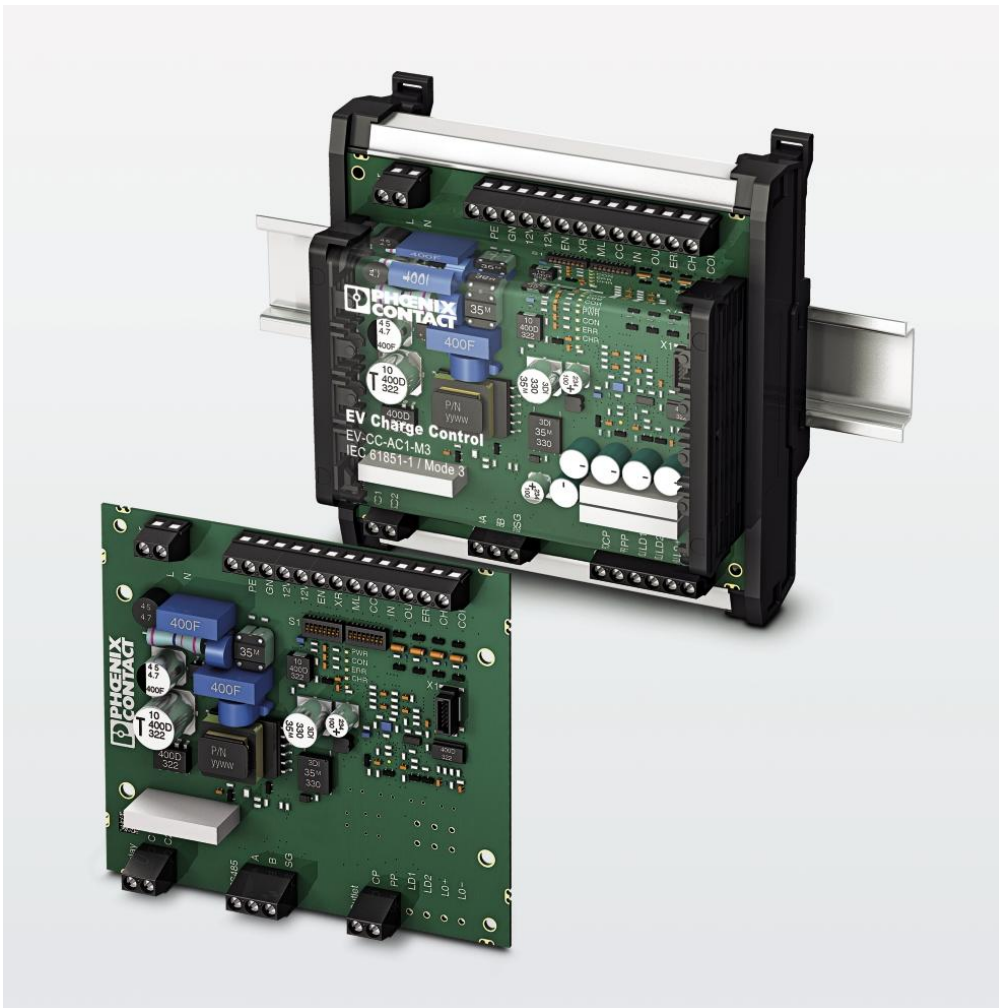


Application Guide

EVCC Basic



Quick Guide for the Set-Up of Charging Stations with the
Charge Controller EVCC Basic

October 2016

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1. Introduction

The charge controller of EVCC Basic from Phoenix Contact is designed for the use in charging stations to charge electric vehicle according to IEC 61851-1, SAEJ1772 and GB/T 18487.1.

Beside the basic requirements of charging control, the device can be used for diverse functions around this application and in combination with products of other manufacturer.

This document provides the user with information on how to use the charge controller EVCC Basic for diverse application scenarios and how to realize specific functions. Attention is focused on the connection and configuration of the charge controller and does not claim to be a complete description of the application. Standard components without specific requirements for the application are not explicitly listed. The wiring examples do not show the complete set up of a charging station. It is the responsibility of the manufacturer to comply with the applicable standards and legal requirements, to take measures to ensure the electrical safety and to the recognized rules of engineering.

If articles from third parties are used, please check whether the technical specifications and the descriptions of the products are suitable for the proposed application.

The delivered safety notes of the Phoenix Contact products and articles from third parties shall be observed in any case.

Although Phoenix Contact E-Mobility GmbH has taken care to ensure the correctness of the content, we can not take any responsibility regarding the perfectibility, accuracy, availability and safety of this Application Note. We do not take any responsibility for damages or costs that occur on an electrical connection through a nonqualified person and/or an installation not done in accordance with the regulations or standards.

2. Device Configuration

There are two levels of configuration of the EVCC Basic: Basic configuration is done by setting the on-board DIP switches, in depth configuration can be done by setting corresponding registers via Modbus RTU.

2.1 DIP-Switches

Basic Configuration and function enabling are possible with DIP-switches on the printed circuit board (pcb), see Figure 1: EVCC Basic pcb layout.

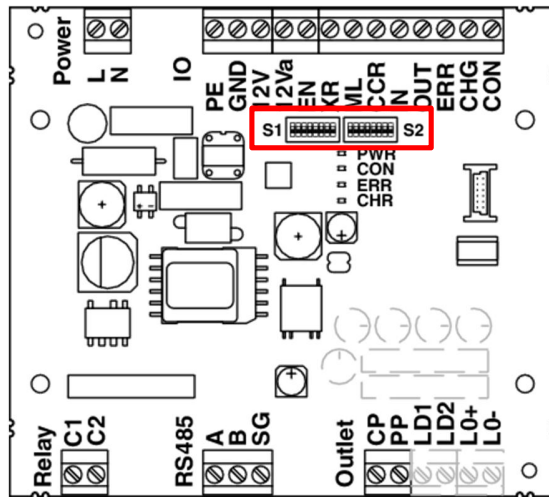


Figure 1: EVCC Basic pcb layout

| No. | DIP | Name | Description | | | | | |
|-------|------------------------------|--------------------------------------|---|--|---------|---------|-----|---|
| S1 | 1 | Connection, case B/C | ON | Charging station with vehicle connector (case C) | | | * | |
| | | | OFF | Charging station with infrastructure socket outlet (case B) | | | | |
| | 2 | XR evaluation | ON | XR input is evaluated, XR = 0 → status F | | | | |
| | | | OFF | XR input is not evaluated or XR input is evaluated in a modified way according to Modbus register 4011 | | | | |
| | 3 | Locking function | ON | Connection locking upon signal at digital input ML, can be configured | | | | * |
| | | | OFF | Connection locking at status B | | | | |
| | 4 | Evaluation of 13 A charging cable | ON | 13 A charging cable is not permissible | | | | * |
| | | | OFF | 13 A charging cable is permissible | | | | |
| | 5 + 6 | Default setting for charging current | | Depending on digital input CCR | CCR = 0 | CCR = 1 | | |
| | | | | 5 = OFF | 6 = OFF | 16 A | 8 A | |
| | | | 5 = OFF | 6 = ON | 20 A | 10 A | | |
| | | | 5 = ON | 6 = OFF | 32 A | 13 A | | |
| | | | 5 = ON | 6 = ON | 63 A | 20 A | | |
| 7 | Evaluation of Proximity Plug | ON | Evaluation according to GB/T 18487.1 | | | | * | |
| | | OFF | Evaluation according to IEC 61851-1 | | | | | |
| 8 | Optional locking | ON | No locking of the charging connector and evaluation of the locking confirmation LD1/LD2 | | | | * | |
| | | OFF | Locking of the charging connector and evaluation of the locking confirmation LD1/LD2 | | | | * | |
| S2 | 1 | Baud rate | ON | 19200 | | | | |
| | | | OFF | 9600 | | | | |
| | 2 - 6 | Modbus address | ON = 1 | 0, 0, 0, 0, 1 = Modbus address 1 | | | | |
| | | | OFF = 0 | 0, 0, 0, 1, 0 = Modbus address 2 | | | | |
| | | | ... | | | | | |
| | | | 1, 1, 1, 1, 0 = Modbus address 30 | | | | | |
| | | | 1, 1, 1, 1, 1 = reserved | | | | | |
| 7 + 8 | | Reserved for future expansions | | | | | | |

* Not for EV-CC-AC1-M3-CC-...



2.2 Modbus-Configuration

In order to connect to the EVCC Basic with a personal computer, adapter like USB-RS485 converter can be used, e.g.

FTDI USB-RS485-WE-1800-BT KABEL, USB-RS485, SER KONV

With this cable, connect the EVCC Basic in the following way, see Figure 2: Connections of the RS385-USB converter:

RS485 / A -> orange

RS485 / B -> yellow

RS485 / SG -> black

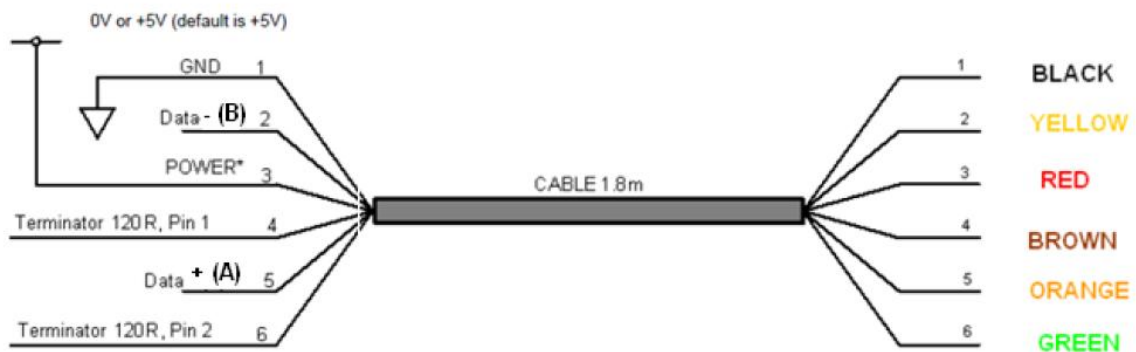


Figure 2: Connections of the RS385-USB converter

After connection, verify the COM port of the adapter and check the selected Modbus address and baud rate of the EVCC Basic.

