

HEBC Manual

High Efficiency Battery Charging

Manufactured by
TRI-M ENGINEERING

Engineered Solutions for Embedded Applications

Technical Manual

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PREFACE

This manual is for integrators of applications of embedded systems. It contains information on hardware requirements and interconnection to other embedded electronics.

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Table of Contents

Table of Contents..... 3

CHAPTER 1 - INTRODUCTION 4

 1.1 General Description 4

 1.2 Features 4

CHAPTER 2 - CONFIGURATION AND INSTALLATION..... 5

 2.1 Introduction..... 5

 2.2 Main Input Power Connector 5

 2.3 Battery Connector..... 5

 2.4 AUX Connector..... 5

CHAPTER 1 - INTRODUCTION

1.1 General Description

The HEBC is a high efficiency, high performance battery charger that charges batteries in the range of 9.5 to 19.5 volts. The battery charger output is controlled by a constant off-time current-mode architecture regulator, which provides excellent line and load transient response. The HEBC includes a flash based microcontroller that supplies advanced power management, and smart battery charging. It has a wide input range of 9.5-40V and is ideal for unregulated input applications. The HEBC using a “buck” switching regulator design, therefore the input voltage must be greater than the required charging voltage.

The HEBC is a state-of-the-art mosfet based design that provides outstanding line and load regulation with efficiencies up to 95 percent.

The HEBC provides up to four stages of battery charging and can charge Lead-Acid, NiCd and NiMH batteries and is also SMBus level 3 compatible. Charge currents are up to 4A and battery charging voltages range from 9.5 to 19.5V.

1.2 Features

- DC to DC switching converter design for high efficiency.
- “Load Dump” transient suppression on input power supply.
- Operates from 9.5VDC to 40VDC input.
- PC/104 size and mounting holes.
- Temperature range -40 to 85C.

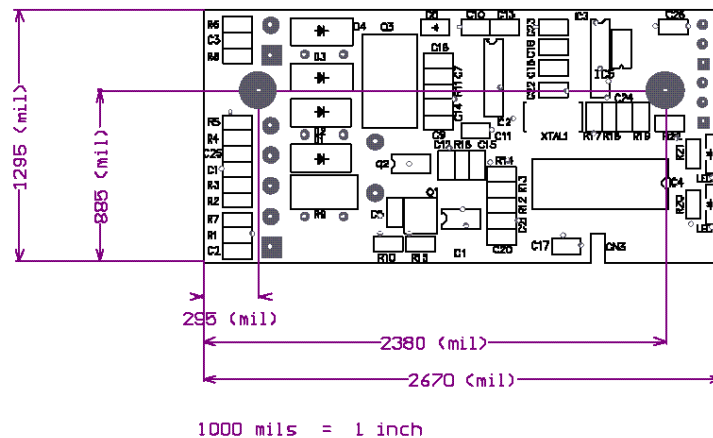


Figure 1

CHAPTER 2 - CONFIGURATION AND INSTALLATION

2.1 Introduction

This chapter describes the configuration and installation of the HEBC power supply. *Figure 2* shows the HEBC connectors.

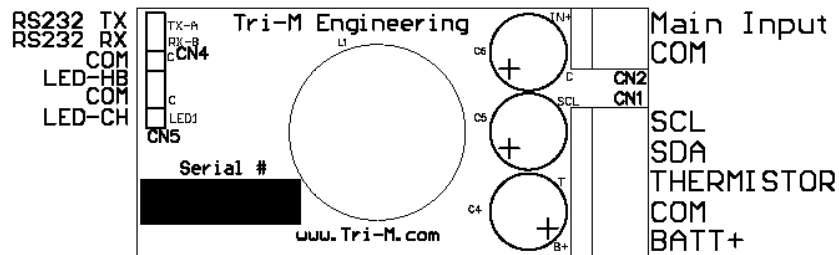


Figure 2

2.2 Main Input Power Connector

Input power is connected to the HEBC by a Molex plug and pin connector CN2. The power supply accepts DC input voltages in the range of 9.5VDC to 40VDC. Unregulated vehicle power is connected as follows:

- Terminal 1: Common (0VDC)
- Terminal 2: Hot "polarity"

2.3 Battery Connector

Batteries are connected to the HEBC by a Molex plug connector, CN1. The HEBC accepts DC battery voltages in the range 9.5V to 19.5VDC through the Battery Power Connector.

- CN1-1: Battery Positive
- CN1-2: Common
- CN1-3: TH, Thermistor safety input
- CN1-4: SDA, I2C/SMBus data input/output signal
- CN1-5: SCL, I2C/SMBus clock input/output signal

2.4 AUX Connector

Connecting to the HEBC through the AUX connector, CN4 and CN5, does the remote setup and monitoring of the HEBC.

- CN4-1: COM
- CN4-2: RS232 RX
- CN4-3: RS232 TX
- CN5-1: LED-CH
- CN5-2: COM
- CN5-3: LED-HB