1. Introduction

ABB Terra 53 series EV fast chargers are equipped with an 8" daylight readable touch screen for user friendly operation under all conditions. This document shows the screens of the Human-Machine Interface (HMI) step by step throughout the charging process.

The screens in this document are from the Terra 53 CJG, which is the most extensive variant of the Terra 53 series. The other Terra 53 series chargers have a similar HMI, on which only the supported connectors are shown.

For readability, the screens in this document are limited to the *happy user flow* in which all events are successful (example: successful authentication, instead of RFiD card not listed). The full HMI on the charger also contains screens for all possible exception conditions.

User centered design

The user interface design was thoroughly evaluated with user groups to optimize understandability and to get the best user experience. Next to the standard screens needed for the charging process, the interface has *help* screens to provide additional information.

For easy identification, the connector holders are marked with multiple, redundant identification marks: a unique color, a number and a textual description. These marks match with corresponding marks shown on the touch screen interface, as is illustrated in Figure 2. The color selection takes into account the majority of color blind people, and readability in poor lighting conditions.
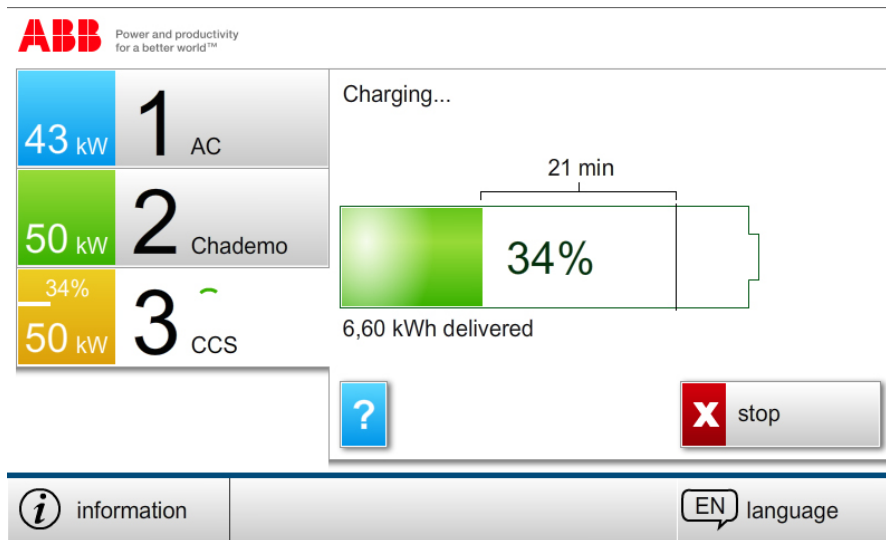

Figure 1: Terra 53 CJG

Figure 2: Markings on the connector holders match with the HMI for clear identification of the outlets

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2. Overview of HMI screens

2.1. Arriving and connecting

The user arrives at the charger and is prompted to select which connector he is going to use. All outputs are available. The *information* tab provides additional information, which can be modified by the charging station owner. The *language* tab allows for selecting a different language.
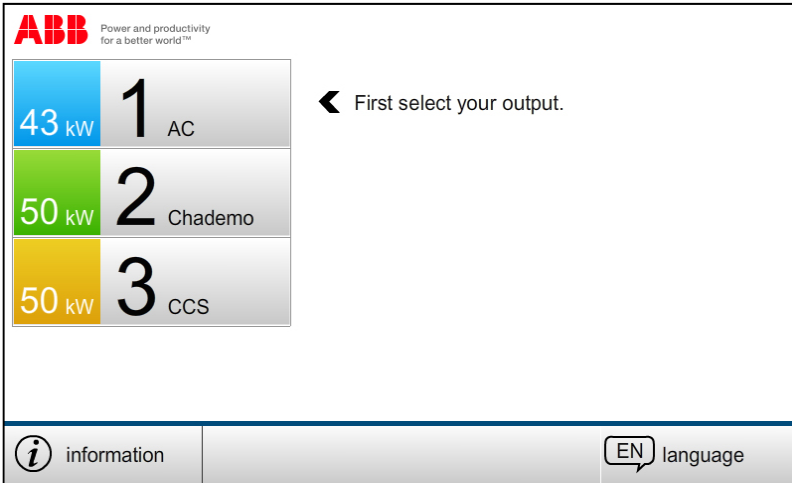
**Outlet 3 selected** (the "?" button toggles a help menu)
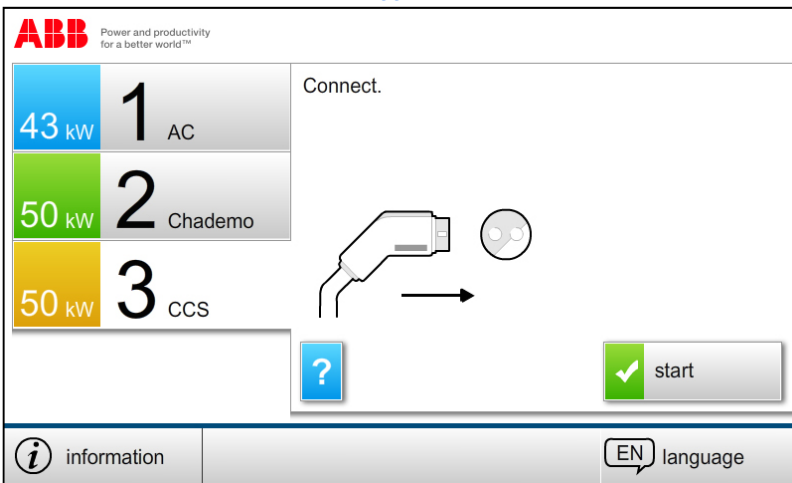