2.2.1 Configuration via the Device Monitor

Phoenix Contact Device Monitor is a configuration and diagnostic tool for remote control of the EVCC basic. This allows the user to write selected registers for the most common applications and read back the currently active configuration and the status from the corresponding Modbus registers.

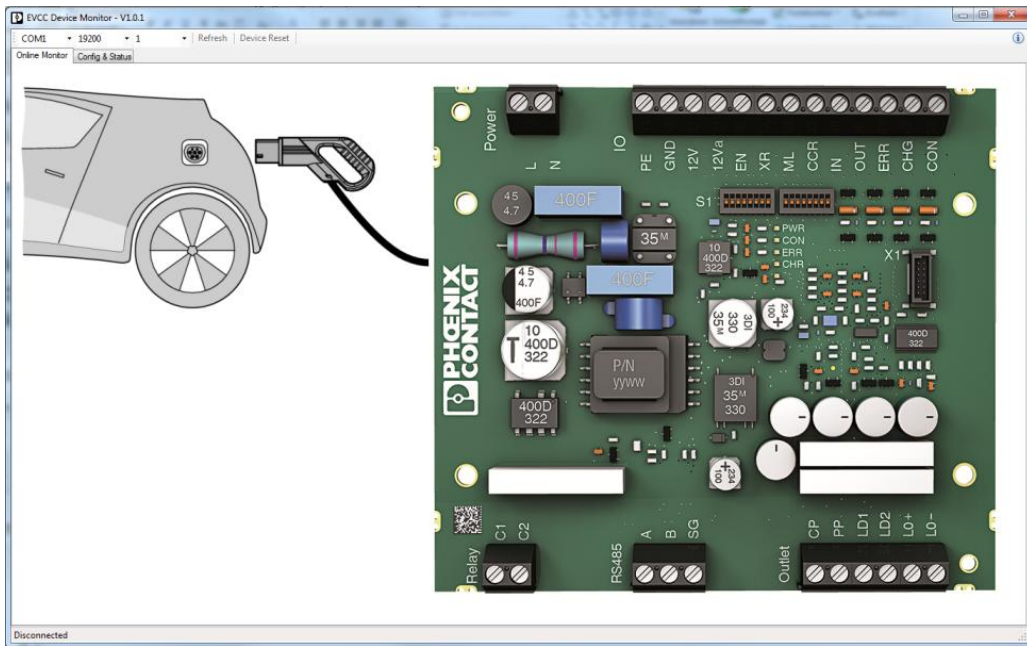


Figure 3: EVCC Device Monitor - Online Monitor

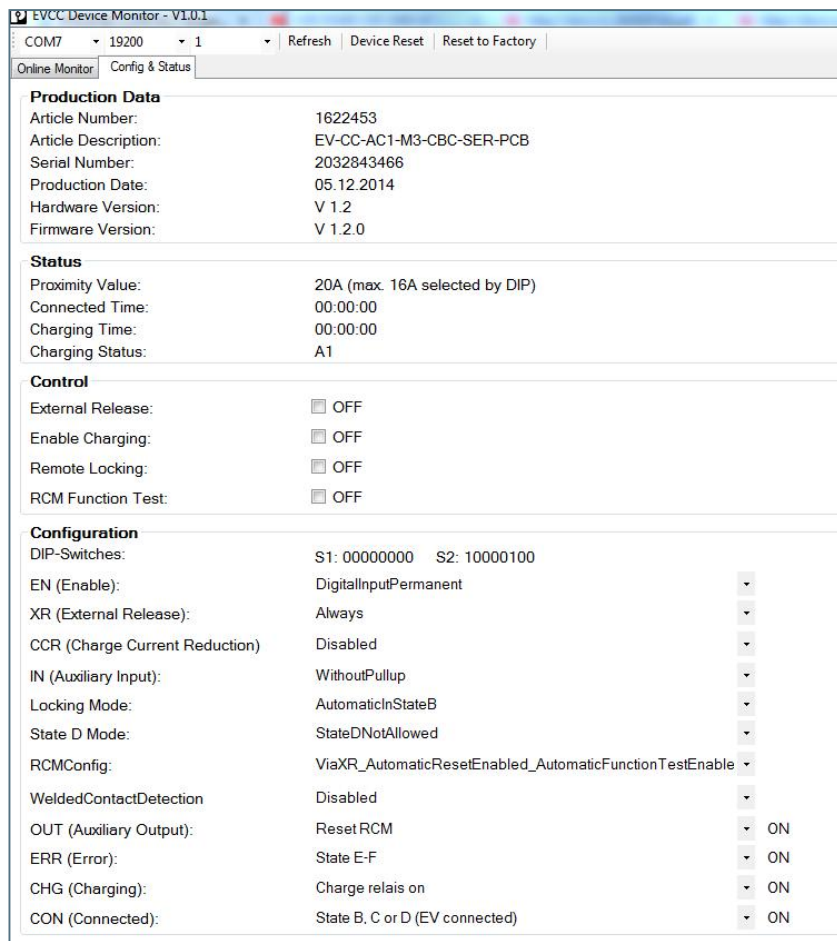


Figure 4: Device Monitor - Configuration and Status



Please contact the product marketing team Control of Phoenix Contact E-Mobility for access to the software.

2.2.2 Configuration via Modpoll

- Please download the program from the website <http://www.modbusdriver.com/modpoll.html>

With this tool, single Modbus commands can be sent, but also multiple commands can be combined in a batch file to make a complete configuration within one step.

Under Microsoft Windows modpoll can be used following the outlined steps:

- Open the Command Prompt window by clicking the Start button, -> All Programs, -> Accessories, and then -> Command Prompt.
- With the "CD" commands navigate to the folder, where the modpoll program has been stored
- The command prompt is a console to enter read and write Modbus commands as text
- A Modbus activity is started by entering "modpoll" in the command line, followed by a parameter list
- By entering modpoll -h all command options available by the modpoll program a listed

Example Commandos

| Commando | Description |
|---|------------------------------------|
| Cd <i>directory</i> | Move to <i>directory</i> |
| cd .. | Moves you up one directory |
| Dir | Show content of the actual folders |
| <name of the batch file> (e.g. "Conf-EVCC") | To run the batch file |

```

Administrator: Eingabeaufforderung - Conf-EVCC
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. Alle Rechte vorbehalten.

C:\Users\pbc101>cd..
C:\Users>cd..
C:\>cd modpoll
C:\Modpoll>dir
Datenträger in Laufwerk C: ist System
Volumeseriennummer: E8C4-7FA3

Verzeichnis von C:\Modpoll

22.07.2015 07:57 <DIR>          .
22.07.2015 07:57 <DIR>          ..
22.07.2015 07:50                470 Conf-EVCC.bat
30.01.2013 18:34                114.688 modpoll.exe
                2 Datei(en), 115.150 Bytes
                2 Verzeichnis(se), 20.627.316.736 Bytes frei

C:\Modpoll>Conf-EVCC
Konfiguration Demoboard EVCC Basic mit RCM
Bitte Comport des RS485-Adapter eingeben und bestaetigen : 8
modpoll 3.4 - FieldTalk(tm) Modbus(R) Master Simulator
Copyright (c) 2002-2013 proconX Pty Ltd
Visit http://www.modbusdriver.com for Modbus libraries and tools.

Protocol configuration: Modbus RTU
Slave configuration...: address = 1, start reference = 4011 (PDU), count = 1
Communication.....: COM8, 19200, 8, 1, none, t/o 1.00 s, poll rate 1000 ms
Data type.....: 16-bit register, output (holding) register table

Written 1 reference.
Der Befehl "wait" ist entweder falsch geschrieben oder
konnte nicht gefunden werden.
modpoll 3.4 - FieldTalk(tm) Modbus(R) Master Simulator
Copyright (c) 2002-2013 proconX Pty Ltd
Visit http://www.modbusdriver.com for Modbus libraries and tools.

Protocol configuration: Modbus RTU
Slave configuration...: address = 1, start reference = 5500 (PDU), count = 1
Communication.....: COM8, 19200, 8, 1, none, t/o 1.00 s, poll rate 1000 ms
Data type.....: 16-bit register, output (holding) register table

```

Figure 5: Command Prompt window (example)

Example Command Lines:

Configuration of the EN input for pulsed or permanent signals

EN = permanent:

```
modpoll -m rtu -a 1 -t 4 -r 4000 -0 -1 -b 9600 -d 8 -p none COM10 1
```

EN = pulse:

```
modpoll -m rtu -a 1 -t 4 -r 4000 -0 -1 -b 9600 -d 8 -p none COM10 2
```

