

# EVlink FS Electric Vehicle Simulator NCA93100 User Guide

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

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## Safety information

### NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a Danger safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

### **DANGER**

**DANGER** indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

### **WARNING**

**WARNING** indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.

### **CAUTION**

**CAUTION** indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

### **NOTICE**

**NOTICE** is used to address practices not related to physical injury.

### PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

## About the Book

### Document Scope

You have just purchased an EVlink FS Electric Vehicle Simulator and we thank you.

This user guide aims to give all needed information to test your Electric Vehicle charging station installations using the EVlink FS Electric Vehicle Simulator.

This guide also explains all advanced functionalities available on the tool and useful when doing repair and maintenance on Electric Vehicle charging stations.

Before using this product, please read carefully this guide and keep it for later reference.

### Related Documents

You can download this technical publication and other technical information from our website at [www.schneider-electric.com](http://www.schneider-electric.com).

### User Comments

We welcome your comments about this document. You can reach us by e-mail at [techcomm@schneiderelectric.com](mailto:techcomm@schneiderelectric.com).

## Presentation

### Description

The aim of the EVlink FS Electric Vehicle Simulator is to check functions of the station and some safety features of the electrical installation. You will have to use it when you install or maintain an Electric Vehicle charging station.

The EVlink FS Electric Vehicle Simulator is compatible with EVlink residential and EVlink parking stations (mainly with EVlink charging stations and with charging stations compliant with the IEC61851-1 Ed2.0) and permits to simulate every type of electric vehicle thanks to the equipped Type1 and Type2 inlets. An Instruction Sheet must be left under the lid of the EVlink FS Electric Vehicle Simulator in order to remind the mandatory checks to be done.

The EV Simulator also allows simulating each electric vehicle state to check feedbacks of the station according to IEC61851.

NOTE: The EVlink FS Electric Vehicle Simulator does not monitor the quality of the earth.

### Safety Instructions

#### **DANGER**

##### **HAZARD OF ELECTRIC SHOCK**

- Do not use this device with the IT neutral earthing system.
- Do not dismantle the device to repair it, as it cannot be repaired.

**Failure to follow these instructions will result in death or serious injury.**

#### **NOTICE**

##### **DAMAGE TO EQUIPMENT**

- Do not inject voltage onto the 3 PP and CP sockets.
- Do not stand on the device.
- Use the handle to carry the closed unit.

**Failure to follow these instructions can result in equipment damage.**

**Characteristics**

Standards	IEC61010-1, IEC61851-1
IP	IP54 (IP44 in use)
IK	IK8
Operating temperature	2°C to 50°C NOTE: Real operating temperature compliant to IEC61010-1: -30°C to 50°C. In case of fall at under 2°C, the case could be damaged.
Shock resistance	Up to one meter
Dimension LxWxD (mm)	305x270x170
Weight	6 kg
Autonomy (Power supply)	No limit (energized by tested station with low power <1A)
Socket-inlet	Type 1 and Type 2
Left inlet: Type 1 inlet	IEC62196 type1; U: 230V 1; I: <1A; F: 50-60Hz
Right inlet: Type 2 inlet	IEC62196 type2-II; U: 400V 3~; I: <1A; F: 50-60Hz
Made in	France

**Checks done by EVlink FS Electric Vehicle Simulator**

- Checking voltage presence and connections (phase-neutral inversion).
- RCD trip test.
- Checking the charging cable cross-section for Type2 (EV side).
- Checking the plug/unplug process of the cable for Type1 (EV side).

**Additional Advanced Test Available**

- Checking the control pilot circuit (Measure PWM signal via coaxial plug)
- Simulate every vehicle state according to IEC61851-1 (Requires oscilloscope not included)

**Necessary Additional Equipment**

- Ohmmeter (to check cables)
- Oscilloscope (for check every vehicle station)
- Cables not included in the case (optional purchase or use the driver's cable)

## Operation

### Handling

Open the EVlink FS Electric Vehicle Simulator before using it and follow the Instruction Sheet under the lid of the EVlink FS Electric Vehicle Simulator to test the EVlink station.

