

# **HEBC+ Manual**

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## ***High Efficiency Battery Charging***

Manufactured by  
**TRI-M ENGINEERING**

Engineered Solutions for Embedded Applications

### **Technical Manual**

P/N: HEBC+MAN-V2  
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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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# CHAPTER 1 - INTRODUCTION

## 1.1 General Description

The HEBC+ is a high efficiency, high performance battery charger that charges batteries in the range of 10 to 35 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 10-40V 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 10 to 35V.

## 1.2 Features

- DC to DC switching converter design for high efficiency.
- “Load Dump” transient suppression on input power supply.
- Operates from 10VDC to 40VDC input.
- PC/104 size and mounting holes.
- Temperature range -40 to 85C.

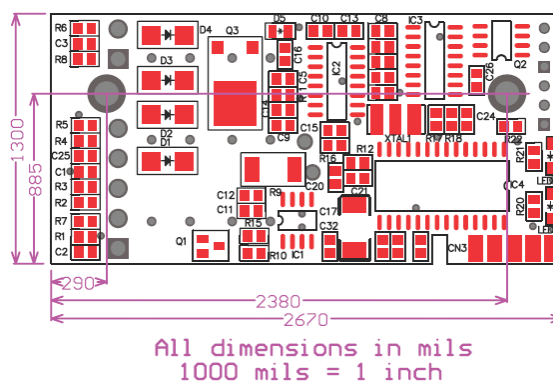


Figure 1

## 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.

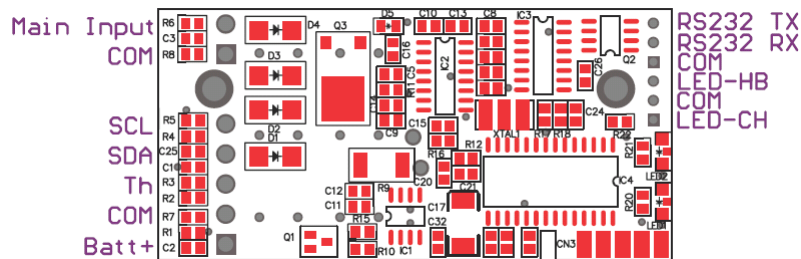


Figure 2

### 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 10VDC 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 10V to 35VDC 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