Release and termination of a charging process via Modbus

```
modpoll -m rtu -a 1 -t 0 -r 20000 -0 -1 -b 9600 -d 8 -p none COM10 1
```

```
modpoll -m rtu -a 1 -t 0 -r 20000 -0 -1 -b 9600 -d 8 -p none COM10 0
```

Batch file to configure the EV CC Basic for Use with an EV-RCM Module

```
@echo off
```

```
echo Configuration of EV Charge Controller Basic for use with EV-RCM
```

```
echo Error signal of EV-RCM connected to "XR" Input of the EV CC Basic
```

```
echo Reset of EV-RCM via the output "OUT" of the EV CC Basic
```

```
@set /p Comport="Please Enter COM-port of RS485-Adapter : "
```

```
@set /p Baud="Please enter Baudrate of the device (19200 / 9600) : "
```

```
@set /p Adr="Please enter Modbus device address (1...31) : "
```

```
echo Activation of the EV-RCM with automatic reset and self test
```

```
modpoll -m rtu -a %Adr% -t 4 -r 4011 -0 -1 -b %Baud% -d 8 -p none COM%Comport% 1
```

```
@wait 1
```

```
echo Configuration of the output "OUT" for automatic reset
```

```
modpoll -m rtu -a %Adr% -t 4 -r 5500 -0 -1 -b %Baud% -d 8 -p none COM%Comport% 38
```

```
@wait 1
```

```
echo Neustart Ladecontroller
```

```
modpoll -m rtu -a %Adr% -t 0 -r 21000 -0 -1 -b %Baud% -d 8 -p none COM%Comport% 1
```

```
@wait 1
```

```
Pause
```

Remark:

In case multiple charge controller shall be configured with the same communication settings, the variables of the previous example can be replaced by fixed values

Example for Modbus-Address 1, COM-Port 15, Baudrate 9600

```
@echo off
```

```
modpoll -m rtu -a 1 -t 4 -r 4011 -0 -1 -b 9600 -d 8 -p none COM15 1
```

```
@wait 1
```

```
modpoll -m rtu -a 1 -t 4 -r 5500 -0 -1 -b 9600 -d 8 -p none COM15 38
```

```
@wait 1
```

```
modpoll -m rtu -a 1 -t 0 -r 21000 -0 -1 -b 9600 -d 8 -p none COM15 1
```

```
@wait 1
```

```
Pause
```

3. Application examples

3.1 Charging Point with Socket Outlet (Case B)

Description

Charging station with socket outlet, release of charging sequence based on external potential free contact (key switch, push button, RFID-reader, etc), plug locking in the socket outlet after vehicle detection.

Wiring Diagram

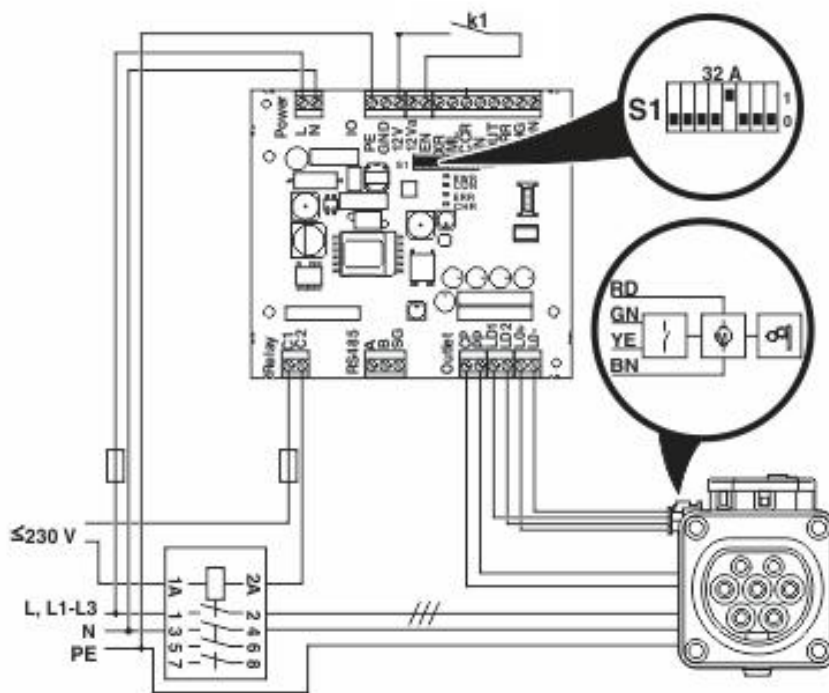


Figure 6: Charging point with socket outlet

Part List of core components

| Phoenix Contact Article | Article description | Article number |
|-------------------------------|---|--------------------|
| Charge controller | EV-CC-AC1-M3-xxx | 1622452 o. 1622453 |
| Socket outlet | EV-T2M3SE12-3ACxxx | E.g. 1405214 (32A) |
| Hinge cover | EV-T2SC | 1405217 |
| Specific Third Party Products | | |
| Load contactor | Standard electrical installation device | |



Configuration

| DIP-Switch | Function |
|-----------------|---|
| S1, DIP 5 | OFF = 16A, ON = 32A |
| Modbus Register | |
| 4000 | EN-Input configuration = "1" (default): potential free contact, switch = "2": potential free contact, push-button |

Configuration via the EVCC Device Monitor

| | |
|--------------------------------|-----------------------|
| EN (Enable): | DigitalInputPulsed |
| XR (External Release): | Always |
| CCR (Charge Current Reduction) | DigitalInputPermanent |
| IN (Auxiliary Input): | DigitalInputPulsed |
| | ModbusEnable |
| | WithoutPullup |

3.1.1 Variant Release of the Charging Process with a Pulsed Signal at EN, Termination in Status A

Description

When a vehicle is connected, a pulsed release signal can be applied to the EN input – configured for permanent signals – by a push button, RFID reader or similar. One output will be configured to the event of „PWM on“, which is connected via a resistor to the EN input. This signal maintains the release signal as long as the PWM signal on the controller is activated. When the vehicle is disconnected from the charging station, the PWM signal is turned off and the charging release is terminated

Remark: In case of a complete power loss, there will be no automatic restart in this configuration possible.

Wiring Diagram

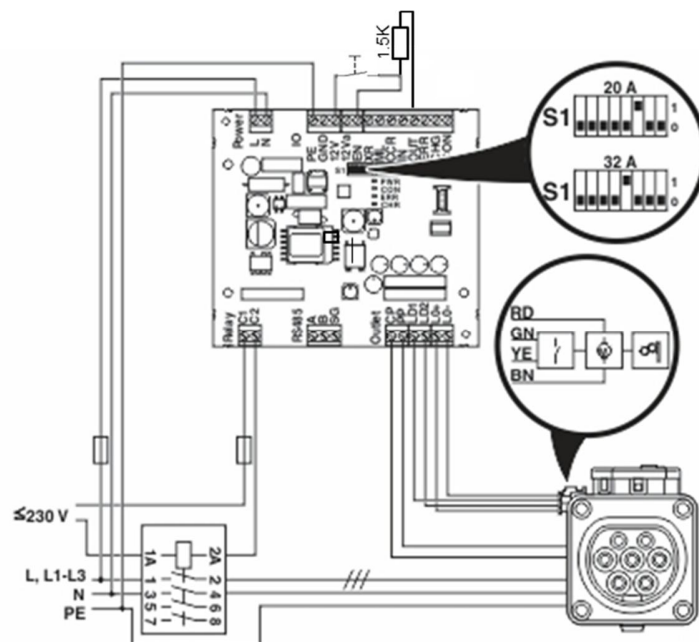


Figure 7: Charge point with socket outlet and self locking push-button

Part List of core components

| Phoenix Contact Article | Article description | Article number |
|-------------------------------|---|--------------------|
| Charge controller | EV-CC-AC1-M3-xxx | 1622452 o. 1622453 |
| Socket outlet | EV-T2M3SE12-3ACxxx | E.g. 1405214 (32A) |
| Hinge cover | EV-T2SC | 1405217 |
| Specific Third Party Products | | |
| Load contactor | Standard electrical installation device | |
| Resistor | 1,5 kOhm | |

Configuration

| DIP-Switch | Function |
|--------------------|---|
| S1, DIP 5 | OFF = 16A, ON = 32A |
| Modbus Register | |
| 4000 = 1 (default) | The charging process will be release with a permanent „high“ signal at the EN input |
| 5500 = 17 | The output “Out” is configured to the event “PWM ON” |

Configuration via the EVCC Device Monitor

| | | | | |
|-------------------------|--------|---|----|---|
| OUT (Auxiliary Output): | PWM on | ▼ | ON | ▼ |
|-------------------------|--------|---|----|---|

3.2 Charging Point with Connector (Case C)

Description

Charging station with connector, LED display function, release of charging process via dry contact