### Checking the Connections Test

Make sure that switch Earth Fault is OFF and EV Status on C, if not you will not see any light on the EVlink FS Electric Vehicle Simulator.



Process:

1. Connect the charging station to the simulator inlet Type 1 or Type 2, depending on the type of charging cable connector.
2. Select the type of inlet connected with the "Inlet Selector Type 1 Type 2" switch.
3. Start charging; the contactor closes:  
On a single-phase charging station, "Phase 1" indicator light should light up. If not, recheck the wiring of the charging station.  
On a 3-phase charging station, "Phase 1", "Phase 2" and "Phase 3" indicator lights should all light up with the same level of brightness. If not, recheck the wiring.
4. Press "Test Lamp" button and check that "Neutral-Phase inversion" indicator light lights up.
5. Release "Test Lamp" button: "Neutral-Phase inversion" indicator light should go out. If not, recheck the wiring.



### Plug Measurement (cable side EV)

Connect an ohmmeter to the simulator PP coaxial connector Type 1 or Type 2 (depending on the charging cable connected: Type 1 or Type 2).



Check that the measured resistance value **R** corresponds to one of the R values suggested in the two following tables (depending on the charging cable connected Type 1 or Type 2),  
If not, replace the charging cable. In case of charging station with attached cable, contact the charging station maker.

#### Type1 vehicle connector

Plug Type1	R
Connected to EV Simulator	150 $\Omega$ $\pm$ 10%
Connected to EV Simulator while pushing unlock button*	480 $\Omega$ $\pm$ 10%

\*To check the proper functioning of the resistance in the Type 1 plug, simply press the pushbutton on the plug and the R will change to the new measurement by itself. It's the case when the Type 1 plug is not correctly connected to the Electric Vehicle.

#### Type2 vehicle connector

This test also permits to check the charging cable cross-section (only for Type 2). Its permit you to check if the charging cable can still be used (right resistance for the right cross-section).

R	Ic	$\varnothing^*$
1500 $\Omega$ $\pm$ 3%	13A	2.5 mm <sup>2</sup>
680 $\Omega$ $\pm$ 3%	20A	4 mm <sup>2</sup>
220 $\Omega$ $\pm$ 3%	32A	6 mm <sup>2</sup>

\*Minimum charging cable copper cross-section recommended. The charging cable cross-section is generally indicated on the cable itself.

### Residual Current Device (RCD) Trip Test

Before this test, make sure that the RCD is accessible (you will have to reset RCDs).

To test the triggering of the RCD in case of error, a switchable leakage current (> 30 mA) is created. This leakage current is conducted from L to PE via an integrated resistance. The leakage current is created by pressing the Test Diff pushbutton. The protective device has to trigger and the charging process should be interrupted directly.

For 3- phase installation, you must test each phase by switching the Selector Phase after restarting charging and pressing the Test Diff pushbutton again.

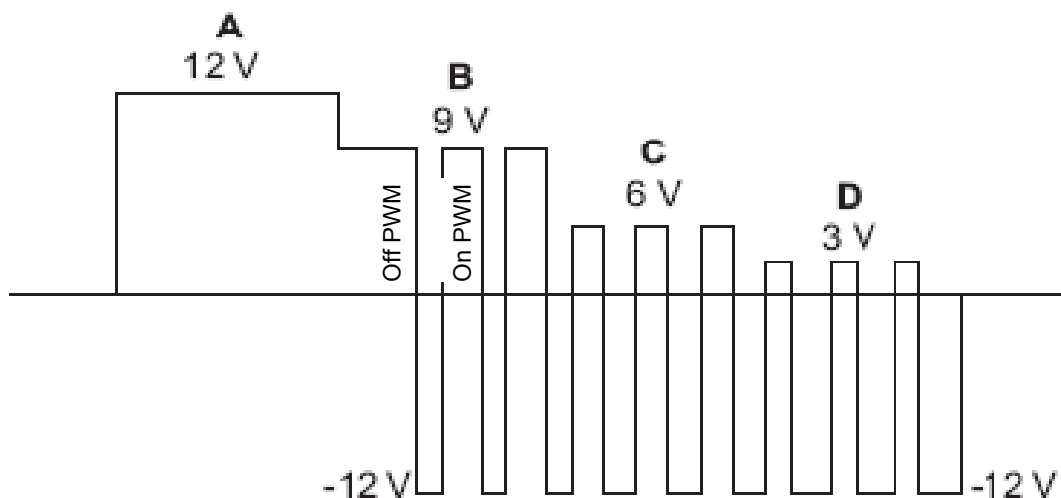
If tripping doesn't occur during one of the tests, replace the RCD.

