



New Contact Address

in-tech smart charging GmbH

Important notice

Dear customer,

in-tech smart charging GmbH is expanding. From now on we will be based in Bitterfelder Str. 1-5 in 04129 Leipzig.

Our email address smartcharging@in-tech.com and phone number +49 341 39290250 remain unchangend.

As of now mail will be received at the new address.

Yours sincerely,

in-tech smart charging GmbH



Charge Control P Datasheet

in-tech smart charging GmbH

Jul 22, 2021

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1 Revisions

Revision	Release Date	Changes
1	July 22, 2021	initial release

2 Introduction

Charge Control P is designed for the prototyping and development of CCS compliant Electric Vehicle Charging Controllers (EVCC). As such, the Charge Control P can also be used for (limited) testing the opposite side, i.e. CCS compatible Electric Vehicle Supply Equipment (EVSE).

The product is based on in-tech smart charging's EVAcharge SE board and includes a specially developed software stack. For communication between EVSE and EV it supports evaluation of the pulse-width modulation (PWM) signal on the Control Pilot (CP) line. It also includes Green PHY communication which enables the charge controller to communicate via Power Line Communication with EVSEs that are ISO 15118 / DIN 70121 compliant.

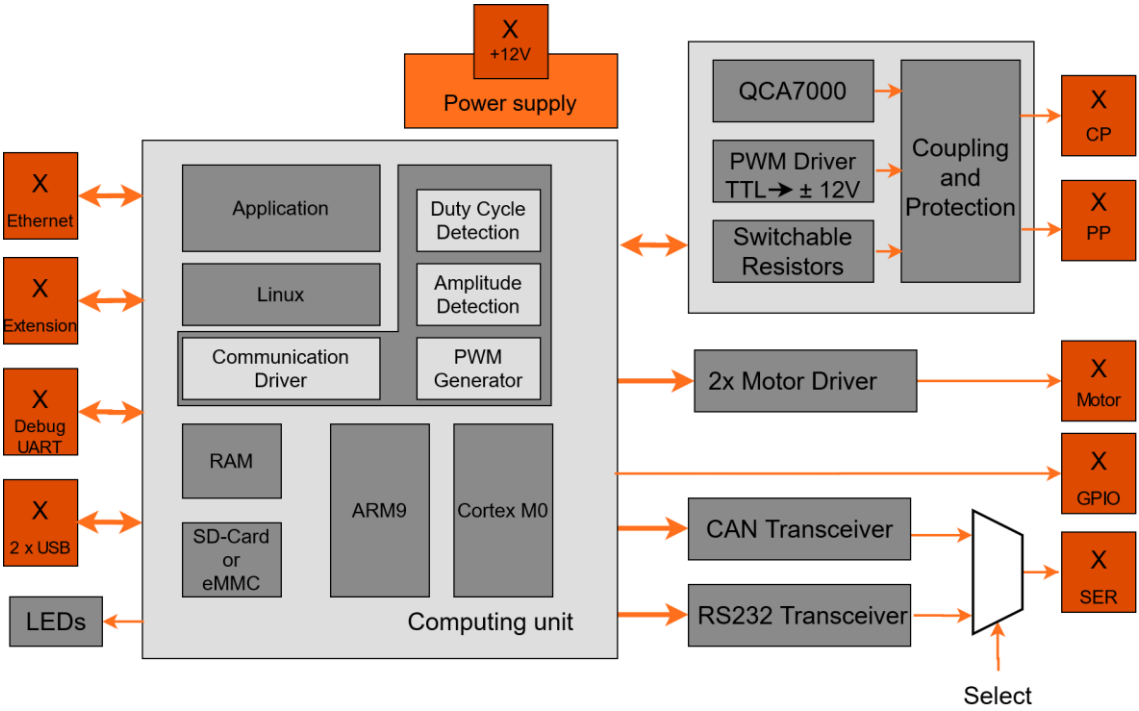
In contrast to the EVAcharge SE hardware product, Charge Control P ships with in-tech smart charging's software stack for charging processes in accordance with DIN 70121 and ISO 15118. These protocols allow support for fast DC charging on EV side. When using such high-level communication protocols, the charging stack supports the authentication profiles External Identification Means (EIM) and Plug & Charge (PnC).

For the communication between the Charge Control P and the power electronics on EV side, the Charge Control P implements a proprietary CAN protocol.