Wiring Diagram

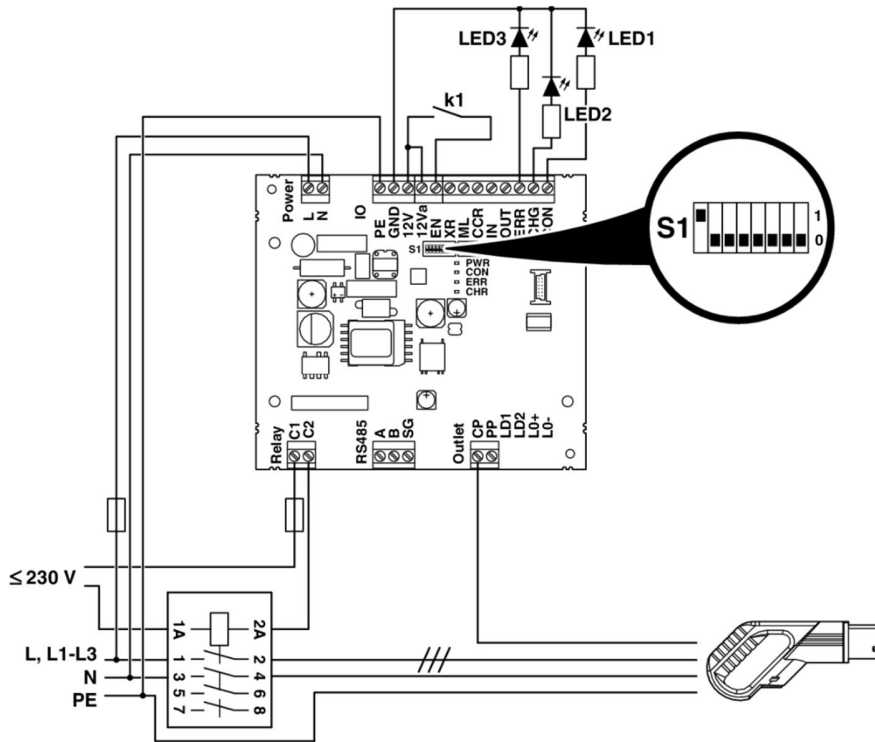


Figure 8: Charging point with Connector

Part List of core components

| Phoenix Contact Article | Article description | Article number |
|----------------------------------|---|--------------------|
| Charge controller | EV-CC-AC1-M3-xxx | 1622459 o. 1622460 |
| AC-Connector, 4 m, spiraled, 20A | EV-T2M3P-1AC20A-4,0M2,5EHBK00 | 1623321 |
| AC-Connector, 4 m, straight, 32A | EV-T2M3P-3AC32A-4,0M6,0ESBK00 | 1622677 |
| Specific Third Party Products | | |
| Load contactor | Standard electrical installation device | |
| Signalling LED | Standard 12V LED | |

Configuration

| DIP-Switch | Function |
|-----------------|--|
| S1, DIP 1 | ON =Charging station with vehicle connector (case C). For article 1622459 and 1622460, this DIP switch is without function |
| S1, DIP 5 | OFF = 16A, ON = 32A |
| Modbus Register | |
| | |

Release Requirements: none

Configuration via the EVCC Device Monitor

| | |
|--------------------------------|---|
| EN (Enable): | <input type="text" value="DigitalInputPulsed"/> |
| XR (External Release): | <input type="text" value="Always"/> |
| CCR (Charge Current Reduction) | <input type="text" value="DigitalInputPulsed"/> |
| IN (Auxiliary Input): | <input type="text" value="ModbusEnable"/> |
| | <input type="text" value="WithoutPullup"/> |



3.3 Connection of the EVCC Basic with a Single Chanel EV-RCM Module

Firmware-Release 1.2.0 or higher

Description

Single AC charging spot with EV CC Basic and DC-Residual Current Detection (6 mA DC) according to IEC 61851-1, IEC 60364-7-722 and DIN VDE 0100-722. In case of DC residual current (> 6mA DC), the charging process will be terminated and the charge controller enters a failure state. After disconnecting the vehicle from the charging station, the EV-RCM module will be – if configured accordingly - reset by the charge controller automatically without manual action.

For the detection of AC failure currents (>30 mA AC), a RCD type A is required in any case for each charging point.

Wiring Diagram

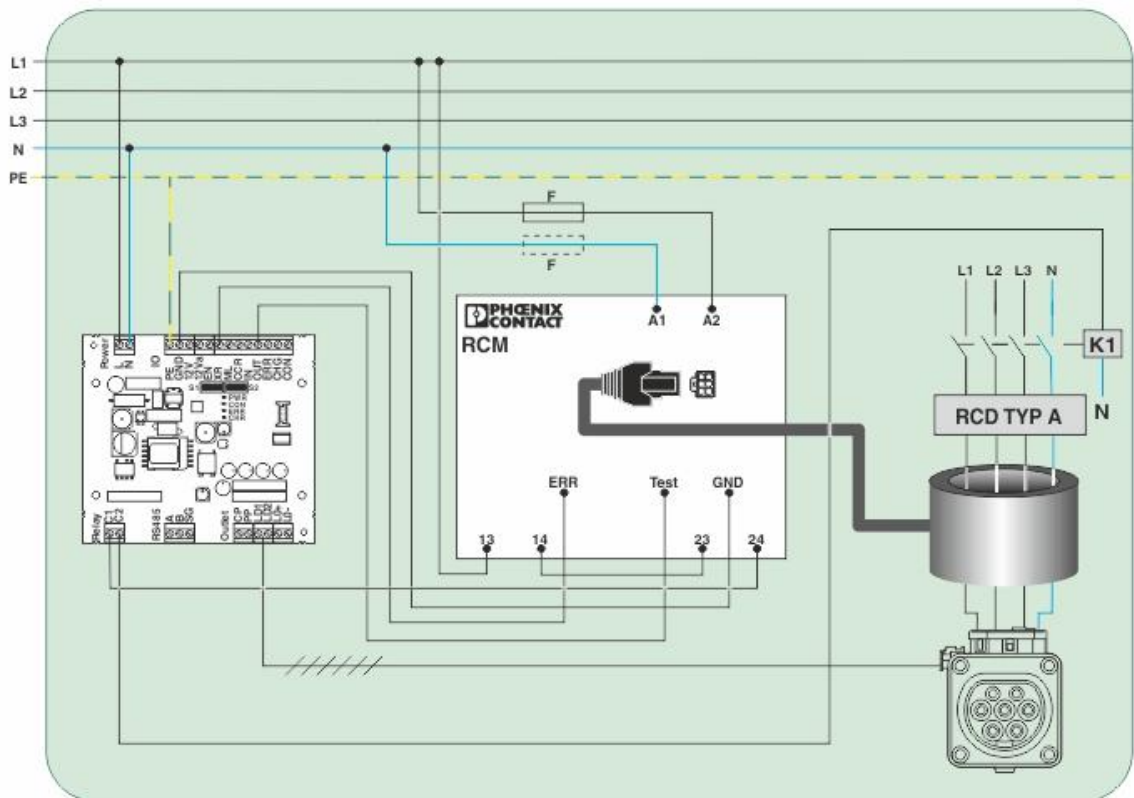


Figure 9: Charging point with residual current detection (RCM)

Part List of core components

| Phoenix Contact Article | Article description | Article number |
|---|--|------------------------|
| Charge controller | EV-CC-AC1-M3-xxx | 1622452, -53, -59, -60 |
| EV-RCM Basic | EV-RCM-C1-AC30-DC6 | 1622450 |
| Socket outlet | EV-T2M3SE12-3ACxxx | E.g. 1405214 (32A) |
| Alternatively: e.g. AC connector, 4m, smooth, 32A | EV-T2M3P-3AC32A-4,0M6,0ESBK00 | 1622677 |
| Specific Third Party Products | | |
| RCD type A | Standard electrical installation product | ----- |
| Load contactor | Standard electrical installation device | |

Requirements for the operation with the RCM module

| DIP-Switch S1 at the RCM | Function |
|--------------------------|--|
| 0 | The error message must be reset manually or using the EVCC Basic charge controller |

Configuration

| DIP-Switch | | Function |
|-----------------|------|---|
| S1 DIP2 | 0 | XR-Input will be evaluated based on modbus register entry 4011 |
| Modbus Register | | Function |
| | | Reset of error messages Automatic self test after every charging process |
| 4011 | "1" | activated activated |
| | "2" | not activated activated |
| | "3" | activated not activated |
| | "4" | not activated not activated |
| 5500 | "38" | Triggering the self-test function of the RCM device with the contact "Out" on the EV CC Basic |

Configuration via the EVCC Device Monitor

| | | |
|-------------------------|---|------|
| RCMConfig: | ViaXR_AutomaticResetEnabled_AutomaticFunctionTestEnable | ▼ |
| WeldedContactDetection | Disabled | ▼ |
| OUT (Auxiliary Output): | Reset RCM | ▼ ON |



3.4 Connection of 2 EV CC Basic with Dual Chanel RCM module

Firmware-Release 1.2.0 or higher

Description

Dual AC charging spot with two EV CC Basic and one dual RCM module for the DC-Residual Current Detection (6 mA DC) according to IEC 61851-1, IEC 60364-7-722 and DIN VDE 0100-722. In case of DC residual current (> 6mA DC), the charging process will be terminated and the charge controller enters a failure state. After disconnecting the vehicle from the charging station, the EV-RCM module will be – if configured accordingly - reset by the charge controller automatically without manual action. For the detection of AC failure currents (>30 mA AC), a RCD type A is required in any case for each charging point.

Please note: Activation of the self-test function

The Activation of the self-test function in combination with the dual channel RCM module is only technically useful if both charge control units (EV CC Basic) are monitored by a master control unit with an RS 485 interface. Please refer to point 3.5.