### Check the Electric Vehicle State (Advanced Check)

1. Connect the charging station with the EVlink FS Electric Vehicle Simulator as described in the first part of the Instruction Sheet.
2. Connect an oscilloscope to the CP coaxial connector
3. Follow step of the table below to check EV state:

Switch position on simulator		Electric Vehicle State	Oscilloscope (PWM)	
Switch Earth Fault	Switch EV Status		Voltage on oscilloscope	PWM: Off or On
ON	B	A = EV not connected to charging station	12V ±1V	Off
OFF	B	B = EV connected to "charging station not ready"	9V ±1V	Off
		B = EV connected to "charging station ready"		On
OFF	C	C = EV Charging (without ventilation required)	6V ±1V	On
OFF	D	D = EV charging (with ventilation required by EV)	3V ±1V	On

\* The PWM signal could be On or Off, if the measured voltage in one of the 4 states is incorrect, contact Schneider Electric EVlink support. The Electric Vehicle State B could be skipped in case of Simplified Mode 3.



## Maintenance

### Cleaning

Before any cleaning operation, unplug the EVlink FS Electric Vehicle Simulator from the charging station and check that both socket-inlet (Type 1 and Type 2) are closed. We recommend cleaning the EV Simulator with a soft and dry cloth. Never use abrasive pads or detergents.

 <b>CAUTION</b>
<b>RISK OF DAMAGE TO EQUIPMENT</b> <ul style="list-style-type: none"><li>• Do not spray the EVlink FS Electric Vehicle Simulator.</li><li>• Do not clean the EVlink FS Electric Vehicle Simulator when is plugged to an EVlink charging station.</li></ul> <b>Failure to follow these instructions can result in injury or equipment damage.</b>

## Troubleshooting

### Troubleshooting Help

If you have any doubt on the proper functioning of the EVlink FS Electric Vehicle Simulator, this does not necessarily mean that there is a breakdown.

Symptom	Potential causes	Action / remedy
Green lights do not light when EV Simulator is plugged	Charge not launched from the charging station	Launch the charge
	Connection problems	Check the charging cable connections
	RCD could be tripped	Rearm the RCD and if another RCD tripping occurs, please check the electrical installation
	Charging cable could not be plugged properly or could be broken	Try to plug your charging cable again or replace the charging cable
	LEDs could be defective	Please contact the Schneider Electric customer support
Neutral-Phase inversion LED light when Test lamp pushbutton not pushed	Connection inversion between one phase and neutral	Check the charging station connection to the network

### Interventions

Risk of electric shocks, electric arcs or burns, do not attempt to unscrew the simulator plate. Failure to follow these instructions will result in damage or injury.

The EVlink FS Electric Vehicle Simulator doesn't contain any parts that can be repaired or maintained by the user. Possible maintenance on your equipment should be undertaken by qualified personnel. When you call the Schneider Electric customer support, state the full reference of your equipment (model, commercial reference, serial number). This information appears on the EVlink FS Electric Vehicle Simulator.