Features:

- Based on the NXP i.MX287
- Storage: internal eMMC 4 GB
- Network interface: Fast Ethernet
- Operating system: Linux
- RAM: 128 MByte DDR2

Parameter	Value
Power supply	12 V
Power consumption	max. 4 W (2.6 W in idle mode) - plus power for USB devices
Temperature range	-40 °C - +85 °C
Air humidity	95% rel. humidity (non condensing)
Outline dimension	100 mm x 120 mm x 20 mm
Weight	92 g
RoHS	This product is manufactured RoHS compliant.



3 Applications

- charge controller in plug-in electric vehicle prototypes (PEV)
- simulators for tests of EVSE

4 Delimitation, Regulatory Requirements

The Charge Control P is not designed and is not tested against automotive standards. Thus in-tech smart charging cannot guarantee for the durability and stability in production vehicles.

It is not the responsibility of in-tech smart charging to ensure compliance with the regulatory requirements of the respective target market regarding market access of the Charge Control P vis-à-vis the competent authorities. Accordingly, it is the customer's responsibility to take all measures required under the respective prescribed approval procedure (e.g. initial sample test, self-declaration procedure, certification procedure) for the approval and operation of the Charge Control P as well as its provision on the market, regardless of whether the supply is integrated in the customer's system or not.

5 Technical Data

5.1 Absolute Maximum Ratings

SYMBOL	PARAMETER	MIN	MAX	UNIT
VCC	Supply voltage (from revision V0R4)	0	30	V
VCC	Supply voltage (until revision V0R3)	0	+18 (1s)	V
V_CP	Control Pilot voltage	-14.0	+14.0	V

SYMBOL	PARAMETER	MIN	MAX	UNIT
V_PP	Proximity Pilot voltage	-0.8	+5.0	V
TSTORE	Storage temperature	-40	+85	°C
RAH	Relative air humidity (non condensing)	0	85	%
ZC_OC	Zero Cross detection overvoltage category		CAT III	
DP	Degree of pollution		2	
ALT	Altitude above sea level		2000	m

Table 1 Absolute Maximum Ratings

5.2 Operating Conditions

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
VCC	Supply voltage (from revision V0R4)	7	12	27	V
VCC	Supply voltage (until revisions V0R3)	11.4	12	12.6	V
TCASE	Top of case temperature	-40	-	85	°C
VZC	Zero Cross Detection Voltage	85		260	V

Table 2 Operating Conditions

Ethernet Parameter

ETHERNET PARAMETER
compliant with IEEE802.3/802.3u (Fast Ethernet), ISO 802-3/IEEE 802-3/IEEE 802.3 (10BASE-T)

Table 3 Ethernet Parameter

GreenPHY Powerline Communication Parameter

PLC ON CONTROL PILOT PARAMETER	MIN	TYP	MAX	UNIT
Reach			300	m
Data rate			10	Mbit/s

Table 4 GreenPHY Powerline Communication Parameter

USB Parameter

USB PARAMETER	MIN	TYP	MAX	UNIT
Output voltage		5		V
Output current			500	mA

Table 5 USB Parameter

CAN Bus Parameter

CAN BUS PARAMETER	MIN	TYP	MAX	UNIT
Data rate			1	Mb/s
CANH; CANL recessive bus output voltage	2.0	2.5	3.0	V

CAN BUS PARAMETER	MIN	TYP	MAX	UNIT
Recessive output current	-5	-	5	mA
CANH dominant output voltage	2.75	3.5	4.50	V
CANL dominant output voltage	0.50	1.5	2.25	V
Symmetry of dominant output voltage (5V - VCANH - VCANL)	-400	0	400	mV
Dominant differential output voltage	1.5	2.0	3.0	V
Recessive differential output voltage	-500	0	50	mV
CANH short circuit output current	-100	-85	-	mA
CANL short circuit output current	-	75	100	mA

Table 6 CAN Bus Parameter

6 Mechanical Dimensions

The mechanical dimensions of the Charge Control P are shown in figure mechanical drawing.

