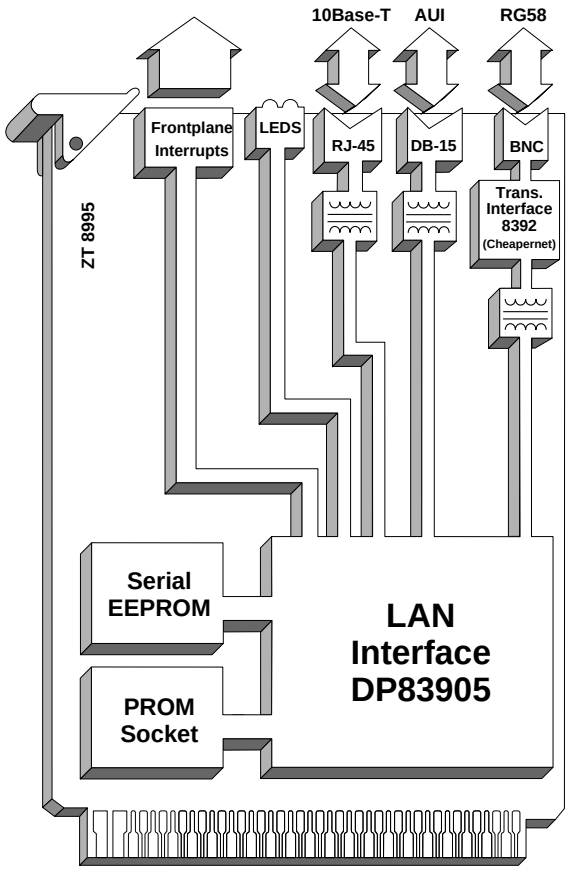
STD 32 Bus Ethernet Interface

High-performance STD 32® Ethernet interface compatible with 10BASE-T thick and thin Ethernet™, and IEEE 802.3 standards.

The ZT 8995 STD Bus Ethernet Interface board allows STD 32® and STD Bus computers to communicate over the Ethernet network protocol. Both twisted-pair (10BASE-T), thin Ethernet (Cheapernet, 10BASE-2), and thick Ethernet (10BASE-5) are supported on one versatile board.

The ZT 8995 conforms to the IEEE 802.3 and Ethernet standards for a 10 Mbps Carrier Sense Multiple Access/Collision Detection (CSMA/CD) local area network. The adapter emulates the Novell NE2000 Ethernet interface board. It includes a ROM socket for BIOS extensions, and software drivers for the following: Novell's NetWare®, NetBIOS, QNX®, and UNIX® Streams. Software support is also available for TCP/IP protocol.

The ZT 8995 can be used in STD systems to implement remote data acquisition units, cell controllers, or file server communications for diskless systems, or for simple data communications in a DOS or non-DOS STD system.



- STD 32- and STD-compatible
- Supports true 16-bit I/O addressing
- Supports 20- or 24-bit memory addressing
- Novell NE2000-compatible chipset
- Supports 10BASE-T (twisted-pair), 10BASE-2 (thin Ethernet), and IEEE 802.3 interfaces
- Dual-port RAM interface for fast buffer accesses
- EEPROM stores system configurations
- Software packages available for TCP/IP support
- Transmit and receive activity LEDs
- Low-power CMOS design
- +5V-only operation
- Software driver support

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Functional Considerations

Network Interface

The network interface is implemented by the National Semiconductor ATLANTIC DP 83905 Network Interface Controller (NIC). It provides the media access control as defined by IEEE 802.3 standards.

Thick Ethernet

Thick Ethernet, often referred to as simply "Ethernet," differs from thin Ethernet in the type of cable used to connect network nodes. Thick Ethernet systems use a small drop cable (called an AUI) attached to the ZT 8995, which in turn connects to the network cable. The network cable can be twisted-pair, fiber-optic, or double-shielded (hence the term "thick"), teflon-coated Ethernet coax cable. Thick coax Ethernet features:

- Maximum cable segment length is 1640 ft. (500m)
- Maximum number of nodes on a segment is 100
- Maximum number of nodes on a network is 1024
- Maximum of three segments when using repeaters

Twisted-pair Ethernet

Twisted-pair Ethernet uses inexpensive telephone wiring that may already be installed in many applications. An RJ-45 connector and 10BASE-T transceiver is provided on the ZT 8995. Two unshielded twisted-pairs (22-26 gauge) are used for each cable segment. Cable segments are arranged in a star topology (unlike thin/thick which are bus topologies) around a multiport repeater. Twisted-pair Ethernet features:

- Maximum cable segment length is 320 ft. (100m)
- Maximum number of nodes on a segment is one
- Maximum number of nodes on a network is 1024
- Maximum number of multiport repeats between any two nodes is four

Thin Ethernet

The ZT 8995 also contains a thin Ethernet interface that uses the small and more flexible coax cable. This cable is connected directly to each ZT 8995 via a BNC "T" connector resulting in a lower cost system. Thin Ethernet features:

- Maximum cable segment length is 600 ft. (185m)
- Maximum number of nodes on a segment is 30
- Maximum number of nodes on a network is 1024
- Maximum of five segments when using repeaters
- Extended length segments are also supported

I/O Addressing

The ZT 8995 decodes all 16 bits for its I/O address and occupies a block of 32 addresses. These addresses can be located at one of seven base address locations (selected by a software configuration register). As shipped, the ZT 8995 requires 32 bytes of I/O at 0280-029Fh.

