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TS-ETH2 Getting Started Sheet

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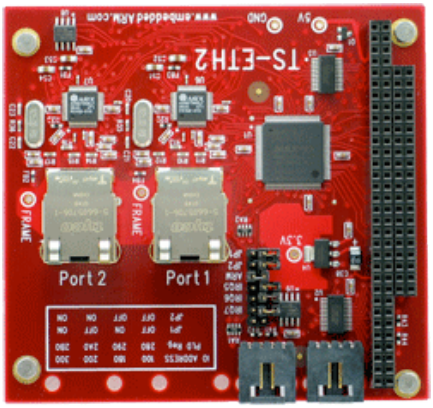
The TS-ETH2 is a PC/104 peripheral board (standard format) that provides dual 10/100 Ethernet ports. The TS-ETH2 is compatible with both Technologic Systems x86 and ARM single board computers. Feature include:

- Two 10/100 Ethernet Ports
- Jumper selectable I/O and IRQ
- PC/104 Dimensions 3.6 x 3.8 inches
- LEDS indicators for link and activity
- Supports 2 LED modes
- Supports external LED connection
- RoHS compliant
- Wake-on-LAN
- Linux 2.4 and 2.6 drivers available



The TS-ETH2 provides two integrated 10/100 ethernet ports through ASIX AX88796B embedded MAC/PHY chips. It interfaces with the PC/104 connector via 16-bit data bus and the register map is NE2000 compatible. The ASIX solution features Wake-on-LAN functionality, enabling the Ethernet chip to enter sleep mode with programmed wake-up on the reception of a "magic packet".

> **Note:** This document uses the references ETH1 and ETH2 to differentiate the two ethernet ports. ETH1 is the port on the middle of the TS-ETH2. ETH2 is the one closest to the edge of the TS-ETH2.

Jumpers

Jumpers JP1 and JP2 select 1 of 4 IO address regions, according to section Address Decode;

Jumper ARM ON selects ARM mode for interrupt sharing and 16-bit bus cycles using 64-pin PC/104 connector;

Jumpers IRQ5, IRQ6 and IRQ7 selects the IRQ lines, according to section IRQ Decode;

Address Decode

Jumpers JP1 and JP2 select one-of-four base I/O regions for the ETH1, ETH2 and

PLD registers, according to the table below:

JP1	JP2	PLD Base Address	ETH1 Base Address	ETH2 Base Address
OFF	OFF	0x280	0x100	0x140
ON	OFF	0x290	0x180	0x1C0
OFF	ON	0x2A0	0x200	0x240
ON	ON	0x2B0	0x300	0x340

ETH1 and ETH2 require 64 I/O locations each. Refer to the ASIXAX88796B datasheet for further information.

> **Note:** On the TS-7200 series, the base address for 8-bit PC/104 cycles is 0x11e0_0000. On the TS-7800 series, the base address for 8-bit PC/104 cycles is 0xee00_0000 and the PC/104 bus has to be enabled.

IRQ Decode

PC/104 IRQs 5,6 and 7 are available to be used with the TS-ETH2. IRQs 5,6 and 7 are TS-7200 series IRQs 22, 33, 40; respectively. Only IRQs 6 and 7 are shareable. Jumpers IRQ5, IRQ6 and IRQ7 allow configuration of the IRQ lines, according to the table below

JP IRQ5	JP IRQ6	JP IRQ7	ETH1 IRQ	ETH2 IRQ
OFF	OFF	OFF	IRQ5	IRQ6
OFF	OFF	ON	IRQ6	IRQ5
OFF	ON	OFF	IRQ5	IRQ7
OFF	ON	ON	IRQ7	IRQ5
ON	OFF	OFF	IRQ6	IRQ6
ON	OFF	ON	IRQ6	IRQ7
ON	ON	OFF	IRQ7	IRQ6
ON	ON	ON	IRQ7	IRQ7

PLD Register Map

The PLD has 4 8-bit-wide registers.

Address	Register	Access	Description
BASE+0	BID: Board ID register	RO	7-0: Board ID (0x2X)
BASE+1	PLD: PLD Rev register	RO	7-0: PLD Revision (0x1)
BASE+2	CFG: TS-ETH2 Configuration register	RW	bit 0: RO JP1 status bit 1: RO JP1 status bit 2: RO ARM status bit 3: RO IRQ5 status bit 4: RO IRQ6 status bit 5: RO IRQ7 status bit 6: RW ETH1 LED mode 0 = selects TS mode (green=link, orange=activity) 1 = selects ASIX mode bit 7: RW ETH2 LED mode 0 = selects TS mode (green=link, orange=activity) 1 = selects ASIX mode
BASE+3	Reserved		Reserved

Linux Driver

The register map of ASIX AX88796B ethernet chip is NE2000 compatible, so driver support is straight-forward. Technologic Systems provides a Linux driver for the

ASIX Ethernet interface suitable for both Kernel versions 2.4 and 2.6. The “mem” and “irq” parameters are available to set up I/O base address and IRQ line, respectively. In order to load the TS-ETH2 Linux 2.4 driver on the TS-7200 series, assuming only the ARM jumper ON, enter the following commands:

cp ax88796b.o ts-dual-eth1.o
cp ax88796b.o ts-dual-eth2.o
modprobe crc32.o
insmod ts-dual-eth1.o mem=0x100 irq=22
insmod ts-dual-eth2.o mem=0x140 irq=33

Should you want to use additional TS-DUALETH boards on a single system, make a copy of the driver using a different name. Notice that in some systems the kernel module “crc32.o” must be loaded before the TS-ETH2 driver. In addition, Technologic Systems provides Linux tools to manage the Wake-on-LAN function. A Linux tool to program the MAC address on the EEPROM chip is also provided. Contact Technologic Systems for further information regarding software support.

Contact Technologic Systems

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