Wiring Diagram

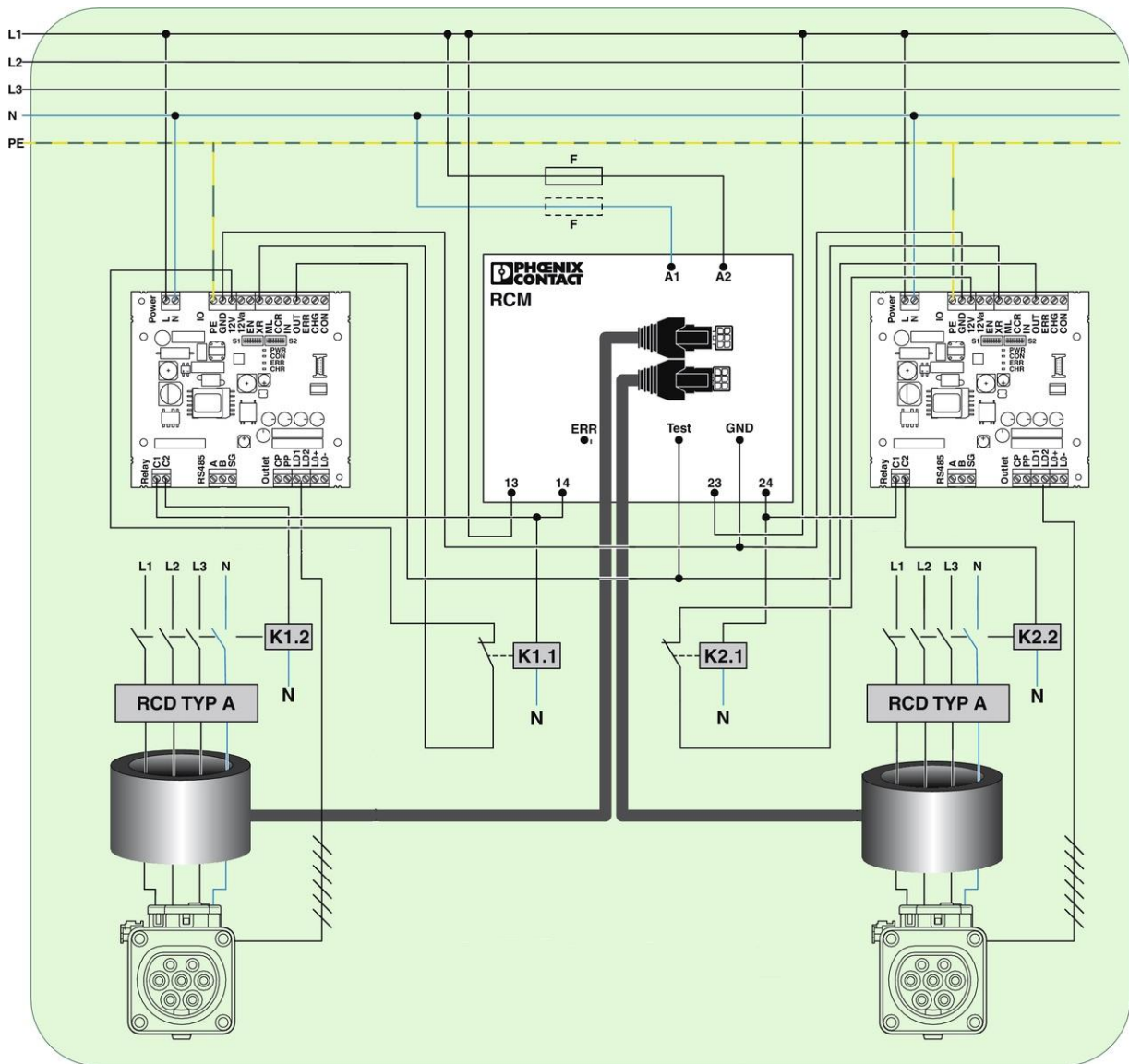


Figure 10: Two Charging points with dual RCM module

Part List of core components

| Phoenix Contact Article | Article description | Article number |
|--------------------------------|--|---------------------|
| 1 x RCM Compact | EV-RCM-C2-AC30-DC6 | 1622451 |
| 2 x Charge Controller | EV-CC-AC1-M3-xxx | 1622452,-52,-59,-60 |
| 2 x Socket Outlet | EV-T2M3SE12-3ACxxx | Z.B. 1405214 (32A) |
| Relais (K1.1, K2.1) | PLC-RSP-230UC/21) | 2966537 |
| Specific Third Party Products | | |
| 2 x RCD type A | Standard electrical installation product | |
| 2 x Load contactor (K1.2,K2.2) | Standard electrical installation product | |



Requirements for the operation with the EV-RCM module

| DIP-Switch S1 at the RCM | Function |
|--------------------------|---|
| 0 | The error message must be reset manually or using the EVCC Basic charge controller. |

Configuration

| DIP-Switch | | Function | |
|-----------------|------|--|--|
| S1 DIP2 | 0 | XR-Input will be evaluated based on modbus register entry 4011 | |
| Modbus Register | | Function | |
| | | Reset of error messages | Automatic self-test after every charging process |
| 4011 | "3" | Activated | Not activated |
| | "4" | Not activated | Not activated |
| 5500 | "38" | Triggering the self-test function of the RCM device with the contact "Out" on the EVCC Basic | |

*: Automatic self-test not applicable in this configuration

Please note:

The Activation of the self-test function in combination with the dual channel RCM module is only technically useful if both charge control units (EV CC Basic) are monitored by a master control unit with an RS 485 interface. In the time of the self-test it must be ensured that no current flows through the sensor otherwise the sensor can be set incorrectly. Thus, the EV CC Basic units (Slave) in combination with the Master control unit detects if electrical vehicles are connected to the charging station or not, to carry out the self-test. This is done by writing the value "1" to the register 20003 of one of the EVCC Basic charge controller.

Please note:

1. The control of the load contactor will be realized by the potential free contacts of the EV-RCM (13/14 and 23/24) and via C1 / C2 of the EVCC Basic charge controller.
2. The error contact (EER) at the RCM module will not be used. The error message (12V signal) is supplied with the auxiliary relays to the corresponding contacts (XR) of the charge controls. In this case, the corresponding auxiliary relay is controlled by the contact 14 or 24 of the RCM module. The 12V signal can be taken from the Basic controller and contact via the NC contacts of the auxiliary relay to the XR terminal of the corresponding control unit.
3. The self-test function cannot be applied in this configuration. The operator has to ensure, that this is done manually on a regular basis.

Configuration via the EVCC Device Monitor

| | | |
|-------------------------|---|--------|
| RCMConfig: | ViaXR_AutomaticResetEnabled_AutomaticFunctionTestDisabl | ▼ |
| WeldedContactDetection | Disabled | ▼ |
| OUT (Auxiliary Output): | Reset RCM | ▼ ON ▼ |

3.5 Connection of 2 EV CC Basic Dual Chanel RCM module and optional a master control unit

Firmware-Release 1.2.0 or higher

Description

Dual AC charging spot with two EV CC Basic and dual RCM module for the DC-Residual Current Detection (6 mA DC) according to IEC 61851-1, IEC 60364-7-722 and DIN VDE 0100-722. In case of DC residual current (> 6mA DC), the charging process will be terminated and the charge controller enters a failure state. After disconnecting the vehicle from the charging station, the EV-RCM module will be – if configured accordingly - reset by the charge controller automatically without manual action.

For the detection of AC failure currents (>30 mA AC), a RCD type A is required in any case for each charging point.

The self-test of the EV-RCM can be initiated by writing the value "1" into the register 20003 by the master control unit. This shall be done when both outlets are not connected to an electric vehicle

