



Preliminary Datasheet

# **EVACharge SE Motor and GPIO daughter board**

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## Revisions

Revision	Release Date	Changes
1a	June 23, 2014	adding pin numbers for connectors X2, X3, X4, X5 in the pdf
1	March 25, 2014	initial release

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## 1 Abstract

This product is an extension to EVACharge SE for driving lock motors and general loads. It is not designed to be used without EVACharge SE.

Parameter	Value
Power supply (motor)	up to 24V
Temperature range	-40 °C - +85 °C
Outline dimension	94 mm x 40 mm x 16 mm
total height (with EVACharge SE)	40 mm (without connectors) / 50 mm (with connectors - add room for wires)
Weight	25 g (without connectors)
RoHS	this product is manufactured RoHS compliant

## 2 Applications

- lock the socket to prevent damage when it is not in use
- lock charging plugs to the charging station
- drive LEDs for signaling
- drive relays for switching the power socket

## 3 Interfaces

- up to 2 DC motors with analog feedback
- up to 6 GPIOs with different configuration
- EVACharge SE daughter board connector

## 4 Handling



This electronic assembly is sensitive to electrostatic discharge (ESD).

## 5 Connector overview

Figure 1 shows the names of all connectors for further reference in the following sections.

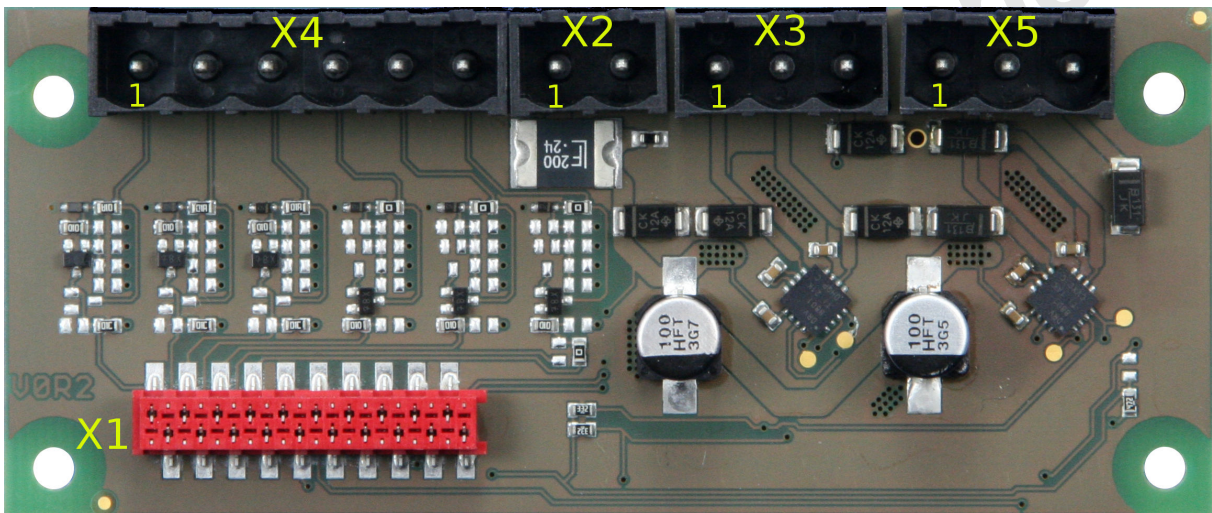


Figure 1: Overview of the connectors

## 6 Pinout

### 6.1 X1 daughter board connector

This connector is to be connected to EVACharge SE. Do not connect anything else.

### 6.2 X2 Motor Power In

This connector is the inlet for the motor power. The voltage is directly fed into the motor drivers that are controlling the motor. GND is connected to the overall EVACharge SE ground.

PIN	Name	Description
1	V_motor	Positive Motor supply
2	GND_motor	Motor ground, connected to EVACharge SE system ground

Table 1: X2 pinout

### 6.3 X3 Motor 1 Connector

PIN	Name	Description
1	Motor1_neg	Negative output of motor driver
2	Motor1_pos	Positive output of motor driver
3	Motor1_end	End position detection

Table 2: X3 pinout

### 6.4 X4 GPIO connector

PIN	Name	Description
1	GPIO_0	GPIO pin
2	GPIO_1	GPIO pin
3	GPIO_2	GPIO pin
4	GPIO_3	GPIO pin
5	GPIO_4	GPIO pin
6	GPIO_5	GPIO pin