The user has connected his vehicle
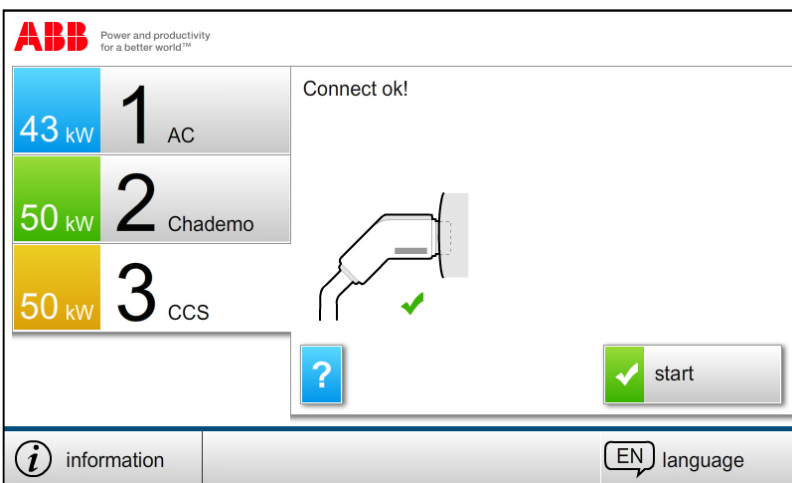
2.2. Authentication