Wiring Diagram

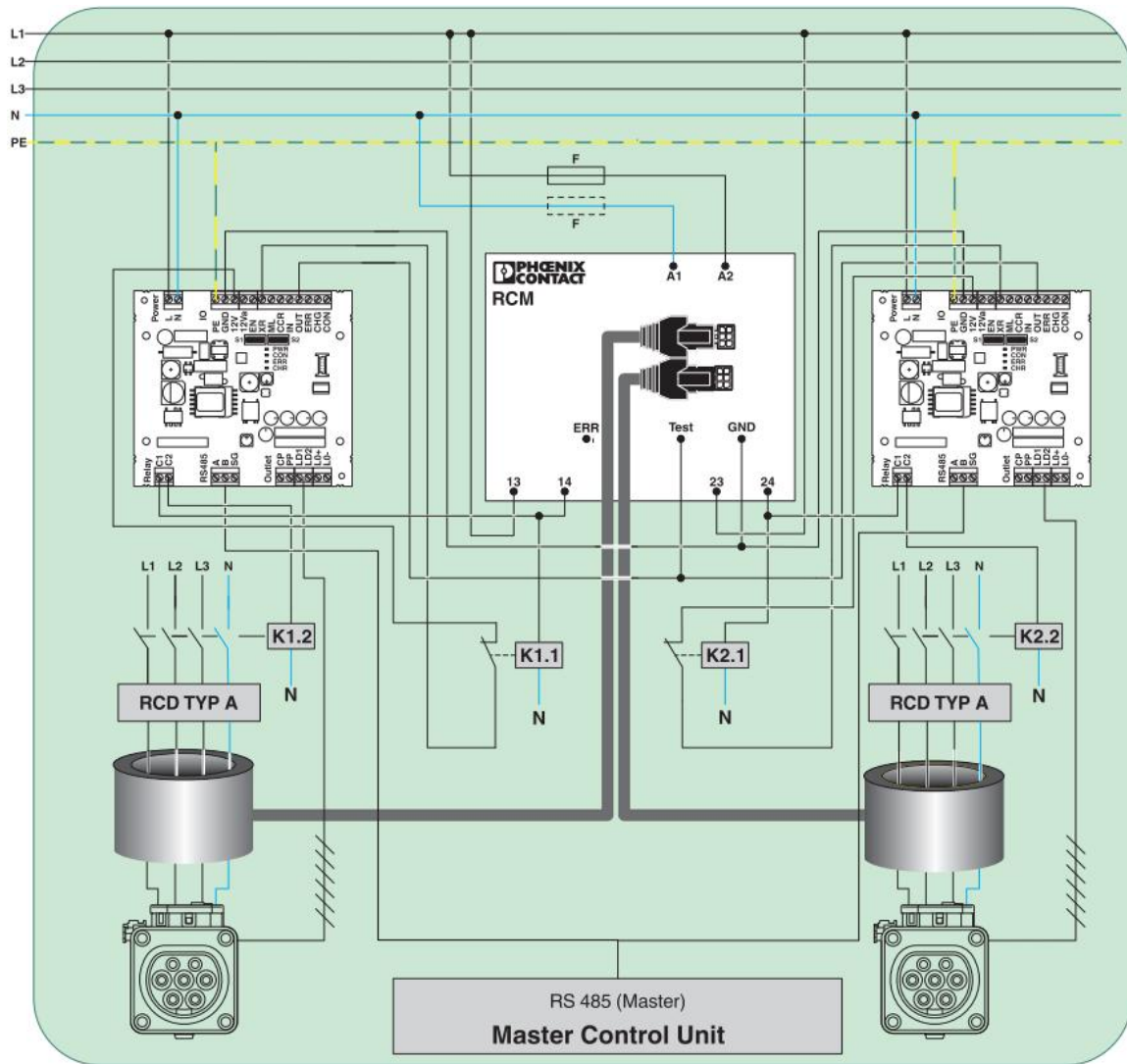


Figure 11: Charging point with residual current detection (EV-RCM)

Part List of core components

| Phoenix Contact Article | Article description | Article number |
|--------------------------------|--|---------------------|
| 1 x RCM Compact | EV-RCM-C2-AC30-DC6 | 1622451 |
| 2 x Charge Controller | EV-CC-AC1-M3-xxx | 1622452,-52,-59,-60 |
| 2 x Socket Outlet | EV-T2M3SE12-3ACxxx | Z.B. 1405214 (32A) |
| 1 x Master Control Unit | ILC 131 | 2700973 |
| 1 x RS 485 Interface Module | IL RS 485/422 | 2861933 |
| Relais (K1.1, K2.1) | PLC-RSP-230UC/21) | 2966537 |
| Specific Third Party Products | | |
| 2 x RCD type A | Standard electrical installation product | |
| 2 x Load contactor (K1.2,K2.2) | Standard electrical installation product | |

Requirements for the operation with the EV-RCM module

| DIP-Switch S1 at the RCM | Function |
|--------------------------|---|
| 0 | The error message must be reset manually or using the EVCC Basic charge controller. |

Configuration

| DIP-Switch | | Function | |
|-----------------|------|--|--|
| S1 DIP2 | 0 | XR-Input will be evaluated based on modbus register entry 4011 | |
| Modbus Register | | Function | |
| | | Reset of error messages | Automatic self-test after every charging process |
| 4011 | "3" | Activated | Not activated |
| | "4" | Not activated | Not activated |
| 5500 | "38" | Triggering the self-test function of the RCM device with the contact "Out" on the EVCC Basic | |

Please note:

The Activation of the self-test function in combination with the dual channel RCM module is only technically useful if both charge control units (EV CC Basic) are monitored by a master control unit with an RS 485 interface. In the time of the self-test it must be ensured that no current flows through the sensor otherwise the sensor can be set incorrectly. Thus, the EV CC Basic units (Slave) in combination with the Master control unit detects if electrical vehicles are connected to the charging station or not, to carry out the self-test. This is done by writing the value "1" to the register 20003 of one of the EVCC Basic charge controller.

3.6 Charging Station with Contactor Monitoring and RCD Trigger

Firmware-Release 1.2.0 or higher

Description

Monitoring of the contactor regarding welded contacts by analysing the position of the auxiliary contacts in relation to the internal state of the charge controller. In case of a contactor failure, an RCD will be triggered by its remote contacts to isolate the socket outlet. The reset condition for this failure is the restart of the charge controller.

Wiring Diagram

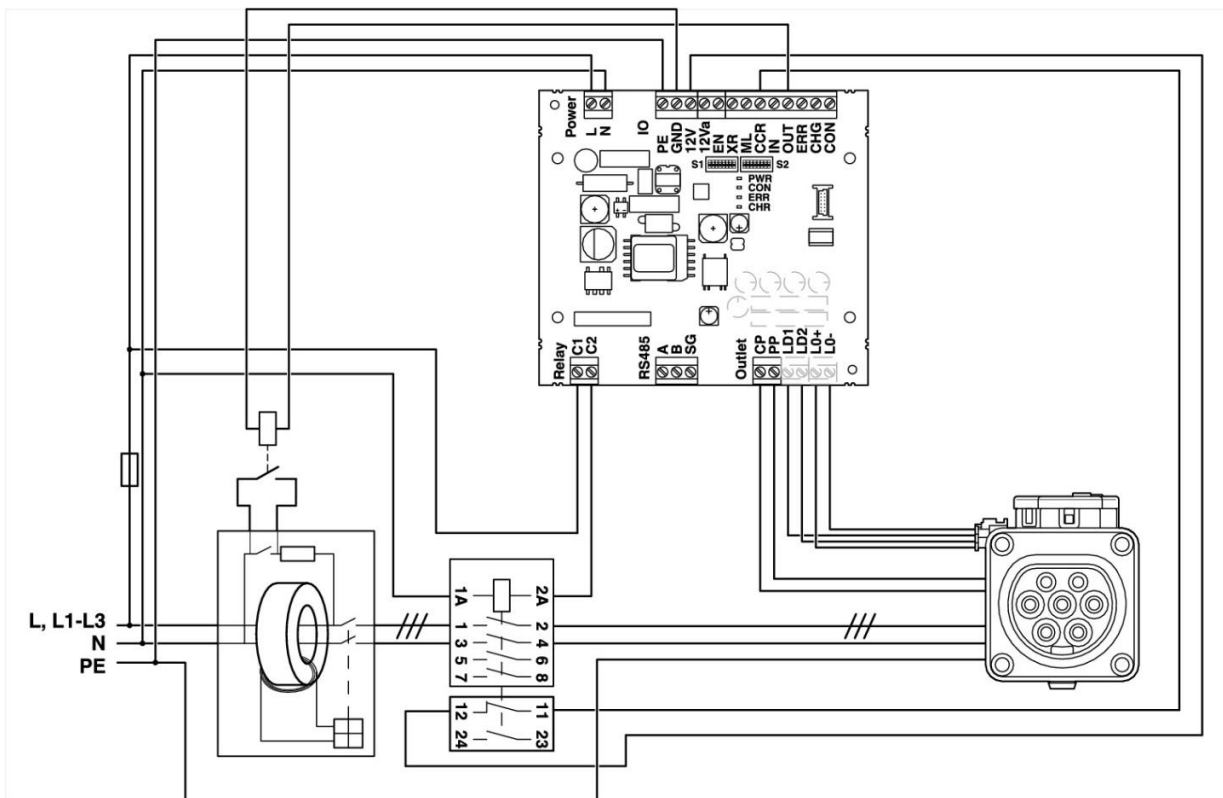


Figure 12: Charging point with contactor monitoring

Part List of core components

| Phoenix Contact Article | Article description | Article number |
|-------------------------------|--|---------------------|
| Charge controller | EV-CC-AC1-M3-xxx | 1622452,-53,-59,-60 |
| Socket outlet | EV-T2M3SE12-3ACxxx | Z.B. 1405214 (32A) |
| Relay | RIF-0-RPT-12DC/21 | 2903371 |
| Optional: EV-RCM | EV-RCM-C1-AC30-DC6 | 1622450 |
| Specific Third Party Products | | |
| Load contactor | Contactor with guided NC (normally closed) auxiliary contact | |

Configuration

| DIP-Switch | Function |
|-----------------|---|
| Modbus Register | |
| 4012 = "0" | CCR function for charging current adaptation is deactivated Vated |
| 4006 = "1" | Charging contactor monitoring via a force-guided N/C contact at the CCR input |
| 4007 = "200" | in ms, Duration between switching off the contactor and eval- uating the auxiliary contact |
| 5500 = "35" | The output is set if charging contactor monitoring has been triggered |

Configuration via the EVCC Device Monitor

| | | | | | |
|-------------------------|----------------------------|---|-------|-----|----|
| WeldedContactDetection | ViaCCR_Enabled | ▼ | Delay | 200 | ▲▼ |
| OUT (Auxiliary Output): | State A/B voltage detected | ▼ | ON | | ▼ |

3.7 Automatic Current Reduction in a Charging Station with two Connection Points

Description

A charging with two connection points, connected to a 32A supply from the mains. If one electric vehicle is charging, the full charging power can be made available for this vehicle. In case a second vehicle is connected, the charging current for both outlets will be reduced to 16A for each vehicle. If one of the cars stops charging (state A or B), the entire charging power will be made available to the other electric vehicle. In order to achieve this, the input CCR (Charge Current Reduction) of the charge controller are configured as analogue input and connected to an output of the other charge controller, which are configured to "State C or D". The CCR input has to be configured to reduce to 16A in case a 12V voltage is detected.