Table 3: X4 pinout

## 6.5 X5 Motor 2 Connector

<b>PIN</b>	<b>Name</b>	<b>Description</b>
1	Motor2_neg	Negative output of motor driver
2	Motor2_pos	Positive output of motor driver
3	Motor2_end	End position detection

Table 4: X5 pinout

## 7 Mapping of GPIO Channels

The GPIO channels are named differently between the daughter board input and output. This document refers to GPIO\_0 to GPIO\_5 (at connector X4) while EVACharge SE has DAUGHTER\_GPIO\_0 to DAUGHTER\_GPIO\_5. The numbers are not mapped equally. Table 5 shows how these pins are mapped.

<b>GPIO name (X4 names)</b>	<b>EVACharge SE name (X1 names)</b>
GPIO_0	DAUGHTER_GPIO_2
GPIO_1	DAUGHTER_GPIO_3
GPIO_2	DAUGHTER_GPIO_4
GPIO_3	DAUGHTER_GPIO_5
GPIO_4	DAUGHTER_GPIO_0
GPIO_5	DAUGHTER_GPIO_1 (or IMX_HEARTBEAT)

Table 5: GPIO channel mapping

## 8 Technical Data

### 8.1 Absolute Maximum Ratings

SYMBOL	PARAMETER	Min.	Max.	UNIT
TSTORE	Storage temperature (max 1000h)	-40	105	°C
RAH	Relative air humidity (not condensing)	10	90	%
I_motor	Motor current (total of all channels)	0	2	A
V_GPIO_IN	Voltage of GPIOs configured as input	0	12	V
I_GPIO_OUT	Sink current of GPIOs configured as output	0	200	mA
V_GPIO_OUT	Voltage at GPIOs configured as output	0	12	V

Table 6: Absolute Maximum Ratings

### 8.2 Operating conditions

SYMBOL	PARAMETER	Min.	Max.	UNIT
V_motor	Motor Supply Voltage		24	V
TCASE	Top of case temperature	-40	85	°C
V_GPIO_IN_L	Input Low voltage of GPIOs	0	1	V
V_GPIO_IN_H	Input High voltage of GPIOs	3		V

Table 7: Operating Conditions

## 9 Motor End Detection

Motors that can be connected to this daughter board need to have the end switch circuit as shown in figure 2.

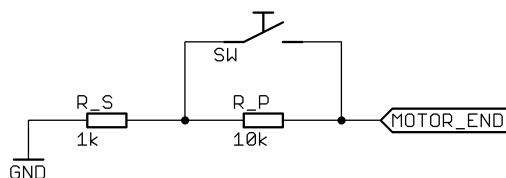


Figure 2: Motor end switch circuit

Please note that the switch needs to be connected to GND on one side, not to one of the motor terminals.



## 10 Order Information

You can order the product in different configurations. Each of it is an assembly option and might be adapted to your needs.

Each GPIO can be selected to be input or output as a hardware assembly option. One channel can be used to select between heartbeat of the Linux (of EVACharge SE) and a general purpose IO. Also you can choose between zero to two motor driver outputs. The default assembly option has the order code **I2ESDB-AAAMMM-H-2**.

### 10.1 Order Codes

The order code for this product can be assembled as follows:

I2ESDB-XXXXXX-Y-Z

where each letter X has to be replaced by one of the letters in table 8, Y is the type of GPIO\_5 (either G for GPIO or H for HEARTBEAT), and Z is the number of motor driver channels from zero to two.

GPIO assembly options (each letter X) that are available on request are shown in table 8.

Type	configuration
A	Input, 100 Ohm series resistor
M	Output, open drain, no pullup/-down

Table 8: GPIO configuration options

The letter Y selects one of the options from table 9.

Type	configuration
G	general purpose IO
H	heartbeat of the linux system

Table 9: GPIO 5 options

For reference: the default variant I2ESDB-AAAMMM-H-2 is configured with two motor drivers, GPIO\_5 as HEARTBEAT and GPIOs as stated in table 10.

GPIO channel	direction	note
0	input	100 Ohm series resistor, no pullup/-down
1	input	100 Ohm series resistor, no pullup/-down
2	input	100 Ohm series resistor, no pullup/-down
3	output	open drain, no pullup/-down
4	output	open drain, no pullup/-down
5	output	open drain, no pullup/-down

Table 10: Default assembly variant

## 11 How to reach us

Home Page: <http://www.i2se.com>

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