After connecting and pressing *start* the user is prompted to authenticate. (Authentication can be disabled if required.) The Terra 53 supports authentication via RFiD, PIN or remote authentication via OCPP – for example via a smart phone app (not illustrated in this manual).
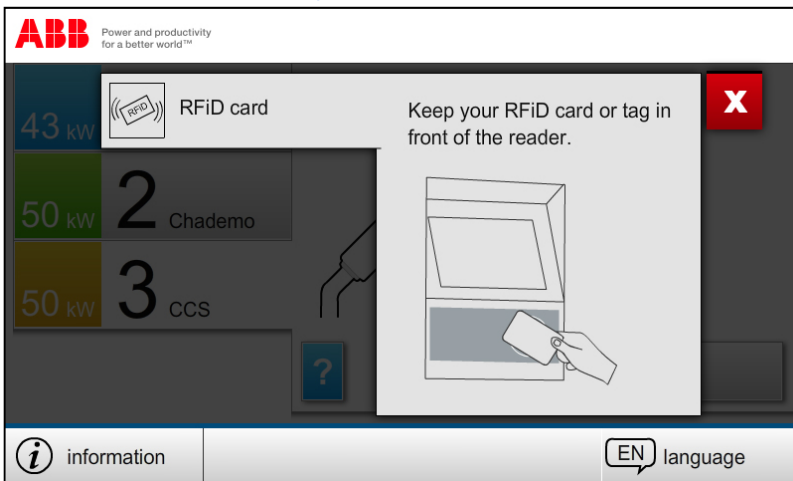
Authentication via RFiD or PIN – PIN selected
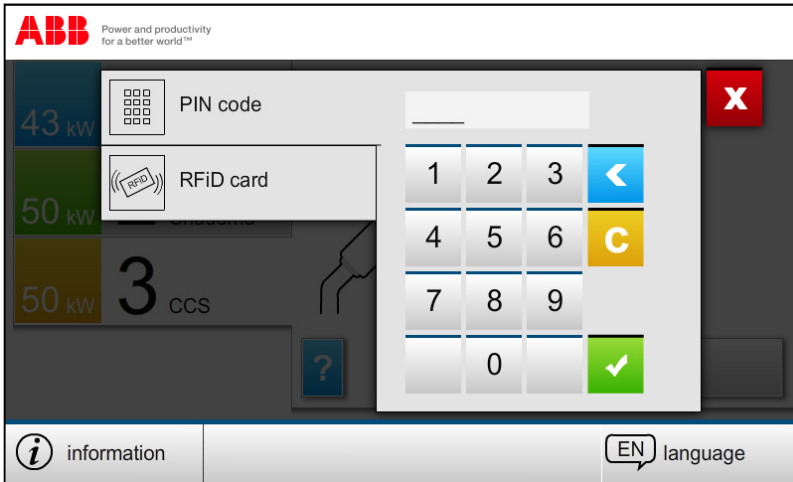
Authentication via RFiD or PIN – RFiD selected
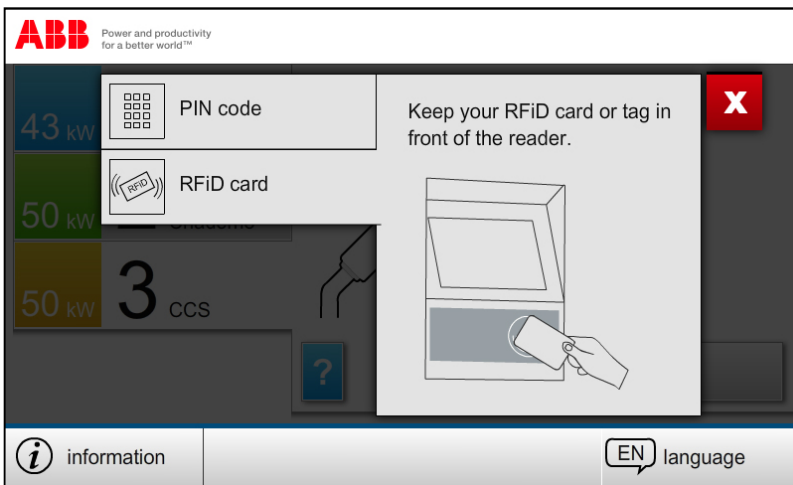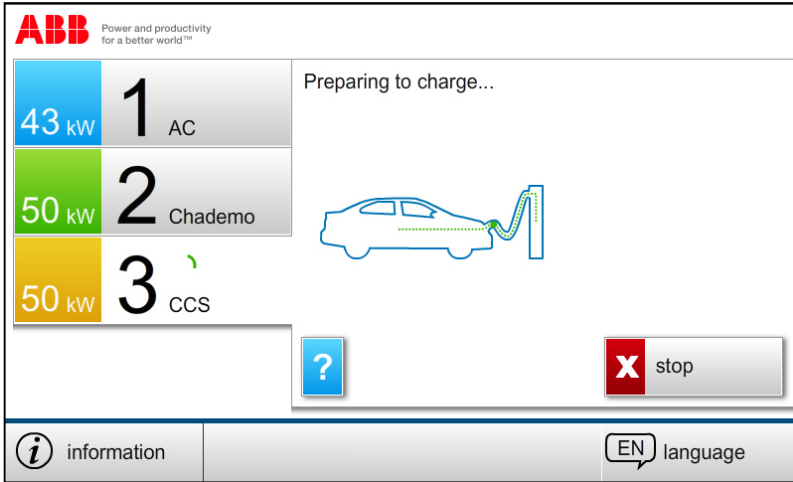

