Note
All modifications from previous versions are listed in Appendix B.
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Product Overview

Introduction

The TS-ENC550 metal enclosure is made to house the TS-5500 Single Board Computer and two PC/104 peripheral boards. The switching power regulator efficiently converts 12-38 VDC to regulated +5 VDC required by the SBC.

Features and Benefits

- 12-38 VDC input provides +5VDC to the SBC
- COM ports adapted to standard 9-pin Sub-D
- PCMCIA slot in front panel
- 2 USB ports available at back panel
- DB25 connector allows 4th COM port or 8 A/D channels or 12 DIO signals to be available at back panel
- Status LED's for Ethernet ports are visible
- Power Good LED visible at back panel
- Reset button recessed into back panel
- Surge suppression on DC power input
- Sturdy metallic design reduces noise
- Dimensions 2-3/8" x 5-3/8" x 7"

Related Products

The TS-ENC550 enclosure is designed for the TS-5500 Single Board Computer and two PC/104 peripheral boards.

Software and Support

- Free system software and documentation updates available on our web site
- Free technical support by phone, fax, or email
- 30-day, money back guarantee on evaluation units
- One-year, full warranty
Installing the Enclosure

**Electrostatic Discharge (ESD) precautions**

Before performing any set up or placement procedures, take the precautions outlined in this section.

---

**Important**

Be sure to take appropriate Electrostatic Discharge (ESD) precautions.

Disconnect the power cable at the rear panel of the enclosure before moving, cabling, or performing any set up procedures.

---

**Setup and Installation Instructions**

Follow these guidelines for safety and maximum product performance:

- Observe local health and safety requirements and guidelines for manual material handling.
- Set the enclosure on a level surface with adequate ventilation.
- Ensure the rubber feet are used for protection and stability on level surfaces.
- Wall-mount the unit if placement on a level surface is not available, or desired.

**Setup Tools**

Depending on the placement and cabling of the enclosure, you may need the following tools:

- Small flat-blade screwdriver
- Small Phillips screwdriver

**Setup Procedure**

After locating, setting up, grounding, and cabling the enclosure:

1. Apply power to the unit.
   
   The amber-colored LED on the rear panel should be lit.

2. Monitor COM2 using a terminal emulator to verify that the enclosure is operating properly.

**Disconnecting AC Power**

1. Unplug the power cord from the power source.
2. Disconnect the power cord from the rear panel of the enclosure.
Components

Standard Headers and Connectors

Front Panel

See Appendix A for a view of the enclosure’s front panel.

Rear Panel

The rear panel of the metal enclosure has six connectors and two additional elements, as indicated in the above view. Identifiers, and a description for each, are listed in the tables below.

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Connector Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ethernet 0</td>
</tr>
<tr>
<td>2</td>
<td>USB</td>
</tr>
<tr>
<td>3</td>
<td>DIO/ADC/COM4</td>
</tr>
<tr>
<td>4</td>
<td>COM1</td>
</tr>
<tr>
<td>5</td>
<td>COM2</td>
</tr>
<tr>
<td>6</td>
<td>COM3</td>
</tr>
</tbody>
</table>
### Additional Elements

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>12-38VDC and Power Indicator LED</td>
</tr>
<tr>
<td>8</td>
<td>Chassis Grounding Lug</td>
</tr>
</tbody>
</table>
**Ethernet**: The Ethernet connector is a standard RJ-45 socket. It can be used to connect a standard 10/100 Ethernet cable into the enclosed EPC.

---

**Note**

The right side LED above the Ethernet port indicates a 100-Mbit link, while the left side LED indicates network activity. Both LEDs are highlighted red in the above graphic.

---

**COM 1**: COM1 is brought in from the base SBC. This 9-pin SubD connector is industry standard for a PC. The TxD, RxD, RTS, CTS, and ground pins are supported for RS-232 communications.

**COM1 9-Pin SubD Outs Table**

<table>
<thead>
<tr>
<th>RS-232</th>
<th>9-Pin SubD</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Receive data</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Transmit data</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>Ground</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>Request to Send</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>Clear to Send</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>
COM 2: COM2 is brought in from the base SBC. This 9-pin SubD connector is industry standard for a PC. The TxD, RxD, RTS, CTS, and ground pins are supported for RS-232 communications.

COM2 9-Pin SubD Outs Table

<table>
<thead>
<tr>
<th>9-Pin SubD</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Receive data</td>
</tr>
<tr>
<td>3</td>
<td>Transmit data</td>
</tr>
<tr>
<td>4</td>
<td>Ground</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Request to Send</td>
</tr>
<tr>
<td>8</td>
<td>Clear to Send</td>
</tr>
<tr>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>
**COM3**: COM3 is brought in from the enclosed SBC. This 9-pin SubD connector is industry standard for a PC. The TxD, RxD, RTS, CTS, and ground pins are supported for RS-232 communications.

See the table below for RS-485 operation.

