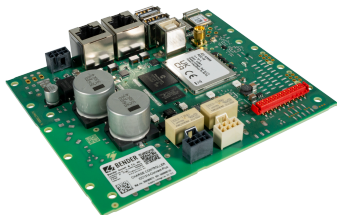# ICC1314

Charge controller for charging systems for electric vehicle charging

depends on the variant

Device features

- Charge controller in accordance with IEC 61851-1 (charging mode 3)
- integrated WiFi module for configuration and connection with other charging systems
- Suitable for single-phase or three-phase charging of electric vehicles up to 80 A, depending on the current carrying capacity of the integrated power module which is used
- integrated residual direct current monitoring module with residual current transformer for DC residual current monitoring (external RCD type A required)
- USB interfaces
  - 1 CONFIG interface (type B) for configuration and maintenance as well as for connecting two charge controllers for dual charging systems
  - 2 USB host interfaces (type A), one of them can be used as an alternative to the CONFIG interface
- Meter interface
  - Modbus RTU for internal energy meters, suitable for Eichrecht-compliant billing
  - Modbus TCP for connecting meters for load management
- Up to two Ethernet interfaces
- suitable for the installation of dual charging systems using two charge controllers
- suitable for the installation of charging systems with two alternatively usable plug systems (e.g. type 2 and protective contact sockets)
- integrated emergency opener of the charging socket actuator in the case of a power blackout
- integrated 2G / 4G modem with router function; provisioning with eSIMs possible from ex works
- 2 optocoupler inputs and 2 relay outputs for additional functions
- integrated DC 12 V voltage supply with a maximum current carrying capacity of 400 mA for customised applications
- Support for RFID reader (in stock or customer-specific)
- Support for OCPP 1.6-J
- ISO 15118 Powerline Communication (PLC) with support of plug & charge authorisation, load management and autocharge
- Dynamic load management for optimised distribution of the available power to connected vehicles, including PV charging optimisation and prioritisation function
- Support for the EEBUS profiles overload protection, optimisation of PV charging, cost-optimised charging and load specification by electricity grid operators
- Support for the Bender app for home loading and API for customer-specific apps
- Tool support for configuring and testing charging systems in production
- configurable support for additional Schuko socket-outlet
- Control Pilot and Proximity Pilot communication
- Internal temperature sensor to reduce the charging current depending on the ambient temperature

Product description

The charge controller controls and monitors all functions of private, industrial or public charging stations. Core function is the release and regulation of the charging current. The charge controller can be integrated into a variety of energy management systems and OCPP backends and is operated as an always-on system. The compatibility of the charge controller with backends, vehicles or energy management systems is ensured in periodic integration tests.

Functional description

The charging system consists of a charge controller in combination with an integrated power module (IPM). The IPM is connected to a charging socket or to a permanently mounted cable with a type 1 or type 2 plug.

General functions (depending on the variant)

- The charging system can be equipped with an electricity meter. Modbus RTU meters can be connected directly to the device. In addition, a second meter can be connected for energy management via Modbus TCP using an Ethernet or WiFi interface.
- A DC 12 V power supply via integrated power module is needed for operation.
- Option to use an HMI module with RFID reader and LED field allow easy user interaction.
- Current flow toward the vehicle is released by enabling the main relay on the integrated power module.
- Using a Micro SIM card (not included in the scope of delivery): The SIM card slot (available on data gateways with a 4G modem only) is located on the charge controller front panel. The SIM card can have a PIN number which can be configured via the **Network** tab.
- For charge controllers with a 4G modem, there is an SMA connector and, depending on the variant, a U.FL connector for an external 4G antenna on the circuit board .