Authentication via RFiD only

2.3. Charging

After successful authentication the connector is locked and pre-charge checks are performed. No user input is required.
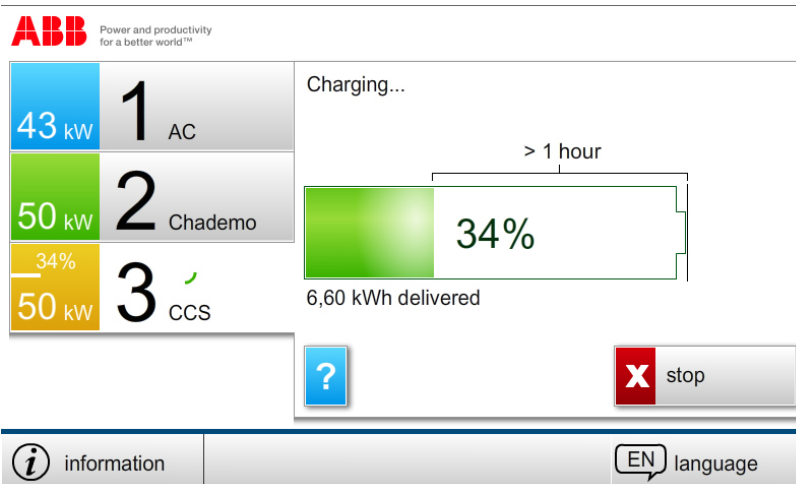

Charge time prediction

During charging the charger will display the State of Charge (SoC) and the predicted remaining charge time, if made available by the car. Depending on the type of car, the charger will have different information on the predicted charge time. If no time prediction is available (always in AC charging), the charger will show elapsed time.
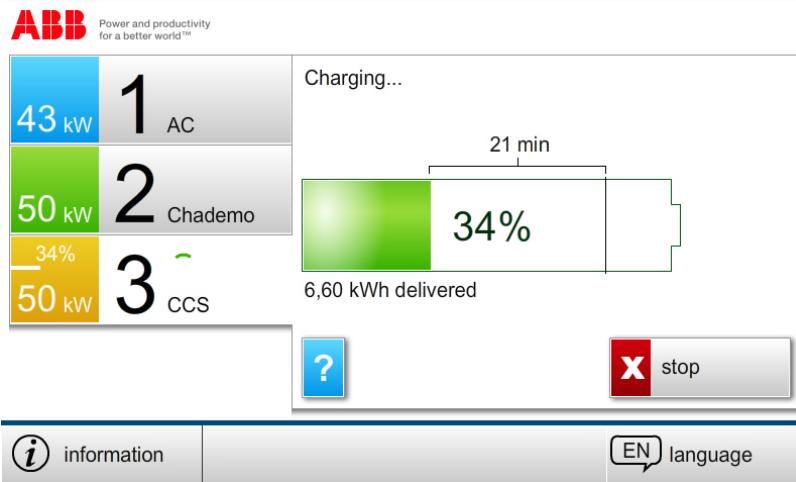

Vehicle predicts charge time until the end of fast charging (usually 80-90% SoC). This is the most accurate prediction, and most useful information to the driver.

(Note: Charging power ramps down when the battery is getting fuller. As a result, charging to 100% takes very long, while charging to 80-90% is relatively fast.)

Vehicle predicts charge time until 100% SoC. (The driver will be familiar with the charging performance of his vehicle, and know the time to 80-90% SoC will be much shorter.)
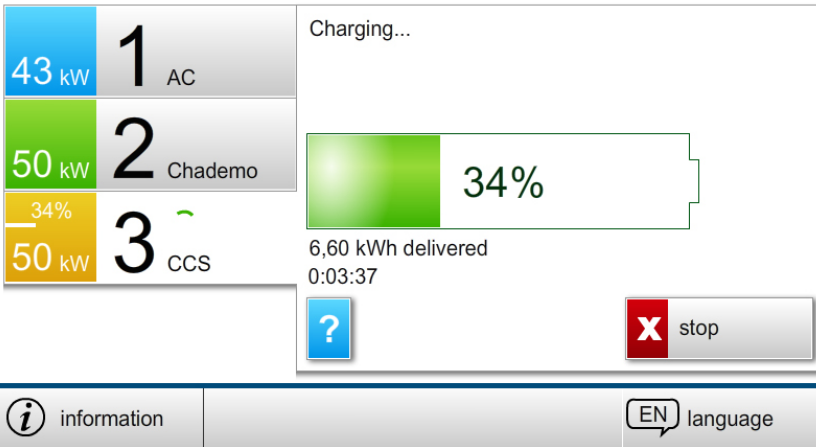
Vehicle provides no charge time prediction. In this case the charger shows the elapsed time.

