

Charge Controller CC612

Preliminary datasheet



Charge Controller CC612



CC612

Device features

- Charge controller acc. to IEC 61851-22 mode 3
- Single and three-phase system
- Control-pilot and proximity signal management
- Universal charge plug control (with or without shutter)
- USB extension port for WiFi home applications
- eHz meter or Modbus interface
- Optional integrated DC 6mA sensing system for type B RCD compliance (only an external type A RCD is required)
- Optional integrated 3G modem including OCPP implementation
- Optional integrated ISO/IEC 15118 power line communication (PLC) for plug & charge and load management systems

Product description

The Bender charge controller CC612 is the main component of a charging point and is designed for use in electric vehicle (EV) charging stations, wall boxes or street light charging points. It enables a setup that is in accordance with current standards, such as IEC 62196, IEC 61851-1 and IEC 61851-22.

The CC612 is characterized by its compact design and size that in turn enables intelligent, small and cost effective charging points. Several product variants are available: one that can connect to a digital eHZ meter using an optical interface while the second variant can read Modbus meters. Both variants can optionally read meters with an S0 interface.

To enable the charge controller in online operation, a backend system is required. Given that most backend providers strictly adhere to the OCPP communication protocol, the charge controller is OCPP 1.5 compliant and compatible with all electric vehicles currently on the market. Integration tests with the backend implementations of providers such as Vattenfall, Bosch, NTT and DRIIVZ have been successfully carried out. The CC612 can be operated as an “always on” system that is always connected to a mobile network. The controller supports 2.5G Edge and 3G UMTS mobile networks. Connectivity for online operation requires a SIM card (which is not included in delivery). User interaction is facilitated using an optional RFID module, which consists of an RFID card reader and LEDs. Charging is initiated by either holding a valid RFID card close to the reader or remotely by the backend system via OCPP. In offline operation, the charge controller can optionally allow charging without authorization or it can authorize users based on RFID and a local white list of authorized RFID cards.

Functional description

As well as the charge controller, a charge point also consists of a relay contactor, which is directly connected to a type 1 or type 2 socket, or to an attached cable with a type 1 or type 2 plug. A 12 V Phoenix Contact Step-PS/1 AC/12 DC/1.5 switched-mode power supply is needed to operate the charge controller, and an optional RFID module is available to facilitate simple user interaction. A charge point may also consist of a meter, and if the meter should be read digitally, either a smart digital meter (EMH eHZ) or a digital Modbus meter is required.

Power flow toward the vehicle is controlled by the contactor (using a signal voltage of up to 30 V), which is itself controlled by the charge controller via a relay in the controller. The CC612 reads the digital eHZ meter readings using a standard optical reader attached to the charge controller via an RJ11 plug. If the Modbus version is used, the Modbus wires are attached directly to the controller. Alternatively, an S0 meter can be attached to one of the available inputs. The SIM card reader is positioned on the controller front panel, as are two USB interfaces, one of which (CONFIG) is used to configure the charge controller. Optionally, this interface can also be used to apply software updates. The other USB interface (USB 1) allows the connection of peripheral USB devices.