- For residual current detection in an AC charging system, the charche controller IPM combination features an integrated residual direct current monitoring module (RDC-M). With integrated monitoring of the DC residual current, only an RCD type A is required in the charging system.
- Data exchange between the electric vehicle and the charging system is possible via ISO 15118 compliant Powerline Communication (PLC).
- Dynamic load management (DLM):
  - The charge controller comes with DLM function, which can be fully used, independent of a backend connection. It detects which charging current is applied to which phase and thus prevents the occurrence of peak loads and unbalanced loads. It is also possible to control the system based on the solar feed-in and prioritise charging points in the DLM. Maximum number of charging points in a network: 250.
- Data management and control functionality of the charge controller:
  - Termination of the charging process after tripping the residual current protective device (RCD) due to a residual current.
  - Detection of critical residual currents by the RCM sensor. For the vehicle owner, this can serve as an early warning, provided that the charge controller is connected to an energy management system and that it supports this function.
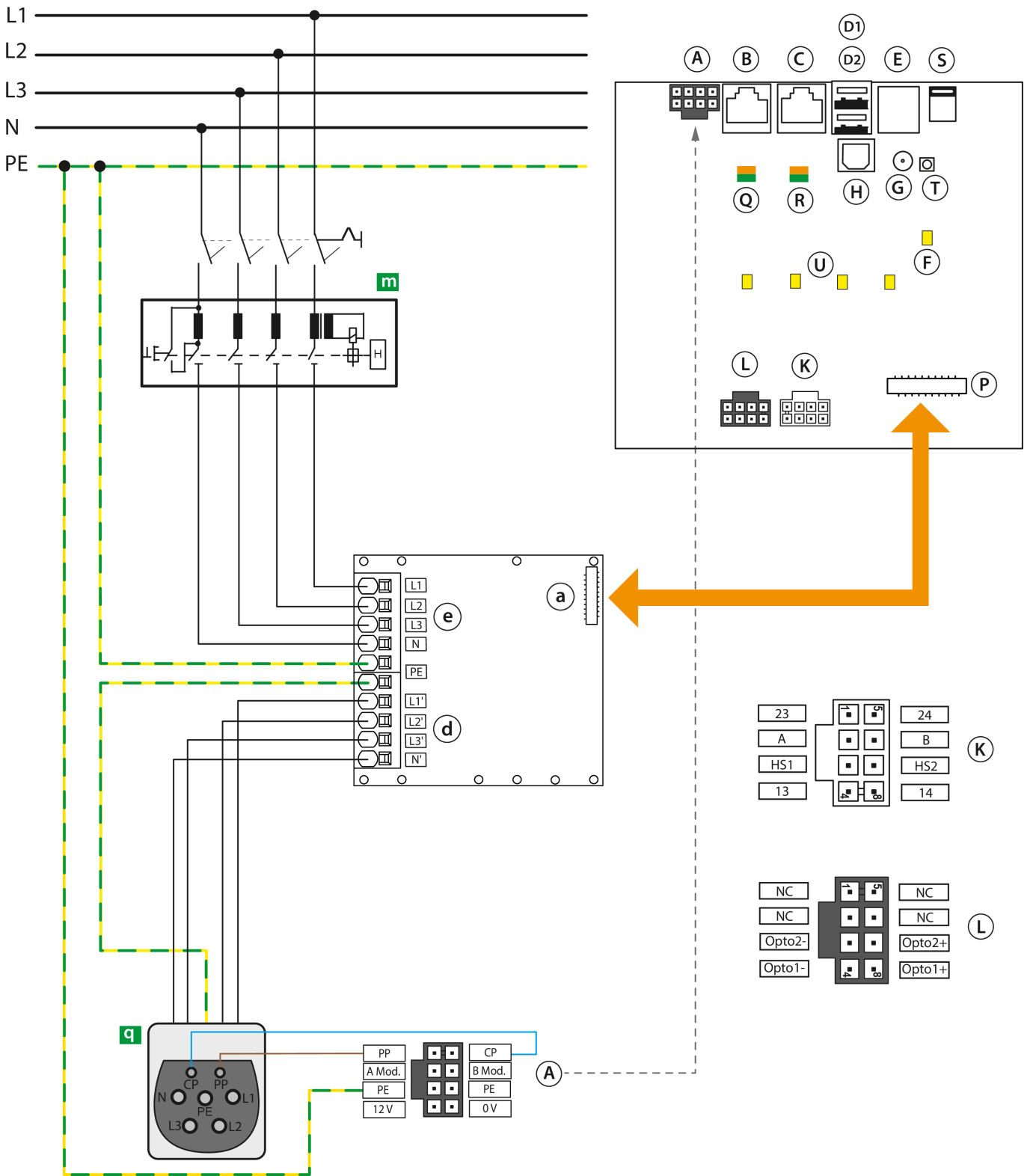
Dimension diagram
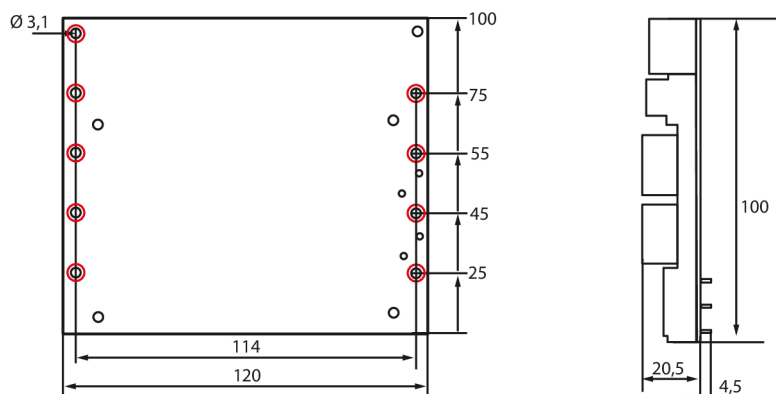
Dimensions in mm

i Red markings: possible fixing points

i *Recommendation for fastening:*
- *Pan head screws: 4 x M 2.5*
- *Torque: 0.36 Nm*