Automatic log out

With the charge session continuing, the expanded window showing outlet 3 will close after some time. Charging proceeds and the progress is shown on the left side. The detailed view can be opened any time. This does not require authentication, so the information is also available to other drivers.
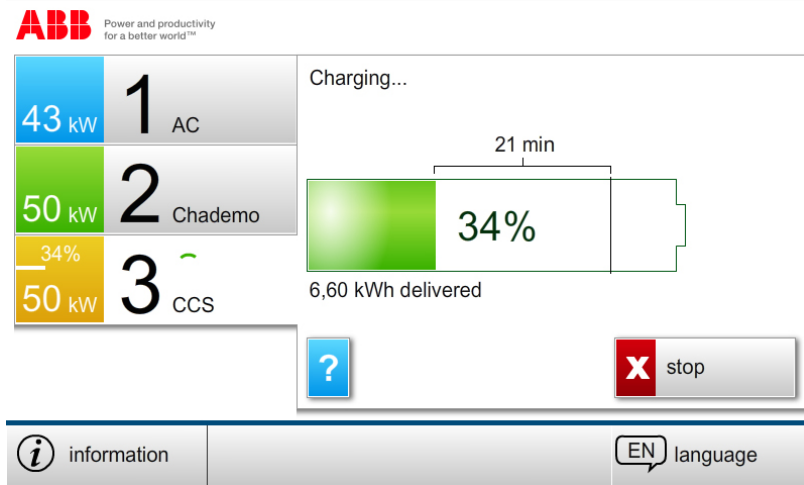
2.4. Stopping a charge session

To stop a charge session, the user selects his outlet to get the detailed view, and presses the *stop* button. The charger responds with the authentication window: a charge session can only be stopped by the user who started the session.

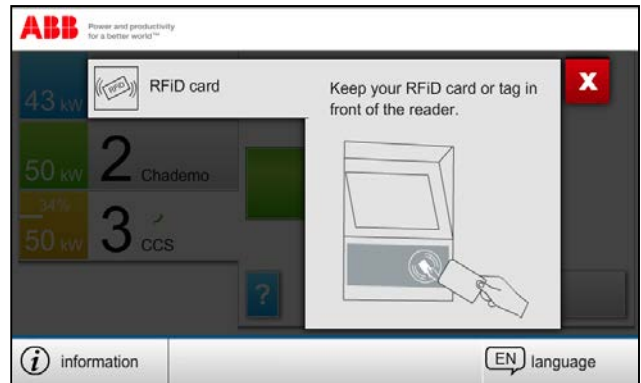*NOTE: Charging on all outlets can always be stopped immediately by pressing the emergency button.*

Start screen – user selects outlet 3
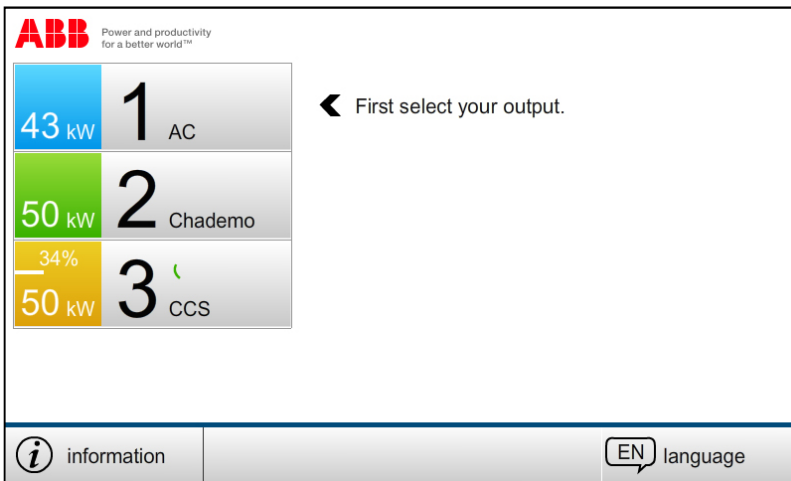
**Detailed view on Outlet 3 – User presses the *stop* button**

Authentication by PIN or RFiD – depending on how the session was started. The session can only be stopped by the user who started the charge session.