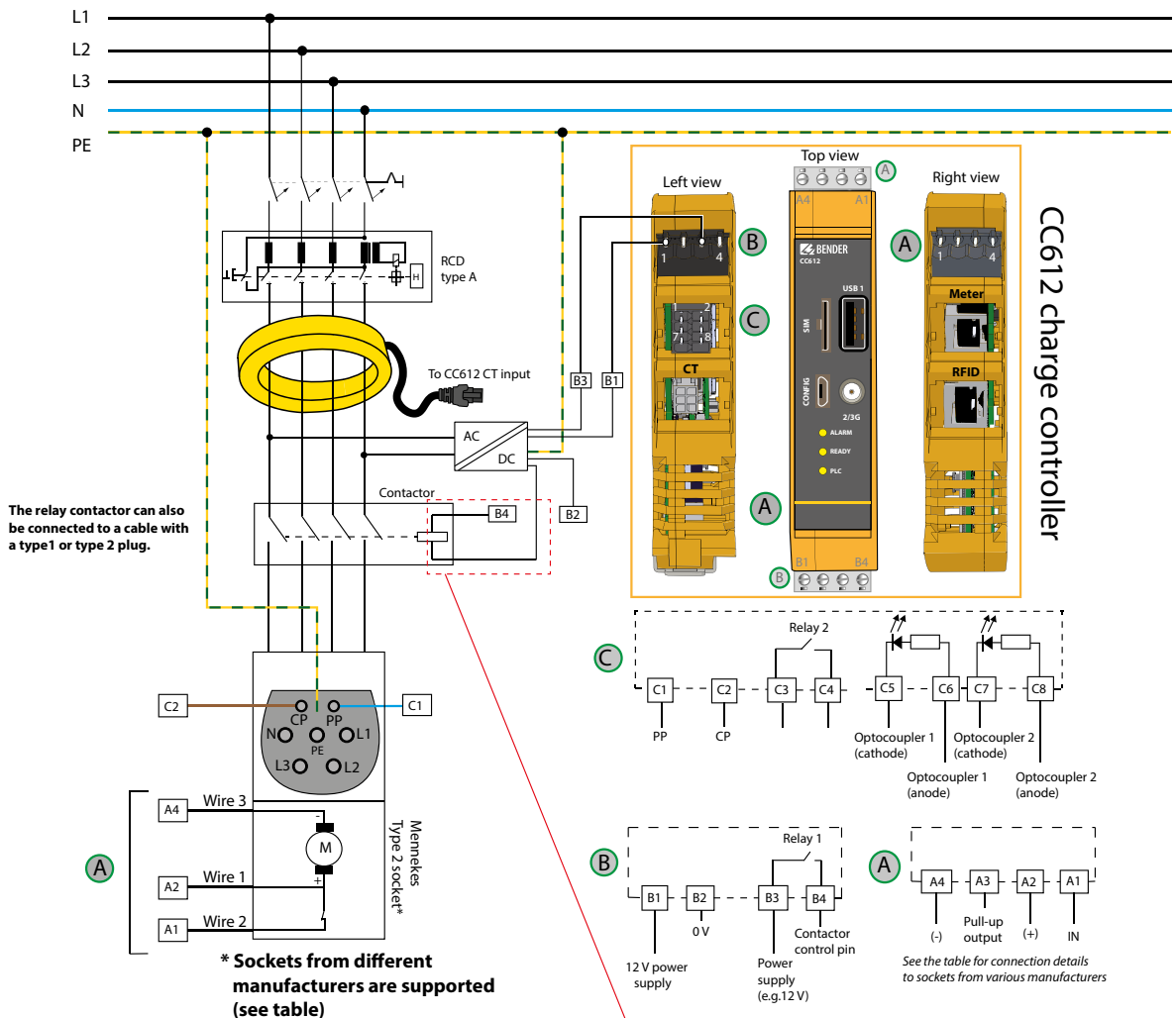
The SIM card can have a PIN number which can be configured via an internal configuration web interface. The APN settings for the card can also be configured via an internal configuration web interface.

The CC612 may feature an optional integrated AC/DC sensitive residual current monitoring function which uses an external current transformer for fault monitoring of AC charging stations. Monitoring of the charging station takes place via an externally connected and shielded current transformer which is connected to the CC612.

Data exchange between the EV and the charge point is possible via ISO/IEC 15118 compliant Powerline Communication (PLC). This feature is optional.