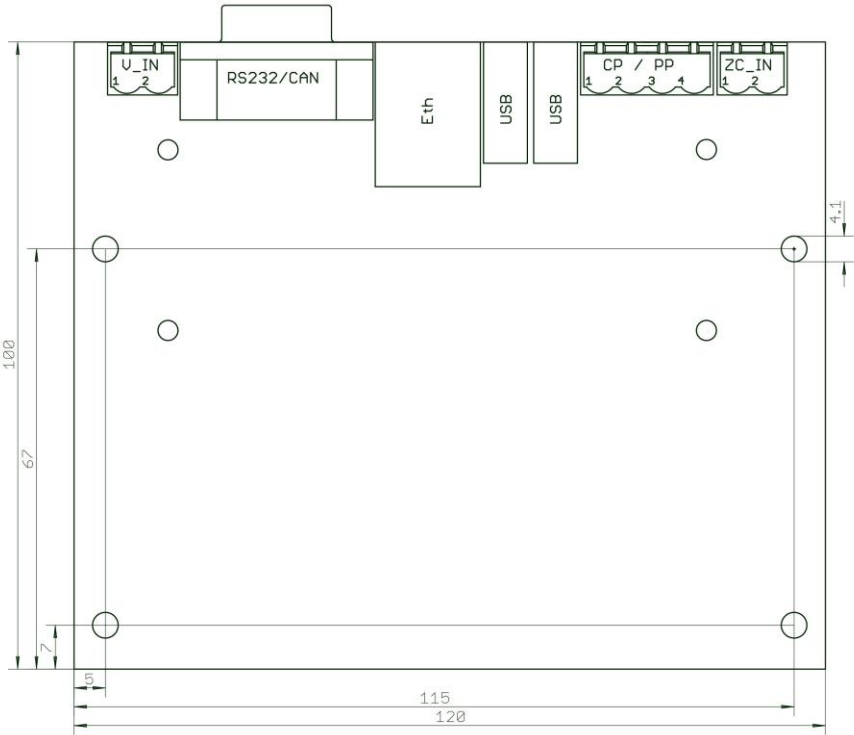


Figure 1 Mechanical Drawing of Charge Control P including Connectors

7 Mounting Holes

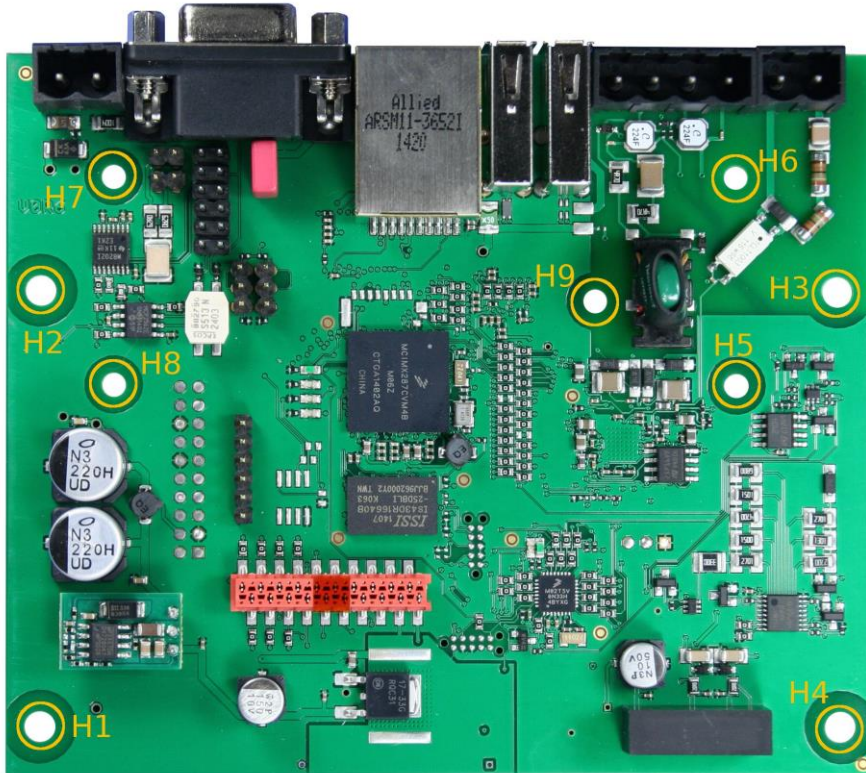


Figure 2 Mounting Holes

Charge Control P supports nine mounting holes, as shown in figure "Mounting Holes".

- H1 . . . H4 - main PCB mounting holes
- H5 . . . H9 - daughter PCB mounting holes

Note: Please only use isolating mounting material with mains connected to X3, especially for H6.

8 Hardware Revision Identification

The hardware revision of the Charge Control P can be identified by reading the device label placed on the bottom side of the PCB. Figure "Product Label" shows a board with revision V0R7e.



Figure 3 Product Label

9 Order Information

In principle, Charge Control P can be populated in different configurations.

The default configuration is:

- populated Zero Cross Detection
- 1 USB port (J3)

Some parts are left unpopulated, for example the second USB port. Please contact in-tech smart charging if you have special requirements.

Permissible Order Codes	SW Variant	HW Revision
I2CCP-E00-000	DC charging with MQTT/CAN API	V0R7d/e

Table 7 Order Code

10 Contact

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