Wiring diagram

Legend

A	12 V, PE, Modbus meter, CP, PP (Molex Nano-Fit 105310-3508)	L	Optocoupler input (Molex Nano-Fit 105310-3508)
B	Connection Ethernet (ETH2)	P	Connection integrated power module (IPM) 20-pole
C	Connection Ethernet (ETH1)	Q	LED activity Ethernet 2
D1, D2	Extension connection (USB type A)	R	LED activity Ethernet 1
E	SIM card holder (3FF, micro)	S	integrated WiFi antenna
F	LED status charge controller	T	Antenna socket 4G modem (U.FL)
G	Antenna socket 4G modem (SMA)	U	4x RGB LED (status charging system)
H	Configuration interface (USB type B)	**m**	RCD type A
K	Connector locking device, control relay (Molex Nano-Fit 105310-4508)	**q**	Type 2 socket-outlet

⚠️ **ADVICE**

Usage variants of the USB type A interfaces (D)
1. *both USB type A sockets (D1 and D2)*
2. *external USB type A socket with the USB type B configuration interface (D1 and H)*

Terminal assignment

A4	12V	DC 12 V voltage source for customer-specific application
A8	0V	
A3	PE	Input PE
A7	PE	Input PE
A2	A Mod.	Modbus meter A
A6	B Mod.	Modbus meter B
A1	PP	Proximity Pilot
A5	CP	Control Pilot
K4	13	Relay 13: relay output 1 (12 V)
K8	14	Relay 14: relay output 1 (12 V)
K3	HS2	Actuator HS2: Locking input actuator switch
K7	HS1	Actuator HS1: Locking 12 V output actuator switch
K2	A	Actuator A: Locking actuator output negative
K6	B	Actuator B: Locking actuator output positive
K1	23	Relay 23: relay output 2 (12 V)
K5	24	Relay 24: relay output 2 (12 V)
L4	Opto1-	Optocoupler input 1 (12 V negativ)
L8	Opto1+	Optocoupler input 1 (12 V positiv)
L3	Opto2-	Optocoupler input 2 (12 V negativ)
L7	Opto2+	Optocoupler input 2 (12 V positiv)

Technical data

Insulation coordination acc. to IEC 60664-1 / IEC 60664-3

Rated voltage	12.5 V / 24 V
Overvoltage category (terminal e)	III
Pollution degree	2
Rated impulse voltage	800 V
Operating altitude AMSL	≤ 2000 m

Supply voltage DC 12 V (Terminal P)

Supply voltage range U_s	DC 11.4 V…12.6 V
max. power consumption	12 W
Average power consumption	6 W

SMA plug connector(terminal G) or U.FL plug connector for 4G antenna

Modem LTE Cat 1 & GSM

Frequency bands	800 MHz/850 MHz/900 MHz/1800 MHz/2100 MHz/2600 MHz
	LTE-FDD: B1/B3/B7/B8/B20/B28; WCDMA: B1/B8;
	GSM: B3/B8
Impedance	50 Ω
Data rate	**GSM:**
	GPRS: UL 85.6 kBit/s; DL 107 kBit/s
	EDGE: UL 236.8 kBit/s; DL 296 kBit/s
	UMTS:
	WCDMA: UL 384 kBit/s; DL 384 kBit/s
	DC-HSDPA: DL 42 MBit/s
	HSUPA: UL 5.76 MBit/s
	LTE:
	LTE FDD: UL 5 MBit/s; DL 10 MBit/s
	LTE TDD: UL 3.1 MBit/s; DL 8.96 MBit/s
recommended antenna	TC ANT MOBILE WALL 0,5M - 2702274
max. length of the antenna cable	< 3 m
max. output power	GSM850/EGSM900: 33 dBm
	DCS1800/PCS1900: 30 dBm
	WDMA: 24 dBm
	LTE: 23 dBm
recommended torque*	1 Nm