2.5. After charging

After a charge session is finished or stopped by the user, the charger shows the final state of charge of the battery. After pressing the OK button, the user is asked to put the connector back in to the connector holder.

Charging is stopped by the user (left) or finished by the vehicle (right)
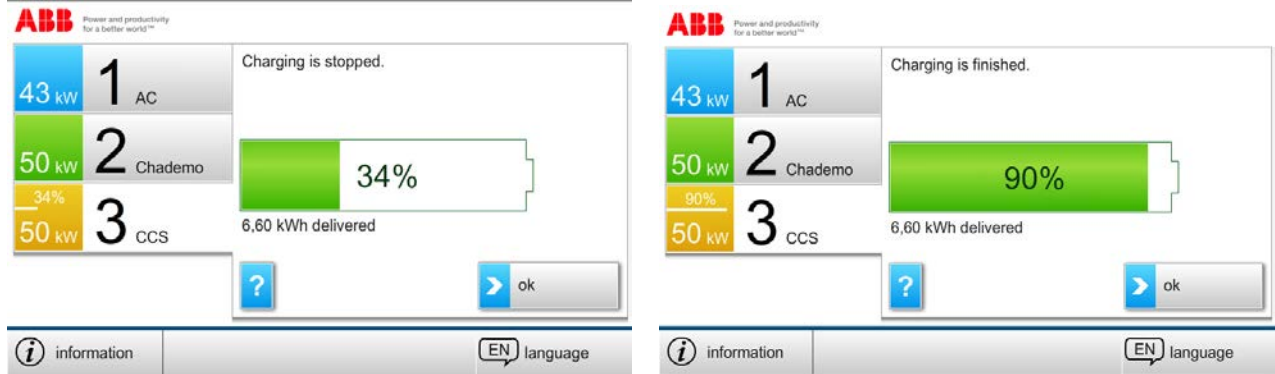
**User is asked to put the connector back in to the connector holder**
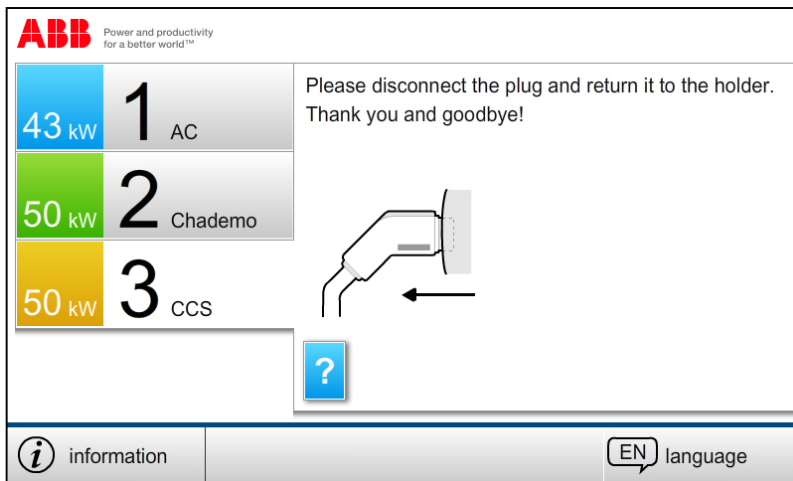
2.6. Second user

The Terra 53 CJG support simultaneous AC charging (Type 2, mode 3) and DC charging (either CCS or CHAdeMO). With one session running, a next user can select one of the remaining outlets and start charging.

Simultaneous charging on two DC outlets is not possible. Instead, the second charging session starts after the first charging session has finished. The behavior of the charger depends on whether a CCS or a CHAdeMO car is the second car to arrive.

If a CCS car is charging, a CHAdeMO car can already connect to the other outlet and press start. Charging will start automatically as soon as the Combo car finishes. The user is informed in the help text (available by a button press on the screen) that he can already connect the car and press start.

If a CHAdeMO car is charging and a CCS car arrives, the CCS car will have to wait for the CHAdeMO car to finish before a CCS session can be started. The Combo car does not support starting already. The user is informed in the help text.

