TS-3400 User's Manual

Technologic
S Y S T E M S

Technologic Systems, Inc.

16610 East Laser Drive, Suite 10
Fountain Hills, AZ 85268

480-837-5200
FAX 837-5300

info@embeddedx86.com

http://www.embeddedx86.com/

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All modifications from previous versions are listed in the appendix.

Limited Warranty

Technologic Systems warrants this product to be free of defects in material and workmanship for a period of one year from date of purchase. Technologic Systems will repair or replace the defective unit during this warranty period in accordance with the following instructions:

- Contact Technologic Systems and obtain a Return Material Authorization (RMA) number and a copy of the RMA form.

- Fill out the RMA form completely and include it and dated proof of purchase with the defective unit being returned. Clearly print the RMA number on the outside of the package.

This limited warranty does not cover damages resulting from lighting or other power surges, misuse, abuse, abnormal conditions of operation, or attempts to alter or modify the function of the product.

This warranty is limited to the repair or replacement of the defective unit. In no event shall Technologic Systems be liable or responsible for any loss or damages, including but not limited to any lost profits, incidental or consequential damages, loss of business, or anticipatory profits arising from the use or inability to use this product.

Repairs made after the expiration of the warranty period are subject to a flat rate repair charge and the cost of return shipping. Please contact Technologic Systems to arrange for any repair service.

Table Of Contents

1   Introduction

The model TS-3400 is a compact, full-featured PC compatible Single Board Computer based on the 386EX processor. If you are coming up from the 8-bit micro controller world, you will find that this product provides much more performance and much quicker development since you can now use standard PC development tools such as Turbo C or Quick Basic. If you have done work in the PC world in the past, you will find you can now build applications for a very small target that does not require a keyboard, video, floppy disks, or hard drives.

You can typically write and debug code on a host PC using standard development tools for the PC platform, then simply copy it to and run it on the TS-3400 without modification. If additional peripherals are required, the PC/104 expansion bus allows for many standard functions available off-the-shelf. It is also very simple to create a custom PC/104 daughter board for those special features that differentiate your product. Technologic Systems can provide technical support as well as a free quotation for any custom hardware, software, or BIOS modifications you may require.

This manual is fairly short. This is because for the most part, the TS-3400 is a standard 80386-based PC compatible computer, and there are hundreds of books about writing software for the PC platform. This is also in part because the TS-3400 is patterned from the TS-3200. The purpose of this manual is documenting where the TS-3400 differs from the TS-3200.

2   Differences Between TS-3400 and TS-3200

The TS-3400 is almost identical to the TS-3200. The TS-3400 was designed to be an extremely low-cost PC/104 board where the full horsepower of a TS-3200 is not needed. Therefore, the manual for the TS-3200 can be used except for the categories below detailing where they differ. A copy of the TS-3200 can be found on our web-page for the TS-3200, or on the utility diskette of the TS-3400.

2.1   Speed

The TS-3400 uses an Intel 386EX chip running at 33 MHz clock rate.

2.2   Spread Spectrum Clock

The TS-3400 takes advantage of a spread spectrum clock to reduce the amount Electromagnetic Interference emitted by the TS-3400. The clock uses a spectrum spread modulated clock that modulates the clock driving the entire board. By eliminating a significant portion of EMI at its source (the clock) the SBC relies less on heavily expensive shielding, packaging, or extra components (such as ferrite beads) to reduce the amount of EMI by other circuits on the board. This will typically realize 15 to 10 db reduction in 100 MHz and higher ranges.

2.3   External Reset on DIO 2 header

Pin 10 of DIO 2 can be optionally set at manufacture time to be an active low reset. Pulling it low through an external filter for more than 1 millisecond will cause a complete reset of the board, effectively causing a "hard" reset of the machine. A resister pull-up keeps the pin in a de-asserted state.

2.4   Size Differences

The TS-3400 is slightly smaller than the TS-3200. It is PC/104 compatible, though it does take advantage of some reserved space of the PC/104 specification for right-angle connectors hanging at the edge of the board.

Though the COM ports are similar mechanically to the TS-3200, they are placed at the top of the board (versus at the left-hand side, like the TS-3200) in order to reduce the total size of the TS-3400. The LCD, DIO1, DIO2 ports are mechanically and physically-located the same as the TS-3200.

3   Feedback and Updates to the Manual

To help our customers make the most of our products, we are continually making additional and updated resources available on the Technologic Systems web site (www.embeddedx86.com). These include manuals, application notes, programming examples, and updated software and firmware. Check in periodically to see what's new!

When we are prioritizing work on these updated resources, feedback from customers (and prospective customers) is the number one influence. If you have questions, comments, or concerns about your TS-3400 Embedded PC, *please let us know*. Details for contacting us are listed in the front of this manual.

Appendix A - Further References

Technologic Systems Web Site
>http://www.embeddedx86.com/

Technologic Systems TS-3200 Data Sheet

>http://www.embeddedx86.com/epc/ts3200-spec.php

Intel 386EX User's Guide
>http://developer.intel.com/design/intarch/manuals/272485.htm

Maxim Integrated Products
>http://www.maxim-ic.com/

National Semiconductor NS16C450 Data Sheet

Omen Technologies
>http://www.omen.com/

PC/104 Consortium Web Site
>http://www.pc104.org/

Appendix B - Manual Revisions

08/08/02   •   New manual.