*   for SMA plug connector

Data interface

USB-Host 1 (terminal D1)	USB port type A; USB 2.0 max. 250 mA
USB-Host 2 (terminal D2)	USB port type A; USB 2.0 max. 250 mA
Ethernet (terminal B, C)	10/100 Mbit
CONFIG (configuration interface, terminal H)	USB port type B
SIM card (only with 4G modem, terminal E)	micro SIM
Modbus meter	9.6 kBit
Control Pilot (terminal (CP))	acc. to IEC 61851
Proximity Pilot (terminal (PP))	acc. to IEC 61851

Inputs

Input voltage (HIGH)	DC 11.4 V…25.2 V
Input voltage (LOW)	DC 0 V
Input current	2.3…6.4 mA
max. potential difference to PE/GND	50 V*
Input PE (Terminal A (PE, PE))	

*   The potential difference between the optocoupler inputs and other inputs/ outputs must be less than 50 V.

Outputs
Contact data acc. to IEC 60947-5-1:

DC 12 V voltage source (Terminal A (12 V, 0 V))	
Output voltage	DC 12 V
max. load capacity	400 mA
Tolerance	DC ± 0.75 V

Relay 1 and 2 (12 V) (Terminal K: Relay 13/14 and Relay 23/24)	
rated operational voltage U_e	DC 24 V
rated operational current I_e	DC 1 A
minimum contact rating	DC 1 mA at ≥ 10 V

Environment / EMC

EMC	see CE declaration
operating temperature	-25...+65 °C

Classification of climatic conditions acc. to IEC 60721:

stationary use (IEC 60721-3-3)	3K23 (except condensation and formation of water and ice)
Transport (IEC 60721-3-2)	2K11
Long-term storage (IEC 60721-3-1)	1K21

Classification of mechanical conditions acc. to IEC 60721:

stationary use (IEC 60721-3-3)	3M11
Transport (IEC 60721-3-2)	2M4
Long-term storage (IEC 60721-3-1)	1M12

Cable lengths /cable types
Ethernet (Terminal B, C)*

Cable	shielded on one side, shield to PE
Connection cable	CAT 6 or higher, shielded
max. connection cable length	100 m

*   • Integrated surge protection for indoor applications
     • An additional surge protection device (SPD) is required for outdoor applications.

Flat band cable connection P

Permissible connection plug/connector system	Micromatch W+P 6990-5-20-1-PPTR
Flat band cable length	< 0.3 m

*   can be ordered separately (see chapter)
     • The plug-in system on the IPM board and on the charge controller can withstand 5 plugging cycles.
     • The plug on the flat band cable is intended for single insertion.

Other

Operating mode	continuous operation
Mounting position	standing
Degree of protection	IP20
Weight (depends on the variant)	max. 110 g

BENDER

Declaration of conformity

Hereby, Bender GmbH & Co. KG declares that the device covered by the Radio Directive complies with Directive 2014/53/EU. The full text of the EU Declaration of Conformity is available at the following Internet address:

https://www.bender.de/fileadmin/content/Products/CE/CEKO_ICC1314.pdf

Standards and approvals

CE   UK CA

Ordering information

Type	4G modem	Interface	WiFi	PLC*	insulated input	12 V relay output	Article no.	Manual no.
ICC1314-Connect-Plus	✓ (CAT1)	USB, Modbus meter, Ethernet, IPM	✓	✓	2x	2x	B94060073	
ICC1314-Connect-Plus-G1	✓ (CAT1)	USB, Modbus meter, Ethernet, IPM	✓	✓	2x	2x	B94060030	D00520
ICC1314- Companion-G1	---	USB, Modbus meter, IPM	---	✓	2x	2x	B94060031	

*   Powerline Communication acc. to ISO/IEC 15118

Accessory type	Article no.	Manual no.
IPM1300 (integrated power module for ICC1314-Connect-Plus-G1 and ICC1314-Companion-G1)	B94060198	D00462
IPM1301 (integrated power module for ICC1314-Connect-Plus)	B94060062	on request
IPM1401 (integrated power module with phase control for ICC1314-Connect-Plus)	B94060065	on request
HMI150 (RFID reader, 11x RGB-LED, 2-Port USB Hub, buzzer and WiFi)	B94060150	
HMI145 (RFID reader, 11x RGB-LED, 2-port USB Hub and buzzer)	B94060151	D00481
HMI140 (RFID reader and 11x RGB-LED)	B94060152	

Connection kit	Content/Quantity	Article no.
Flat band cable for connecting the IPM	Lenght 0.3 m, 20-pole (1 x)	on request
Cable set Connect Plus and Companion	8-pole, 0.5 m (3 x)	on request

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