**COM3 9-Pin SubD Outs Table**

<table>
<thead>
<tr>
<th>Half Duplex RS-485</th>
<th>RS-232</th>
<th>Full Duplex RS-485</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-Pin SubD</td>
<td>Signal</td>
<td>9-Pin SubD</td>
</tr>
<tr>
<td>1</td>
<td>RX/TX +</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Ground</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>RX/TX -</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>9</td>
</tr>
</tbody>
</table>
DIO/ADC/COM4 25-Pin SubD Outs Table

<table>
<thead>
<tr>
<th>25-Pin SubD</th>
<th>Signal</th>
<th>25-Pin SubD</th>
<th>Signal</th>
<th>25-Pin SubD</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Transmit data</td>
<td>9</td>
<td>Ground</td>
<td>1</td>
<td>DIO0</td>
</tr>
<tr>
<td>3</td>
<td>Receive data</td>
<td>10</td>
<td>AD0</td>
<td>2</td>
<td>DIO1</td>
</tr>
<tr>
<td>4</td>
<td>Request To Send</td>
<td>11</td>
<td>AD1</td>
<td>3</td>
<td>DIO2</td>
</tr>
<tr>
<td>5</td>
<td>Clear To Send</td>
<td>12</td>
<td>AD2</td>
<td>4</td>
<td>DIO3</td>
</tr>
<tr>
<td>6</td>
<td>Data Set Ready</td>
<td>13</td>
<td>AD3</td>
<td>5</td>
<td>DIO4</td>
</tr>
<tr>
<td>7</td>
<td>Ground</td>
<td>22</td>
<td>AD4</td>
<td>6</td>
<td>DIO5</td>
</tr>
<tr>
<td>8</td>
<td>Data Carrier Detect</td>
<td>23</td>
<td>AD5</td>
<td>7</td>
<td>DIO6</td>
</tr>
<tr>
<td>20</td>
<td>Data Terminal Ready</td>
<td>24</td>
<td>AD6</td>
<td>8</td>
<td>DIO7</td>
</tr>
<tr>
<td>22</td>
<td>Ring Indicator</td>
<td>25</td>
<td>AD7</td>
<td>14</td>
<td>Ground</td>
</tr>
</tbody>
</table>

- DIO/ADC/COM4: COM4 for the ENC550 can be connected internally to one of three functions.
  - COM4 RS-232
  - Analog to Digital Converter inputs
  - Digital I/O points

The DIO is a standard feature of all Technologic Systems SBCs. By default the 25-pin connector is plugged into DIO1. If the ADC or COM4 options are purchased, the 25-pin connector is plugged into the purchased option. Only one of the headers on the TS-ENC550 power supply board may be connected at one time. Plugging more than one of the headers in may damage the circuitry.
12-38VDC: The three-pin connector accepts 12-38 VDC of external power to supply power to the board.

Power Indicator Light: The amber-colored LED indicator on the rear panel, shown highlighted above in red, is the power LED. It is lit whenever power is applied to the unit.

Chassis Grounding Lug: The lug labeled with the chassis ground symbol is used to ground the chassis (optional).

Note
Connect this to earth ground during installation.
Product Specifications

Dimensions

The TS Enclosure 550 measures 2-3/8" x 5-3/8" x 7"

Cabling

- A mating power connector is supplied with the enclosure
- A null modem cable is available as CB7-05

Environmental

To ensure optimum product operation you must maintain the operational environmental specifications listed in the table below.

<table>
<thead>
<tr>
<th>Environmental Specifications</th>
<th>Standard Temp Products</th>
<th>Extended Temp Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient Temperature</td>
<td>0 - 60° C</td>
<td>Allow for a much greater range.</td>
</tr>
<tr>
<td></td>
<td>The internal temperature must not exceed +70° C.</td>
<td>Note: Refer to your product manual, or contact Customer Service at Technologic Systems if the environmental temperature of the location is in doubt.</td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>Not to exceed 90% noncondensing</td>
<td>Not to exceed 90% noncondensing.</td>
</tr>
</tbody>
</table>
Options and Other Features

- RS-485 is optional on COM3
- A wall-mounted power supply is available for this product
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.

Repairs

During this warranty period Technologic Systems will repair or replace the defective unit in accordance with the following process:

A copy of the original invoice must be included when returning the defective unit to Technologic Systems, Inc. at the address below.

Not Covered

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.

Out-of-Warranty Repairs

Repairs made after the expiration of the warranty period are subject to a repair charge and the cost of return shipping.

Please contact Technologic Systems to arrange for any repair service and to obtain repair charge cost information.

16525 East Laser Drive
Fountain Hills, AZ 85268

TEL 480.837.5200
FAX 480.837.5400

http://www.embeddedx86.com/
Regulatory Notices

FCC Advisory Statement

Warning

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly (that is, in strict accordance with the manufacturer’s instructions), may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the owner at his own expense will be required to correct the interference.

If this equipment does cause interference, which can be determined by turning the unit on and off, the user is encouraged to try the following measures to correct the interference:

1. Reorient the receiving antenna.
2. Relocate the unit with respect to the receiver.
3. Plug the unit into a different outlet so that the unit and receiver are on different branch circuits.
4. Ensure that mounting screws and connector attachment screws are tightly secured.
5. Ensure that good quality, shielded, and grounded cables are used for all data communications.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The following booklets prepared by the Federal Communications Commission (FCC) may also prove helpful:

- How to Identify and Resolve Radio-TV Interference Problems (Stock No. 004-000-000345-4)
- Interface Handbook (Stock No. 004-000-004505-7)

These booklets may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402
Appendix A: Enclosure Views and Diagrams

Enclosure TS-ENC550 Front-Top View

Enclosure TS-ENC550 Rear Panel View
TS-ENC550 Board Diagram and Dimensions
# Appendix B: User Manual Revisions

<table>
<thead>
<tr>
<th>Date of Issue/Revision</th>
<th>Revision Number</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 2005</td>
<td>1.0</td>
<td>First release</td>
</tr>
<tr>
<td>July 2008</td>
<td>1.1</td>
<td>Fixed broken web links</td>
</tr>
<tr>
<td>June 2009</td>
<td>1.2</td>
<td>Updated mailing address</td>
</tr>
</tbody>
</table>
Contact Information

16525 East Laser Drive
Fountain Hills, AZ 85268

TEL 480.837.5200
FAX 480.837.5400

info@embeddedx86.com

http://www.embeddedx86.com/