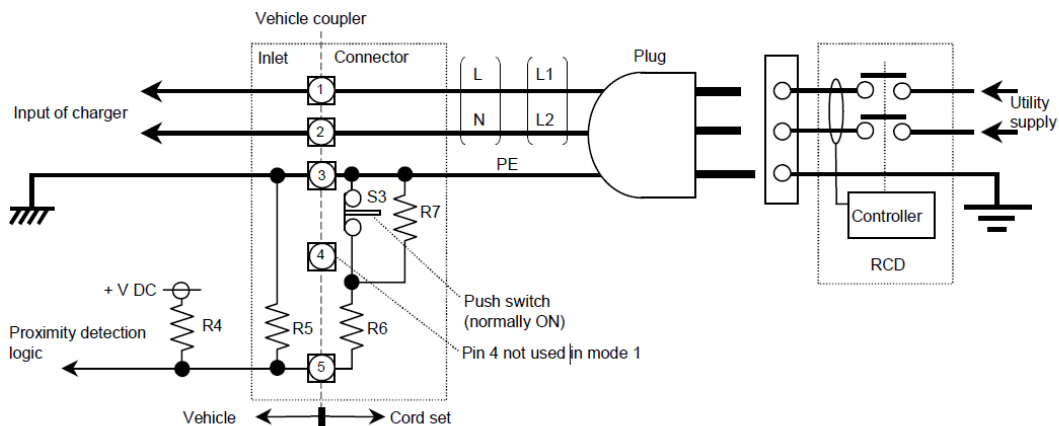
### Schneider Electric Customer Support

To access to the Schneider Electric customer support, please contact your EVlink country contact.

## Appendices

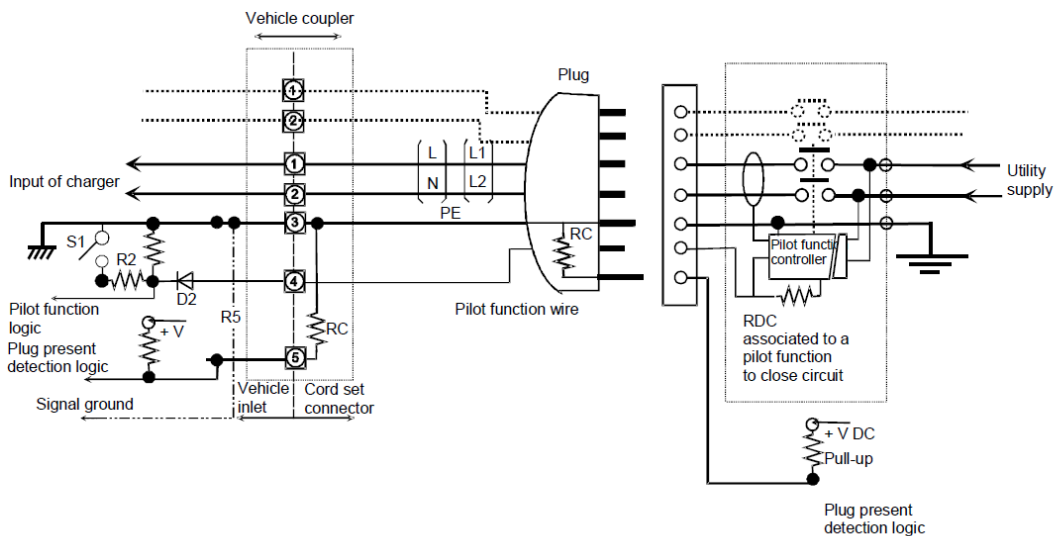
All following appendices are taken from the IEC61851-1 Ed.2.

### Appendix 1: Type 1 Vehicle Connector



IEC 2380/10

### Appendix 2: Type 2 Vehicle Connector



IEC 2384/10

**Appendix 3: Component Values for Type 1 Vehicle Connector and Type 2 Vehicle Connector Drawings**

This appendix permits to understand resistance values of the two appendices above.

	Value	Tolerance
R1, R2, R3	As defined in tables A.1 and A.2	
R4	330 $\Omega$	$\pm 10\%$
R5	2700 $\Omega$	$\pm 10\%$
R6	150 $\Omega$	$\pm 10\%$
R7	330 $\Omega$	$\pm 10\%$
+ V DC	Low voltage supply A + 5 V DC regulated supply is recommended.	



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*As standards, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.*

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