Charger informs the user that there is no power available for his charge.
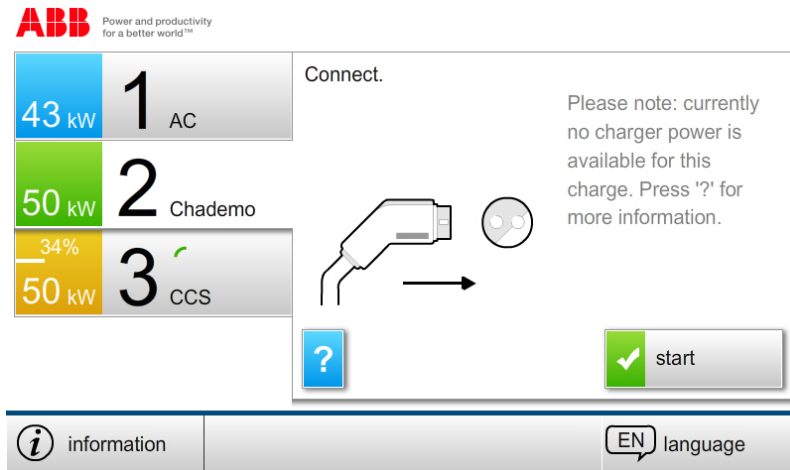

2.7. Emergency stop

Charging on all outlets can be stopped immediately by pushing the red emergency button. The voltage output to the car(s) is stopped, but the control systems and user interface remain operational. The user interface will show a warning that charging was stopped because the emergency stop button was pressed.

The emergency button can be reset by the user himself by twisting the button. The charger then performs a self test to ensure the system is safe. After a successful self test the charger becomes operational again.
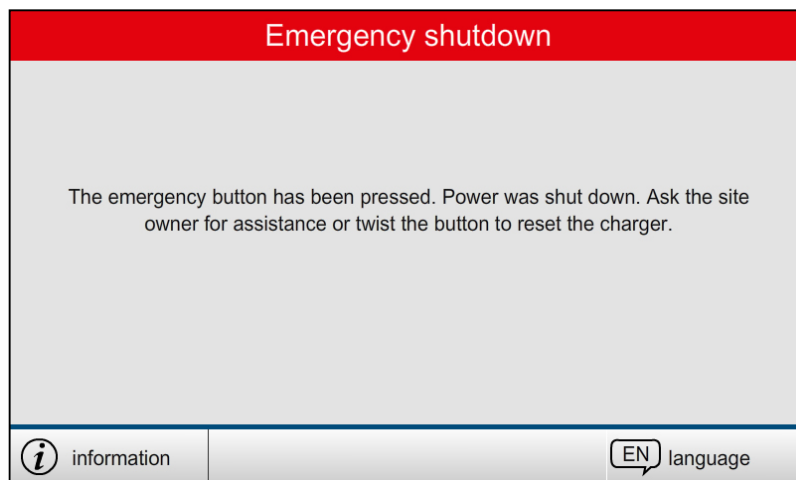
2.8. Out of order
In case a charger faces a problem it shows the *Out of order* screen.
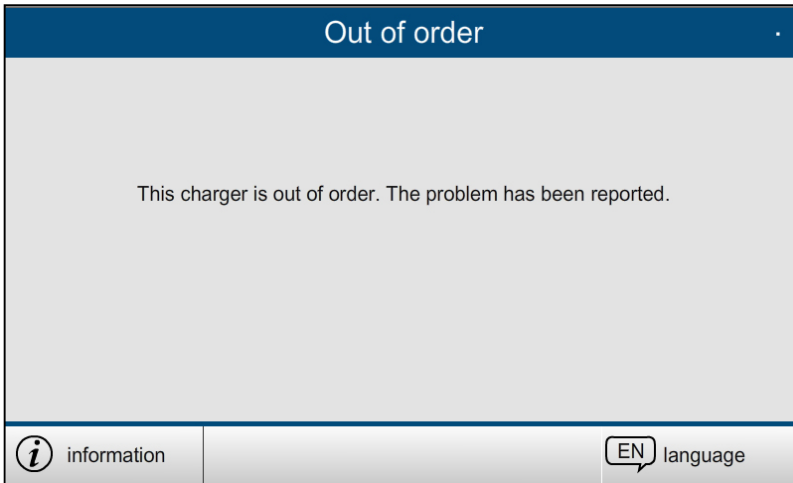
3. Customization
The logo of the charge station owner can be placed in the top-right corner.