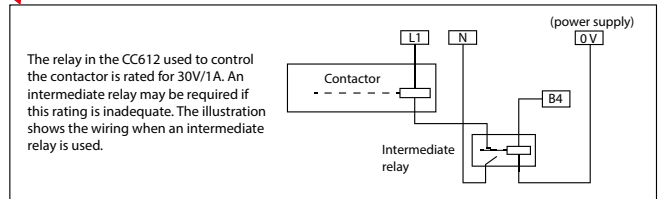
The RFID module consists of an RFID card reader and three charging status LEDs. The module is a separate PCB that should ideally be placed under a semi-transparent part of the outside housing at a distance of at least 20 mm from any significant metal surface or metal parts to ensure optimum reading performance. It is connected to the charge controller using a standard RJ45 cable. Optionally, a display can be attached to this module for more detailed user interaction.

Wiring diagram for a charge point with a type 2 socket



Type 2 sockets**	A4	A3	A2	A1
	Socket actuator wiring			
<ul style="list-style-type: none"> • Mennekes (31016, 31023, 31024, 31038) • Bals (801191 - 801195, 80300, 9743205000, 9743211000) • Walther Werke (9743205000, 9743211000) • Harting 	Wire 3		Wire 1	Wire 2
Phoenix contact (1405213, 1405214, 1405215, 1405216, 1408171, 1408172)	Brown wire	Green wire	Red wire	Yellow wire

** Each type 2 socket can also be used in conjunction with lock release modules from Mennekes and Phoenix Contact. Please refer to wiring diagrams in the CC612 operating manual for connection details.



Technical data

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

Rated voltage	12 V
Overtoltage category/Pollution degree	III/3
Rated impulse withstand voltage	800 V
Application range	≤ 2000 m above sea level

Supply voltage

Nominal supply voltage U_s	DC 12 V
Operating range of the supply voltage	DC 11.4...12.6 V
Power consumption without modem	< 5 VA
Power consumption with modem/short-term peak	< 11 VA

Measuring range residual current

Rated frequency	0...2000 Hz
Measuring range	100 mA rms

Response values

Residual current $I_{\Delta n1}$	DC 6 mA
Response tolerance $I_{\Delta n1}$	-50...0 %
Residual current $I_{\Delta n2}$	30 mA (rms)

Response tolerance $I_{\Delta n2}$ for:

$f \leq 1$ kHz	-20...0 %
$f > 1$ kHz	-20...+100 %

Restart sequence value:

DC 6 mA	< 3 mA
AC/DC 30 mA (rms) for $f \leq 1$ kHz	< 12 mA
AC/DC 30 mA (rms) for $f > 1$ kHz	< 22 mA
Operating time t_{ae1} for $1 \times I_{\Delta n1}$	< 600 ms
Operating time t_{ae2} (at DC or > 15 Hz) for:	
$1 \times I_{\Delta n2}$	< 180 ms
$2 \times I_{\Delta n2}$	< 70 ms
$5 \times I_{\Delta n2}$	< 20 ms

Inputs/outputs and operation

LED ALARM	yellow
LED READY	green
LED PLC	green
USB Extension interface (Ethernet, WiFi, ...)	USB socket type A
CONFIG (Configuration interface)	Micro socket type AB
SIM card	micro SIM
Control pilot (incl. ISO/IEC15118 powerline communication)	
Relay, proximity and optocoupler input (terminal block C)	input/output
Meter (Variant dependent – either RJ11 plug or Modbus connectors)	external
RFID interface (RJ45 cable)	external
Power supply and relay output (terminal block B)	input/output
Plug lock (terminal block A)	input/output

Switching elements

Alarm relay K1	configurable
Alarm relay K2	charging contactor
Switching elements	2 x 1 N/O contacts
Operating principle	N/C operation
Electrical service life	10,000 switching cycles
Contact data acc. to IEC 60947-5-1:	
Rated operational voltage	30 V
Rated operational current	1 A
Minimum contact rating	1 mA at AC/DC ≥ 10 V