Wiring Diagram

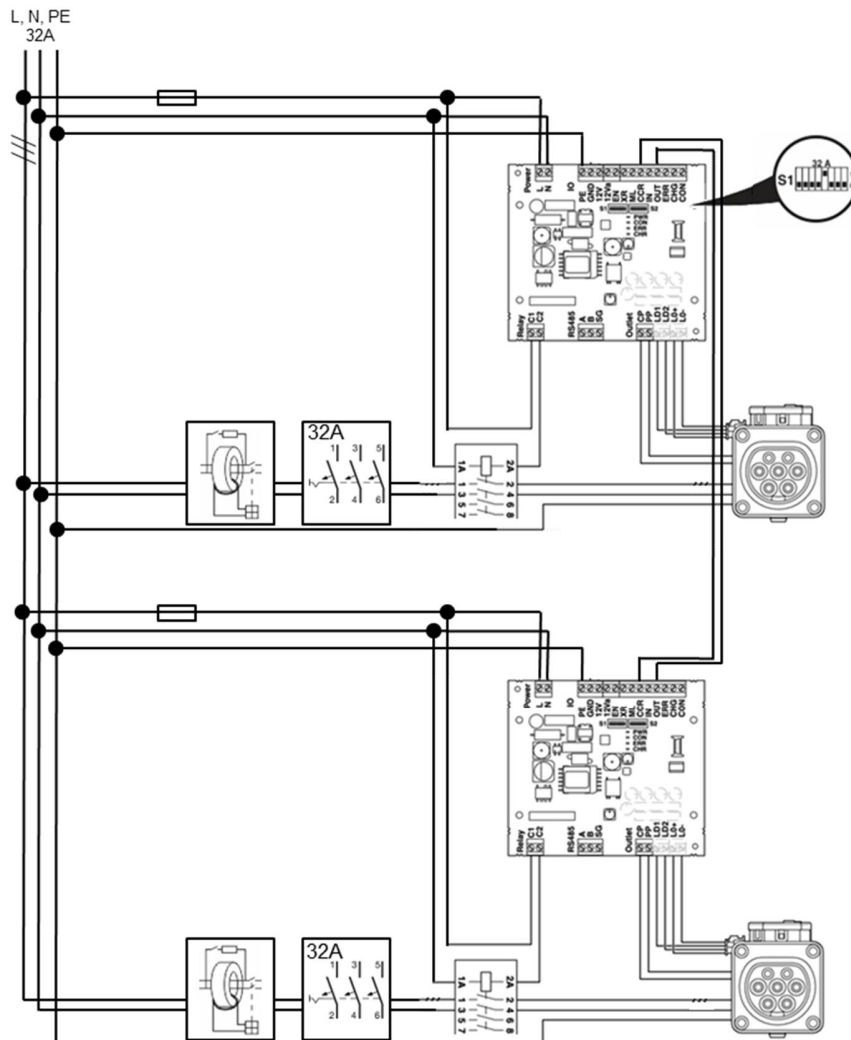


Figure 13: Simple load sharing for two outlets in case of parallel usage

Part List of core components

| Phoenix Contact Article | Article description | Article number |
|-----------------------------------|--|-------------------------|
| 2x Charge Controller | EV-CC-AC1-M3-xxx | z.B. 1622452 o. 1622459 |
| 2x Socket Outlet 32A / 3ph | EV-T2M3SE12-3AC32A-0,7M6,0E10 | 1405214 |
| Alternative: 2x Vehicle Connector | EV-T2G3C-3AC32A-4,0M6,0ESBK01 | 1623505 |
| Optional: EV-RCM | EV-RCM-C2-AC30-DC6 | 1622451 |
| Specific Third Party Products | | |
| 2x Load contactor | Contactor with guided NC (normally closed) auxiliary contact | |
| 2x MCB 32A | Standard electrical installation product | |
| RCD | Typ A (if EV-RCM is used) | |

Configuration

| DIP-Switch | Function |
|-----------------|--|
| S1, DIP 5 | ON = 32A |
| | |
| Modbus Register | |
| 4012 = 2 | CCR Input configured as analogue input |
| 4013 = 20000 | Theoretical threshold value of 20V for the reduction to 6A |
| 4014 = 500 | Threshold value of 100mV or less, maximum power available |
| 4015 = 1 | Update cycle for the analogue input |
| 5500 = 37 | Output OUT is "high" in state C oder D |

The configuration is identically for both charge controller

Configuration via the EVCC Device Monitor

| | | |
|--------------------------------|---|-------------------|
| EN (Enable): | DigitalInputPulsed | |
| XR (External Release): | Always | |
| | Analog | upper value 500 |
| CCR (Charge Current Reduction) | | lower value 20000 |
| | | RefreshCycle 1 |
| IN (Auxiliary Input): | WithoutPullup | |
| Locking Mode: | AutomaticInStateB | |
| State D Mode: | StateDNotAllowed | |
| RCMConfig: | ViaXR_AutomaticResetEnabled_AutomaticFunctionTestEnable | |
| WeldedContactDetection | Disabled | |
| OUT (Auxiliary Output): | State C or D | ON |



3.8 Connection of a Socket Outlets with Third Party Locking Actuator

Description

Connection of a socket outlet with a third party locking actuator, e.g. from Hella. Hella locking actuators are equipped with a three pole connector and inverted detection logic.

Wiring Diagram

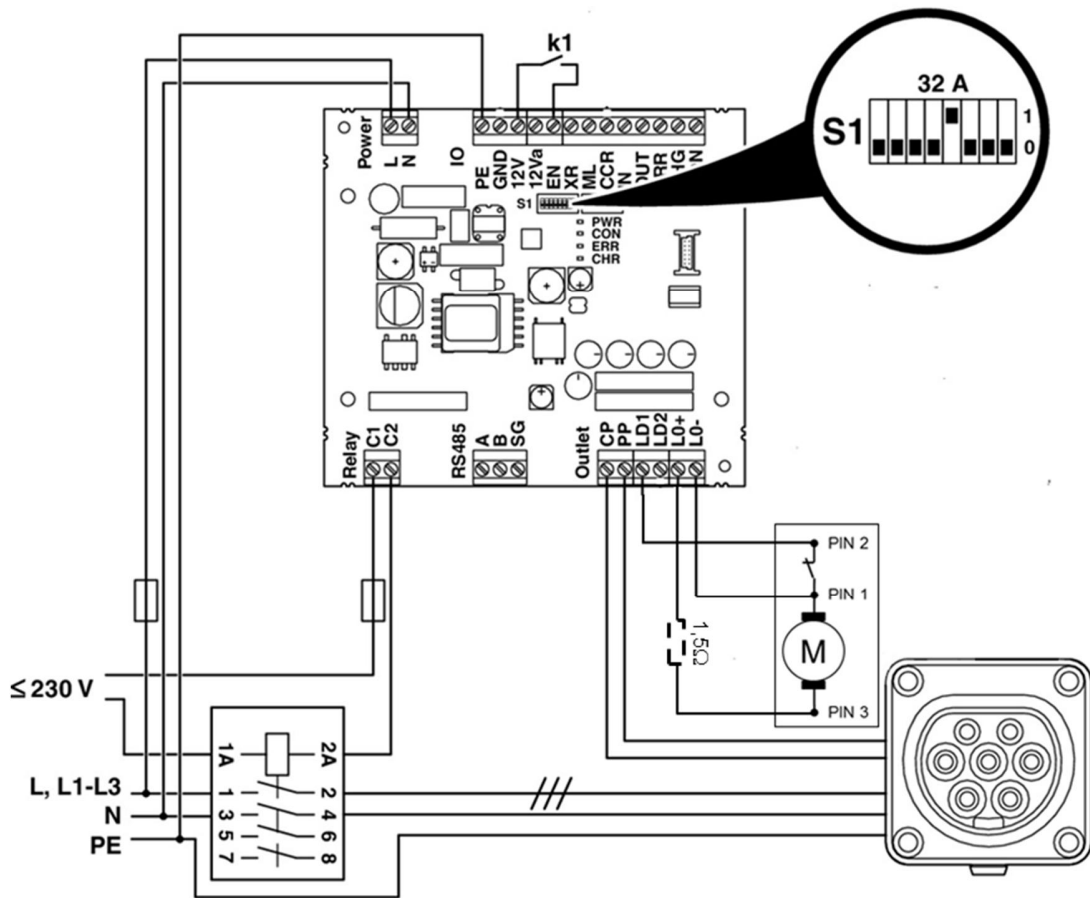


Figure 14: Charging point with socket with third party locking actuator

Part List of core components

| Part | Article description | Article number |
|------------------------|--|--------------------|
| Charge controller | EV-CC-AC1-M3-xxx | 1622452 o. 1622453 |
| Optional: EV-RCM Modul | EV-RCM-C1-AC30-DC6 | 1622450 |
| Third Party Products | | |
| Socket outlet* | Third Party with Hella actuator | Hella 8961-07 Q01 |
| Load contactor | Standard electrical installation product | ----- |
| RCD | Typ A (if EV-RCM is used) | |