Memory Addressing

The ZT 8995 decodes either 20 or 24 memory address bits for its on-board PROM socket and packet RAM buffer.

PROM Socket

A PROM socket is provided for vendor-specific BIOS extensions for diskless workstations or for custom software. The PROM sizes can be 32, 64, 128 or 256 Kbytes where only the top 32 Kbyte block is accessible. The PROM can be mapped into any 8, 16, 32, or 64 Kbyte boundary beginning at one of eight software selectable locations between 0C000h and 0D000h.

Packet RAM

The on-board 16 Kbyte static RAM provides packet storage for receive and transmit buffers. The packet buffer is dual-ported, allowing interleaved network and processor accesses. The packet buffer can reside on any 8 Kbyte boundary in 20- or 24-bit memory systems.

Activity LEDs

Separate transmit and receive LEDs provide visual indication of network activity along with LEDs which are used to indicate a link, collision and polarity.

Interrupts and DMA

Interrupts are software selectable for backplane signals INTRQ*, INTRQ1*, INTRQ2* INTRQ3*, INTRQ4*, and NMIRQ*. Frontplane interrupts can also be selected through software control across FP3*, FP5*, FP6* and FP7*. Since IRQx is slot specific, it is always driven out onto the backplane.

Software Configuration

A software setup program simplifies the installation of the ZT 8995. The setup program displays the configuration of the board, detects conflicts with other boards in the system, and allows configuration of the I/O address and memory address.

Software Drivers

Ziatech includes National Semiconductor software drivers for Novell's NetWare, Windows 3.11 and UNIX with each ZT 8995 shipped under license agreement with National Semiconductor. TCP/IP software is available from FTP Software Company, including remote log-in, file transfer, electronic mail and other functions. A NetBIOS emulator is also included. When used in DOS systems, the ZT 8995 is the software equivalent of the Novell NE 2000 AT Bus adapter.

Specifications

Compatibility

- Compatible with Ethernet versions 1 and 2
- Compatible with Thick Ethernet (IEEE 802.3, 10BASE-5)
- Compatible with Thin Ethernet (IEEE 802.3, 10BASE-2)
- Compatible with twisted-pair (IEEE 802.3, 10BASE-T)

Electrical

- Data rate: 10 Mbits per second

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Power requirements for thick Ethernet (10BASE-5)

Power Req.	Min.	Typ.	Max.
Supply Voltage, V_{CC}	4.75V	5.00V	5.25V
Supply Current, V_{CC} = 5V	–	120mA	330mA
*Aux Voltage, V_{aux+}	11.4V	12.0V	15.0V
*Aux Current, V_{aux+}= 12.0V	–	165mA	220mA

**Note: When using the AUI interface (Thicknet) the adapter attached to J3 of the ZT 8995 will use +12V. Users must reference the data sheet for their AUI adapter to determine its power consumption and subsequent load on the STD 32 backplane/power supply.*

Power requirements for thin Ethernet (10BASE-2)

Power Req.	Min.	Typ.	Max.
Supply Voltage, V_{CC}	4.75V	5.00V	5.25V
Supply Current, V_{CC} = 5.0V	–	495mA	705mA

Power requirements for twisted-pair (10BASE-T)

Power Req.	Min.	Typ.	Max.
Supply Voltage, V_{CC}	4.75V	5.00V	5.25V
Supply Current, V_{CC} = 5.0V	–	140mA	350mA

Mechanical

Size- and backplane-compatible with STD 32 and STD-80 mechanical specifications

- Occupies one STD slot (0.625" [1.6026cm] spacing)
- Connectors:
  - J1: 10-pin latching header for interrupts
  - J2: RJ-45 connector for 10BASE-T
  - J3: 15-pin latching D-shell connector for Ethernet AUI transceivers
  - J4: BNC thin Ethernet connector

STD 32 Compliance

- I/O Slave: SA16, SA8-I, IXP
- Memory Slave: SA16, SA8-I, IXP

Note: SA8 is equivalent to STD-80 Series Rev. 2.3 (5 and 8 MHz).

Reliability

- MTBF: 25 years
- MTTR: five minutes (based on board replacement)

Ordering Information

ZT 8995	STD Ethernet Interface and driver software
D1	RJ-45 Connector for 10BASE-T (twisted-pair) support
D2	10BASE-5 (thin) and AUI (thick) Connectors
ZT ME8995	STD Bus Ethernet Interface electronic manual
ZT 94037	STD QNX Development Environment
ZT 97115	ZT 8995 drivers, utilities and software manual

Accessories

Cables *(see Data Book cable section for details):*

ZT 90063	Frontplane interrupt cable
ZT 90106	2' (61cm) Dual RJ-45 cable

All products are shipped FOB San Luis Obispo, CA, USA. OEM discounts are available for some products. Contact Ziatech for additional information.

Warranty – Five years with an optional five-year extension. See the full warranty statement in the *Technical Data Book* appendix.

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