Environment/EMC

EMC	IEC 61851-1
Operating temperature	-25...+70 °C
Classification of climatic conditions acc. to IEC 60721:	
Stationary use (IEC 60721-3-3)	3k5 (except condensation and formation of ice)
Transport (IEC 60721-3-2)	2K3
Storage (IEC 60721-3-1)	1K4
Classification of mechanical conditions acc. to IEC 60721:	
Stationary use (IEC 60721-3-3)	3M4
Transport (IEC 60721-3-2)	2M2
Storage (IEC 60721-3-1)	1M3

Connection

Connection type (terminal block C)	push-wire terminal
Connection properties:	
rigid/flexible	0.2...1.5 mm ² (AWG 24...16)
flexible with ferrule without plastic sleeve	0.25...1.5 mm ² (AWG 24...16)
flexible with ferrule with plastic sleeve	0.25...0.75 mm ² (AWG 24...20)
Stripping length	10 mm
Opening force	0.5-0.6 Nm (4-5 lb-in)
Connection type (terminal blocks A and B)	screw terminal
Connection properties:	
rigid/flexible	0.2...2.5 mm ² (AWG 24...14)
flexible with ferrule without plastic sleeve	0.25...2.5 mm ² (AWG 24...14)
flexible with ferrule with plastic sleeve	0.25...1.5 mm ² (AWG 24...16)
Stripping length	7 mm
RJ 45	RFID reader
RJ 11	meter
Molex Micro-Fit 3.0 TM	CT

Other

Operating mode	continuous operation
Degree of protection	IP 20
DIN rail mounting	IEC 60715
Documentation number	D00254

Ordering information

Supply voltage U_s	6 mA sensor	Type	Art. No.
DC			
12V	■	CC612-1P3-R	B 9406 0001

Accessories

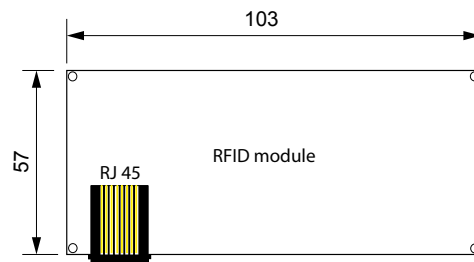
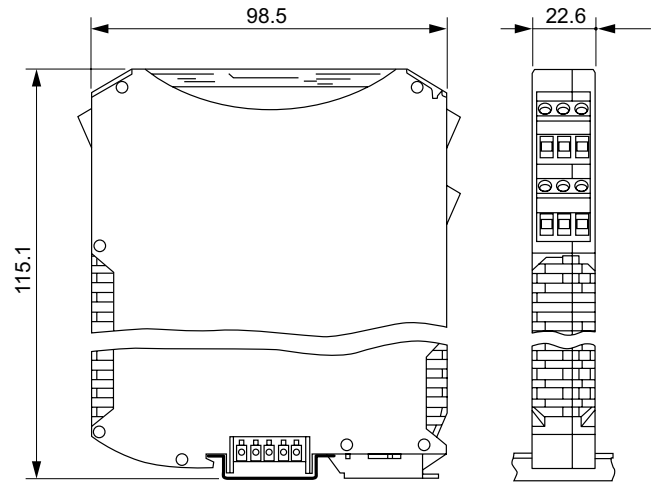
Type designation	Art. No.
RFID PCB (RJ45 cable (length 500mm) included)	B 9406 0110
Current transformer W15BS (cable length 1500mm)	B 9808 0065
Current transformer W15BS-02 (cable length 180mm)	B 9808 0067

Accessories to be ordered separately by customer

Type designation	Art. No.
Phoenix Contact PSI-GSM/UMTS-QB-ANT antenna	2313371

Dimension diagram

Dimensions in mm





Bender GmbH & Co. KG

P.O. Box 1161 • 35301 Gruenberg • Germany
Londorfer Strasse 65 • 35305 Gruenberg • Germany
Tel.: +49 6401 807-0 • Fax: +49 6401 807-259
E-Mail: info@bender.de • www.bender.de



BENDER Group