**In order to reduce inrush currents of the third party socket outlet, it may be necessary to reduce this current by applying a resistor of ~ 1,5 Ohm*

Configuration

| DIP-Switch | Function |
|-----------------|--|
| S1, DIP 5 | OFF = 16A, ON = 32A |
| Modbus Register | |
| 7001 | = "300": Switching time in ms |
| 7010 | = "0": Closed switch (0 Ohm) in state "unlocked" |
| 7011 | = "65535": Open switch (∞ Ohm) in state "locked" |

3.9 Switching between Different Supply Circuits (32A / 20A)

Description

Depending on the detected charging cable (Proximity contact), the charge controller can switch between different power supply circuits. Thus overload of the charging cable can be avoided, if a car draws higher energy than the capacity of the charging cable

Wiring Diagram

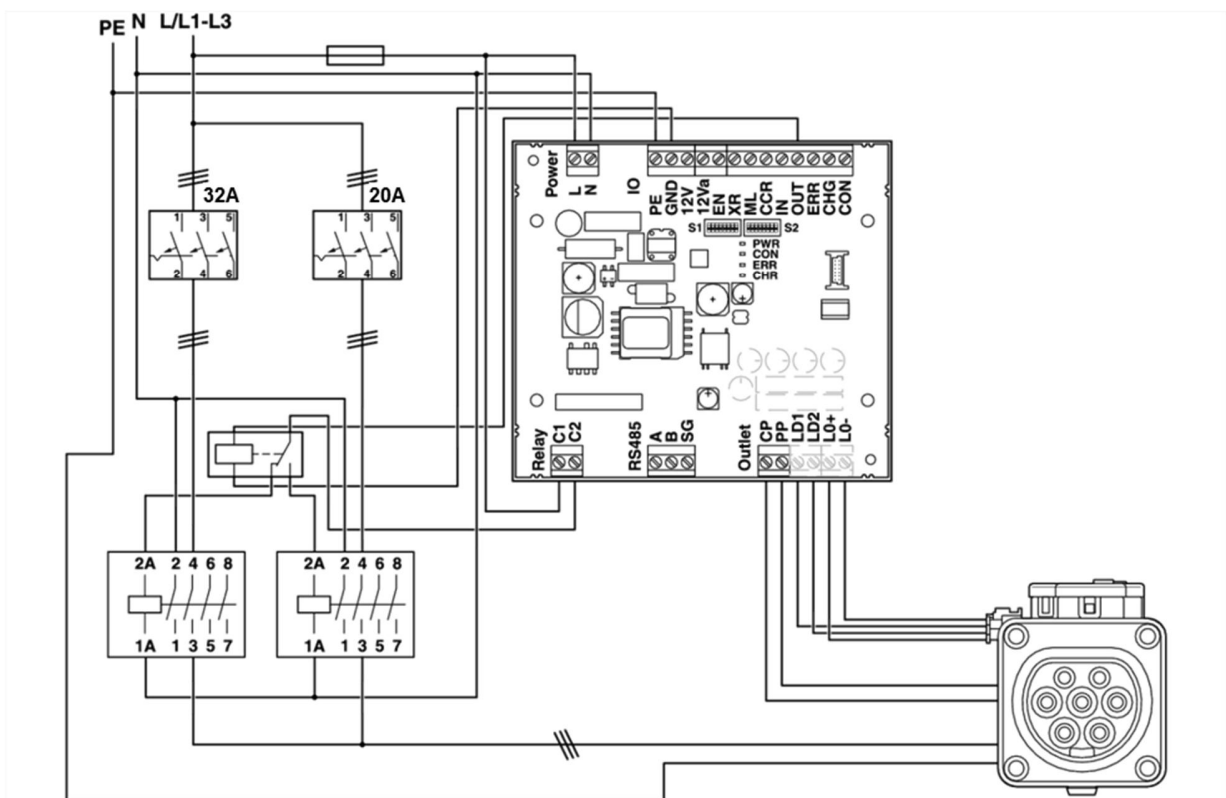


Figure 15: Switching between two differently protected supply circuits (32A / 20A)

Part List of core components

| Part | Article description | Article number |
|-----------------------------|--|------------------------|
| Charge controller | EV-CC-AC1-M3-xxx | 16224-52, -53, -59,-60 |
| Socket Outlet | EV-T2M3SE12-3AC32A-0,7M6,0E10 | 1405214 |
| Relay | RIF-0-RPT-12DC/21 | 2903371 |
| Optional: EV-RCM | EV-RCM-C1-AC30-DC6 | 1622450 |
| Third Party Products | | |
| 2x MCB 20A + 32A | Standard electrical installation product | |
| 2x Load contactor 20A + 32A | Standard electrical installation product | |
| RCD | Typ A (if EV-RCM is used) | |

Configuration

| DIP-Switch | Function |
|-----------------|--------------------------------------|
| S1 DIP 4 | Reject 13 A cables |
| S1 DIP 5 | 32 A preset charging station |
| Modbus Register | |
| 5500 = 21 | 20A plug detected at Proximity input |

Release Requirements: none

Configuration via the EVCC Device Monitor

| | | | |
|-------------------------|--------|------|---|
| OUT (Auxiliary Output): | PP 20A | ▼ ON | ▼ |
|-------------------------|--------|------|---|

3.10 Charging Station According to GB/T 20234 (China)

Description

For the charging according to GB/T 20234, the proximity in the plug is a 0 Ohm connection between the Proximity and the PE. The wiring according to GB/T is optionally.

Wiring Diagram

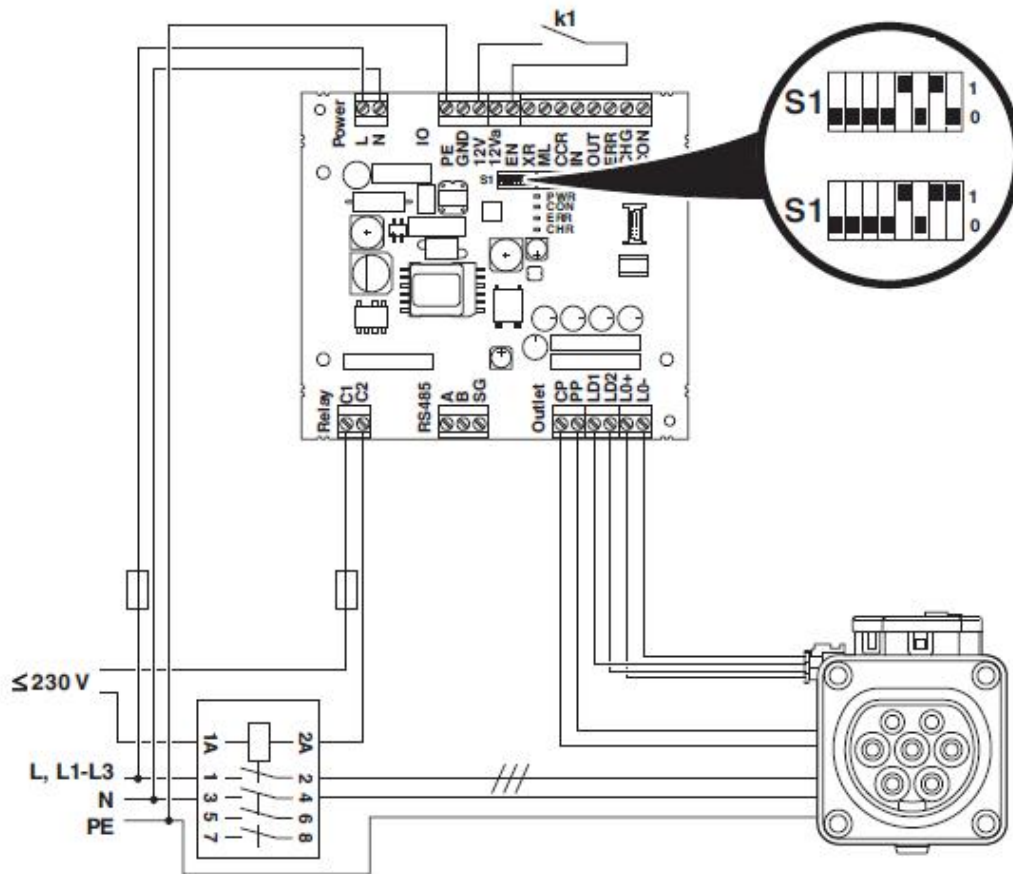


Figure 7: Charging point with socket outlet according to GB/T

Part List of core components

| Part | Article description | Article number |
|-------------------------|--|--------------------|
| Charge controller | EV-CC-AC1-M3-xxx | 1622452 o. 1622453 |
| Socket outlet 32A / 3ph | Without / with locking actuator | 1408170,-72 |
| Third Party Products | | |
| Load contactor | Standard electrical installation product | |

Configuration

| DIP-Switch | Function |
|-----------------|--|
| S1, DIP 5 | ON = 32A, OFF = 16A |
| S1, DIP 7 | ON = Proximity detection according GB/T 20234 |
| S1, DIP 8 | OFF= Locking activated; ON=Locking deactivated |
| Modbus Register | |
| | |

Release Requirements: none

